Values by Design Imaginaries: Exploring Values Work in UX Practice

By

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Abstract

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Recognizing the prevalence of initiatives to align technology with social values through design and "by design" (such as privacy by design, security by design, and governance by design), this dissertation explores the current and potential role of design techniques in attending to values, and analyzes user experience (UX) professionals' "values work" practices—practices used to surface, advocate for, and attend to values—within large technology companies.

The first part of the dissertation interrogates the relationship between values and design practices, looking at privacy as a case study. A review of human computer interaction literature about privacy and design suggests the importance of thinking about the *purpose* of design, *who does* the work of design, and *on whose behalf* is design work done. In order to better understand how design in the service of "values work" could be used towards purposes of exploration, critique and speculation, I create a set of speculative design fictions depicting a range of fictional products that suggest different sets of privacy harms. These designs serve as way to surface and foster reflection on values. The success of this design intervention in a laboratory setting sparked interest in understanding whether and how design approaches were used in values work within the technology industry.

The second part of the dissertation seeks to understand the practices and strategies of UX professionals who already see addressing values as a part of their practice. I conducted interviews with UX professionals working at large technology companies, and field observations at meetups in the San Francisco Bay Area about technology design and values. These UX professionals report doing values work as a part of everyday configurations of UX work, such as when designing interfaces or conducting user research. More strikingly, UX professionals also report on engaging in a range of other activities aimed at shaping the organization, rather than a technical product or system. These practices are used by UX professionals to re-configure how values work is conducted at their organizations in several ways: by making more space for UX professionals' values work; by getting others in the organization to adopt human-centered perspectives on values; and by changing the politics and strategies of the organization regarding values. Moreover, UX professionals' values work practices occur within relations and systems of power. UX professionals often engage in tactics of soft resistance, seeking to subtly subvert existing practices towards more values-conscious ends while maintaining legibility as conducting business-as-usual within the organization. Together, these values work practices create social and organizational infrastructures to promote an alternative sociotechnical imaginary of large technology companies in a way that views these companies and their workers as more cognizant,

proactive, and responsible for identifying and addressing social values, in particular reducing harms to users and other stakeholders.

The last part of the dissertation reflects on the politics of using speculative design techniques in the service of values work. Experiences sharing speculative designs with others who interpreted the designs in ways that do not recognize their speculative, critical, and reflective nature, raises questions about how speculative design can be re-appropriated by or co-opted towards the very ends that are being critiqued and reflected upon. One approach to this dilemma might be to conduct speculative design work with and for specific groups of stakeholders, instead of for broad public discussion. Another approach might be to create *organizational fictions* that focus a designer's and viewer's attention more on practices and social relationships, compared to traditional speculative designs that focus attention on fictional products. Informed by the practices of UX professionals involved in values advocacy, the dissertation concludes by suggesting a new purpose for design, *design for infrastructuring imaginaries*, to complement the social practices of values advocacy. I reflect on the politics of choosing design as a mode of action when conducting values work, and reflect on implications that this work has for values in design researchers, practitioners, and stakeholders.

To my parents for their love, care, and support.

I'm glad to finally fulfill the statement engraved in a brick that sits with my name on it somewhere in an elementary school courtyard in Illinois, reading "Writer to be, Class of 2003."

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Chapter 1: Introduction – The Work of Design in Values; and Values in Design Work

Recent public discussions about the intersection of technologies and social values call for greater consideration of social values in technology development and deployment. These calls recognize technical artifacts and their development processes as potential sites of contestation and intervention. The desire to see technology companies address social values has been surfaced in new ways, in part due to regulatory forces (e.g., the California Consumer Privacy Act and the EU General Data Protection Regulation), public scandals like data breaches or systems that cause harm to marginalized communities, as well as technology worker actions such as walkouts and letter writing. These efforts enlist technical artifacts and practices related to their production as sites of intervention to promote, protect, or embed social values. The range of social values at stake range from concerns about privacy and fairness in data collection and use, to the potential harms of algorithmic categorization and decision making, to the potential for platforms to enable action based on racial biases or spread misinformation, to manipulation of users' behavior using data or dark design patterns, to corporate contracts with militaries and governments perpetuating harms, to the need for greater diversity and inclusion within technology companies' workforces. The location of the values problem varies across these concerns. For instance, some concern the design of technical products themselves, some focus on the ways in which technologies are used, and others focus on the people and organizations creating technical artifacts.

Interdisciplinary research under the rubric of "values in design" has long been interested in how technological artifacts promote or embed social values, and how technology designers' practices and beliefs affect these artifacts (Flanagan, Howe, and Nissenbaum 2008; Winner 1980; Latour 1989; Akrich 1992; Nissenbaum 2001). Values in design research in Science & Technology Studies (STS) and adjacent fields has sought to analyze how social values are implicated in practices of technology design, creation, use, maintenance, and repair (Nissenbaum 2005; Shilton 2013; Jackson 2014). Parallel research from the human computer interaction (HCI) and design research communities has offered a range of design approaches to develop technical systems in ways that are cognizant of values and center their promotion as a core goal of design (Dourish et al. 2004; Knobel and Bowker 2011; Friedman, Kahn, and Borning 2008; Sengers et al. 2005). However, these approaches have had limited adoption in industry design and engineering practice.

There remains a need for research about how design approaches can be used in relation to values, and how these design approaches might scaffold or build onto existing ways in which values in design is practiced in the technology industry. Shilton's concept of values levers provides a useful lens to consider how values rise to the surface in technical practices among academic research groups (Shilton 2013). This dissertation tackles the follow-on questions, investigating: how are values are raised in corporate design practices? Once surfaced, how are they acted upon (or not acted upon)? How could existing design practices serve as "scaffolds" for more explicitly values oriented design practices? Finally, this project also includes the development of values-oriented design tools to better understand the role they might play in values work.

Two brief vignettes from my own research experiences help motivate this research.

Vignette 1: "Design" In Privacy by Design

In the summer and fall of 2014, I became particularly interested in the public discourse surrounding privacy concerns of the newly-released beta version of Google Glass. My initial reaction to Google Glass was to see it through the lens of design, influenced by my undergraduate background in Science & Technology Studies and Information Science, particularly through my exposure to critically oriented design methods (Pierce et al. 2015). The potential privacy hams of unwanted intrusion and unknown recording seemed readily apparent when viewing promotional material from Google, and it seemed that a range of design methods from value sensitive design, to speculative design, to participatory design with users would have surfaced those issues. This suggested to me that changes to design *processes and practices* could help surface and avoid potential privacy harms earlier in the design process, before the actual deployment of a new technology. Early research I conducted investigated corporate concept videos of Google Glass as a case study to show how early design representations could be critically analyzed to surface potential privacy concerns and surface other values questions relevant to possible futures, such as who has power and agency when these technologies are used and deployed (Wong and Mulligan 2016).

In parallel to conducting this research, I was quite excited to then hear of a regulatory movement called "Privacy By Design," embedding privacy protections into products during and throughout the design process, rather than retroactively. In my mind, this meant the application of the range of design techniques that I had learned about to the space of privacy: user centered design, value sensitive design, and critical design, among others.

I was quite surprised, then, to learn through a series of Privacy by Design workshops (Computing Community Consortium (CCC) 2015b) that privacy by design was largely dominated by lawyers, computer scientists, and engineers, and conversations tended to focus on designing systems that complied with privacy laws, regulations, and exogenous privacy principles. The few design and human computer interaction (HCI) people present at those workshops expressed how they felt that design, user experience research, and usability approaches to privacy were often overshadowed by the legal, software, and engineering practices (Hemmings, Le Pichon, and Swire 2015). Even among the design and HCI researchers and practitioners present, their approaches did not seem to cover a full spectrum of design practices (many focused on usability and user centered design approaches).

It felt like Privacy By Design was missing out. It was disengaged from the design research and design practice communities and had failed to consider a broader range of design practices that focus on surfacing and exploring privacy as situated, site and context specific, and emergent from human experiences. Designers and design practices seemed well aligned with goals of the Privacy by Design community, such as moving beyond compliance with a narrow set of privacy principles (such as the Fair Information Practices) and thinking about privacy as contextually grounded in social experiences and relationships.

While recognizing that design has its own politics and that "design thinking" approaches cannot solve all societal problems (Sims 2017; L. Irani 2018), these observations of the Privacy by Design community motivated the part of the dissertation project that asks what could the role of 'design' be in values in design practice.

Vignette 2: From Privacy to a Broader Set of Values in Practice

In late 2018, I was sitting in a coffee shop in SoMa (the South of Market area in San Francisco), within walking distance of many technology company offices, such as Google, Uber, LinkedIn, Slack, and Yelp. I was waiting to meet a worker from a user experience team at a company that creates enterprise software, software for other businesses and organizations to buy and use. At this point in the project, I was intending to study how design and user experience (UX) professionals address privacy in their work, to try to understand their current values in design practices. I initially focused on the social value of privacy. Given Europe's General Data Protection Regulation (GDPR) which went into effect in 2018, and the passage of the California Consumer Privacy Act in 2018, companies have begun shifting more internal resources towards building systems and organizational processes that comply with these laws. From initial field observations at Bay Area tech privacy meetup events, it seemed that many organizations organized their privacy teams around people with either legal backgrounds, such as legal counsel or privacy law specialists, or those with engineering backgrounds, some being called privacy engineers.

I sought to study a different group of technology practitioners—user experience, or UX, professionals. With job titles like user researcher, interaction designer, or UX designer, their expertise lays in understanding aspects of the social contexts of technology use: how people may use or interact with systems, and how to design something that a human will interact with. Given this skillset, I had planned to interview UX professionals to try understand how they were doing "privacy work" as part of their user-centric work despite not being officially part of the formal "privacy team."

Concerned that asking directly about "privacy" might evoke narrow definitions of privacy rooted in legal instruments and the concept of data protection, I asked interviewees about their experiences in trying to avoid causing harm to users, or avoid potential negative social implications of their products. I had expected that this would lead to discussion about data-oriented harms related to privacy—such as unwanted collection of data, or unknown processing or disclosure of personal data. Instead, I heard about efforts to address a broader set of values and ethical issues.

The interviewee I met at the coffee shop in San Francisco began to discuss an incident where she and other co-workers learned that one of her company's client organizations was involved in perpetuating harms against migrant families at the US-Mexico border. The client requested help to improve the accessibility of their installation of the enterprise software made by interviewee's company. She and a co-worker were opposed to helping this client because of their involvement in harming migrant families. She and her colleague drafted a letter that they planned to share, explaining how this violated their personal values. When I asked why they framed it as being about "personal values," she noted that they were unsure "how empowered" they were when objecting and raising concerns from within the company. She noted some co-workers pushed back, saying that by not helping this client, they might be harming the clients' workers with disabilities.

While the interviewee felt that her immediate manager was supportive, upper management was resistant. She recounted a response back from a chief officer of the company as basically "do your job," and that not working for this client would "open a can of worms": what if anyone could stop work based on their personal values? Management hired an outside contractor to help this particular client. The interviewee had mixed feelings about this outcome—on one hand she was glad she didn't personally have to help this client; but at the same time, it

outsourced, rather than resolved, the problem. The workers' goal in objecting wasn't solely about personally not working for that client, but about raising concerns with corporate participation in human rights violations. The company's "solution" silenced this broader conversation. While the potential magnitude of harm in this situation is high compared to many other decisions and disputes about values, stories like hers shifted this project to be broader than just a privacy project, acknowledging how values including privacy, accessibility, and dignity are often entangled in practice.

Studying Values, Design, and Values in Design Practice

This dissertation project works towards answering the following research questions:

1. **When and how do UX professionals working within technology companies raise and address values issues in their work practices?** What tactics, strategies, or processes do UX professionals use to think about values, respond to values issues, or structure their conversations about them? How do they frame and justify arguments about values to other organizational stakeholders? When do UX professionals see it as their responsibility to think about and respond to values issues?
2. **How can design methods and techniques build on existing technical and social practices to promote a more reflexive practice around values in design?** How might values oriented and critically oriented design techniques scaffold onto existing designers' practices within technology companies? What existing practices might serve as starting points for new design interventions?

To answer these questions, I use qualitative methods involving interviews with UX professionals and field observations at meetup events related to technology design and social values. I also use design-based research methods as a form of researcher reflection and analysis, and as a form of engagement with study participants. Before outlining the dissertation, I briefly present how I approach the concepts of values, design, and values in design practice.

Values

The nature of social values as related to technological design has a history of scholarly debate over the sources and nature of values—such as asking if humans inscribe values into technologies, or if materials themselves embody values—and asking how values should inform design (Akrich 1992; JafariNaimi, Nathan, and Hargraves 2015; Latour 1992; Shilton, Koepfler, and Fleischmann 2014; Winner 1980). In this work, I discuss social values as conceptions of what is good, proper, important, or desirable in human life (Friedman, Kahn, and Borning 2008; Graeber 2001). The sources of values that I discuss are multiple, including myself and collaborators as researchers and designers, interviewees and study participants, organizations that interviewees work for, technical design artifacts, and broader social norms (Shilton, Koepfler, and Fleischmann 2014).

While a commitment to certain values may be broadly shared, my framing in this project focuses on how values arise as a part of situated lived experiences (Le Dantec, Poole, and Wyche 2009). My goal is not to find and extract immutable values held by participants to create a set of design requirements. Moreover, I use JafariNaimi et al.'s view of values as hypotheses, to see how participants and interviewees use values to "examine what the situation is, what the possible courses of action are, and how they might transform the situation." (JafariNaimi, Nathan, and

Hargraves 2015, 97). My investigation is mostly concerned with how people use values as a lens for choosing and understanding their own practices, for example studying how lab study participants use values as a lens to interpret a set of speculative designs, or studying how UX professionals use values as a lens to advance certain actions within their organizations.

Design

This project aims to provide both a descriptive analytical component to understand design and UX professionals' current practices, and a normative practice-based component that looks towards new forms of engagement or intervention in design practice.

Related, but largely separate lines of work in the fields of human computer interaction and design research have led to a range of scholarship offering design-based approaches aimed at surfacing and addressing social values during the design process. Value sensitive design (VSD) provides one framework to elicit and address values during the process of building systems. VSD includes looking at direct and indirect stakeholders of a technology or context; mapping benefits, harms, and values to the different stakeholders; and identifying potential values conflicts (Friedman, Kahn, and Borning 2008; Friedman, Hendry, and Borning 2017).

Parallel design research under the broad rubric of critically oriented design or speculative design serves to surface values, critique social issues, and present alternative visions of the future by creating conceptual designs and design artifacts (Dunne and Raby 2013; Pierce et al. 2015). Rather than create design solutions that are deployable at scale, critically oriented design creates conceptual designs and design artifacts that subvert expectations, provoke, or exaggerate existing trends in order to surface, critique, and discuss values issues. Values are at the heart of these speculative and critical design practices: values are surfaced and contested by creating artifacts that articulate and present alternate worlds, centering different sociotechnical configurations of people, technologies, and values than what are experienced or focused on in today's normative design practices. Examples of these include speculative prototypes and installations to generate critical reflections (Sengers et al. 2005), or using conceptual design artifacts to elicit discussion of values from interviewees (Wong et al. 2017; Hutchinson et al. 2003).

Design encompasses more than the technical implementation of products and artifacts. While design can prescribe solutions, it can also be used to formulate arguments. Practices such as critical making, adversarial design, or speculative design consist of designing an artifact with an explicit set of politics in order to critique, contest, explore or propose different arrangements of sociotechnical systems as a way of learning about the politics of design practices and material artifacts (DiSalvo 2012; Ratto 2011; Vertesi et al. 2016; Sims 2017).

However, these research contributions of values-oriented design practices have limited use and adoption in industry design and engineering practice. Two goals of this project are to (1) better understand what current design practices in industry are used in values work and (2) how those practices may serve as scaffolding for the adoption or adaptation of explicit values-oriented design approaches—value sensitive design, and critically oriented design. This project uses design as a research method in two ways: as a form of reflexive inquiry and data analysis method, and as a form of research engagement with design and UX professionals.

Values in Design Practice and Values Work

While the expression of technologies' politics is co-constructed among the designers, users, contexts of use, and material artifacts (Akrich 1992; Verbeek 2006), this project focuses on the role of a specific set of actors: design and UX professionals. The focus on design and UX

professionals' values work practices follows prior work by Shilton and Verbeek studying how engineers "do ethics by other means" (Shilton 2013; Verbeek 2006). Beyond studying design and UX professionals' practices of values work, this project also pays attention to the tools, resources, and artifacts utilized by design and UX professionals to do values work, interrogating the co-construction of values among the workers, their tools, their products, and the organizational contexts in which they are embedded.

A body of analytical STS scholarship studies the work practices of technologists to understand the values and politics of their work, e.g., (Suchman 2006; Shilton 2013). This work focuses on a broad range of actors in a technology's design constituency (Pfaffenberger 1992), including technologists, including engineers, developers, and managers. Shilton's work on values levers studies engineers in an academic research setting to understand what practices help surface values and make them salient for action (Shilton 2013). Some prior research has focused on design and UX professionals, including how they construct the category of "user" and the politics of user centered design practices (Woolgar 1990; Wilkie and Michael 2009; Garrety and Badham 2004). Although some recent work by Gray et al. has begun to investigate how UX designers in industry contexts view design methods and how they navigate ethical issues in their work (C. M. Gray 2016; C. M. Gray and Chivukula 2019), design and UX professionals' roles (and their potential roles) in conducting values work remains underexplored.

This project focuses on the current practices that UX professionals use in "values work" where values are understood as hypotheses, rather than emanating from a particular ethical framework or its application. While ethics is not the entry point, interviewees sometimes use the term "ethics" when discussing their practices, and thus it emerges in the research as an emic term, coming from interviewees' perspectives. Regardless, the primary concern of this project is understanding the work practices conducted by design and UX professionals, and the resources they utilize, in the name of values—towards what they see as good, proper, important, or desirable social worlds. I refer to these practices as ***values work.*** This builds on the idea of values advocacy, or Shilton's use of the term "ethics advocate" as someone who "has a designated interest in, and lobbies for, social and ethical concerns within the design process." (Shilton 2010, 2). However, unlike Shilton's ethics advocates who are formally tasked with advocating for values, UX professionals I study are not deputized to engage in values and ethics work as a formal part of their job. Thus, I use the term "work," to highlight how addressing values comes up in existing work practices, rather than as a job function separate from everyday UX work.

An Outline of the Dissertation

This dissertation is organized to both study current industry practices of values work, and to study how those practices may serve as scaffolding for the adoption or adaptation of explicitly values-oriented design approaches. The first section of the dissertation presents the development of an initial design-based tool to surface discussion of values. The middle section of the dissertation then investigates the values work conducted of user experience (UX) professionals in the technology industry. The last section unites these two strands of research, reflecting on how design can support UX professionals' values work.

Chapters 2 and 3 focus on the different roles of design in relation to social values, using privacy as a particular case study. Chapter 2 conducts a review of the human computer interaction literature that discusses both privacy and design, and proposes a set of dimensions to think about design in relation to values: the purpose of design (why is design used, and towards

what ends is design being used), who does the work of design, and who is the supposed beneficiary of that design work. The review finds many projects where design is oriented towards solving a problem posed by privacy, but also highlights another set of underutilized practices that use design to critique, speculate, and present alternatives. Chapter 3 investigates the potential of using design to critique, speculate, and present alternatives by creating a set of conceptual design fictions and speculative designs inspired by the science fiction novel *The Circle*. Rather than be viewed as proposals for potential products, these designs attempt to intentionally provoke reflection about what privacy might mean among a range of different social and technical settings. When presented to technology practitioners in-training in a laboratory setting, the designs helped study participants discuss privacy in complex, sociotechnical ways. However, this raises questions about how such a design practice might be useful within the technology industry.

Chapters 4 through 6 then describe the practices of user experience (UX) professionals in the technology industry who see social values as important to their work. These chapters investigate how values arise in current design practices, and UX professionals' attempts to act on addressing social values (sometimes successfully, sometimes not). Chapter 4 introduces the qualitative and design-based methods used to study UX professionals, provides an overview of the interviewees and field observation sites, and highlights major public events and controversies in the technology industry that formed the backdrop of this work. Chapter 5 discusses the findings from the qualitative work, describing the configurations of these UX professionals' values work. UX professionals report on attending to values through everyday configurations of technical UX work, such as when designing interfaces or conducting user research. More strikingly, UX professionals also report on engaging in a range of other social practices aimed at shaping the organization, rather than a technical product or system. These practices are used by UX professionals to re-configure how values work is conducted at their organizations in several ways: by making more space for UX professionals' values work; by getting others in the organization to adopt human-centered perspectives on values; and by changing the politics and strategies of the organization regarding values. Chapter 6 examines the power dynamics and affective experiences involved in trying to enact these practices. It analyzes these practices as a tactics of "soft resistance" (Nafus and Sherman 2014), reflecting the reality that some aspects of organizational and technical practice are open to critique and reform, while other parts remain off limits and can only be resisted.

Chapters 7 and 8 return to reflecting on design in relation to values. Chapter 7 highlights the politics involved in speculative design, focusing on the politics of conveying designers' intent through, and the politics in how viewers receive and interpret the designs. The work to make speculative designs legible to audiences also create opportunities for designs to be re-interpreted and re-appropriated towards the very ends they attempt to critique. The legibility of a fictional product to standard processes of corporate product development can thus mute or undermine its critical stance. I suggest a different orientation to speculative design—organizational fictions—that places speculative practices and relationships at the center of designers' concern, rather than speculative products. Chapter 8 considers the potential design might provide for infrastructuring values work in technology companies, helping to create alternate sociotechnical imaginaries that place greater responsibility for addressing values in technology companies and their workers. Design can help re-imagine and articulate how values work can be done differently at technology companies. Using design in this way can assist in UX professionals' social practices of making values visible to others, agenda setting, and managing

relationships with other organizational stakeholders. Design interventions for values work should pay attention to how they can assist with social practices as well as with technical practices, while being reflexive about the politics and limits of design. The chapter also presents *Timelines*, a proposed design activity that attempts to use design to help infrastructure new imaginaries of values work.

The dissertation offers a richer understanding of how UX professionals advocate for values through both technical design practice and a range of social practices aimed at shaping organizational receptivity to values—as UX professionals see and practice them. These insights open up a new problem space for design-based interventions under the umbrella of values in design. While most design interventions focus on incorporating consideration of values into a product design process, future design interventions can consider supporting the existing social practices of values work that re-design corporate practices.

Chapter 2: Relating Design in HCI to Values and Privacy

Values in design consists of both descriptive and practical research—the former based in analyzing how values are reflected in existing technical artifacts and practices, the latter based in finding ways of "bringing selected values to bear in technical design" (Nissenbaum 2005). Practices of "design" span many fields, including computer science, engineering, and art. For instance, rooted in computer science, Abebe et al. outline a set of roles for computing practices to address values such as fairness, bias, and accountability, including: computing practices to diagnose and measure social problems in technical systems; computing practices to formalize social inputs and goals; computing practices to rebut and show limits of technical interventions; and computing practices as synecdoche, framing social problems in new ways (Abebe et al. 2020).

In this chapter, I turn specifically to the interdisciplinary field of human computer interaction (HCI), to understand how practices of design relate to values, looking at the relation between "design" and "privacy" as a case study. I first motivate this review by providing an overview of design in values in design, regulatory initiatives like Privacy By Design (PBD) that rhetorically foreground the role of design in addressing issues of privacy, and the role of design in HCI. I then conduct a curated literature review of HCI publications that discuss privacy and design, to articulate the breadth of ways HCI researchers have positioned design in relation to privacy along a set of three dimensions: the purpose of design, which actors do design work, and which actors are the beneficiaries of design work. I also reflect on how design has been predominantly deployed to address privacy within HCI, and the political and intellectual commitments made in these approaches. In particular, I argue that critically oriented design approaches are a missing piece of the PBD puzzle and are essential to the protection of a fuller range of privacy concepts and the full realization of PBD—and by extension, are an essential set of approaches for values in design.

HCI's Turn to Design

Human Computer Interaction (HCI) presents a useful field to understand the diversity of design approaches to values, in part because researchers in this community have taken on Nissenbaum's call for a "turn to practice" in values in design (Nissenbaum 2005), and in part because HCI draws on multiple disciplines' concepts of design. HCI, while an interdisciplinary field, traces its lineage from engineering, computer science, and psychology. Harrison et al. describe the history of HCI as a series of three waves or paradigms[1] (S. Harrison, Tatar, and Sengers 2007). Each wave has a different orientation towards describing "interaction," and is associated with different types of research questions, disciplines, and forms of legitimacy. In my own reading of Harrison et al., each wave also suggests a different orientation toward the use of "design," including what disciplines are being drawn from, and how design should be conducted and evaluated.

[1] Harrison et al. describe the waves or paradigms as additive, rather than mutually exclusive. In other words, third wave HCI work co-exists with continuing first and second wave HCI work, rather than replacing it.

The first wave wanted to optimize the fit between man and machine to solve localized problems and reduce errors, which Harrison et al. describe as a pragmatic engineering orientation to find "cool hacks" to solve specific problems (S. Harrison, Tatar, and Sengers 2007). Design here is presented as a way to solve immediate and practicable problems, drawing on traditions from engineering and computer science.

The second wave sees interaction as information communication: by thinking about humans and machines both as information systems, researchers can create generalizable models that optimize for accuracy and efficiency in information transfer. This perspective draws on psychology and cognitive science, leading to a growth in the use of laboratory studies and experimental methods (S. Harrison, Tatar, and Sengers 2007). In this paradigm, design is presented as a way to solve generalizable problems, or to support humans in generalizable ways. Addressing usability, and efficiency were often the focus design with the goal of aligning a system's design with a user's mental model (Card, Moran, and Newell 1983; Norman 1988).

The late 1990s and early 2000s marked a critical turn to "third wave" HCI, which views interaction and knowledge as situated and socially constructed; foregrounds consideration of values and politics embedded in and associated with design; and embraces the use of interpretive research methods (S. Harrison, Tatar, and Sengers 2007). HCI's focus expanded during this time period, as computers expanded from the workplace into other aspects of everyday life. New questions about society, culture, and ethics were not well addressed by traditional experimental modes of HCI investigation.

With this expansion of research questions and perspectives, HCI began broadening to include people, methods, and epistemologies with roots in social science, humanities, and art (Zimmerman, Forlizzi, and Evenson 2007). As such, the ways design practices were used in HCI expanded. New approaches included values in design, which identifies and designs for a range of social values (Friedman, Kahn, and Borning 2008; Shilton, Koepfler, and Fleischmann 2014; Knobel and Bowker 2011); and research through design, which uses the process of design to ask questions about the world (Zimmerman, Forlizzi, and Evenson 2007; Pierce et al. 2015; W. Gaver 2012). Many of these new design practices were often framed as critical methodological interventions against dominant HCI practices which were mismatched to explore questions of society, culture, and ethics. These include practices such as critical design, speculative design, or reflective design (Pierce et al. 2015; B. Gaver and Martin 2000; Sengers et al. 2005). In one such project involving a probe consisting of a plastic inflatable pillow with an LCD screen, authors Dunne and Gaver explicitly frame their work against dominant HCI practices of user centered design, writing "The aim is not to assess the design's usability, of course, nor the degree to which it fills recognised needs. Instead, the purpose is to trigger people's imaginations, to challenge them to consider how this sort of technology might fit into their lives." (Dunne and Gaver 1997, 362). These new design methods explicitly foreground questions of social values.

However, design approaches that do not explicitly foreground values may still be used to address issues related to social values (for instance, a second wave design approach may seek to create a generalizable model about behavior related to a particular social value). To understand the breadth of design approaches in relation to values, I look to how design in HCI has been used to approach the value of privacy, as there is a large body of research focusing on privacy in the field.

As I will discuss in greater detail in this chapter, much of HCI privacy research, often under the rubric of "usable privacy" and "usable security," draws on the approaches and models of second wave HCI, with a focus on usability, matching interfaces' content and interactions

with user mental models, and aiming to increase the accuracy and efficiency of interfaces such as privacy notices or security controls. Yang Wang, inspired by Harrison et al., critiques usable privacy security research for using a "generalized" user, a hallmark of second wave HCI. He instead argues for "inclusive privacy and security," understanding users as socially situated with varying characteristics, abilities, needs, and values (Wang 2017), reflecting a third wave-inspired approach to privacy and security. At the same time, as companies and regulators look toward how to implement Privacy By Design (PBD), many are looking to usable privacy research, which is steeped in second wave HCI approaches. While this is highly useful to ensure that PBD takes approaches consistent with user and human centered design, this approach risks missing out on some of the more subjective, generative, and exploratory uses of design reflected in other areas of HCI, particularly third wave approaches. Following the third wave ethos that Wang calls for, this dissertation explores some of the ways critically oriented and third wave HCI design approaches can advance privacy and other social values, moving beyond the (first and second wave) solutionism perspective that dominates legal and engineering discussions of PBD.

In this chapter, I review HCI literature on privacy and design to explore the richness of ways that HCI has used design to approach privacy, which includes, but also moves beyond second wave HCI design approaches. This motivates and suggests opportunities for new design approaches that this dissertation will begin to explore.

Focusing on Privacy

Beyond having a large body of HCI research on privacy, privacy represents a useful case study because regulatory and practitioner communities have pointed explicitly to privacy as an important value to consider in the design of technical systems and artifacts.

The concept of *privacy by design* (PBD)—embedding privacy protections into products during the initial design phase, rather than retroactively—uses the word design to enlist technical artifacts in implementing policy choices. Traditional legal and regulatory levers generally forbid or demand behaviors that invade or protect privacy, but rely on after-the-fact penalties to enforce privacy protections. PBD in contrast suggests a proactive approach, to make occurrences of privacy harms impractical in the first place. It demands that privacy be "built in" during the design process. PBD is gaining traction in part due to its inclusion in the E.U.'s General Data Protection Regulation, policy recommendations by the U.S. Federal Trade Commission, and guidance from privacy advisory and regulatory bodies around the globe. While championing PBD, these regulatory discussions offer little in the way of concrete guidance of what "privacy by design" means in technical and design practice. While privacy and legal scholarship have developed a rich set of conceptualizations and approaches for thinking about privacy that view privacy as relational, situated, contextual, and multi-dimensional (Solove 2002; Solove 2003; Mulligan, Koopman, and Doty 2016; Nissenbaum 2009), and engineering communities have begun developing engineering privacy solutions (Spiekermann and Cranor 2009; Gürses, Troncoso, and Diaz 2011; Gürses and Del Alamo 2016; Brooks et al. 2017; Hoepman 2018), the term "design," its practices, and the roles it might play in protecting privacy remain under explored.

At the same time, the privacy research and practice community has identified challenges that go beyond privacy engineering. Design methods and approaches may be uniquely equipped to address these challenges. Privacy professionals have expressed a desire for tools and approaches to help "look around corners" (Bamberger and Mulligan 2011; Bamberger and Mulligan 2015) to anticipate possible privacy concerns with emerging systems and technologies,

rather than assuming that current conceptualizations of privacy are the correct ones to design into technological systems. Engineering approaches that dominate PBD today assume that privacy is pre-defined; it is exogenous to the design process. In contrast, some design approaches position the work of identifying relevant concepts of privacy and other values as being a part of design processes. These design practices are largely absent from policy and implementation efforts around PBD. This chapter argues that broader perspectives on the role of design are needed for the privacy research and practitioner community.

Privacy by Design: A Brief History

A brief overview of "Privacy by Design" helps situate the current conversation and suggests gaps and opportunities for design perspectives to address. In the late 1990s and early 2000s, law and policy scholars began to consider how technologies, not just legal mechanisms, could support and protect liberties and rights (Foner 2002; Cohen 2000; Lessig 2006). For instance, the Platform for Privacy Preferences was seen as a technical way to address the policy problem of privacy (Cranor and Reagle 1997).

In one of the earliest mentions of privacy by design, the 2000 *Computers, Freedom and Privacy* Conference hosted a "Workshop on Freedom and Privacy by Design," calling for participation by lawyers, social scientists, privacy and technology writers, and participatory design and accessibility experts (Computers Freedom & Privacy 2000 2000). While not providing an explicit definition for privacy by design, workshop chair Lenny Foner described PBD's goal as "using technology to bring about strong protections of civil liberties that are guaranteed by the technology itself" (Foner 2002, 153).

In the early 2000s, several legal and technical researchers utilized the term "privacy by design." For instance legal scholar Julie Cohen used the term to express hopes that technical design choices could enforce conceptions of privacy present in regulation and law, using "both technology and law to create and sustain the conditions for meaningful, autonomous choice." (Cohen 2000, 1437). Computer science researcher Marc Langheinrich used the term in regard to designing technical systems that will support "acceptable" social behaviors, such as by designing mechanisms to provide notice and choice, avoid privacy intrusions, or providing anonymity or pseudonymity (Langheinrich 2001).

One of the more prominent versions of PBD is "Privacy by Design" as articulated in the early 2000s by Ann Cavoukian, former Information and Privacy Commissioner for Ontario, Canada. Cavoukian provides a set of 7 principles, writing that privacy "must be approached from ...[a] design-thinking perspective. Privacy must be incorporated into networked data systems and technologies, by default," describing design-thinking as "a way of viewing the world and overcoming constraints that is at once holistic, interdisciplinary, integrative, innovative, and inspiring." (Cavoukian 2012) Subsequently there has been a growth in calls for forms of privacy by design. The E.U.'s General Data Protection Regulation enshrines this, stating that data controllers "shall implement appropriate technical and organizational measures" as part of "Data protection by design and default" (General Data Protection Regulation (GDPR) 2016b). The U.S. Federal Trade Commission has recommended companies adopt "Privacy by Design," to "promote consumer privacy throughout their organizations and at every stage of the development of their products and services." (Federal Trade Commision (FTC) 2012)

Despite these calls for PBD by regulators, there are still gaps between PBD in principle and as implemented in practice, highlighted by a series of recent workshops (Computing Community Consortium (CCC) 2015a; Hemmings, Le Pichon, and Swire 2015; Computing

Community Consortium (CCC) 2015b). These gaps may stem in part from PBD's focus on legal and engineering practice and research. Prior work has documented the growth of *privacy engineering* as both a sub-discipline in computer science and a set of engineering practices (Gürses, Troncoso, and Diaz 2011; Gürses and Del Alamo 2016; Spiekermann and Cranor 2009). Often privacy engineering approaches attempt to translate high level principles into implementable engineering requirements. The Fair Information Practices (FIPs) are a common set of principles used to derive privacy engineering requirements (Gürses, Troncoso, and Diaz 2011). The FIPs tend conceptualize privacy as individuals having control over personal data—a definition that may not apply in every situation.

As an illustrative example of some of the short comings of these existing requirements-derived practices, in 2008 the U.S. Department of Homeland Security and Transportation Security Agency (TSA) used a privacy impact assessment (PIA) to analyze the potential privacy impact of airport security whole body imaging systems. Using the FIPs, the PIA conceptualized privacy as control over personal data. The assessment found that while the system captured naked-like images of persons' bodies, it was designed such that the images would be deleted and faces were blurred so that images were not personally identifiable (U.S. Department of Homeland Security 2008). Nevertheless, many citizens, policymakers, and organizations cited privacy concerns about increased visibility and exposure to the TSA. Simply put, the privacy invasion arose from TSA agents viewing images of naked bodies, not from the potential to re-identify people in the images. The PIA's focus on privacy risks form data collection and identification did not match people's concerns of closed-booth ogling by TSA agents, leading to expensive redesigns. The system was eventually redesigned to show a generic outline of a person rather than an image of the specific person being scanned.

Gürses et al. have critiqued privacy engineering's uses of the FIPs and the UK's PIA approach to PBD as "checklist" approaches, arguing that "it is not possible to reduce the privacy by design principles to a checklist that can be completed without further ado," as these approaches do not capture the complexities of creating systems to address privacy, and could enshrine a concept of privacy that is not applicable in all cases (Gürses, Troncoso, and Diaz 2011). Building on this work, this chapter charts a richer set of HCI design approaches to explore and address privacy in ways beyond checklists.

Privacy By Design's approaches to design have largely been informed by legal scholarship which conceives of design as a tool for implementing objectives, or a process designed to attend to preset objectives. Privacy and legal scholarship have developed a rich language to discuss privacy, including multiple conceptions of privacy (Solove 2002; Mulligan, Koopman, and Doty 2016), types of privacy harms (Solove 2003), or the role of social context (Nissenbaum 2009). Privacy is thus not a value with a singular universal definition, but is situated in sociotechnical contexts and relationships, involving different harms and motivations. Mulligan et al. describe how this multi-facetedness is core to the "essentially contested" nature of privacy, allowing for productive conversations about what form of privacy and whose privacy is at stake in a given situation (Mulligan, Koopman, and Doty 2016). However, the complexity and richness of design has received significantly less attention in these communities. This chapter investigates design through the lens of HCI to see how design work can align with and contribute to PBD work, and values in design work more broadly.

Curated Literature Review

I conducted a curated literature review to explore the richness of design and privacy work. Analysis began by collecting research publications from HCI-related conferences. Using the ACM Digital Library (ACM-DL) web interface in January 2018, I searched the Full-Text collection with the "sponsor: SIGCHI" filter (Special Interest Group on Computer Human Interaction), sorted by the built-in relevance feature. As I was searching for breath and richness of design approaches, I included demos, posters, workshops, and colloquia in the search results (as well as full papers), as design research contributions are often published in non-full paper tracks. I manually checked that each returned paper used the word "design" in reference to a practice or process, and used the word "privacy" at least once each. Papers that did both were included; those that did not were excluded.

I used the exact search term ["privacy by design"], returning 11 results with 6 meeting our inclusion criteria. I then used the search terms [privacy by design] and [privacy design], which each returned over 1000 results. Sorted by relevance, I skimmed the top 50 results from each search to see if they met our inclusion criteria, resulting in an additional 48 papers.

I read and coded all the papers in the corpus (n=54). Papers were openly coded for: what is designed; when is design done; who does design; who is design done for; how design relates to privacy; and how privacy is conceptualized. Analysis was done in collaboration with Deirdre Mulligan.[2] We thought that these initial categories would help highlight differences among design practices. I then used affinity diagrams on the open codes, which both collaborators discussed and refined into 3 categories, which I then used to re-code the corpus. These categories are briefly shown below and discussed more in the next section:

- Why design? To solve a privacy problem; To support or inform privacy; To explore people and situations; To critique, speculate, or present critical alternatives.
- Design by who? Design authorities; stakeholders
- Design for whom? Design authorities; stakeholders

After this initial analysis, while the corpus included some papers on usable privacy, we decided to look at a subset of papers from the Symposium on Usable Privacy and Security (SOUPS) as a way to spot check our categories' breadth and richness, to see if there were additional categories we left out. We did not seek to capture an exhaustive or representative sample of SOUPS papers.

In July 2018, I used the SOUPS USENIX proceedings web interface with the same search terms, ["privacy by design"], [privacy by design], and [privacy design], resulting in 119 unique papers. There was no "relevance" sort feature, so I used every fourth paper to generate a sample to examine. I applied the same inclusion and exclusion criteria, resulting in 9 papers. I skimmed the titles of additional SOUPS papers to see if they suggested additional design orientations, adding an additional paper on nudges (though this paper was eventually coded as "to support or inform privacy"). While this second search was not exhaustive, it was a tradeoff made given that the goal was to spot check our initial set of categories, as well as time and resource constraints. I then coded the SOUPS papers (n=10) using the 3 refined coding categories listed above. The SOUPS papers all fit into existing coding categories.

The combined corpus (n=64) spans a range of HCI conferences, including CHI, Computer Supported Cooperative Work, Participatory Design Conference, Designing Interactive Systems, Computer-Human Interaction in Play, Ubiquitous Computing, and SOUPS. The range

[2] A published account of this collaborative work can be found in (Wong and Mulligan 2019)

in conferences helps provide greater variety and diversity to the corpus as each conference focuses on different approaches to HCI. For instance, some focus more on technical contributions, while others focus on design techniques and practices, or on social processes.

As with any map of a space, this analysis and corpus has some limitations. Most HCI research is published in conference proceedings, however research from journals, books, and HCI publications not published by ACM SIGCHI (except SOUPS) are not captured in the corpus. However, this analysis does not aim to provide a complete review of every paper that has discussed privacy and design. Rather it highlights the breadth and diversity of how design is considered in relation to privacy in HCI.

Dimensions of Design Practice

I highlight three dimensions that emerged from the analysis and coding: the purpose of design in relation to privacy; who does design work; and for whom is design done. While these are not the only way to think about design practices, they provide a useful framework to explore how design and privacy relate. I provide coding frequencies to describe how often these categories appeared in our corpus (each paper was allowed to have more than one code); however, these are not necessarily representative of all privacy and design literature at large.

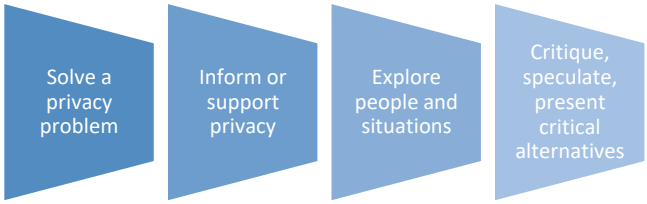


Figure 2.1. Spectrum of design purposes that emerged from our corpus: To solve a privacy problem (56%); To inform or support privacy (52%); To explore people and situations (22%); and To critique, speculate, and present critical alternatives (11%).

Purpose: How Privacy is Addressed by Design

Towards what ends is design used in relation to privacy? This section identifies and discusses four purposes of design which emerged from our coding process (Figure 2.1). In practice, these purposes overlap and are not mutually exclusive, but nevertheless have different enough foci to be discussed separately.

To Solve a Privacy Problem.

(56%: 32 ACM, 4 USENIX papers) In the corpus, design is most commonly referred to as a way to solve a privacy problem. Some solutions take place at a system architecture level, including pseudonymous-based identity management, computational privacy agents to help make privacy decisions for users, limiting data retention, or encryption systems (Langheinrich 2001; Liu et al. 2016; Xu et al. 2016; Bai et al. 2016). Others focus on solutions at the user interface and interaction level, such as using anti-spam tools to protect users from being intruded upon, or using wearable LEDs to design a private, intimate communication system for partners (Nguyen and Truong 2003; Jacob and Dumas 2014). Some researchers design non-technical systems to solve privacy problems. Considering personal drones, Yao et al. propose the design of a legal registration system as well as the technical design of the drone to provide privacy and enforcement (Yao et al. 2017). In design *to solve a privacy problem,* privacy is presented as a

problem that has already been well-defined outside of the design process. A solution is then designed to address that definition.

To Inform or Support Privacy

(52%: 24 ACM, 9 USENIX papers) Second, design is seen as a way to inform or support actors who must make privacy-relevant choices, rather than solving a privacy problem outright. A system's design can help inform or support users' privacy-related actions during use. A large body of work focuses on improving the design of privacy policies and notices, ranging from their visual design, to textual content, to how and when they get presented (Kelley et al. 2010; Kelley et al. 2009; Schaub et al. 2015; Gluck et al. 2016). Other work considers the design of user privacy controls, their visual and interaction design, and their choice architecture (Park et al. 2017; Davis, Steinhoff, and Vela 2012; Jancke et al. 2001; Tang, Hong, and Siewiorek 2012; Rueben et al. 2016). The design of privacy nudges or cues similarly supports users' decision making by encouraging users to engage in privacy-enhancing behaviors (Pötzsch, Wolkerstorfer, and Graf 2010; Rajivan and Camp 2016; Chang et al. 2016).

Design can also be deployed outside of a specific system to inform publics about privacy risks or raise awareness about protecting privacy. This includes designing educational materials or games (Suknot et al. 2014; Warshaw, Taft, and Woodruff 2016; Zhang-Kennedy and Chiasson 2016). Others create third-party systems to support end user decision making, such as browser plugins and apps that highlight websites' and mobile apps' data practices, or icons to help compare multiple websites' privacy behaviors (Clement et al. 2008; Singh et al. 2015). Visualizations of personal data, audiences of social media posts or ambient privacy and security warnings attempt to create greater awareness of potential privacy risks (Patil and Kapadia 2012; Mazzia, LeFevre, and Adar 2012; Raber, De Luca, and Graus 2016; De Luca et al. 2010). Some tools are designed to support the work of other privacy designers and researchers, such as mathematical models to represent user mental models, or privacy risk assessment tools (Hong et al. 2004; Jensen 2004; Houser and Bolton 2017; Joinson, Hancock, and Briggs 2008).

In design *to inform and support*, the problem posed by privacy is conceptualized as an informational problem for users, or as a lack of the right tools for designers. Thus, design *to inform and support* privacy decision making focuses on providing information to users in ways that will encourage them to make privacy-enhancing decisions, or providing tools and methods to designers so that they can more easily address privacy in their technical practices. This implicitly assumes that if users receive "right" types of information to users, or designers have the "right" tools, then they will choose to act in more privacy-preserving ways.

To Explore People and Situations.

(22%: 13 ACM, 1 USENIX papers) Third, design is used to explore the relevance of privacy to people or situations. One collection of research uses design as the method of inquiry to understand people and situations. A range of design activities can be used to engage stakeholders, in which designers, researchers, and stakeholders create or discuss design concepts to understand stakeholders' experiences and concerns about privacy (Wong et al. 2017; Kumar 2008; Müller et al. 2013). Relatedly, technology probes or conceptual design artifacts can be shared with stakeholders to understand privacy-related concerns arising in the context of their daily activities (Qin, Xu, and Cosley 2017; Van Kleek et al. 2016). Design sketches and conceptual designs can help researchers analyze empirical data, teasing out perceptions and concerns about privacy (Kuzminykh and Lank 2016).

Another collection of research uses a range of qualitative and quantitative research methods—such as ethnography, interviews, or surveys—to understand people, privacy beliefs, and behaviors. This includes studying: specific populations such as older adults, children, or medical practitioners (McNeill et al. 2017; Rode 2009; Chen and Xu 2013); locations such as workplaces (Murphy, Reddy, and Xu 2014); or specific technologies, such as social media and online communities (Qin, Xu, and Cosley 2017). Here researchers generally do not conduct design work themselves, but frame design as something to make use of empirical findings, often termed "implications for design."

In design to *explore people and situations*, privacy is conceptualized as situated in relation to varying social and cultural contexts and practices, in line with recent theorizations in privacy scholarship (Mulligan, Koopman, and Doty 2016; Nissenbaum 2009). In design *to explore*, design and privacy are related in two ways. In the first collection of this research, design methods are utilized to empirically explore what conceptions of privacy are at play. In the second collection, other empirical methods are used to explore what conceptions of privacy are at play, and design can then make use of those findings. There is some controversy about whether "implications for design" should be how empirical work, particularly ethnographic work, is discussed in relation to design (Dourish 2006). I raise this not to present an argument for how design practices and empirical investigation should epistemologically relate to one another, but rather to highlight how design is deeply intertwined with other practices and methods (such as ethnography, user research, and evaluation).

To Critique, Speculate, or Present Critical Alternatives.

(7%: 11 ACM, 0 USENIX papers) Fourth, design can create spaces in which people can discuss values, ethics, and morals. However, *design to critique, speculate, or present critical alternatives* is not necessarily about exploring the world as it is, but focuses on how the world could be. This work is often discussed under the broad rubric of critically oriented HCI (Pierce et al. 2015; Khovanskaya, Baumer, and Sengers 2015; Dunne and Raby 2013). Rather than create design solutions that are deployable at scale, critically oriented HCI creates conceptual designs and design artifacts that subvert expectations, provoke, or exaggerate existing trends in order to surface, critique, and discuss values issues, and utilizes different evaluation criteria than performance, efficiency, or usability. From the corpus, this approach has been used to probe privacy implications of systems by conceptually designing: a fictional drone regulatory system (Lindley and Coulton 2015b), a range of fictional human biosensing products deployed in a variety of contexts (Wong, Van Wyk, and Pierce 2017), and conceptual search engine technologies that embed alternate sets of values (Kuzminykh and Lank 2016).

Similar to design *to explore*, design *to critique* also considers privacy as situated in relation to varying social and cultural contexts and practices. However, it serves to ask a different set of questions, such as "what should be considered as privacy?", "privacy for who?", and "how does privacy emerge from to technical, social, and legal entanglements?"

Design Work By and Design Work For

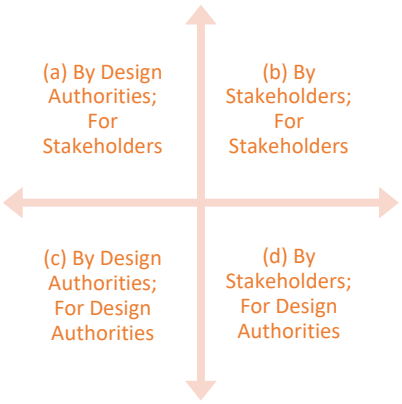


Figure 2.2. Actors involved in design. The horizontal axis represents a spectrum of *design work by*. The vertical axis represents a spectrum of *design work for.* Combining those provides 4 categories: By design authorities, for stakeholders (89%); By stakeholders, for stakeholders (13%); By design authorities for design authorities (17%); and By stakeholders, for design authorities (3%).

The second and third dimensions that arose from the analysis consider who is involved in design processes: who does the design work (*design work by*), and who the design work is meant to benefit (*design work for*). I discuss two meta-categories of actors involved: design authorities and stakeholders. I use the term "design authority" to refer to the subject position of designer: someone who inhabits a social role where they have the social license and power to create or design systems. This includes HCI researchers and practitioners, interaction designers, engineers, anthropologists, behavioral scientists, and so on. The dimension *design work by* captures who does design work in practice, whether or not they are a design authority. I use the term stakeholders as it is used in value sensitive design to include all those affected by systems, including direct users, indirect users, and non-users (Friedman, Kahn, and Borning 2008). The design authority and stakeholder categories are simplifying, as there is not always a clear distinction between them. Given the blurriness of these categories, I view them as a continuous spectrum rather than binary qualities. Acknowledging these simplifications, I attempt to map the space of actors involved in design by varying design authorities and stakeholders along two perpendicular axes: *design work by* and *design work for* to gain a sense of how the relationships between actors and the practice of design may differ (Figure 2.2).

(a) By design authorities, for stakeholders.

(89%: 47 ACM, 10 USENIX papers) Most often, design work is done by design authorities for stakeholders, generally users. In these cases, the design authority might be a UX designer, an engineer, or a researcher. There is variation in how stakeholders are conceptualized. Several papers conceptualize stakeholders as specific populations with specific privacy practices and needs, such as users in the Middle East or medical workers (Abokhodair 2015; Chen and Xu 2013). Other papers discuss heterogeneous groups of stakeholders, such as considering parent-child relationships when designing, thinking about families and their guests, or designing for crowdsourcing collectives (Zhang-Kennedy et al. 2016; Davis, Steinhoff, and Vela 2012; Clement et al. 2008). Other papers refer to designing for "the user" in a general sense (Kelley et al. 2010; Luger and Rodden 2013).

The design of privacy design and engineering tools can also be considered design *by design authorities, for stakeholders*, because in those cases designers and engineers are conceptualized as users of the tool. For instance Hong et al. design a privacy risk modelling process for other design authorities to use when building systems (Hong et al. 2004). Other design authorities are conceptualized as users of their modelling process.

(b) By stakeholders, for stakeholders.

(13%: 8 ACM, 0 USENIX papers) In its purist form, this recognizes bottom-up forms of design that emerge from users and stakeholders, often in acts of re-appropriation or self-help. In a study that placed cameras and screens in an organizations' multiple break rooms to facilitate non-collocated interactions, some users modified the system by putting up signs to block the cameras' view (Jancke et al. 2001). In a more moderated form, participatory and co-design techniques invite users and stakeholders to take a larger part in the design process, though these are generally facilitated by a design authority. For example, a workshop inviting children to help design location-sharing apps represents *design work by stakeholders (*and *by design authorities)* (Müller et al. 2013). These approaches recognize (or provide) agency that non-design authorities have in (re)designing systems toward their own goals. Beyond this corpus, HCI research has explored this theme by studying stakeholders' repair, maintenance, and re-appropriation practices (Dourish 2003; Rosner and Ames 2014; Houston et al. 2016).

(c) By design authorities, for design authorities.

(17%: 11 ACM, 0 USENIX papers) Design authorities can design for themselves through reflexive design practices, in which they use conceptual designs as a way to explore the problem space of privacy, and create room to critically reflect on and discuss the social and ethical issues at the intersection of technology, society, and privacy. These designs might be created and reflected on individually or with other design authorities. For example, Wong et al.'s design workbooks of privacy scenarios were created as a way for the authors to reflect on the nature of emerging privacy concerns related to sensing technologies (Wong, Van Wyk, and Pierce 2017). Using design for reflexive practice has been more broadly explored in HCI under the rubrics of reflective design, and critical and speculative design (Pierce et al. 2015; Dunne and Raby 2013; Sengers et al. 2005).

(d) By stakeholders, for design authorities

(3%: 2 ACM, 0 USENIX papers) The corpus did not provide much evidence for or examples of this quadrant within HCI. Potentially some user feedback mechanisms could be considered here, such as the PIPWatch browser toolbar which allows users to see information about websites' privacy practices and contact websites' privacy officers (Clement et al. 2008). However, feedback mechanisms fall short of allowing stakeholders to practice design. This speaks to structural differences between design authorities and stakeholders. Users might have choices to configure settings or leave a service, but generally have little opportunity to practice design work with the same latitude that design authorities have. Future privacy research might explore more ways for design to be practiced *by stakeholders, for design authorities*.

Mapping Design Approaches to Privacy

In the previous section, I identified three dimensions along which the privacy and design papers varied: the purpose of design; who does design work; and who design work is meant to benefit.

In this section, I map existing design orientations—collections of approaches and methods—that appeared in papers in the corpus onto the dimensions, and suggest how they might support different ways of approaching privacy (summarized in Table 2.1). While these design orientations are also used in HCI to address issues beyond privacy, they emerged in the corpus as common ways that design was positioned in relation to privacy.

As a researcher who does privacy work in HCI, design, and legal communities (often in collaboration with others in these communities), I argue that PBD should engage with the richness of ways of why and how design is used for privacy—and that HCI researchers and practitioners are uniquely positioned to help PBD broaden and productively use alternative design approaches. I provide this specific synthesis and mapping to help build bridges among the PBD, privacy, and design communities. If design is used to address privacy, the ability to articulate and specify among these multiple relations of how and why to use design, and who should do design work for whom, will become important for collaborating across disciplines. Moreover, this mapping suggests ways in which design can relate to values at large, not just privacy.

Design Orientation	Purpose(s)	Design work by	Design work for	How does design relate to privacy?
Software Engineering	Solve a problem; Inform and support	Design authorities	Stakeholders	Conceptions and problem of privacy defined in advance. Lends itself well to data privacy
User-Centered Design	Solve a problem; Inform and support; Explore	Design authorities	Stakeholders	Could have conception of privacy defined in advance, or might surface from users. Lends itself well to individual-based conceptions of privacy
Participatory Engagement & Values Centered	Solve a problem; Inform and support; Explore;	Design authorities; Stakeholders	Stakeholders	Surface stakeholder conceptions of privacy, involve stakeholders in the design process
Resistance, Re-Design, Re-Appropriation	Solve a problem; Critique	Design authorities; Stakeholders	Stakeholders	Shows breakdown or contestation in current conceptions of privacy
Speculative and Critical Design	Explore; Critique	Design authorities	Design authorities; Stakeholders	Critique current conceptions of privacy, explores and shows potential ways privacy might emerge in new situations

Table 2.1. Summary of design orientations mapped to design dimensions

Software and System Engineering & Design

Software and system engineering are predominantly oriented toward *solving a problem*, although it might also be used to design systems that *inform or support*. This includes designing a system's architecture or creating and applying software design patterns. This design work is generally done *by design authorities* (engineers), *for stakeholders* to use. This orientation usually begins with a well-defined conception of privacy, then derives system requirements to engineer. Software engineering lends itself well to issues of data privacy. If privacy is conceptualized as maintaining control over personal data, then appropriate access control mechanisms can be designed; if privacy is conceptualized as data disclosure, then sharing mechanisms can be designed, and so on. Some work has taken the FIPs as a set of principles from which to derive engineering requirements (Langheinrich 2001; Jensen 2004). Beyond the corpus, privacy

engineering has used engineering design practices toward privacy, such as software design patterns applied to privacy (Hafiz 2006). Others have looked to sector-specific laws or theories of privacy to derive formal privacy definitions and engineering requirements (Breaux, Vail, and Anton 2006; Barth et al. 2006). The growth of privacy-specific engineering techniques, methods, and degree programs suggests that privacy engineering is developing as its own subfield (Brooks et al. 2017; Gürses and Del Alamo 2016; Gürses, Troncoso, and Diaz 2011; Spiekermann and Cranor 2009).

User Centered Design

User centered design approaches have been at the center of HCI practices for several decades. User centered design's purpose is generally to *solve a problem* or create a system to *support and inform*, but often includes methods to *explore people and situations*. Design is conducted *by design authorities, for stakeholders*, where stakeholders are conceptualized as users. User centered design emerged from human factors and cognitive science, originally focusing on aligning mental models between humans and machines to improve usability, efficiency, and reduce the cognitive burden placed on users, and has expanded to consider a broader set of user needs. Privacy research with this design orientation has focused on improving the usability of privacy notices, making them easier to comprehend, easier to compare across services and products, and timing their display to be more useful to users. Systems are designed to match users' understandings and mental models of privacy.

Implicitly, this work assumes that if privacy tools and settings are made more usable or better align with users' expectations of privacy, then people will make more privacy-preserving decisions. Usable privacy often operationalizes an individual control orientation to privacy, where privacy is about an individual's ability to control or make choices about their data. This aligns well with the Fair Information Practices which take a similar individual control orientation to privacy, such that many usable privacy projects focus on improving forms of notice, choice, and control for users. User centered design can also surface other conceptualizations or expectations that users have about privacy but generally focuses on addressing individuals' current understandings, preferences, and behaviors related to privacy.

Participatory Engagement & Value Centered Design

While participatory and value centered design have different histories, I discuss them together, as they share properties when seen through the lens of this chapter's design dimensions. HCI adopted participatory design from its original Scandinavian form to allow users and stakeholders to take more active roles in the design process, rather than being end users or usability test subjects who lack agency (Asaro 2000). Value centered design approaches originated from a set of perspectives and techniques to consider social values beyond those of efficiency and usability during design. The end purpose of these orientations is also to create a system that *solves a problem* or one that helps *inform or support*. But to arrive at this end goal, design is also used to *explore people and situations.* Design work is done *for stakeholders* both *by design authorities* and *by stakeholders,* by inviting stakeholders to participate in the design process often through group activities or workshops to help elicit their values and expertise. For example, Abokhodair proposes using a value sensitive design methodology to *explore* and learn about privacy and social media use among Saudi Arabian youth by doing design activities with them, with the goal of developing culturally-sensitive design principles to help *solve a privacy problem* and *support* this population (Abokhodair 2015). Müller et al. use a participatory design process to involve

young girls in designing and evaluating sketches of several location-based mobile apps for youths (design *by stakeholders*) (Müller et al. 2013). These approaches highlight how privacy solutions can be sensitive to sociocultural differences and specificities by incorporating design work *by stakeholders* or using design *to explore peoples' and situations'* values and desires. In participatory and values centered design, stakeholders are often broader than users, including people such as indirect users, administrators, and non-users.

Privacy in these orientations is seen as contextual and sociocultural. Rather than starting with a pre-defined conception, the privacy concept emerges from a participatory or exploratory process. By understanding how privacy arises for a variety of stakeholders, systems can be better designed in ways that are sensitive to multiple communities and populations. Privacy is viewed as a property of users, stakeholders, and the social, cultural, and institutional contexts in which they are situated.

Re-Design, Re-Appropriation, and Resistance

Design is not solely in the hands of design authorities; users and stakeholders can change or use systems in unexpected ways. Usually this is done to try to *solve a problem* that the current system does not address; at other times it might be to try to *critique or present critical alternatives.* For instance, Martin et al.'s urban camouflage workshop created a space for people to design resistance and obfuscation strategies to urban surveillance systems, presenting alternative ways for people to relate to surveillance systems (Martin, Dalton, and Jones 2012). These resistance and re-design practices were done *by stakeholders, for stakeholders*, as the people in the workshop were not designers of surveillance systems, but were stakeholders (potential subjects of surveillance system). In an example of re-appropriation, Chen and Xu document how hospital employees employ workarounds when their computer systems' privacy features mismatch their work practices. Chen and Xu suggest a set of recommendations for "privacy-by-redesign" in order to solve a problem currently unaddressed by the current system (Chen and Xu 2013).

Moments of re-design, re-appropriation, and resistance for privacy suggest that the meaning of privacy is being contested. The way privacy is considered by the existing system, if at all—including who and what privacy should protect, the theory and operationalization of privacy, and who or what is responsible for providing privacy—does not match the needs, beliefs, and lived experiences of stakeholders. In these cases, some stakeholders modify systems or behaviors towards alternative privacy ends.

Speculative and Critical Design

Speculative and critical design employs design *to explore* and *to critique, speculate, and present critical alternatives.* This is generally done *by design authorities, for design authorities* to reflect on or discuss social issues, but recent work has experimented with using speculative and critical design artifacts *for stakeholders* to engage with (Elsden et al. 2017). Design authorities create conceptual designs or artifacts that at first glance might seem like everyday objects, but upon closer inspection might seem slightly out of place in today's world. These artifacts encourage viewers to imagine a world in which these objects could exist as everyday objects and ask what social, economic, political, and technical configurations of the world would allow for these objects to exist, and how would that world differ from the present? This research prompts discussions about future worlds we might strive to achieve or avoid. Lindley and Coulton's *Game of Drones* surfaces privacy concerns within a world of personal drone use, presenting a

speculative regulatory framework, enforcement notices, public infrastructures, and drone controller designs, raising questions about what types of privacy concerns emerge from drone use, and whether or not gamification mechanisms are appropriate tools to use to address privacy (Lindley and Coulton 2015b). Wong et al. create a booklet of imagined privacy-invasive sensing technologies to engage technologists in discussions to surface what conceptions of privacy might be at stake in different contexts (Wong et al. 2017).

Speculative and critical design can help explore and critique privacy shortcomings in current systems, and explore and speculate what might be considered "privacy" in emerging sociotechnical contexts. The focus of these projects is not about accurately predicting the future. Instead, their motivating questions are around "what values, practices, and politics are implicated in a system and its deployment?", or "In a world like this, whose and what privacies are at stake, what is threatening privacy, and where might we place responsibility for addressing privacy?" Importantly, speculative and critical design encourages critical reflection and reflexivity on the part of design authorities, and acknowledges the different subject positions that a people have in relation to technologies and institutions. These methods are useful for engaging with the interconnectedness of social, economic, political, and technical configurations of the world to try to surface new conceptualizations of privacy. Rather than trying to solve privacy, speculative and critical design can be used to interrogate and broaden the problem space of what is considered "privacy" in the first place.

Discussion

After surfacing design dimensions from the corpus of privacy and design HCI papers, and synthesizing them with existing design orientations in HCI, I reflect on how these dimensions of design could shape PBD research, practice, and policy. I first discuss opportunities for design to unearth contextual understandings of privacy's situated meaning and to explore and critique—rather than just solve—privacy problems. I next discuss the utility for PBD of viewing privacy as sociotechnical (rather than purely technical or social).

Utilizing Design's Multiple Purposes

Most papers in the corpus used design to *solve a problem* or to *support or inform* privacy decision making, often utilizing software engineering or user centered design practices. Indeed, regulators and practitioners are already looking to software engineering and user centered design to implement PBD. However, the corpus reveals HCI researchers employing a broader set of design approaches to privacy, including design *to explore people and situations* and to *critique, speculate, or present critical alternatives*. These purposes of design are largely absent from the policy discussion and practice of PBD. Given the contested, contextual, and positional nature of privacy, we believe utilizing design towards these purposes is crucial to advancing PBD in design, policy, and practice.

Design practices that aim *to solve* or *support* privacy work best when the problem or goal of privacy is well known and clearly defined, such as privacy as anonymity, privacy as individual control over personal data, or privacy as the FIPs. These conceptions of privacy often drive system and software engineering and user centered design.

In contrast, other design orientations are most productive when the conception of privacy that ought to guide design is unknown or contested. Participatory engagement & value centered design can surface relevant conceptions or experiences of privacy through the study of stakeholders in context. Speculative and critical design can surface, suggest, and explore

alternative conceptions of privacy. Re-design, re-appropriation, and resistance can challenge dominant conceptions of privacy (such as individual control over personal data) and propose competing concepts of what privacy is for.

Design thus is not just a tool for solving privacy problems, but also a tool to broaden our understanding and stretch our imagination about what privacy might entail, and encourage forward-looking, sociotechnical, and reflexive thinking about privacy. Bamberger and Mulligan provide an overview of how privacy professionals struggle to address concepts of privacy beyond data protection and to address situated experiences of privacy in light of sociotechnical change. They argue that "to successfully protect privacy, firms…must integrate…collective, contextual, and varied understandings of the ways that corporate use of personal information can intrude on the personal sphere, individual autonomy, and the public good of privacy" (Bamberger and Mulligan 2015, 27). The PBD movement will miss this broader view of privacy if it restricts its view of design to engineering solutions to implement regulatory demands. Viewing design through a solutionism lens misses the opportunity to further push and develop the exploratory, critical, and speculative design practices that could and should enable the contextual and inductive privacy work necessary to build privacy protections that respond to challenges of the future rather than solely those of the present and past.

A Sociotechnical Stance Towards Privacy

If design is to be used to address privacy in ways beyond *solving* or *supporting and informing*, how might privacy be conceptualized? I argue that the privacy must viewed as inherently sociotechnical and situated—even if the design output at first seems solely technological. This sociotechnical stance could be used with many theories of privacy that HCI researchers already draw on, including contextual integrity (Nissenbaum 2009), Solove's privacy harms and conceptualizations of privacy (Solove 2003; Solove 2002), privacy regulation theory (Altman 1975), and communication privacy management (Petronio 2002), or frameworks like the Fair Information Practices (Gellman 2017). Different privacy theories or frameworks may make more sense in some sociotechnical contexts over others.

A sociotechnical stance towards privacy recognizes that social values are not stable and universal phenomena, but are instantiated through specific practices and ongoing processes. Mulligan et al.'s discussion of privacy as an essentially contested concept provides a mapping of the multiplicity of concepts of privacy that might be at stake in a given situation or practice, which must take into account both social and technical aspects to understand: different conceptions of why privacy should exist, from whom privacy is sought, and what privacy protects (Mulligan, Koopman, and Doty 2016). Mulligan et al. also suggest that responsibility for privacy protection may be split among different institutions and modalities including technology design, law, and social norms.

Design approaches that *explore people and situations* and *critique, speculate, and present critical alternatives* are well suited to identify the multiple aspects and concepts of privacy at play in a given situation or context, as these help identify and think about entangled relationships among the social, technical, and legal. Furthermore, values are always being enacted and contested, thus design solutions are in some sense always partial. This is important to recognize when designing *to solve a problem* or to *inform and support privacy*. As Baumer and Silberman write, not all problems are best solved through technical design solutions (Baumer and Silberman 2011), and in many instances privacy protection will require designing both technical and human processes. Explicitly acknowledging the partialness of design solutions for privacy—

by specifying the theory of privacy used, who and what privacy protects (and does not protect), as well as why privacy is needed—can allow other mechanisms (such as law, regulation, markets, or social norms) to be deployed to address additional aspects of privacy if necessary.

Recognizing Design's Politics

What are the politics in the turn to "design" in privacy research and practice vis a vis privacy by design? Design is not an equal, neutral replacement of regulators' policy mechanisms. Design has its own set of affordances and politics which may provide new opportunities, risks, and ways to approach privacy. A long history of work has described how technological artifacts are not neutral, but promote particular values and ways of order (Winner 1980; Latour 1992; Friedman and Nissenbaum 1996; Nissenbaum 2001). Similarly, the act of design is not neutral. How we use design to frame and address problems has a set of politics. In this paper, the dimension of purpose(s) of how privacy is addressed by design (Figure 2.1) describes design's multiple political orientations.

It is perhaps easier to see how design *to explore* or *to critique* concepts of privacy uses design in political ways. However, *all* design has politics. Even when a conception of privacy seems like it has already been settled, as is often the case in design *to solve* or *to inform and support*, the very act of choosing design as a tool is a political act. It can have a potentially subversive politics in that through design, its political ends can be both enacted and concealed (Winner 1980). Yet when the political ends and values being designed for are those societies have chosen to privilege—e.g., human rights—then design may help us double down on our political commitments.

Furthermore, design is not a discrete practice separate from the rest of society. Jackson et al. describe design, practice, and policy as a metaphorical knot: "the nominally separate moments of design, practice and policy show up as deeply intertwined… They are mutually constitutive…informing one another in forceful and sometimes subtle ways." (Jackson, Gillespie, and Payette 2014, 589) Gürses and van Hoboken analyze the intertwining of privacy governance and software development with the shift to agile development practices, creating new relationships among people, companies, and data (Gürses and Hoboken 2017). Design shapes and is shaped by the sociopolitical in ways that frame, foreground, and foreclose what and whose privacies are possible.

PBD rides the popularity of "design" in the contemporary moment, but it stems from a recognition of design's power. When advocating for the use of PBD as privacy and HCI scholars, we need to acknowledge the complexity of design's power—its multiple political orientations, its limitations, its dynamism, and its entanglement with other sociotechnical systems—which affects when, where, how, and by whom design can best be used.

Bringing Design to The Privacy (By Design) Table

Given the range of actors related to PBD, I diffract this chapter's findings and discussion through specific sub-communities relevant to privacy and PBD research and practice to generate implications.

PBD researchers can benefit by expanding design orientations used in privacy research, utilizing methods from Participatory & Values Centered Design, Re-Design, and Speculative and Critical Design, adding to the already rich body of privacy engineering and usable privacy research. Not all problems posed by privacy are problems of engineering or usability. These additional design orientations can help solve, inform, explore, and critique other types of

problems posed by privacy. Fully utilizing this range of design orientations in HCI, particularly ones that center design *to explore* and *to critique*, requires a commitment to creating and maintaining spaces and opportunities (perhaps building on the success of multiple privacy workshops at HCI conferences (Stark et al. 2016; Vitak et al. 2015; Wisniewski et al. 2017)) for interdisciplinary research and engagement across multiple epistemologies spanning engineering, social sciences, humanities, and arts.

Privacy researchers in HCI can similarly expand the design orientation utilized in privacy research. While our corpus may not be representative of all privacy and design research, our findings begin to suggest that privacy and design work in HCI is heavily weighted towards design for *solving a problem* or *informing and supporting*, and are designed *by design authorities*, *for stakeholders* (often through software engineering and user centered design orientations). Other orientations which use design toward other purposes and involve different combinations of actors appear to be underused in HCI privacy research, but could beneficially complement privacy engineering and usable privacy approaches. HCI privacy research can usefully broaden its design perspectives and orientations, making greater use of participatory, exploratory, and critical design traditions in HCI, or collaborating with those already utilizing those design research approaches.

HCI design researchers, particularly those practicing speculative and critical design, should engage with HCI privacy researchers and engage with regulatory and commercial processes, broadening beyond doing design work *for design authorities*, to also doing design work *for stakeholders*. The potential value of speculative and critical design approaches to the work of others in the PBD field and to the protection of privacy suggests engaging with these stakeholders. This follows Elsden et al.'s call for speculative and critical design to engage with "applied, participatory and experience-centered" aspects of HCI (Elsden et al. 2017). These can contribute to PBD by critiquing current conceptions of privacy, and exploring what and how privacy might emerge in new sociotechnical situations. The complicated forward-looking work that corporate privacy practitioners do could benefit from approaches that help not only see around corners but imagine new or alternative corners to see around. While speculative and critical design are sometimes seen as impractical, these practices may resonate with existing corporate speculative practices such as scenario planning or visioning videos (Wong and Khovanskaya 2018). Tactically utilizing these resonances may allow speculative and critical design to gain legitimacy in corporate spaces while still maintaining their political commitments. Design researchers can also bring to privacy research approaches that foreground exploration or critique of social values, but were not reflected in our corpus, such as critical making, adversarial design, or social justice-oriented design.

Privacy practitioners, particularly industry privacy officers, have sought to find contextual and anticipatory privacy tools (Bamberger and Mulligan 2015). While privacy engineering provides a useful set of tools for addressing well-defined privacy threats, the design orientations in Table 2.1 can aid in addressing privacy in contextual and anticipatory ways. Many companies already have interaction and UX designers with knowledge of these methods, but they may not be involved in privacy efforts. Inviting designers to the table at companies' privacy teams (which often already include legal and engineering experts) can help address privacy not just as a data problem, but also as problem of contextual sociotechnical practices.

Policymakers, in calling for addressing a range of social values "by design," (e.g., privacy, security, fairness) should consider which values technology should protect and which should be protected by social or legal processes. Dwork and Mulligan note how design for

privacy might conflict with design for fairness (Dwork and Mulligan 2013); Mulligan and Bamberger argue for the need to prioritize and think across multiple values and their interactions when using technology to regulate (Mulligan and Bamberger 2018). While some design processes like value sensitive design offer some guidance for navigating values conflicts, policymakers might also look to other social or legal processes to debate and address values conflicts. Furthermore, when calling for addressing social values "by design," policymakers should recognize design as a multi-dimensional process with its own politics and affordances (rather than design as static properties of an end product or as a neutral implementation of law and policy goals). Conceptualizing design in PBD as only an engineering process would lead to a different (likely more data-centric) implementation than conceptualizing design in the broader and multiple ways that HCI has used.

Conclusion

This chapter aims to broaden perspectives on how design might be used in relation to social values, using the value of privacy as a case study. For the HCI design and privacy communities, the paper suggests reflection on how design has been predominantly deployed to address privacy, and the paper aims to build bridges to show how these communities' work and approaches can help inform each other and help broaden PBD's design efforts.

In the literature review of design and privacy research in HCI, I identify three proposed meta-dimensions along which design can be described in relation to privacy: the purpose of design, who does design work, and for whom design work is meant to serve or benefit. The four proposed purposes of design, while identified in relation to privacy, can be used in reference to values more broadly as well: design *to solve a values problem*; design *to inform or support a social value*; design *to explore people and situations*; and design to *critique, speculate, or present alternatives*. These purposes are referred to throughout the dissertation when design is discussed.

Several common HCI design orientations that have been used to address privacy were mapped onto these three meta-dimensions, including: software engineering; user centered design; participatory engagement & value centered design; re-design and resistance; and speculative and critical design. From this analysis, O specify implications for multiple PBD-relevant audiences. Overall, I suggest new roles that HCI and design can play in PBD, by taking up participatory, value centered, and speculative and critical design practices as part of PBD's repertoire. These can help PBD realize its full potential by going beyond deductive, compliance, and checklist-based approaches, and encouraging more holistic reflections and discussions by explicitly drawing connections among privacy's social, legal, and technical aspects.

Throughout the course of the dissertation, design is deployed in several ways referring to the dimensions proposed in this chapter. Grounded in this review's broader perspective of design, the next chapter details a design project utilizing design methods *to critique, speculate, and present alternatives* and *to explore people and situations.*

Chapter 3: Eliciting Privacy Reflections with Design Workbooks

Conversations about the relationships among technology development, social values, and societal outcomes occur in popular works of fiction, informed by and informing technical practices. For instance, *Black Mirror*, a television anthology series which uses dystopian stories around emerging technology trends to provoke critical reflection, has in turn informed product design exercises, academic HCI workshops, and teaching activities in classes for technologists-in-training (Mauldin 2018; Soden et al. 2019). These activities suggest that the discussion of values and technology present in the cultural imagination can be utilized in technical research and practice to spark critical reflection and discussion. The previous chapter articulated several ways design can be oriented towards values using the example of privacy: (1) using design to solve a privacy problem; (2) design to inform or support privacy; (3) design to explore people and situations; and (4) design to critique, speculative, or present critical alternatives. Most privacy research in HCI design as a way to solve a privacy problem, or to inform and support privacy. This chapter presents a design-based project that utilizes the other two orientations of design: to explore people and situations, and to critique, speculative, or present alternatives.

In this chapter, I discuss a collaborative project in which we create a set of speculative design fictions, inspired by the 2013 fiction novel *The Circle* which critiques issues of privacy related to social media and emerging sensing technologies. I first outline the process of creating the designs. These speculative design fictions were initially created to be used among a group of design researchers to explore privacy and surveillance implications of sensing technologies, interrogating and expanding on the how *The Circle* frames problems of privacy and surveillance. We then shared the speculative design fictions with 10 graduate student technologists-in-training through semi-structured interviews in a laboratory setting. We found that the technologists-in-training engaged with the designs to surface discussion of values such as privacy in a variety of ways. While seeing the introduction of workbooks of speculative design fictions as a potentially useful values lever to encourage discussion of values, this study also raised a series of new questions about values in design practice.

Design Fiction

Design fiction is an authorial practice that uses yet-to-be-realized design concepts to understand, explore, and question possible alternative worlds. Design fictions often focus on a particular artifact to illustrate a broader fictional world. Rather than predicting the future, design fictions create fictional worlds to ask questions about possible futures and to think through sociotechnical issues that have relevance and implications for the present. Bleecker describes design fiction a way to explore the mutual entailment of fact and fiction, proposing that "this knotting action—the tying together of fact and fiction—become a deliberate, conscientious, named part of the design practice, rather than something to be avoided or hidden after things are done" (Bleecker 2009, 25), using design objects to explore these connections. Bleecker builds on Kirby's notion of "diegetic prototypes," that technologies in science fiction films "exist as 'real' objects that function" within the world of the film (Kirby 2010, 43). Others expand on how design fiction "props" help imply or create a fictional world in which they exist (Lindley and Coulton 2015a;

Bosch 2016). This suggests that when creating and reading design fictions, we must think beyond what the object itself represents, and consider the object in relation to the sociocultural contexts in which it is presumed to exist. In the design research community, design fiction has been predominantly deployed in one of two ways.

First, a line of work uses the process of making design fictions as a method of inquiry. Blythe has used fictional abstracts to interrogate the genre of research papers (M. Blythe 2014), expanded upon by Lindley and Coulton who use fictional research papers to examine and critique practices in the HCI community (Lindley and Coulton 2016). Design fictions have increasingly taken non-textual forms, including textual-visual artifacts studying the roles of "counterfunctionals" (Pierce and Paulos 2014), videos exploring sustainability futures (Hauser, Desjardins, and Wakkary 2014), and creating material artifacts (Wakkary et al. 2015; M. Blythe et al. 2016). These bring attention to the exploratory and critical roles the process of *making* design fictions can play. A second line of work uses the lens of design fiction to analyze diegetic practices and narratives, including the practices of steampunk communities (Tanenbaum, Tanenbaum, and Wakkary 2012) or concept videos that portray corporate futures (Wong and Mulligan 2016). Tanenbaum et al.'s analysis of the film *Mad Max: Fury Road* (Tanenbaum, Pufal, and Tanenbaum 2016) and Lindley et al.'s analysis of *Her* (Lindley, Sharma, and Potts 2015) suggest considering science fiction films as design fictions. These authors use design fiction as an *analytical lens* to interrogate fictional worlds created by others, particularly ones in popular culture.

This chapter brings these lines of work together by creating new design fictions to both analyze an existing fictional world from a novel, and to ask and explore new questions about privacy. Instead of using science fiction media as objects of analysis, this project uses a science fiction text as a starting point to create new design fiction artifacts. The design fictions are then used in an empirical way, engaging interview participants in reflection on the designs.

This work builds on past connections drawn among design, research, fiction, and public imagination (Linehan et al. 2014). For researchers and designers, speculative fiction and science fiction have helped shape the field of ubiquitous computing (Dourish and Bell 2013) and inspired interface and interaction design (Shedroff and Noessel 2012). Pastiche scenarios use characters from fiction in design scenarios to flesh out personas (M. A. Blythe and Wright 2006). Sturdee et al. explicitly find inspiration in the sci-fi film *Blade Runner* to create design fiction (Sturdee et al. 2016), while Dunne and Raby's "United Micro Kingdoms" train design fiction (Dunne and Raby 2012) appears implicitly inspired by the film *Snowpiercer*. Literary scholars note how science fiction has garnered more literary respect in recent years and how literature engages technology in complex (and not purely adversarial) ways (Freese and Harris 2004). Fictional representations of technology also take hold in the public imagination, such as the vernacular use of "big brother" from George Orwell's dystopian novel *1984* or the popularity of the speculative fiction anthology show *Black Mirror.*

In collaboration with designer Ellen Van Wyk and design researcher James Pierce, we used design fiction as a way to explore privacy-related issues in near-future scenarios. Inspired by fictional sensing technology products from the 2013 fiction novel *The Circle*, this chapter uses a design workbook to develop variations of visual design fiction proposals, exploring privacy and surveillance implications of sensing technologies. This work develops and deploys design fictions in a novel way: by explicitly adapting written speculative fiction we tap into an author's existing richly imagined world, rather than creating our own imagined world from scratch or being implicitly inspired by ideas from speculative fiction. Adapting fictional worlds

from literature allows researchers who are not professional fiction writers to engage in creating design fictions. This helps us engage ideas in the cultural imagination, forging a bridge between popular speculative fiction and research. We also use Mulligan et al.'s privacy analytic (Mulligan, Koopman, and Doty 2016) as a way to map out how our design fictions explore different concepts of privacy, providing analytical depth to the design explorations and allowing us to reflect on relationships between technical, social, and political aspects of privacy.

While the design fiction workbooks were created by us as a group of design researchers in order to reflect on privacy and surveillance issues related to emerging sensing technologies, we later wanted to know how these design artifacts might be viewed and interpreted by other audiences. In particular, how might technology professionals view and interact with these design fictions, and could they do so in a way that elicits values reflections and discussions about privacy? Values in design research suggests that by understanding values held by stakeholders and values associated with or embedded in technologies, we can better acknowledge or anticipate possible values-related issues that may emerge from technologies' use, including privacy (Stark et al. 2016; Friedman, Kahn, and Borning 2008; Shilton, Koepfler, and Fleischmann 2014). Finding ways to elicit reflections and discussion on privacy-related values at the beginning of the design process can be useful in technology professionals' work. After creating and reflecting on our workbook of speculative design fictions, we then adapted our (digital) design fiction workbook into physical workbooks to use as interview prompts with an external audience—an expert population of graduate students preparing to enter technology-related professions—to understand how the workbooks could serve as tools to elicit values reflections.

Creating Design Workbooks from Speculative Fiction

We use a speculative fiction text as a starting point to create our own design fiction artifacts to ask and explore new questions about privacy.[3] Our design work draws from the fictional world of *The Circle*, a 2013 novel by Dave Eggers. Set at an unspecified time in the near-future, the novel focuses on Mae, a new employee at The Circle, the most powerful internet company in the world. The Circle (the company) provides services like social media, email, and personal finance, and creates hardware devices like cameras and health-monitoring bracelets. In the story, consumers are encouraged to share more and more details of their lives online in the name of transparency and knowledge building. The Circle uses its power to limit users' desire and ability to opt out of its systems. Though critical of technology, the novel is not fully dystopian. Rather it employs a dark humor, as throughout the story new technologies and services are introduced in the name of providing greater user value, though to the reader they may seem increasingly invasive.

The Circle (the novel) presents an opportunity to look at a contemporary popular depiction of sensing technologies, and reflects timely concerns about privacy and increasing data collection. We have no interest here in assessing the literary or cultural quality of the novel. Rather we were drawn to the novel as it was a New York Times bestseller, and thus a noteworthy part of the public discourse about the social, political, and ethical implications of new sensing technologies. We were also drawn to news that a film adaptation of the novel was in production, suggesting that the story will play a larger role in the public imagination after its release.[4] *The Circle* can be viewed as speculative fiction, defined broadly, using a near-future narrative to

[3] For a published account of this project, see (Wong, Van Wyk, and Pierce 2017).

[4] Our designs were created before the film adaptation's release in 2017 and represent our visual interpretation of the novel's world.

explore social issues related to fictional technologies that have a discernible basis in what is being developed today.

While prior design fictions incidentally touch on privacy—such as gestures towards data collection concerns in *Game of Drones* (Lindley and Coulton 2015b) and the *Future IKEA Catalogue* (Brown et al. 2016)—we wanted to use design fiction to explore a space of possible futures involving sensing technologies' potential privacy implications. We turned to design workbooks as our method to open this space, *using design to critique, speculate, and present critical alternatives*. Before starting the design work, we recognized that contemporary privacy literature views privacy as *contextual* (Nissenbaum 2009); that is, the same technologies can preserve or violate privacy in different social contexts. Furthermore, Mulligan et al.'s privacy analytic framework suggests that rather than attempting to discuss privacy under a single definition, it is more productive to map how various *dimensions* of privacy are represented in *particular situations* (Mulligan, Koopman, and Doty 2016). This theoretical understanding led us to focus on creating variations on our designs by placing them into new contexts and new social situations to change the values of these dimensions.

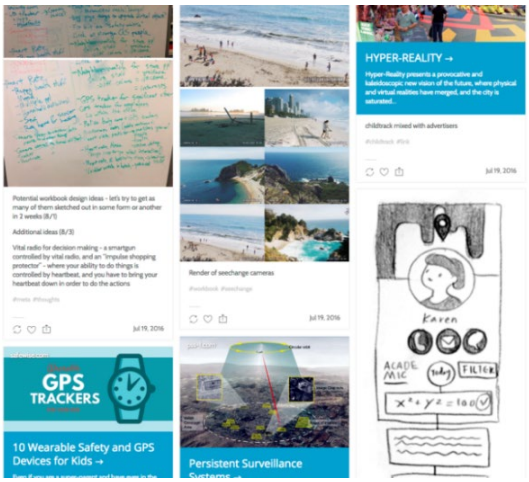


Figure 3.1. A screenshot of early design ideas and references, shared among the authors on a tumblr blog.

We follow the design workbook method to create a set of design fiction proposals. Design workbooks are collections of design proposals or conceptual designs, drawn together to investigate, explore, reflect on, and expand a design space; they purposely lack implementation details, allowing designers and workbook viewers to reflect, speculate, and generate multiple stories of possible use (W. Gaver 2011). Grounded in our readings of *The Circle*, we chose a set of sensing technologies that might be interesting to explore variations upon. Our goal was to create a set of proposals to open a design space of possible futures that would both include and expand beyond the future described in the book. We also wanted to see what new themes might emerge over time. Designs were primarily brainstormed and created by Ellen Van Wyk and myself, and shared amongst us and James Pierce through a blog (Figure 3.1), and periodically all three collaborators would discuss the design ideas to reflect on what questions and themes arose from the designs. In parallel, I worked on a separate but related project using surveys to explore respondents' reactions to technologies from *The Circle* (Wong, Mulligan, and Chuang 2017). Qualitative responses from that project's pilot survey were reviewed to provide design inspiration.

Our designs make use of two design genres: "interfaces," and "products and services." Our interface designs imagine what these technologies' user interfaces might look like. Product and service designs play on the genres of Amazon product pages, or websites for startups, products, and services. These genres help us think about the designs as everyday objects and imagine how they might be situated in the world. To create the interfaces we used Photoshop, Illustrator, and Sketch. To create the product and service pages we adapted HTML and CSS from websites including Amazon.com and getbootstrap.com. We included a variety of public domain stock images, hand drawn illustrations, and photos that collaborator Ellen Van Wyk staged and shot as assets.

We began our first set of designs by trying to visually imagine the technologies described in *The Circle*, staying as close to the textual descriptions as possible. We then discussed privacy themes emerging from the designs. We did two more rounds of design iterations to explore new combinations of privacy dimensions creating variations on our first set of designs. In these iterations, we used new social contexts, put the technologies in the hands of different users, or integrated Eggers' fictional technologies with real-world contexts and technologies. After each round of iteration, we evaluated how our collection of designs mapped onto Mulligan et al.'s dimensions. We ended our iterations after finding we explored a wide variety of combinations of privacy dimensions, suggesting that we had opened and broadened our design space.

Inspiration Technologies from *The Circle*

Our design fiction proposals draw from three technologies presented in *The Circl*e. While reading the novel, we noted that the story reminded us of several non-fictional technologies. To diversify and blend our design work with non-fictional technologies, some proposals were based on a fourth technology being researched and developed in the (real life) ubiquitous computing community but could fit into the novel's story world. I provide a brief summary of Eggers' three technologies from *The Circle* and a description of the fourth non-fictional technology.[5]

SeeChange

SeeChange is the most prominent technology introduced in the novel. It is described as a small camera, about the size of a lollipop, which wirelessly records and broadcasts live high-definition video. Its battery lasts for 2 years without recharging. It can be used indoors or outdoors and can be mounted discreetly. Live video streams from the cameras can be shared with anyone online. The story introduces the cameras as a way to monitor outdoor sports locations, share video streams for entertainment, or monitor spaces to prevent crimes. Later in the story, SeeChange becomes ubiquitous: they are placed in Mae's parents' house while they undergo medical treatment; worn continuously by elected officials to ensure democratic transparency; and eventually worn by Mae to promote The Circle to consumers through a constant live personal video stream. Below is a short excerpt from the novel which takes place during SeeChange's product launch, in which a lead executive from The Circle publicly demos the product.

[5] **Spoiler alert:** Several descriptions of these technologies include mentions of major plot points from the novel.

SeeChange Excerpt from The Circle

Now the page was refreshed, and the coastline was full-screen, and the resolution was perfect. There were sounds of awe throughout the room.

[…] He was holding a small device in his hand, the shape and size of a lollipop.

[…] "I set up that camera this morning. I taped it to a stake, stuck that stake in the sand, in the dunes, with no permit, nothing. In fact, no one knows it's there. So this morning I turned it on, then I drove back to the office, accessed Camera One, Stinson Beach, and I got this image. Actually, I was pretty busy this morning. I drove around and set up one at Rodeo Beach, too. And Montara. And Ocean Beach. Fort Point." With each beach Bailey mentioned, another live image appeared, each of them live, visible, with perfect clarity and brilliant color.

"Now remember: no one sees these cameras. I've hidden them pretty well. To the average person, they look like weeds, or some kind of stick. Anything. They're unnoticed. As you know, to do this with extant technology would have been prohibitively expensive for the average person. But what if all this was accessible and affordable to anyone? My friends, we're looking at retailing these – in just a few months, mind you – at fifty-nine dollars each."

[…] "You can buy ten of them for Christmas and suddenly you have constant access to everywhere you want to be – home, work, traffic conditions. And anyone can install them. It takes five minutes tops. Think of the implications!"

[…] The screen atomized into a thousand mini-screens. Beaches, mountains, lakes, cities, offices, living rooms. The crowd applauded wildly. Then the screen went blank, and from the black emerged a peace sign, in white.

"Now imagine the human rights implications. Protestors on the streets of Egypt no longer have to hold up a camera, hoping to catch a human rights violation or a murder and then somehow get the footage out of the streets and online. Now it's as easy as gluing a camera to a wall. Actually, we've done just that."

A stunned hush came over the audience.

"Let's have Camera 8 in Tahrir Square, Cairo."

A live shot of a street scene appeared. There were banners lying on the street, a pair of police in riot gear standing in the distance.

"They don't know we see them, but we do. The world is watching. And listening. Turn up the audio."

[…] "The square is quiet now, but can you imagine if something happened? There would be instant accountability. Any soldier committing an act of violence would instantly be recorded for posterity. He could be tried for war crimes, you name it. And even if they clear the square of journalists, the cameras are still there. And no matter how many times they try to eliminate the cameras, because they're so small, they'll never know for sure where they are, who's placed them where and when. And the not-knowing will prevent

> abuses of power. You take the average soldier who's now worried that a dozen cameras will catch him, for all eternity, dragging some woman down the street? Well, he should worry. He should worry about these cameras. He should worry about SeeChange. That's what we're calling them."
>
> There was a quick burst of applause.
>
> "Like it?" Bailey said. "Okay, now imagine any city with this kind of coverage. Who would commit a crime knowing they might be watched any time, anywhere? My friends in the FBI feel this would cut crime rates down by 70, 80 percent in any city where we have real and meaningful saturation."
>
> The applause grew. Live shots from all over the world filled the screen, and the crowd erupted again. Now Bailey cleared the screen again, and new words dropped onto the screen:
>
> ALL THAT HAPPENS MUST BE KNOWN. (Eggers 2013)

ChildTrack

In the novel, ChildTrack is introduced as an ongoing project at The Circle. It is a small chip that can be implanted into the bone of a child's body, allowing parents to know their child's location at all times. In the story, ChildTrack starts as a pilot program involving the insertion of location chips into children's wrists to prevent kidnapping. This leads to the problem of criminals knowing where the chips are located, and removing them from children. The solution is to embed the chips into children's bones, making it harder for criminals to extract. Later in the story, The Circle uses the same chips to store data about a child's educational records which parents can access "in one place." It is speculated that there eventually would be a complete record of a student's every academic activity, including every word ever read and every math problem ever completed.

NeighborWatch

NeighborWatch is introduced as a product pitch to The Circle within the novel. It is a neighborhood watch service utilizing SeeChange cameras placed throughout a neighborhood, so that residents can identify suspicious persons. People in the neighborhood register their data and biometrics with NeighborWatch to identify them as residents. Via a screen-based interface users can see an outlined-version of the inside and outside of nearby homes. Residents of the neighborhood or known visitors are displayed as blue figures. Unknown people are displayed as red figures, triggering a notification to residents. It is speculated in the story that other sources of data, such as criminal records, can be further used to color-code people.

Vital-Radio

Vital-Radio is a real-life prototype developed at MIT which uses radio waves to wirelessly detect a user's breathing and heart rate. It can monitor users up to 8 meters away and in separate rooms (Adib et al. 2015). Adib et al. note that Vital-Radio is limited to monitoring users who stay in-place and can only monitor three people simultaneously. We imagined a future version of Vital-Radio that could monitor more than three people simultaneously while moving. We also imagined that users could see and interact with their heart rate data as well as their stress levels,

emotional states, and other extrapolated information. In order to imagine how Vital-Radio might exist in the world of *The Circle*, we composed a short fiction passage in the style of Eggers depicting a launch and demo event for Vital-Radio by Victor, our own made up executive at The Circle.

Our Vital-Radio Fan Fiction

> Mae watched as Victor held a sleek black box, about the size of a small WiFi router. He turned to the audience and smiled.
>
> "My grandma's eighty-seven. Last year she broke her hip and I've been concerned about her. Last week, while she was napping--"
>
> A wave of laughter rippled through the audience.
>
> "Forgive me! Forgive me!" he said, "I had no choice. She wouldn't have let me do it otherwise. So I snuck in, and I installed Vital-Radio in her bedroom and the living room. It can see through walls up to twenty-five feet, so with just two of these boxes I can cover her whole house. She won't notice it."
>
> "And of course," Victor continued "all that data is stored in the cloud, and in your tablet, anywhere you want it. It's always accessible, and is constantly updated. So if you fall, hit your head, you're in the ambulance, the EMTs can access everything about your vitals history in seconds. And it's not just healthcare. Imagine your home adapting music and lighting based on your vital signs and your mood. Or getting customized assistance based on your stress level at a Vital-Radio kiosk in an unfamiliar airport. Imagine the possibilities!"

The Design Workbook

We present our design fiction proposals that show the progression of our design explorations, the breadth of design ideas inspired by the four technologies, the varying genres we used, and different ways we were inspired by our reflections on the novel, popular culture, and current technology trends.

Design Set 1: Adapting *The Circle*

Our first designs adapt the technologies from the novel's textual descriptions. As there are no illustrations in the novel, these designs realize our interpretation of the novel's world, in which these technologies were sold as consumer products by a large technology company.

SeeChange Beach (Figure 3.2) interprets SeeChange's interface based on its introduction in *The Circle*, when Bailey, one of the company's executives, reveals live SeeChange footage. This design highlights the features of the fictional camera by juxtaposing two languages—glossy stock photos, and a security camera overlay that usually accompanies grainy, low resolution footage. This design felt surprisingly believable after we made it, and slightly creepy as it put us in the position of feeling like we were surveilling people when looking at the design.

ChildTrack UI (Figure 3.3) interprets the book's description as an interface. Since ChildTrack is a complicated system that tracks children's location and academic records, its look is borrowed from Facebook's design patterns to make the concept easier to consume. A contrast is presented between presumably benign, user-friendly design, and the reality that The Circle has

an extensive knowledge of their users that goes beyond individual posts and photos. ChildTrack builds more 'meaningful' profiles by aggregating feed data over time, which is represented in the "overview" tab. This design puts the viewer in the position of a parent, able to see all of their child's information.

Grandma's Data (Figure 3.4) is an interface for Vital-Radio which realizes the description from our own *Circle*-like fiction passage. This design focuses on the presentation of the device's data and the visual design is kept to a wireframe stage. The data present a narrative of grandma's day and raise questions about how the data are related and how "emotion" and "stress" are classified and quantified.

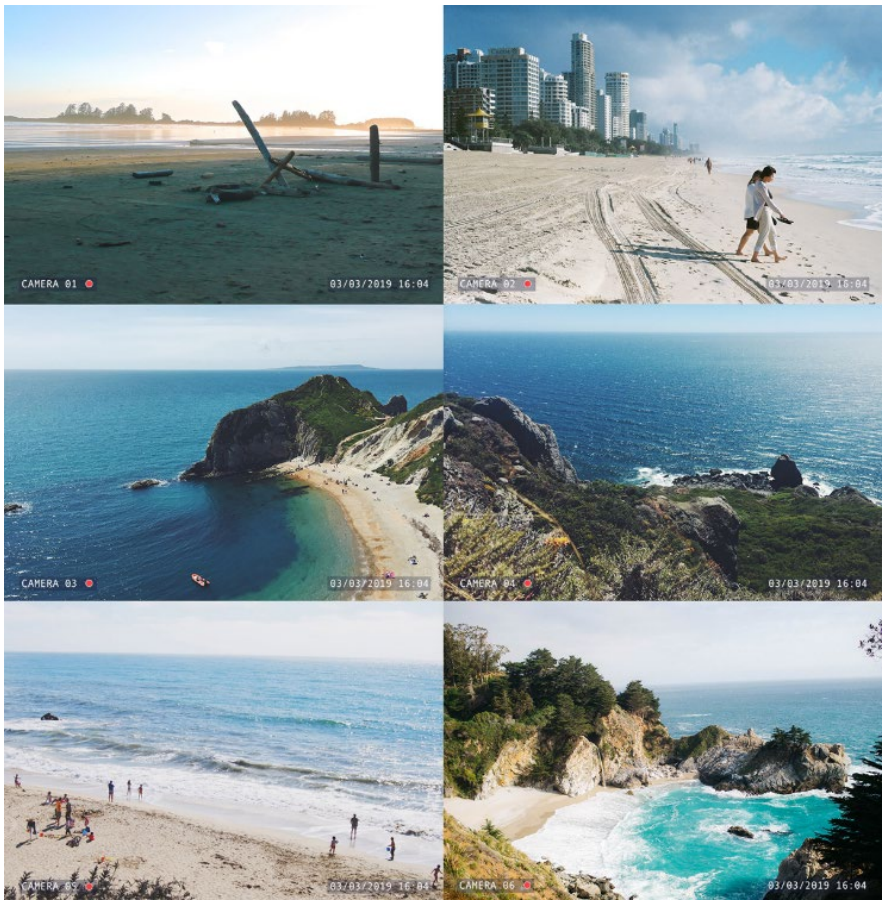


Figure 3.2. SeeChange Beach cameras

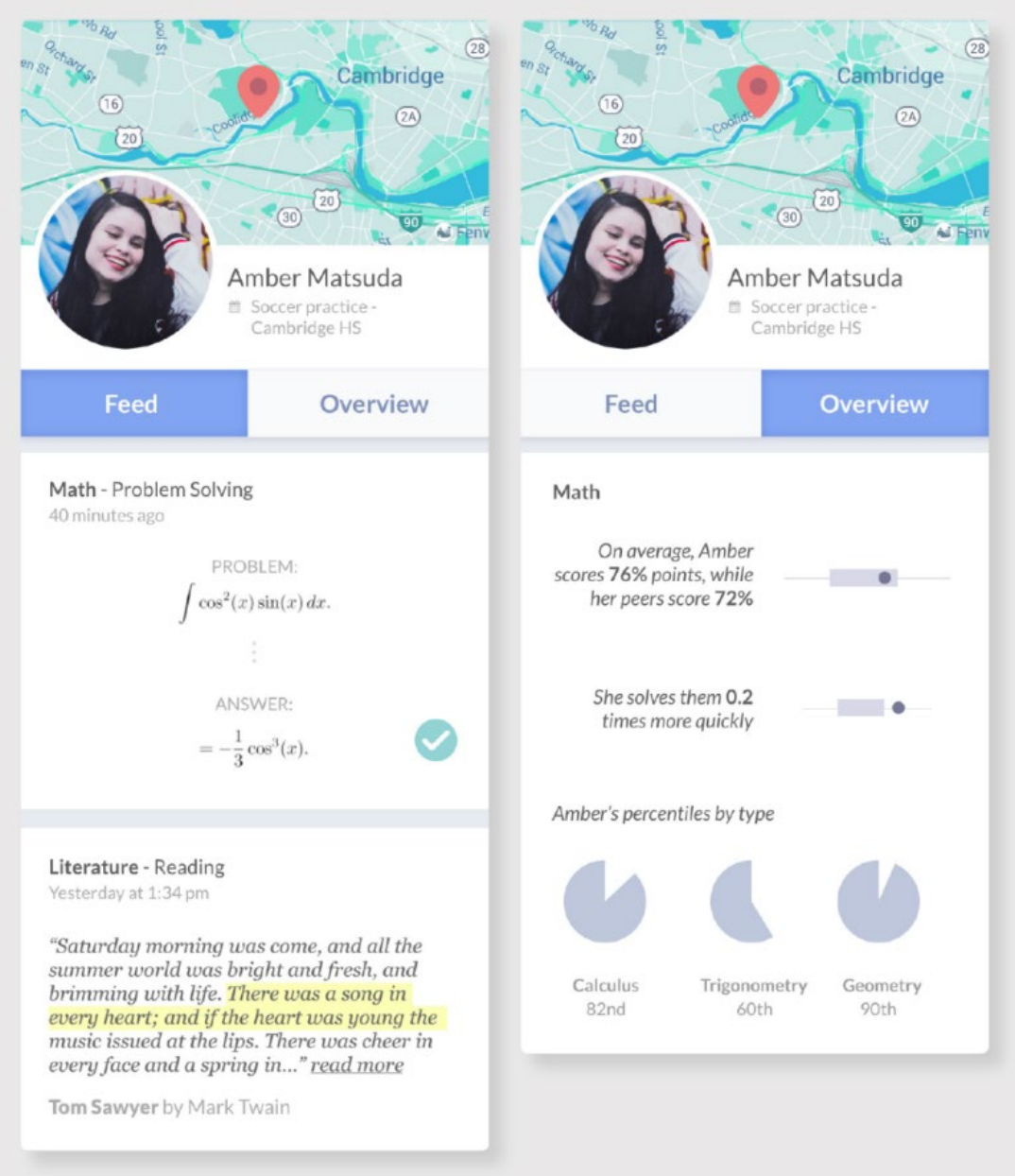


Figure 3.3. ChildTrack UI

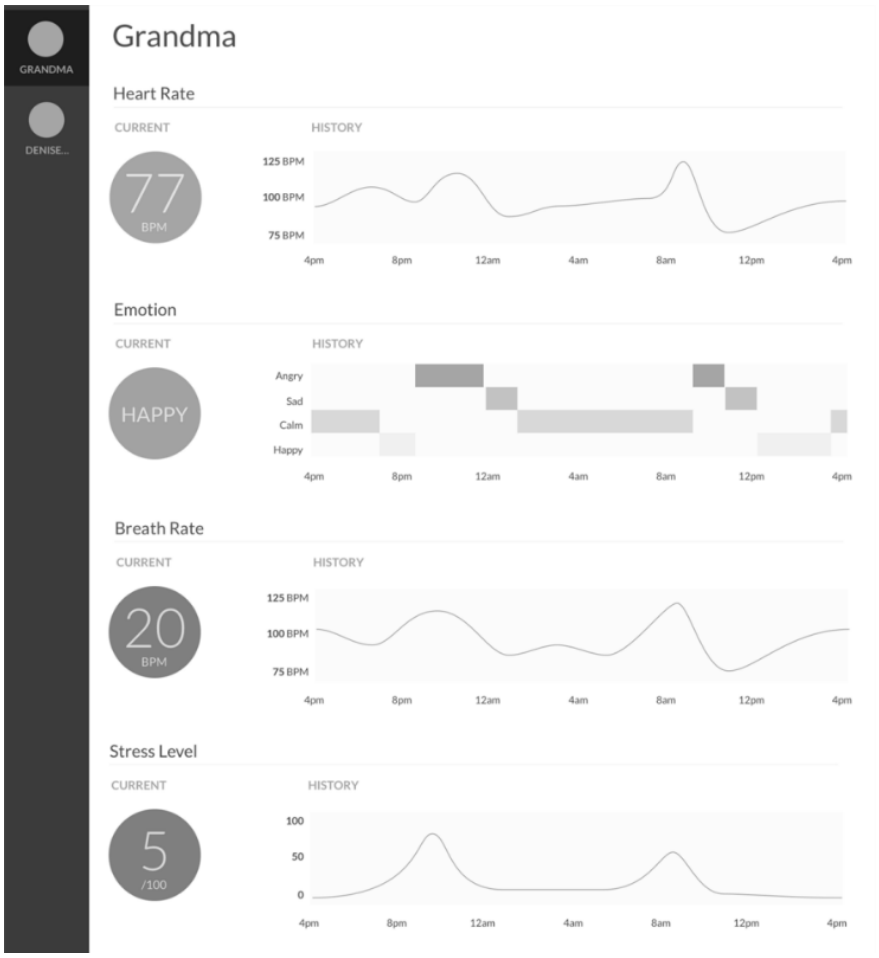


Figure 3.4. Grandma's Data in Vital-Radio

Design Set 2: *The Circle* in New Contexts

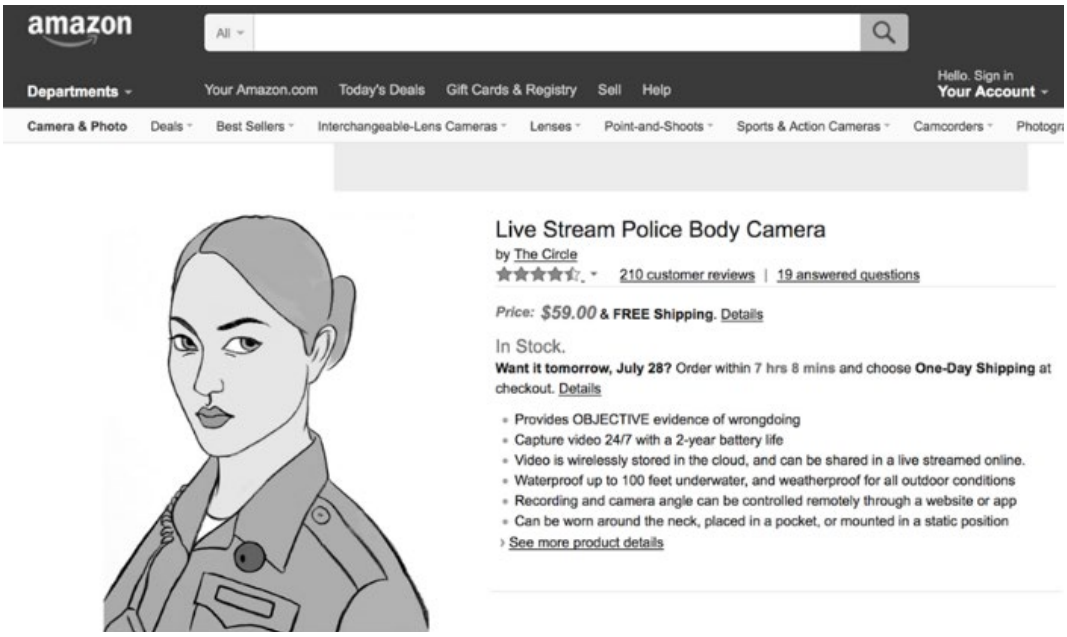
After our initial set of designs adapting technologies from their descriptions in *The Circle* (and our Vital-Radio fiction passage), we discussed how our first set of designs reflected potential privacy concerns. We began thinking about how the same set of technologies might be used in other situations and other social contexts within the world of the novel, but not depicted in Eggers' story, and how that might lead to conceptualizing privacy concerns in new ways by placing the technologies in a different set of social norms (Nissenbaum 2009; Mulligan, Koopman, and Doty 2016). This second set of designs goes beyond the textual descriptions in the novel by taking the same technologies and re-imagining them for new sets of users or for use in new social contexts, but could still exist and be sold in the fictional world presented in *The Circle*.

The **SeeChange Amazon pages** present the SeeChange camera being sold as three different products to user groups not discussed in *The Circle*. First is SeeChange as a **police body camera** (Figure 3.5a). Second is SeeChange framed as a small, hidden, wearable **camera for activist groups** like PETA (Figure 3.5b). Third is SeeChange marketed "**For Independence, Freedom, and Survival**," to be used by people suspicious of the government who may want to monitor government movements (Figure 3.5c). The latter was inspired by a pilot survey respondent's worry that SeeChange could be used by "right-wing activists harassing liberal groups" in the U.S. Our design frames SeeChange as a product that might seem valuable and

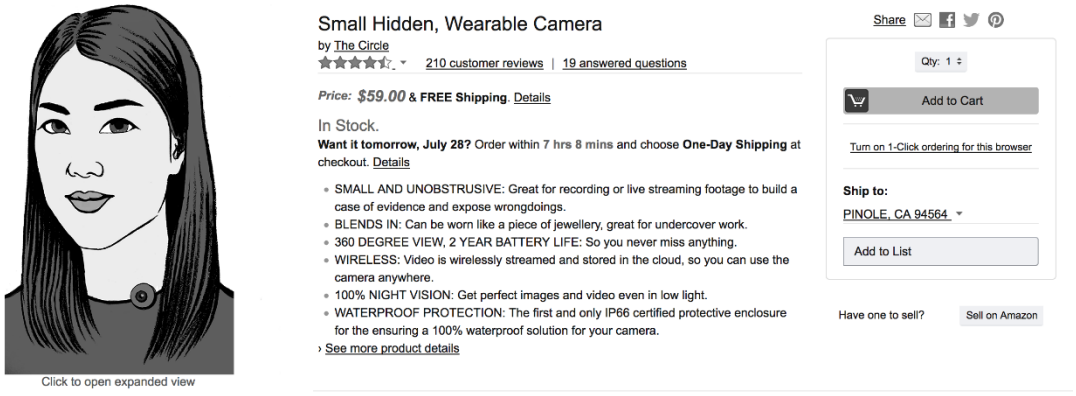
useful to a person who might want to hide the camera with the desire to watch government employees for perceived abuses of power. This set of designs interrogates which surveillance concerns stem from SeeChange's technical capabilities and which come from concerns about who SeeChange's users or subjects are. We play on this question by writing in the body camera's product description "Provides OBJECTIVE evidence of wrongdoing," leaving ambiguity about whether it is recording the police officer's or citizen's wrongdoing.

NeighborWatch Pro (Figure 3.6) uses a product website to market a version of NeighborWatch. While presented in the book as a service that any community could use, a pilot survey participant expressed concerns that only "wealthy closed communities" would use it. Our design imagines an "enhanced" automated version of NeighborWatch which intentionally caters to those communities, raising questions about racial and socioeconomic biases reflected by users, datasets, and algorithms utilized by the system.

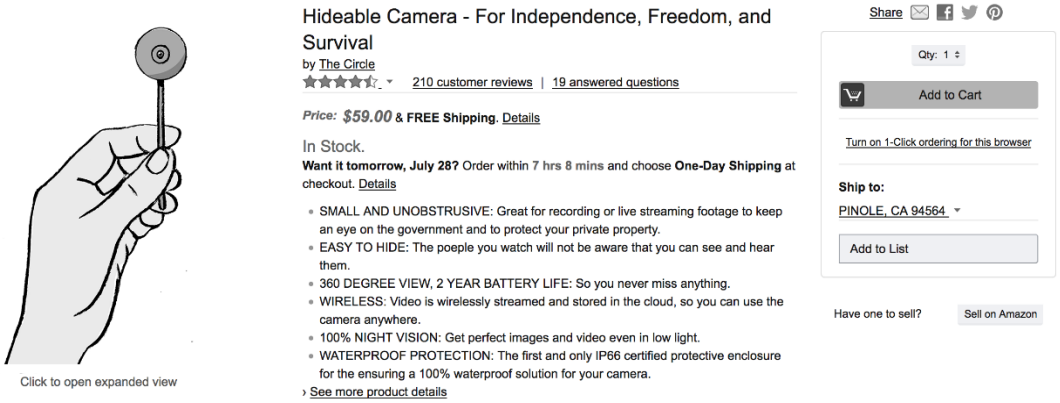
SeeChange Angles (Figure 3.7) was inspired by our thinking about the implications of ubiquitous SeeChange cameras always recording and broadcasting. On one hand, it might be nice to be able to automatically (re)watch sports and special events from multiple angles. Conversely, it might be creepy to use many multiple angles to watch a person doing daily activities. To explore this use case, the second author took photos of a subject from multiple angles inside and outside a room, and added a security camera overlay. The high quality and large quantity of photos suggest what may be possible with many high-definition SeeChange cameras.



(a



(b)



(c)

Figure 3.5. Amazon wireframe pages. Swapping out the product name and image, we show SeeChange as (a) a "live stream policy body camera", (b) a small wearable version for activists, and (c) SeeChange "For Independence, Freedom, and Survival", small enough to hide and monitor the government.

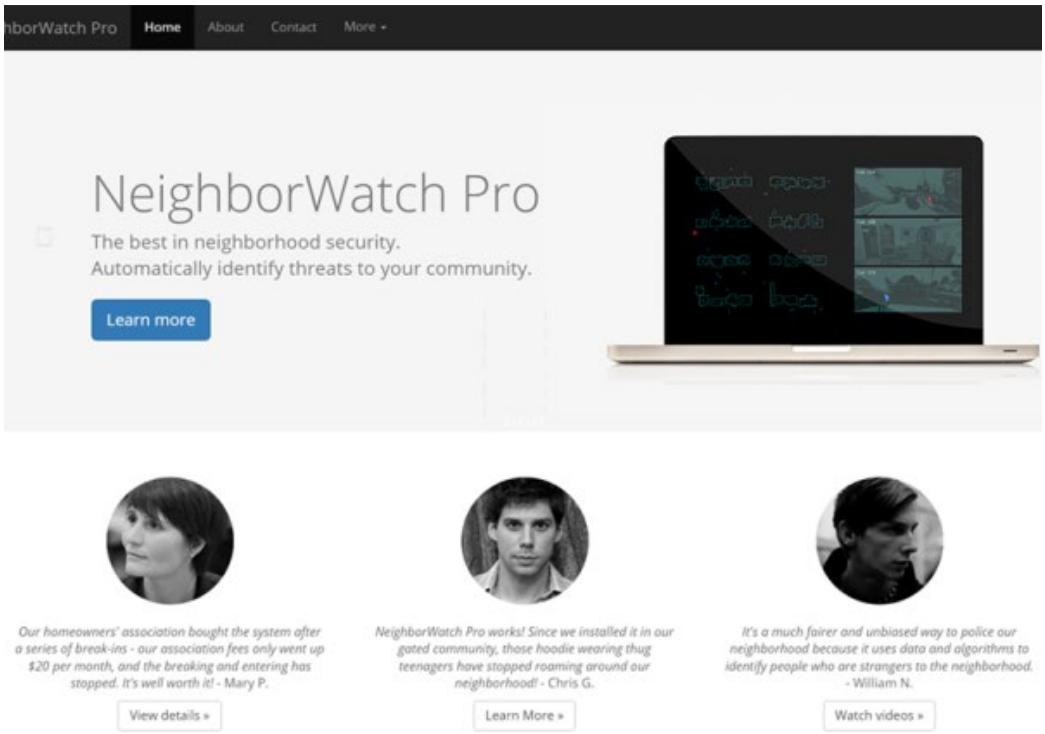


Figure 3.6. NeighborWatch Pro website

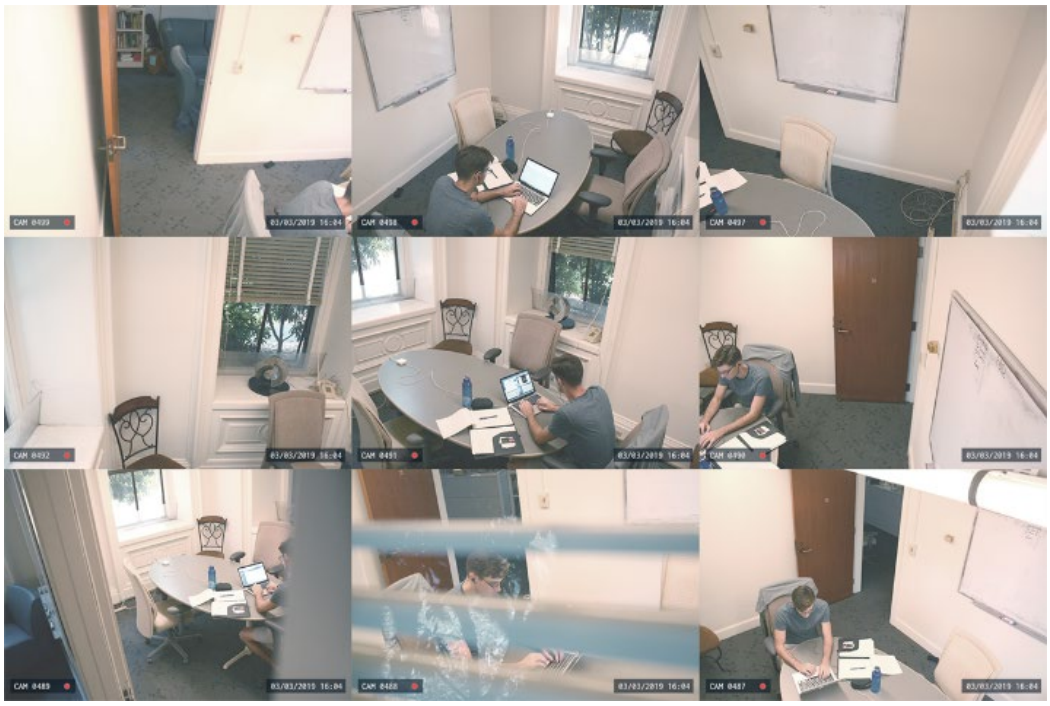


Figure 3.7. SeeChange Angles

Design Set 3: New Fictions and New Realities

After our second round of designs and thinking through the privacy analytic, we began thinking about privacy concerns that were *not* particularly present in *The Circle* or our existing designs, such as government surveillance (instead of surveillance by web companies), or how advertisers

or other third parties might benefit from this expanded collection of data. We also began to realize that many of the design ideas we were thinking about reflected non-fictional products being researched or developed. We wanted to more tightly integrate fictional and real emerging technologies through our proposals. The following designs, while inspired by *The Circle*, are imagined to exist in worlds beyond the novel's.

Airport Security (Figure 3.8) depicts an imagined use of NeighborWatch and SeeChange, where an airport surveillance system automatically assigns threat statuses to people by color-coding them. Rather than focusing on consumer technologies like in the novel, we re-imagine these as government technologies. The user interface is omitted in this design in order to invite questions about how the system classifies people, and what each of the colors mean. One interpretation is that it uses computer vision or machine learning techniques to classify people (instead of the manual database entry technique in the novel).

The **License Plate Tracker** (Figure 3.9) also puts SeeChange in the hands of the police or government intelligence agencies. It is presented in a low fidelity mockup where the UI elements help describe system's context and capabilities. For instance, the imagined user is a government official who can easily see anybody's location history and traffic camera images using the search feature, without restriction.

TruWork (Figure 3.10) re-imagines ChildTrack as an implantable tracking device for employees that employers use to keep track of their whereabouts and work activities, as employer surveillance is not critically addressed in the novel. Our design presents a product website targeting employers, using language like "Know the truth" about your employees. While presented positively, the lack of employee viewpoints raises questions about power, and how employees may try to resist or game these systems.

The next set of designs employs the visual language of startup companies and their products and services. For example, onboarding tutorials or advertising often include cute, simple cartoons explaining the use of a product. **Vital Radio Match** (Figure 3.11a) extends the real-world Vital Radio to be used as an online dating service by matching people's "compatible" heart rates. The visual language draws comparisons to other dating applications, and provokes questions about the persuasive power of algorithmically generated results. **CoupleTrack** (Figure 3.11b), based on ChildTrack, allows adult couples to use implanted chips to continuously track each other's location and activities. **ChildTrack for Advertisers** (Figure 3.11c) allows advertisers, who are never discussed in *The Circle*, to leverage a child's location data to individually target them with advertisements, or for things that children with a "similar profile" like. Together these designs interrogate the relationship between privacy and personal data from the viewpoints of different stakeholders.

Amazon Echo with Vital-Radio combines the real Amazon Echo—a hands-free speaker, smarthome controller, and virtual assistant—with Vital Radio, presented as a product for sale by Amazon (Figure 3.12). Our design proposal uses a person's heartbeat patterns to adjust a home's lighting and temperature settings, and automatically buys items from Amazon.com that it thinks will suit the user's current mood, raising questions about what types of third parties have access to a user's data.

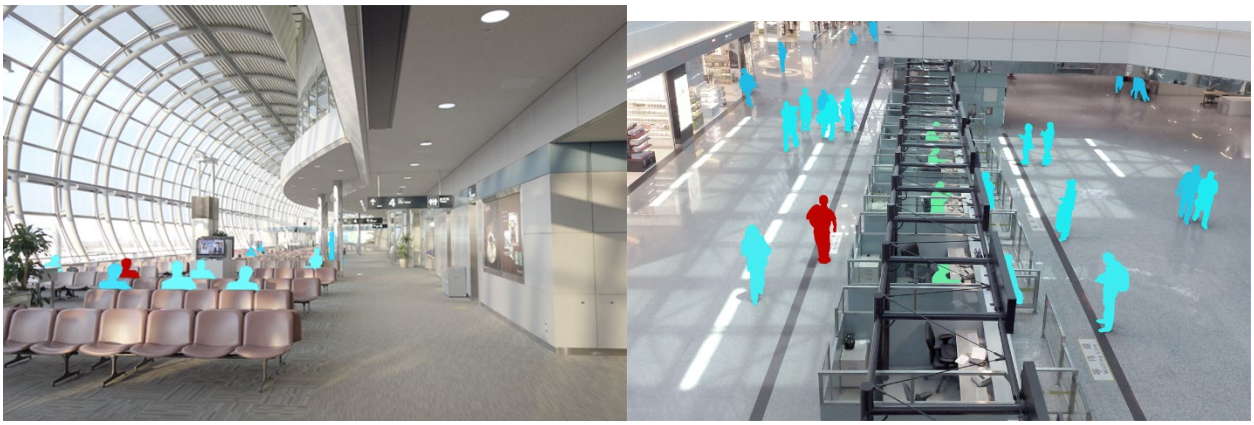


Figure 3.8. Airport Security, inspired by NeighborWatch.
Images adapted from (Pelican 2013; Wiechers 2007) under CC BY-SA 2.0

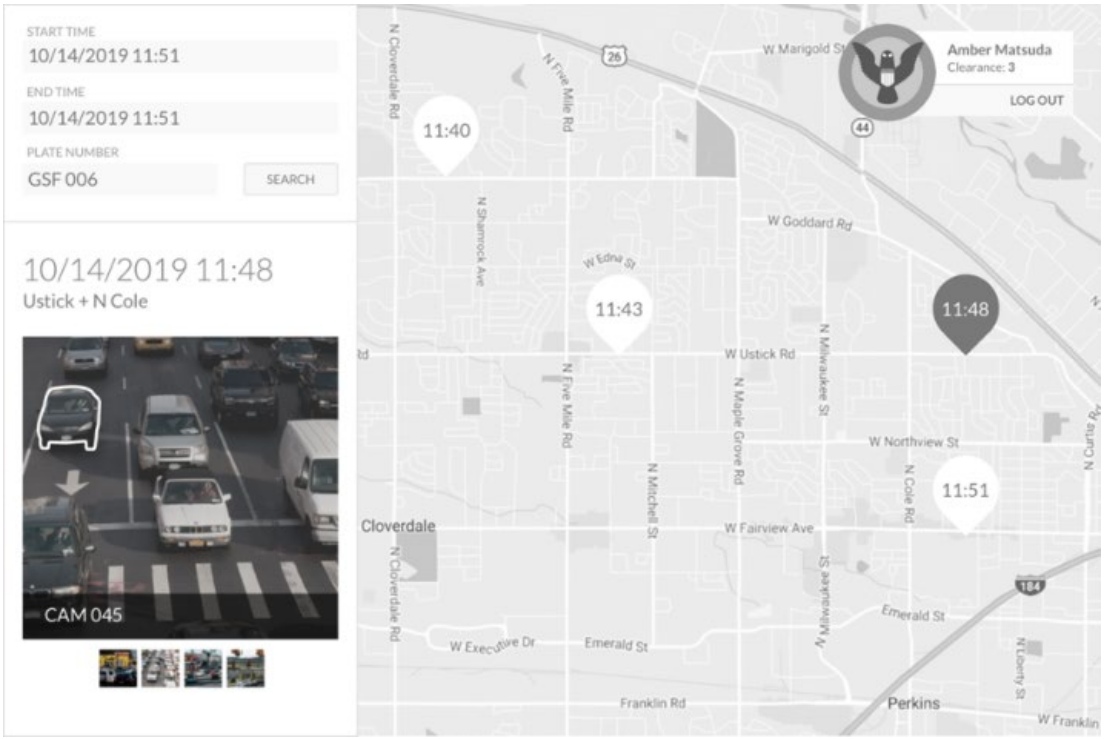


Figure 3.9. License Plate Tracker, inspired by SeeChange

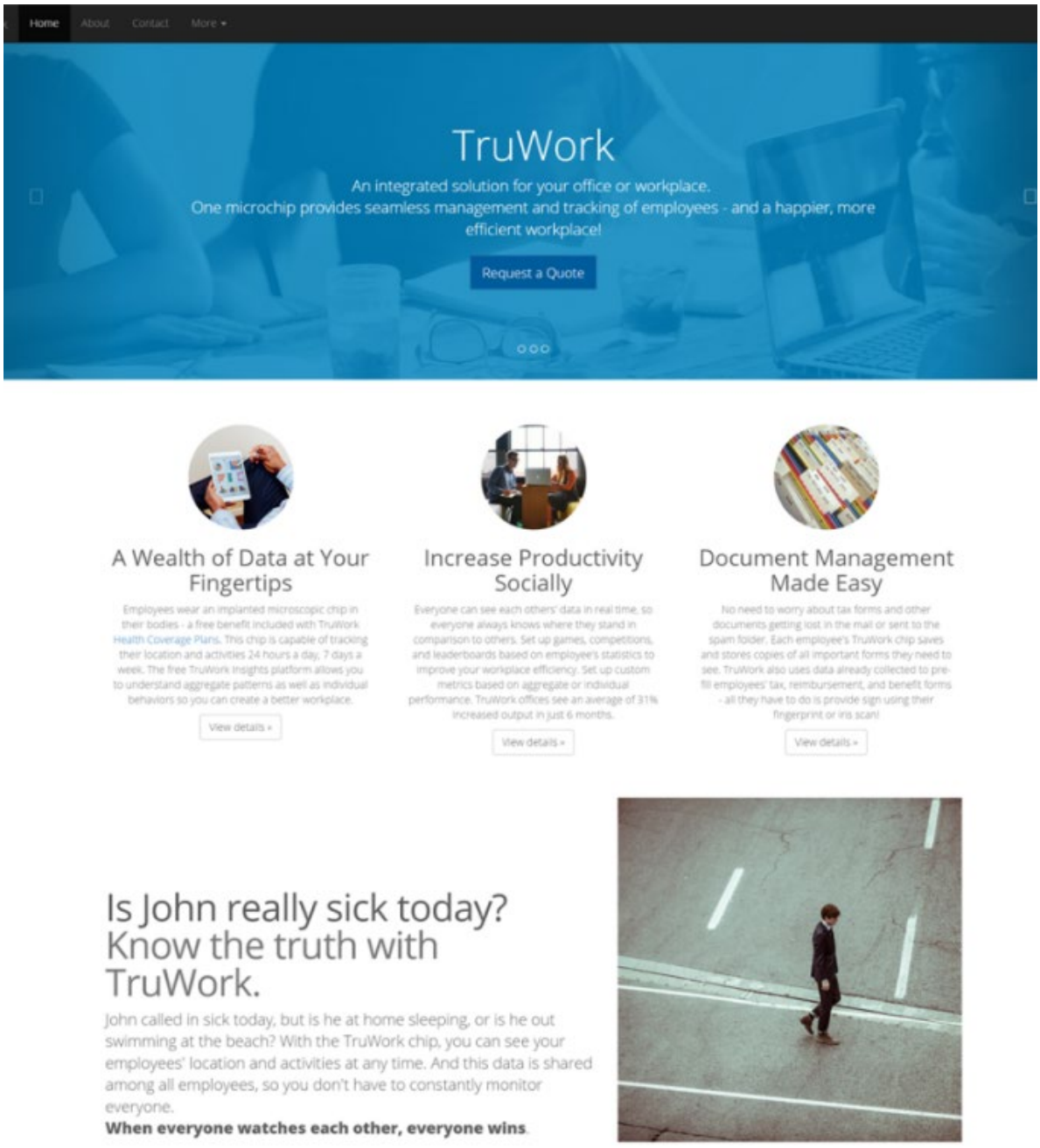


Figure 3.10. TruWork website, inspired by ChildTrack

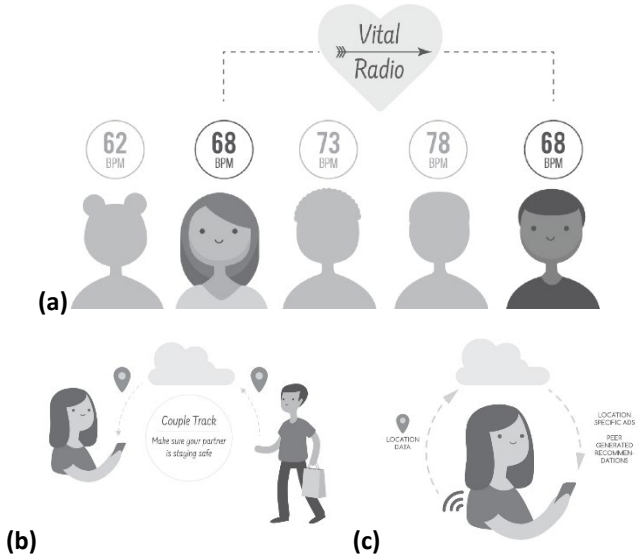


Figure 3.11. Product diagrams depicting (a) Vital Radio Match, (b) CoupleTrack, (c) ChildTrack for Advertisers

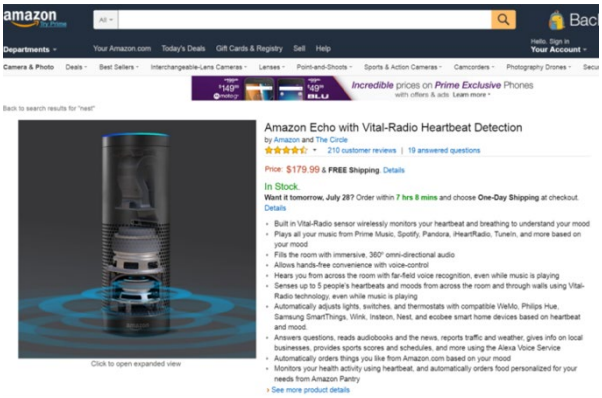


Figure 3.12. Amazon Echo with Vital-Radio

Analyzing Privacy Dimensions in Our Designs

Using Mulligan et al.'s privacy analytic (Mulligan, Koopman, and Doty 2016) to interpret our design fictions after each round of designs, we ended our iterations after finding we explored a wide variety of combinations of privacy dimensions, allowing us to explore a broad space of privacy issues in and beyond *The Circle*. Applying an analytical framework created for specific empirical topics to our workbook helps provide deeper and more theoretically-informed reflections on our designs, in contrast to other speculative design research that views the viewer or reader as primarily responsible for reflecting on the designs, rather than the designer/researcher. In contrast, we sought to conduct some deeper reflections on the multiple ways in which privacy might get conceptualized through our designs. We present a brief analysis and interpretation of our design fictions using the privacy analytic dimensions (theory, protection, harm, provision, and scope) before discussing some broader reflections on our design process.

First looking at the issues arising from our initial round of designs (SeeChange Beach, ChildTrack UI, Grandma's Data), the main theory of privacy employed is that privacy protects individuals' personal information. What is being protected is individuals' data and their image or

likeness (in SeeChange). Privacy harms stem from other individual consumers who buy and use these technologies. The novel does away with mechanisms that might provide privacy protection: laws and social norms that require consent before collecting information or embedding devices in someone's body do not exist in this fictional world; and new technical abilities that make it easier to hide or disguise sensing technologies. The scope of these privacy issues is broad, encompassing both public and private spaces. Our design fiction proposals in subsequent rounds of design vary or provide more specifics to these dimensions of privacy, to think about issues not present or central in the Eggers novel. Each of these dimensions is outlined below.

Theory. Our designs go beyond conceptualizing privacy as merely keeping data secret. NeighborWatch Pro and Airport Surveillance both conceive privacy as protecting adults' personal autonomy from surveillance. SeeChange Angles shows another conception of privacy focused on maintaining the sanctity of private space. Our designs also challenge dominant conceptions in U.S. policy of privacy as individual control over personal information. Designs such as the SeeChange Live Stream Body Camera, SeeChange Activist Camera, Airport Security, and TruWork all represent situations where an individual does not have complete control over when they are being recorded or when their data are being collected.

Protection. ChildTrack UI, CoupleTrack, and TruWork are imagined to use the same technology, but identify new specific groups being protected by privacy. ChildTrack UI violates a child's privacy; CoupleTrack explores privacy in the context of an adult relationship; TruWork explores employers violating employees' privacy.

Harm. Our designs identified privacy harms caused by actors beyond consumers and users. TruWork identifies employers as causing privacy harms, while License Plate Tracker and Airport Surveillance imagine government institutions using sensors to violate privacy. These highlight the role of power-laden relationships as one potential vector of causing privacy harms. Amazon Echo with Vital-Radio and ChildTrack for Advertisers raise questions about privacy harms caused by data-sharing with third parties. NeighborWatch Pro and Airport Surveillance suggest that computer vision coupled with algorithmic decision making could also cause privacy harms. The potential of algorithmic decision making similarly troubles the concept of privacy as control over personal information, as algorithmic inference may attribute information about a person that they did not knowingly disclose, and automated forms of classification may place people into groups that they did not know they were a part of. In these cases, individuals are unable to make an informed decision before their data is collected, because they (and often the system-makers) do not know what can be learned from their data until after it has been collected and processed.

Provision. Understanding why a design fiction violates privacy helps us understand what mechanisms currently protect privacy. For instance, ChildTrack would likely be illegal in the U.S. due to child privacy laws, highlighting legal privacy protections. It is also currently not technically possible to make a consumer camera as small as SeeChange with such high resolution and streaming capabilities or make a GPS transmitter as small as ChildTrack, highlighting technical limitations that help provide privacy protection (Surden 2007). And as of today, many people do not feel comfortable embedding digital technologies in their bodies, excepting small groups of body hackers and artists (e.g. (Wainwright 2015; Berg 2012)), surfacing social norms that help protect privacy.

Scope. Many designs help us understand potential privacy violations that could occur in public space (e.g. Airport Surveillance, License Plate Tracker), or private space (e.g. Grandma's

Data). However, scope is not limited to physical spaces. SeeChange Angles helps us understand a scope of scale – the privacy violation of nine cameras in one room is different than a violation caused by one camera in the room. The designs also begin to think about privacy in a broader temporal scope—collection of data from children in schools and by governments start to raise questions around longer-term privacy implications.

Turning to a Technologist Audience

We created the design fiction workbook in our roles as design researchers, as a way to explore the problem space of privacy and surveillance issues related to emerging sensing technologies (Wong, Van Wyk, and Pierce 2017). As we found them insightful for our own reflective purposes, we were curious to know how others might react to them. We wanted to share these designs with people beyond our research team, to engage interviewees in discussions about how privacy and values relate to technical design, social norms, and other factors by using intentionally provocative speculative design fictions.[6]

We adapted and used these designs as interview prompts with an external audience—an expert population of graduate students preparing to enter technology-related professions—to understand how the workbooks could serve as tools to elicit values reflections. To do so, we draw on perspectives from values in design research, which uses a variety of methods to engage stakeholders in discussions about values.

This stage of the project builds on value centered design research that brings in speculative and critical design inspired practices, often in the form of presenting stakeholders or participants with a speculative artifact or scenario. This includes Nathan et al.'s use of design noir to create values scenarios (Nathan et al. 2008), Sengers' et al.'s documentation of speculative prototypes and installations to generate critical reflections (Sengers et al. 2005), Hutchinson et al.'s technology probes (Hutchinson et al. 2003), and Cheon et al.'s use of futuristic stories to elicit values from roboticists (Cheon and Su 2017). This work adds to this in several ways. First, our designs were originally created in a research through design process that explicitly explored different aspects of privacy informed by a privacy analytical framework, providing the designs with analytical rigor focusing specifically on privacy, rather than values at large (Wong, Van Wyk, and Pierce 2017). We re-deploy these artifacts, originally used for researchers' reflection, with new audiences to elicit values reflections and discussions. Second, our designs presented speculative sociotechnical configurations, instead of highlighting new operational technologies in the way a technology probe or prototype might. Our design variations emphasized different aspects of sociotechnical systems: sometimes emphasizing fictional values, social norms, legal regimes, or technologies. Collectively, our designs pay attention to multiple sources of values – some surface values that result from use, others that result from the design of the product, and so forth. Third we engage an expert population in values reflections, rather than users, in part to encourage discussion about how they might address values conflicts might through their technical practice.

[6] For a published account of this project in collaboration with Deirdre Mulligan, Ellen Van Wyk, James Pierce, and John Chuang, see (Wong et al. 2017)

Transforming the Design Workbook

Figure 3.13. Brainstormed ideas of how the design workbook might be transformed into physical artifacts. Row 1 (left to right) envisions sketched versions of the designs, cards, self-addressed postcards for people to take home, and a product catalog to envision the designs as everyday products. Row 2 shows a fictional instruction manual, a classroom worksheet for students, a textbook using the designs to discuss privacy concepts, and an illustrated guide of designs. Row 3 shows an illustrated version of The Circle for children, picture inserts to leave behind in library or bookstore copies of the novel, a fanfiction website, and a video prototype of the designs.

While the original design fiction workbook existed as digital images, we wanted to print the visual designs in a physical medium that interviewees could interact with. We imagined several audiences might generatively interact with the design proposals, including engineering students, regulators, developers, or other technology professionals. Given calls to increase the diversity of design research artifacts (Pierce 2014) and documented complexities in negotiations between interviewers and participants when presenting speculative designs (Khovanskaya, Baumer, and Sengers 2015) we wanted to create multiple forms of the workbook, as people might interact with them differently. We first brainstormed a number of ways that we might transform the workbooks for multiple audiences (Fig. 3.13) before choosing a few to prototype and use with interviewees. We developed three versions of the workbook: a hardcover book, a set of sketches, and a set of cards. Each version of the workbook contained the set of designs presented earlier in the chapter, and are listed in Table 3.1.

Design Name	Description	Style
	SeeChange-inspired Designs	
SeeChange Beach	Small wireless live streaming camera that can remotely monitor beaches and outdoor locations	Interface (shows a set of camera views)
SeeChange Body Camera	Small wireless live streaming camera as a police body camera that can be worn on the body	Amazon.com page
SeeChange Hideable Camera	Small wireless live streaming camera for undercover activists that can be worn on the body and is difficult for others to see	Amazon.com page
SeeChange "Survival" Camera	Small wireless live streaming camera for the protection of private property, or for anti-government activists, and is difficult for others to see	Amazon.com page
SeeChange Angles	Multiple small wireless live streaming cameras that looks at the same conference room from 9 different angles	Interface (shows a set of camera views)
	NeighborWatch-inspired Designs	
NeighborWatch Pro	An identification system that automatically detects and flags "suspicious people" who enter a neighborhood	Product Website
Airport Security	A system that automatically detects and flags "suspicious people" by color-coding people in surveillance camera footage	Interface (shows a set of camera views)
License Plate Tracker	A system searchable by license plate number to track the location history of any vehicle	Interface
	ChildTrack-inspired designs	
ChildTrack UI	Implanted chip that keeps track of a child's location and educational activities	Interface (mobile app)
TruWork	Implanted chip that allows employers to keep track of employees' location, activities, and health, 24/7	Product Website
CoupleTrack	An implanted chip that people in a relationship wear to keep track of each other's location and activities.	Infographic advertisement
ChildTrack for Advertisers	Shows advertisers how they can make use of an implanted chip that constantly tracks a child's location	Infographic advertisement
	Vital Radio-inspired designs	
Grandma's Data in Vital Radio	A wireless sensor that can detect heartbeats and breathing without bodily contact, then infer emotional state and stress levels	Interface
Vital Radio Match	An online dating service that matches people based on their "compatible heartrates"	Infographic advertisement
Amazon Echo with Vital Radio	Adds a sensor that wirelessly detects heart rate and breathing to the Amazon Echo voice assistant and speaker device, so that the Echo can take actions based on a user's vital signals.	Amazon.com page

Table 3.1. A summary of the designs from the workbook shared with participants

The first way we adapted the workbook was to bind the designs in a hardcover book (Figure 3.14). We intentionally made the book look and feel like a professional product, using high finish images on glossy paper. The book is split into four sections based on the inspiration technologies, each section containing a text passage from *The Circle* (or with Vital Radio, a short fan-fiction passage in the style of *The Circle*). We thought that these passages would help describe and contextualize the technologies for participants unfamiliar with *The Circle*. Image books are a relatively common format, and we hoped that this familiarity would help ground our speculative designs.

Figure 3.14. The hardcover book shows the designs (left) and has section title pages with passages from *The Circle* (right)

Our second transformation was to make a sketchbook, creating new mockups and hand-drawn sketch versions of the original designs printed on letter-sized paper (Figure 3.15). We thought the lower fidelity of sketches might invite critiques or reflections from participants. We also thought printing sketches on plain printer paper might invite participants to draw or annotate the sketches. The sketches were more visually abstracted and less detailed than the hardcover book. They also had less text; we did not include long passages describing the technologies. By making the sketches easy and cost-effective to re-print, we could iterate more quickly than with the hardcover book. We changed some visual elements when participants did not understand figures (e.g. thinking a silhouette of a person looked like a bear). We also changed the sketchbook's binding over time: we first created stapled sketchbooks which forced participants to look at sketches one at a time, and later created paper clipped and unbound versions which allowed participants to look at multiple sketches simultaneously.

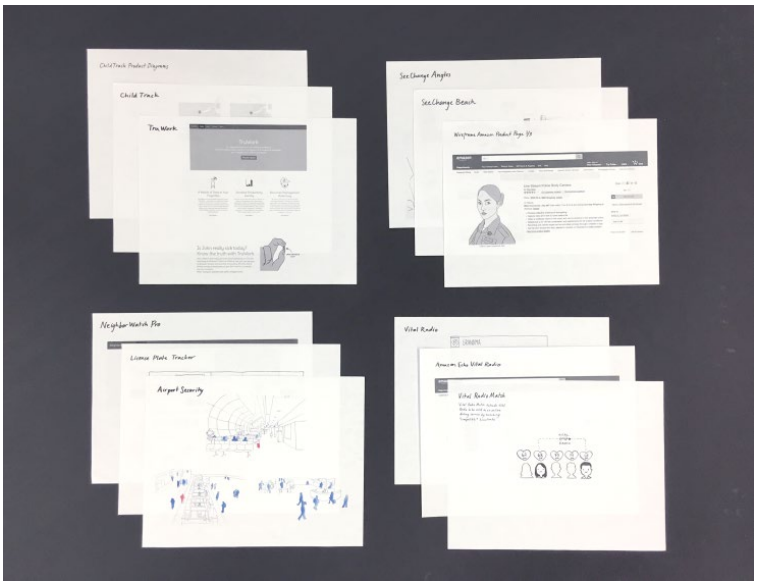


Figure 3.15. Sketchbook versions of the designs

Third, we made card versions of the designs because we thought they would allow for novel interactions: people can spread them out to make comparisons and connections between designs. Unlike the hardcover book, cards may encourage non-linear progression through the designs. We were inspired by existing cards for ideation, thinking about values, or working through technical issues (IDEO 2003; Friedman and Hendry 2012; Shostack 2014), although our cards present fictional products or scenarios rather than questions or prompts. Because the designs are physically smaller than the sketchbook or hardcover book, participants might spend less time reading the copy text and look more at the visuals. The cards were printed on cardstock, approximately 5 by 7 inches. Important parts of the designs' copy or short text descriptions were printed at the bottom of the cards. Since we distinguished designs by technology type in our prior transformations, we initially color-coded the cards (SeeChange-red, NeighborWatch-orange, ChildTrack-green, Vital Radio-navy) (Figure 3.16). However, we realized that participants may see different relationships between the cards unrelated to our categories. To allow us to ask participants to group cards based on their own interpretations, we created a second iteration of the cards that all used the same color (Figure 3.17). Figure 3.18 shows how the "SeeChange Angles" design looked across the three transformations.

Figure 3.16. Color-coded cards version of the designs.

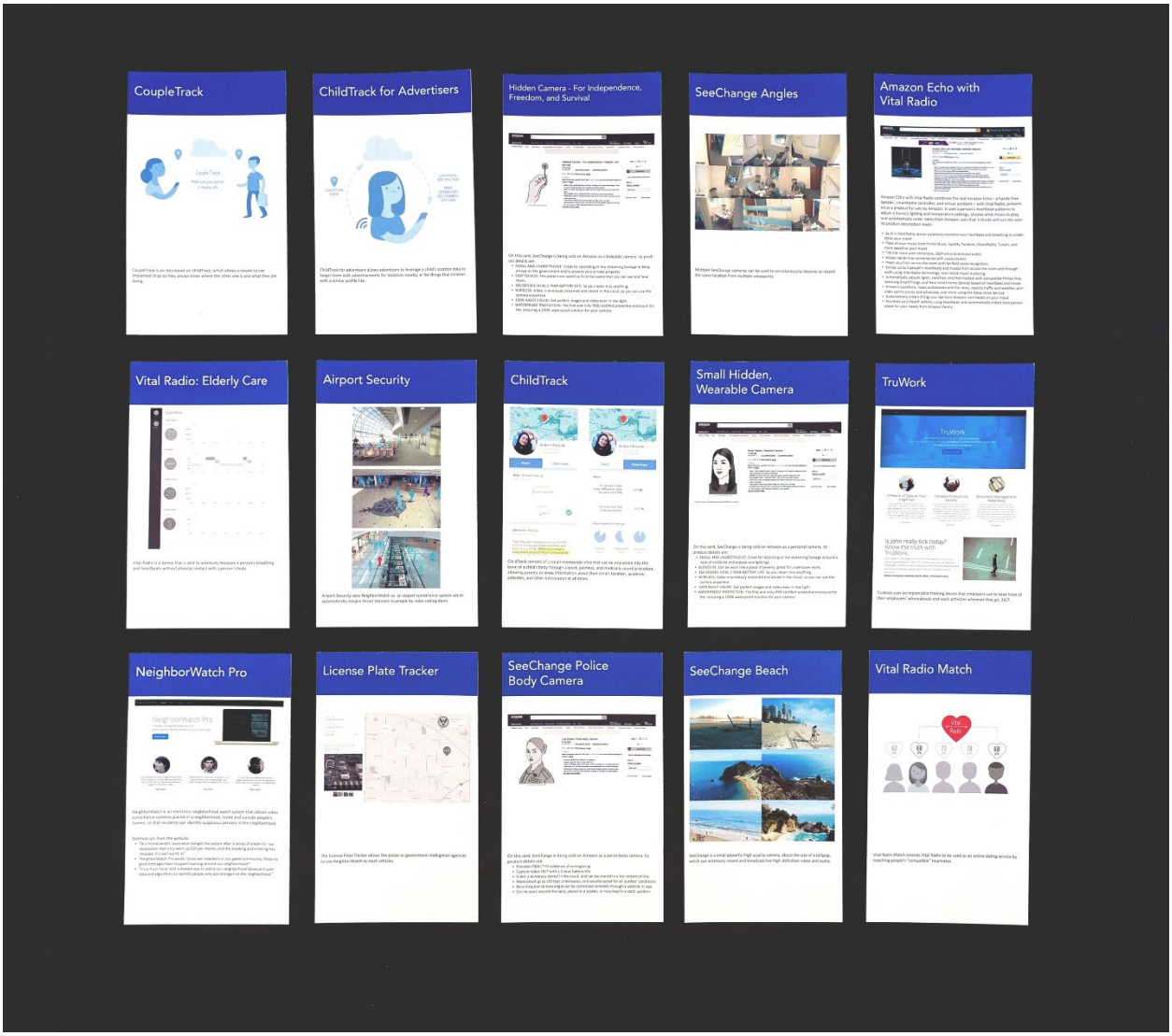


Figure 3.17. Blue card version of the designs

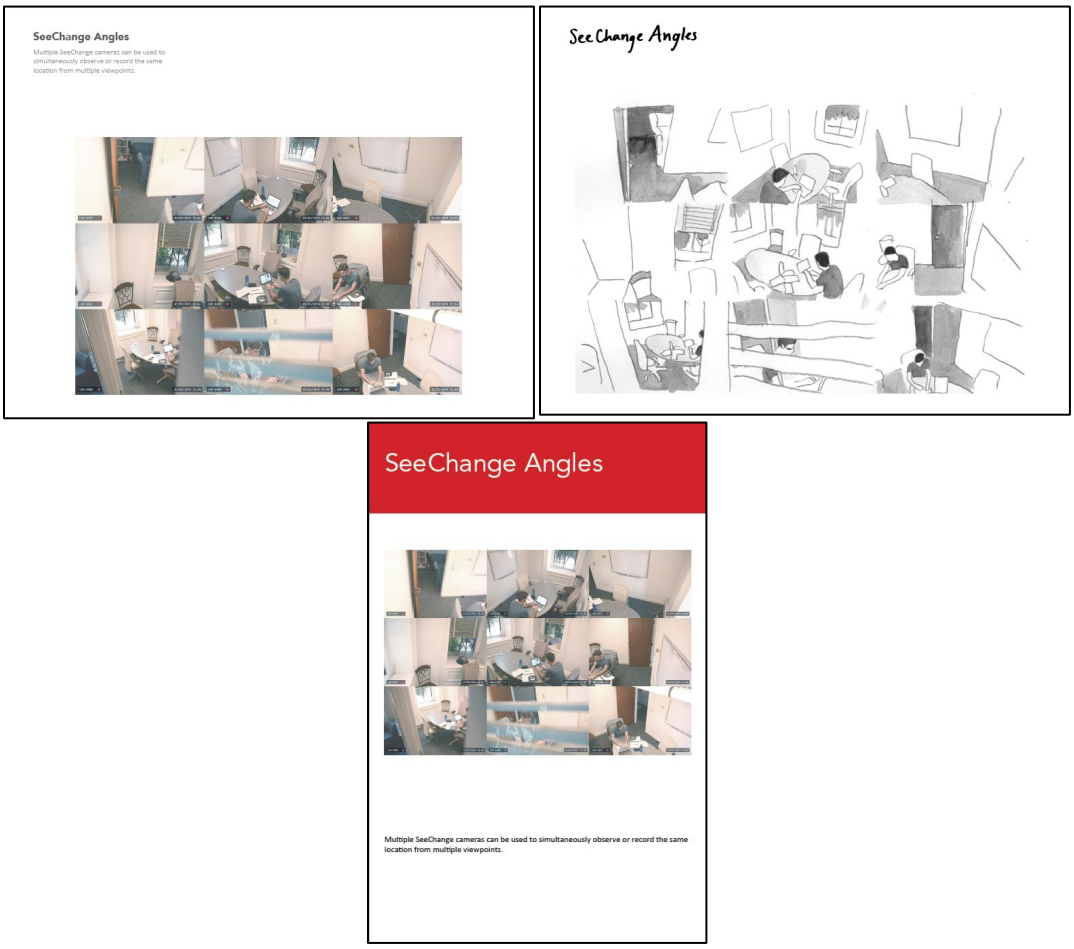


Figure 3.18. SeeChange Angles as depicted in the Hardcover Book (top), Sketches (middle), and Color-coded Cards (bottom).

Conducting Interviews

This project uses design as a way to "critique, speculate, and present critical alternatives," and to "explore people and situations", by first creating a set of speculative design fictions, and then using them as interview probes. As Privacy By Design initiatives encourage integrating an understanding of privacy into all aspects of the design and engineering process, the ability for technology professionals—including product managers, designers, and developers—to surface, discuss, and address values becomes vital.

I recruited graduate students from a professionally-oriented information management program in the San Francisco Bay Area, who are training to go into technology professions such as those listed above. This population was purposefully selected given our research interests and questions. In order to talk with participants with a certain level of expertise, I recruited participants who had finished the program's required core courses (or equivalent coursework), which includes technical courses and courses that address social aspects of technology. To get domain-relevant responses, we recruited participants interested in technologies that sense humans.

I met with 10 graduate students in late 2016: 9 from the information program, and 1 student from a computer science program who saw the call for participation. 7 were Master's students and 3 were Ph.D. students. 6 identified as female and 4 as male. 8 participants ranged in age from 24 to 32 (average 27.9, median 27.5); 1 participant provided their age as within a range of 30-49, and 1 participant declined to state their age. Most participants had experience in a technology-related job either from before entering the graduate program, or by doing an internship while in the program.

After filling out a short demographic questionnaire, each participant was shown one version of the design workbook and looked at all the designs in an approximately 1-hour session. While I wanted to make sure that each transformation was looked at by at least 1 participant, following a quick iterative user centered design process, I did not show the transformations to participants evenly. Rather, I continued using ones that seemed more useful and generative, and discontinued or iterated on ones that became problematic (for instance we found the hardcover book difficult to use because it had the most text and took longer for the participant to go through). My goal was not to measure significant differences between different versions, but to understand how participants used values as a lens to explore the design workbooks (JafariNaimi, Nathan, and Hargraves 2015). 1 interviewee received the hardcover book, 6 received sketches, and 3 received cards (2 with the color-coded, and 1 with the non-color-coded).

Semi-structured interviews were conducted by 1 or 2 researchers on a university campus. Participants were compensated with a $20 amazon.com gift card. At the start of the interview, I explained that the designs were conceptual, and that while we were interested in understanding what people thought about the designs, we were not planning to develop them into products. Participants were not told that the designs were created to think about privacy. Participants were asked to "think aloud" and provide their initial thoughts as they looked through the designs and were asked periodically about their comfort with the designs, and what technical, legal, or social changes they might make to address discomforts or other issues they identified.

Interview transcripts were analyzed through several rounds of coding. I generated an initial list of codes while reviewing the data using process coding (or action coding) to identify participants' interactions with the workbooks (Saldaña 2013, 96), and values coding to identify values, attitudes, and beliefs (Saldaña 2013, 110). These codes were refined and organized into themes based on patterns identified in the data. To understand how participants were conceptualizing privacy, I did another round of coding using Mulligan et al.'s privacy analytic framework (Mulligan, Koopman, and Doty 2016), which provides multiple dimensions of privacy that can be represented in a given situation: theory (why there should be privacy), protection (who/what is protected by privacy), harm (actions/actors that violate privacy), provision (what provides privacy protection), and scope (how broadly does privacy apply). These five dimensions were used as codes. Seeing where interactions, values, and privacy dimensions overlap in the data helped me identify points when participants discussed values in relation to privacy.

Values and Privacy in Workbook Interactions

Participants interacted with the workbook in seven main ways that elicited discussion of values:

- Seeing self as a user;
- Seeing self as professional;
- Participating in world building;
- Affective responses;

- Comparing to the present world;
- Comparing configurations within designs; and
- Comparing between designs.

While these themes are not mutually exclusive, participants' interactions while discussing values tended to cluster around these types of actions.

Seeing Self as a User

Values were surfaced when participants imagined themselves as users (direct and indirect) of products in the workbook. P8 put herself in the subject position of working for an employer who makes employees use implantable TruWork tracking chips, reflecting on the copy text "Is John really sick today? Know the truth with TruWork."

> P8: If I called in sick to work, it shouldn't actually matter if I'm really sick. […] There's lots of reasons why I might not wanna say, "This is why I'm not coming to work." The idea that someone can check up on what I said—it's not fair.

In contesting TruWork's abilities to expand employers' power, P8 raises the values important to employee subjects of the product: fairness, trust, and limits on intrusion by the employer. P1 imagined herself as an indirect user of Grandma's Data in Vital Radio, imagining her grandma as the subject of Vital Radio while seeing herself as the recipient of the data. Here, P1 discussed her grandmother's consent, agency, and autonomy.

> P1: In terms of emotion, breath rate, stress level, I don't know why I need to know—I can see wanting to know if grandma is alive, you know. Or if grandma's pulse is weakening, and grandma's ok with it. But something like—do I need to know grandma's happy? I mean that's her prerogative to tell me. You know, I don't need that, that to be sensed objectively.

Raising concerns about values from different subject positions surfaces how privacy harms are spread unevenly. The values also imply what is protected by privacy in these situations, such as fairness, the ability to separate work and home, and personal autonomy.

Seeing Self as a Professional

Participants also viewed designs through the lens of their professional practices and experiences. Some participants explicitly linked their reflections to a professional identity. When thinking about how the Airport Security design might automatically flag and detect people, P5 reflected on his self-identification as a data scientist and the values implications of predicting criminal behavior with data.

> P5: The other thing, the creepy thing, the bad thing is, like—and I am a data scientist, so it's probably bad for me too, but— the data science is predicting, like *Minority Report.* Predicting whether this person—the tendency of this person to be a criminal. That would probably be bad, because you don't know if this person will be a criminal […] You shouldn't go the Minority Report way, you know? Basically, you don't hire data scientists (*Laughs*).

Similarly, P10 mentioned his experience working in online advertising to discuss legal constraints surrounding the collection of children's data that would make ChildTrack for Advertisers difficult to implement.

Others discussed designs in relation to their technical practices. P7 compared CoupleTrack to an IOT project he was working on. When asked how his project was similar or different, he discussed the value of voluntary consent.

> P7: [CoupleTrack] is very similar to our idea. We're thinking of features, except ours is not embedded in your skin. It's like an IOT charm which people [in relationships] carry around. […] It's voluntary, and that makes all the difference. You can choose to keep it or not to keep it. […] [If] it's like something that's under your skin, you forget about it if you're not constantly paying attention to it. A charm, that's something that's external.

Similarly, P9 discussed a wearable device that she built that created visualizations of sounds while discussing how data collected by Amazon Echo with Vital Radio could be used.

And P6 brought her prior professional experience from her prior filmmaking career to her analysis of the technology designs. At one point, she used this experience to contest to advertising copy on the SeeChange Body Camera design, which claims to provide "objective" video evidence.

> P6: I worked in documentary. So I can say "Oh, I'm working on this documentary film, it's totally objective," but we all know that it's not objective because you choose what is on screen or not, and in filmmaking how to cut it together. In this case, if it's a body cam you can still choose to move your body around and show or not show certain things. Also, things can always be cut out or shown only a specific point of time.

P6 also considered the notice and choice process in her prior filmmaking career (posting signs while filming on a public street) and how that might help inform notice and choice in public spaces with various forms of camera technologies.

Participants used their professional identities, experiences, and practices to interpret and reflect on the designs. While many participants drew on technical identities or experiences, P6 and others also brought in experiences from other professional identities that they held before they entered the technology industry. This perhaps begin to suggest that people who enter the technology industry from non-technical backgrounds may provide greater diversity in their perspectives and reflections on values issues.

Participating in World Building

Even though participants were aware that the designs were fictional and conceptual, they often tried to participate in building out and expanding the fictional world presented by the designs. Prior researchers have identified world building as a key part of creating design fictions (Coulton et al. 2017), though the prior work tends to focus on the role of the designer or researcher in doing the world building, rather than research participants.

P4, reading testimonials on the NeighborWatch Pro website began asking for more details about one of the customers, "William." In the design, a testimonial by William attributes the algorithmic identification system as a "fair and unbiased" way to eliminate "no good teenagers" from the neighborhood. While fairness and justice are important values, P4 suggested that the outcome that William feels is fair and just may not be the same for the banished

teenagers; in this system William would not be considered a suspicious person, but might have a different opinion if he was wrongly accused as being "suspicious."

Other participants participated in world building by thinking about the designs' longer-term effects—how they might be adopted by users, or how they may help shape social changes over time. For instance, P5 wondered how social norms around "wrongdoing" may change if wearable livestreaming SeeChange Hideable Cameras become widely adopted.

> P5: That just means that people have accepted this as a normalcy. If anyone can do it, then everyone would do it. […] Then the definition of wrong-doing would be questioned, would be scrutinized. […] Are the nannies picking up my children at the right time or not? The definition of wrong-doing will be challenged. If it's 59 bucks, then it'll be used for everything.

Some participants began to imagine alternative use cases beyond those presented in the designs themselves. While CoupleTrack seems to enable tracking between two consenting partners, P6 began to describe a potential scenario with a non-consenting partner, how that could be problematic, and wanting some form of protection for those cases.

> P6: At least they [the proposed users] are adults so they can consent to this in most cases. Of course, think about abusive relationships, manipulative relationships, relationships where one person physically overpowers the other person and then forcibly inserts the chip. […] I would want some kind of way to get it [out]—I assume there's a way to get it out, but if you're in one of those shitty situations where you didn't really want it, you'd be coerced or forced into it, there's physical danger with getting it removed. But I just worry about the nonconsensual uses of it. If it's consensual for adults, okay, fine. I would want some kind of ability, some way to deal with coercive use of this.

At other times, participants questioned the motivations behind the designs from the perspective of the fictional company producing these products, highlighting how values might be embedded in these designs while imagining the social values present in the world of the design. While looking at TruWork, P10 found that it imagines its users in a way that minimizes their autonomy.

> P10: A lot of these are just about not trusting […]. [TruWork] really bothered me more than the others cuz it's—I can't really articulate well. […] It basically treats the person as an algorithm who should be—whose existence should be optimized to benefit the company. It's someone else imposing their vision of optimization onto someone else's existence. I think that's maybe why that bothers me.

Participants also suggested new motivations, framings, and values for the products. P9 suggested an alternate version of NeighborWatch Pro based on communal values, using the name "Neighbor Companion" or "Neighbor Friend," which would encourage people to invite others into their neighborhood rather than keep them out. Some participants also contested the idea that technological solutions were appropriate for the types of problems that the designs professed to solve. For instance, while looking at the SeeChange Police Body Cam, P1 suggested an improved body cam might not be the best way to promote justice.

> P1: There's this like narrative around "oh all we have to do is like capture it on film and then people will care. And then they'll do something." […] I don't think that the issue is

> that people don't know about these things and just need video evidence. […] But I think for the most part this is not like this guarantee of justice.

Participants who reflected on the designs' motivations often did a close reading of the textual portions of the design, noting specific phrases that suggest particular motivations on the part of the products' producers. Participants linked values underlying the products' motivations to the products' design and functionality. Through these different interactions, participants became involved in fleshing out and creating the worlds in which these designs might exist.

Affective Responses

Participants had a variety of affective responses to the designs. When participants were asked if they would make any changes to products they did not like, some felt conflicted because they did not want the design to exist at all. Suggesting a change would concede that the product could exist in some form, such as in P5's response to the SeeChange Hideable Camera and "Survival" Camera.

> P5: I would not have this system. If there is something that makes me have this system, I would be—it would be much more regulated. […] I'm trying to salvage something here and say, okay, if you put these regulations in, and people can only get these cameras in extreme cases where they petition to the government and stuff. Even then, I don't think any good will come out of providing people access to cameras and recording data.

In other designs, participants laughed or provided sarcastic responses, similar to how some of the designs intentionally exaggerated and parodied current trends:

> P8: TruWork. Okay. *[Laughs]* I'm laughing at the "happier, more efficient workplace"—okay. This is, again, positioned to the person who would be doing the tracking, not the person who would be tracked.

Others immediately expressed visceral reactions upon seeing the design, often of shock or creepiness. P6's reacted to ChildTrack UI by calling it "crazy town" and "super creepy", before further explaining teenagers' need for privacy to create their own identity and suggesting that good parents should not constantly surveil their kids.

The SeeChange Angles design caused a visceral reaction in some participants. It depicts the interface of hidden wireless live streaming cameras looking at the same conference room from 9 different angles (Figure 3.7). The conference room depicted in the photos in the Hardcover Book and Cards versions of the design was the same conference room where we interviewed participants. Several participants with the Hardcover Book and Cards started looking around the room when they saw the design, as if looking for the hidden cameras, whereas participants with the Sketches version thought design depicted a generic room.

Comparing to the Present World

Many participants discussed values when drawing comparisons between the designs and the present world. Current technologies were mentioned to make sense of the designs, including GoPro cameras, Snapchat Spectacles, smartphone location tracking, and the website Nextdoor. Often these were used as cautionary tales. For instance, when looking at SeeChange Beach, P4

used Google Glass to illustrate how awareness is implicated in design choices, such as having (or not having) a blinking recording light.

Some participants referred to current social norms and legal structures that help provide privacy protections or recourse when privacy is violated. P10 discussed how the value of recourse is practiced differently based on legal jurisdiction while looking at the SeeChange-inspired designs.

> P10: [I]n California, you have to have the consent of both parties in order to record, technically. That doesn't mean people do it all the time, but their legal system currently at least, has recourse for the improper use of some of this information. Whether or not that recourse is sufficient to account for any potential harm that came out of it is another question, but it's there. Actually, there's something recently that came out in the UK and Scotland. Someone installed a CCTV camera in their house. […] They sued the person, and even though there was no proven […] monetary harm. They still won a bunch of money, because of differences in E.U. [and] U.K. regulations versus U.S. in terms of privacy violations, where you don't have to demonstrate harm there, whereas you very clearly do here [in the U.S.].

Others reflected on ways in which handoffs of responsibility shift from a human (in the present) to a technology (in the speculated design future) implicates how they think about values. For instance, P9 reflected on when these types of shifts might be more or less appropriate when looking at the Grandma's Vital Radio design. While viewing handoffs to a menstrual tracker in real life was seen as generally helpful, she was less optimistic about handoffs to a speculative emotion tracker that helped mediate human relationships.

> P9: Yeah, I was thinking about this the other day, about how much of a role would I actually want technology to play if it could sense my emotions. For instance, I'm a woman. I have a menstrual cycle. I have an app right now that I use to track that stuff. It warns me, for instance—warns is a funny word to use, but it does feel like a warning—"your period is about to start." It's a chance for me to know that I'm gonna be a little crankier than maybe normal, or maybe I'll be a little bit more prone to tears or whatever it is, whatever my things are. It tells me that they're coming. That's helpful because the problem is when the hormones start going crazy, your ability to assess how crazy you are drastically deteriorates. To have an external thing, this isn't bias. This isn't my boyfriend being like, "Mm, it's the time of month." It's tracking it because I told it what I'm doing. That's helpful. […]
>
> But what I would worry about is this offloading of the task and offloading of responsibility for dealing with stuff. For instance, now if I have this thing that automatically tells me when grandma is stressed out—do I really need to do anything, or can I automate the playing of a cute puppy photo that I know will calm her down? Then I don't have to be involved in that anymore. Is that good cause now she's not stressed anymore? What's the point? Now our relationship is this weird mediated through sharing of a random—an automated video that I've selected? […] You get into this weird place where it feels like humans are being managed by machines rather than the other way around.

Participants also used anecdotes to draw comparisons between the designs and their own experiences or experiences of people they knew. While looking at NeighborWatch Pro, P9 recounted a story from her youth playing outside with friends at 2 a.m., asking "Isn't that also

okay for teenagers to get into a little bit of trouble? That's part of growing up, right, this pushing of boundaries of yourself and societal expectations." Participants also compared the designs to fictional worlds in popular culture. Designs were compared to episodes from the speculative fiction series *Black Mirror*, the book *1984*, or the film *Minority Report*. Comparing the workbook designs to present day technologies, norms, experiences, and cultural works helps elucidate the values differences between scenarios and situations.

Comparing Configurations within Designs

Participants compared multiple possible sociotechnical configurations within a design. One way was by comparing different ways a design might be implemented. Our workbooks describe products' functions but do not specify technical implementation details, allowing participants to imagine multiple implementations. As briefly excerpted earlier, P5 compared how the Airport Security system might flag "suspicious" people based on identifying people who have existing criminal backgrounds versus using behavioral predictors, and how fairness and presumed innocence are implicated in these two implementations.

> P5: So there's two things. One can be definitive: this person is red based on criminal history. […] The other thing, the creepy thing, the bad thing is, like—and I am a data scientist, so it's probably bad for me too, but—the data science is predicting, like *Minority Report.* Predicting whether this person—the tendency of this person to be a criminal. That would probably be bad, because you don't know if this person will be a criminal. […] As long as the first one, where it's innocent until proven guilty, basically. If you've done something before and if you have a history […] then this person should be red. Otherwise, there's no such thing of likeliness of being a criminal, I think. You shouldn't go the *Minority Report* way, you know?

P6 focused on the different types of data CoupleTrack might use to share between couples. She discussed the values of control and appropriateness, noting that collecting different data types could lead to different harms. She felt more comfortable sharing data about her location and biosignals, but not her activities. Another type of configuration discussed was delegation, or how certain functionalities or responsibilities could be placed in the hands of a human or a machine. This particularly emerged in the Vital Radio-related designs, which profess to read and interpret moods and emotions.

> P1: The point is you should be understanding your mood, not an algorithm. You need to learn for yourself what your signals are and what they mean and take the time to do that. So this is like actually offloading the reflection, which is the most important part of self-growth and self-regulation, onto an algorithm.

P1 and others argued that reflective tasks should not be delegated from humans to machines, discussing values of mindfulness, self-reflection, and algorithmic transparency.

Comparing Between Designs

Participants also highlighted values when comparing designs with each other. P4 compared CoupleTrack negatively to ChildTrack UI, noting how trust emerges differently between parents and children than between significant others, saying "I feel like within a child-parent relationship, you have almost obligated trust between parent and child. Whereas in CoupleTrack,

maybe your relationship hasn't gotten there yet where you're completely trusting of your partner."

While participants across all workbook types compared designs, some versions more easily allowed for physical comparisons (Figure 3.19). P8, who had the hardcover book, had to flip back and forth between pages to point out differences between designs. P1's version of the sketches was stapled, and she also had to flip back and forth to make comparisons. Later versions of the sketches were unstapled, and many participants spread them out on the table, although space became an issue after 3 or 4 pieces of paper. The cards were easier to physically spread across the table.

Participants with the Hardcover Book, Sketches, and Color-coded Cards saw the designs in the same order (as shown in Table 3.1), which groups the designs based on their inspiration technology. Often this led participants to make comparisons among these pre-determined groups. However, P10 received the non-color-coded cards and when asked to group the cards, he provided a different set of 7 categories: (1) Designs with "I don't trust people" motivations; (2) Designs with "there are shady people around" motivations; (3) Designs used to surreptitiously record people; (4) Dragnet surveillance technologies without explicit contexts of use; (5) Products that use biometrics; (6) Random products that someone might use; and (7) Products that will not happen. Some of his groupings dealt with the presumed motivations behind the technologies, while others dealt with use cases, data types collected, or how realistic the designs seem. These groupings help chart out new relationships among the designs beyond those we had imagined.

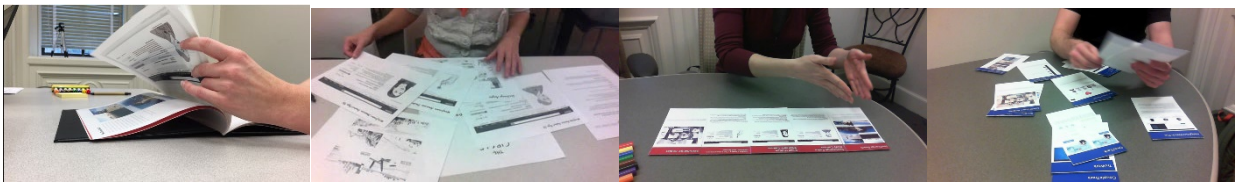


Figure 3.19. A participant with the hardcover book flips pages (Left). A participant spreads sketches across the table (Center Left). A participant compares SeeChange-related cards (Center Right). A participant with non-color-coded cards arranges the cards in piles (Right).

Values Reflections Elicitation and Values Levers

Our design fiction workbooks share similarities with other design approaches utilized in value centered design, but add to them in several important ways. Like envisioning cards which stimulate ideation by combining cards prompting discussions about stakeholders, human values, and use and adoption (Friedman and Hendry 2012), participants envisioned themselves as different types of stakeholders, and walked through longer term use and adoption implications by imagining the designs as real. While our design fiction cards were similar to envisioning cards in their physical form, we used cards to provide a fictional context or scenario for participants to explore and reflect on, rather than providing questions or prompts.

The workbooks also work as a set of probes (B. Gaver, Dunne, and Pacenti 1999; Hutchinson et al. 2003), similar to other scenario- or artifact-based values in design work (e.g., (Sengers et al. 2005; Nathan et al. 2008; Boehner et al. 2005; Cheon and Su 2017; Hutchinson et al. 2003)), eliciting conversations about values that may prove inspirational for design. However, our design artifacts were created through a research through design process to explicitly explore and reflect on privacy by use of a privacy analytical framework before being shared with

participants, giving the designs a theoretical and analytical depth specific to privacy. Furthermore, we focused our inquiry on sociotechnical systems rather than specific technologies by placing variations on four technologies in different sociotechnical configurations. Participants noticed these variations, and draw comparisons between the designs' sociotechnical configurations. The visual-textual speculative designs invited participants to expand, contest, and (re)imagine the fictional worlds in which the designs exist (imagining designs as real, and reflecting on the designs' framing and motivations). The workbook's ambiguity of implementation details allowed participants to interpret the designs in multiple ways (comparing configurations). The speculative design fictions also allow us to have conversations about technologies that would be difficult to prototype or implement due to legal, social, or technical constraints. Lastly, while much values work focuses on engaging users, we deployed the workbooks with an expert population.

The design fiction workbooks, like "values levers" identified by Shilton in her field work in a collocated work setting (Shilton 2013), opened up discussions about values. Shilton describes effective values levers as changing the topic of conversation to foreground values, causing values to be viewed as relevant and useful to design, and leading to values-based modifications (Shilton 2013). While our work was conducted in a laboratory interview setting, participants centered values in their discussions, saw values as central to design, and proposed alternative values-based implementations of the designs, suggesting that the workbooks can serve as effective values levers.

Some interactions participants had with the workbooks share similarities to Shilton's specific values levers (Shilton 2013). Participants' seeing themselves as users is similar to Shilton's "experiencing internal self-testing" lever; by putting themselves in the subject position of a user, participants focused on discussing specific interactions that might cause privacy harms. Shilton also discusses a "designing around constraints" lever, that values might constrain (or help generate) designs. While our participants were not actually creating and implementing a system, they nevertheless used the workbooks designs to identify values constraints by comparing designs to the present, identifying social and legal norms. Comparing configurations suggested values tradeoffs between different technical implementations of the designs.

Two of Shilton's levers, "working on interdisciplinary teams" and "internalizing team member advocacy" arise from interpersonal interaction, in which an interdisciplinary team member or values advocate raises questions that cause the group to think about values. Our artifacts (and to some extent the interviewers) played similar roles. By depicting provocative designs that caused visceral and affective reactions, the workbooks were like actors who brought attention to and raised questions about particular sociotechnical configurations, which participants responded to with discussion about values during their initial reactions to the designs. The interviewers' follow up questions probing why participants felt a certain way helped further surface values discussions.

Workbooks as a Method for Studying Handoffs

The workbooks also served as a way for some participants to consider *handoffs*, a lens that "revels key differences in the configurations of system components, in turn altering the values embedded in respective systems" (Goldenfein, Mulligan, and Nissenbaum 2019). As described by Goldenfein, Mulligan, and Nissenbaum, the handoffs model takes two versions of a sociotechnical system, where a particular system function (such as recognition of a human emotion from the "Vital Radio" design) shifts from one type of actor in the first system (such as

a human recognizing their own emotional state) to a different type of actor in the second system (the Vital Radio device). Thus we could say that one of the designs depicts the function of recognizing a human emotion as being *handed off* from the human experiencing the emotion to the Vital Radio device. The ways in which the human and the Vital Radio device complete this function differ, and the differences in these actions are values-laden – with participants discussing differences in privacy, autonomy, and qualities of interpersonal relationships.

Participants made these types of handoffs comparisons between two configurations of a system during the "comparing to the present world," "comparing configurations within designs," and "comparing between designs," modes of reflection. Recognizing that responsibility for performing a system's action shifted from one component to another prompted them to discuss the values implications of that move. Goldenfein et al. discuss a "trigger" that ushers in a new configuration—often a new technological advance that allows for a system to be reconfigured. However, in this study, the workbook of speculative design fictions served as an artificial trigger. By presenting a speculative new configuration, it allowed participants to recognize and discuss the implications of the handoffs depicted in the designs.

Embracing Multiple Subjectivities

We recruited our participants on the basis that they were an expert population, training to be technology professionals. However, participants played multiple roles during interviews, placing themselves in relation to the design workbooks from multiple subject positions. Sometimes participants reflected their professional experience and expertise. This included referencing a professional identity, such as "data scientist" or referencing their work experiences and practices to explain their thoughts about the design. Others related the designs to technical projects that they were working on. However, participants also—and often with the same designs—discussed the designs from multiple user perspectives. As already noted, participants would imagine using the products themselves. This self-testing practice has been called "dogfooding", and suggested as a way to find bugs in development (W. Harrison 2006), and as a values lever by Shilton (Shilton 2013)—although assuming that developers' personal experiences match (or should match) users' experiences does not always lead to successful design outcomes (Ames 2015). Interestingly, our participants went beyond self-testing, that is, they discussed the designs from users' perspectives beyond their own. Sometimes participants discussed the designs from the perspective of a friend or relative, or from the perspective of an imagined person, like a police officer or child.

Our group of participants themselves plays multiple roles. While training to be professional experts, they are also potential future (and current) users of biosensing and IoT technologies, such as Fitbits or Snapchat Spectacles. They use, reflect, and understand—as well as design, make, and produce—with both professional skill and responsibility, and with experience as a user. In line with work on post-userism (Baumer and Brubaker 2017), the multiplicity of relations and subject positions that our participants took did not always clearly fit the categories of "the user" and "designer." Being able to interpret the workbooks from multiple subjectivities aligns with the values in design goal of understanding a design from multiple stakeholders' perspectives. This is particularly useful when thinking through how privacy differs from different subject positions. While not a replacement for user research, these reflections can help sensitize technology professionals to others' subject positions and help identify stakeholder populations to further engage with.

Reflections on Privacy and Beyond

Given that recent literature conceptualizes privacy as contextual and dependent on subject position, our design workbook approach allowed viewers to imagine themselves in different subject positions and in different contexts of use. Our goal was not to extract a set of user expectations of privacy or extract a set of user requirements, but rather to understand how our participants might discuss values related to privacy, and use values to reflect on the implications of technical (and non-technical) choices.

Our participants provided texture and nuance when describing how privacy was implicated in the designs. One way they did this was by discussing multiple dimensions of privacy. Using Mulligan et al.'s privacy analytic (Mulligan, Koopman, and Doty 2016) to analyze participants' responses to the designs, we saw that the workbook designs often led participants to explicitly identify and discuss privacy harms. In discussing harms, participants often explicitly or implicitly expressed beliefs about what is protected by privacy, what provisions provide privacy, and the physical and temporal scope of privacy. After identifying a harm that violated privacy, participants discussed aspects such as contextual norms, who is being protected by privacy (and who is not), or "from whom" does privacy protect. Dimensions of privacy theory were implicitly addressed through the expression of values. For instance, in discussing NeighborWatch-inspired designs, participants suggested that privacy provides justice or fair treatment to those protected by privacy; or in discussing ChildTrack UI, privacy provides children the space to develop their identities and personal autonomy.

We were surprised by some participants' emotional conflict over some of the designs, but found that these moments highlighted complex privacy issues. There were few designs that participants completely rejected or accepted; rather most participants noted positive and negative aspects, contexts, or use cases for the designs, sometimes struggling to reconcile them. For example, with many of the NeighborWatch-inspired designs, participants felt that the systems might be useful if used by experts with certain training or in circumscribed contexts, but were worried that the designs suggested that the systems were available to the general public, where abuses might occur. Others stated that prominent physical notices about data collection need be posted for the designs that take place in public spaces, but also worried that the notices would not be seen, not provide enough information for meaningful consent, or not provide a meaningful opt-out choice for users. These highlighted how privacy-related values can be expressed in multiple and conflicting ways, representing a gray area of complex and entangled issues where it can be difficult to address issues with simplistic rules (such as expecting that a rule mandating a posted notice of data collection in public spaces is enough to protect privacy). While our discussions did not lead immediately to concrete design solutions, they are useful in order to raise values as points of consideration and to identify possible points and forms of intervention where values might be addressed or implicated.

Using a set of speculative design workbook was useful at surfacing nuanced and affective reflections along multiple dimensions of privacy. We were limited by time constraints; given fewer designs or more time with participants, we might be able to further probe and explicitly surface more of participants' views on the theory, protection, provision, and scope dimensions of privacy.

Notably, participants used the workbooks to discuss values beyond privacy, indicating how thinking about privacy requires complex simultaneous thinking about other entangled social values. Participants discussed privacy and surveillance, but they also discussed how these intersect with concerns of justice, fairness, equality, and access.

Workbooks for Values in Design Research and Practice

We now turn to reflections and lessons learned that others who deploy workbooks in privacy-related activities can use.

Creating Provocative Designs: We intentionally created provocative designs that we thought would heighten participants' awareness of privacy. Many participants had generative visceral and affective reactions to these designs, suggesting benefits to using techniques from speculative and critical design.

We were surprised by how important the textual content of our designs was, as participants employed close reading techniques when seeing copy text in fictional product descriptions and websites. We intentionally included techno-utopian phrases in the advertisement copy and product descriptions that might heighten participants' awareness of privacy, such as a camera that "provides objective evidence of wrongdoing" or TruWork's promise to create "a happier, more efficient workplace." Participants used these phrases to comment on and contest the designs' framings and motivations. Further work might leverage research on design fictions and narratives (M. Blythe 2017) when crafting text and copy. However, there were tradeoffs, as participants took a long time to read the text. The hardcover book had the most text and took the longest for the participant to finish, thus we stopped using it after one interview. That format might be more appropriate for a different type of reflection activity (such as if the participant gets to take the book home with them).

Supporting Comparison Making: Many participants made comparisons among and between the designs to comment on differences in their framings, motivations, values, and potential privacy harms. Presenting design proposals in a set linear order (the order of Table 3.1) helped convey that we were depicting design variations on a set of four technologies. However, being able to physically re-arrange designs, such as the Sketches and the Cards, made it easier for participants to draw comparisons. In particular, the Non-color-coded Cards allowed P10 to organize and compare designs in different groupings than we had imagined beforehand. Randomizing the presentation order and presenting the designs in a way that do not suggest pre-determined groupings may help elicit new interpretations, values, and relationships that the designers do not foresee. Furthermore, creating design variations that vary sociotechnical configurations, rather than just focusing on technologies, helped encourage participants to compare differences in social norms and values.

Managing Real-Fictional Entanglements: While it is important for viewers to be able to *imagine* the designs as real, these designs are not early drafts of actual products. In this sense the workbook of speculative design fictions serves as a useful research product (Odom et al. 2016). These designs do not need to be developed into commercial products; their purpose is to serve as probes to explore a problem space through envisioning multiple futures and to elicit values reflections from professionals. Even though the designs were fictional, we wanted participants to imagine them as real products, so we visually and textually grounded them in familiar contexts (such as airports, education, or the workplace). While this was generally successful, some designs stretched participants' disbelief. One dismissed ChildTrack for Advertisers, saying that it would "never happen" due to child privacy laws and attitudes towards implantable technologies. Several felt that Vital Radio Match's claims to match couples based on heartbeat had no discernable basis in scientific evidence. Future work might further this by encouraging participants to *experience* the designs as real, perhaps as speculative enactments (Elsden et al. 2017).

Study Limitations: There are some limitations to this study. Our participant population of future technology professionals was drawn from a graduate program that provides interdisciplinary training. Future work can inquire if sharing the workbook with technology professionals from different disciplinary backgrounds or if integrating this workbook process into design practices will lead to the same types of results.

Towards Workbooks in Practice

While we note that there are limitations to doing our study in a laboratory-based setting with graduate students training to be professionals, and to conducting our study separate from an specific product's design process, we postulate that our workbook process could fit into product development workflows due to external regulatory pressures for companies to address privacy during the design process and due to similar existing design practices.

Pressures external to companies suggest greater impetus to identify and address privacy during the design process. In the E.U., "Privacy by Design" is a principle written into the General Data Protection Regulation (General Data Protection Regulation (GDPR) 2016a), meaning that businesses are under an obligation to consider data privacy at the initial design states of a project. In the U.S., the Federal Trade Commission—the major regulatory agency addressing consumer privacy—has also embraced privacy by design in its recommendations to businesses and policymakers (Hoofnagle, n.d.; Federal Trade Commision (FTC) 2012). Ongoing efforts by organizations like the U.S. National Institute of Standards and Technology and the Computing Community Consortium to translate Privacy By Design into technical practice (Brooks et al. 2017; Computing Community Consortium (CCC) 2015b) suggest a shift in expectations that companies should address privacy issues throughout the design process.

Some publicly available work discussing companies' design processes suggests ways in which privacy-focused speculative design workbooks might fit into existing practices and workflows. Our view of workbooks being useful to deploy even if they do not represent actual products under development, is similar to IDEO's method of "sacrificial concepts"—ideas that "do not need to be feasible, viable, or possible," but are used as probes to start conversations when conducting early user research interviews (IDEO, n.d.). Our design workbook approach might fit well into an organization already using sacrificial concepts as part of their user research workflow: sacrificial concepts might be repackaged into speculative design workbooks to be shared among internal stakeholders like developers during early ideation stages. Other card-based practices stemming from industry such as Google's Moving Context Kit (O'Leary et al. 2017) and Microsoft's Elevation of Privilege cards (Shostack 2014) use design-inspired practices to think through risks, harms, and problems in future scenarios. These existing practices suggest possible openings for additional forward-thinking tools that focus on issues of privacy. While not a replacement for empirical user research, speculative design workbooks can be especially useful at this stage, as the workbook allows exploration of many possible futures, (including those that may not be feasible to physically prototype due to resource, technical, or legal constraints) while still being grounded within specific contexts and situations. Furthermore, design workbooks may function as objects that can cross disciplines or functional boundaries, serving multiple communities. While we shared our workbooks with technology professionals, future work may investigate how the same workbooks can be used with other stakeholders such as potential users, a company's legal team, or with privacy advocates.

Eliciting values discussions with professionals is useful to reflect on the values and privacy implications of their practice. For those whose do not directly interact with users, this

process may help sensitize them to multiple users' viewpoints by inviting them to take multiple subject positions in relation to a design concept. However, workbooks and the reflections they enable by themselves are not a panacea for addressing privacy. Further strategies that might leverage these values reflections and discussions include implementing organizational procedures support discussions about values, or creating roles for privacy advocates or values advocates (Shilton 2013; Bamberger and Mulligan 2011).

New Questions Raised

This study documents a case study showing how design workbooks can be adapted from a self-reflective tool to a values elicitation tool, engaging future technology professionals in interviews to discuss and reflect on values. This case study also suggests that designers and design approaches—specifically, speculative designs and design fictions presented in a design workbook—can help ground discussions about privacy, be useful in a PBD process to "look around corners," and can contribute to design-based values in design approaches. However, the limitations and findings of this study raise additional questions:

- How might this type of speculative workbook activity fit into existing UX professionals' work practices, and into existing organizational structures?
- How can values in design tools be used to recognize the complexities and entanglement of multiple social values?
- What does the work of addressing privacy and surfacing values look like inside technology organizations?

The next part of the dissertation is motivated by these questions.

Chapter 4: Finding Values in UX Practice

While the research discussed in Chapter 3 revealed how speculative designs could encourage socially-situated discussions of social values among technology practitioners in-training, it raises new questions about how technology professionals raise and address social values in their work. The next several chapters provide insight into this question through empirical research of user experience (UX) professionals' conceptions of their own practices. This project builds on prior research by Shilton, and Gray and Chivukula on how technology practitioners in academia and industry come to see values and ethics as relevant in their work (Shilton 2013; C. M. Gray and Chivukula 2019). However, this project focuses on a different population, and takes a different perspective on values work: I focus primarily on UX professionals who work at large established technology companies (rather than academic technologists, design consultancies, technology startups, or companies in other sectors), and I focus on UX professionals who already have come to see values as relevant to their work and have some expertise in attending to values. Rather than studying how values come to the forefront of UX professionals' work, I investigate what comes next: how UX professionals attend to values in their work. Specifically, I seek to answer the following questions:

1. When and how do UX professionals working within technology companies raise and address values issues in their work practices?
2. How can design methods and techniques build on existing technical and social practices to promote a more reflexive practice around values in design?

This chapter motivates and situates this project's focus on studying UX professionals. The chapter then provides an overview of the data collection methods, field site, research subjects, as well as a description of the project's use of qualitative and design-based methods for data analysis. In addition, the chapter briefly describes the broader sociopolitical context in which this the empirical project was situated.

Studying UX Professionals

This project follows the call of Gürses and Hoboken to study values in design in the context of technology production, as "inquiries into their production can help us better engage with new configurations of power that have implications for fundamental rights and freedoms." (Gürses and Hoboken 2017). This project focuses a specific set of people who have the capacity to contribute to the design of technologies, UX professionals. While the expression of technologies' politics is co-constructed among the designers, contexts of use, and material artifacts (Verbeek 2006), UX professionals present a unique perspective among those involved in the design of a technology, by integrating consideration of technical and social factors. Having titles including user experience designers, user researchers, and interaction designer, UX professionals' jobs include learning about and understanding users of technology (often through qualitative or quantitative empirical methods), and considering and advocating for those users' needs during the design of systems and products. Survey research shows that UX professionals obtained undergraduate or master's degrees in a wide range of fields, particularly in social science fields for user researchers and design related fields for designers. This includes sociology, psychology,

cognitive science, communications, computer science, English, history, informatics, media, graphic design, industrial design, and fine arts at the undergraduate level; and includes human-computer interaction, interaction design, computer science, information sciences, and human centered design at the postgraduate level (Rosala and Krause 2019, 30–31). Many of these fields have engaged in research related to values and technology. Altogether, these suggest that many UX professionals have current occupational roles and some prior training that allow them to leverage thinking about social values in their work.

A body of analytical scholarship has studied the work practices of technologists to understand the values and politics of their work, e.g., (Suchman 2006; Shilton 2013). This work focuses largely on a broad range of actors in a technology's design constituency (Pfaffenberger 1992), such as technologists, engineers, developers, and managers. Of these studies, I build on Shilton's ethnographic work studying engineers in an academic research setting to understand what practices help surface values and make them salient for action, which she terms "values levers" (Shilton 2013). Shilton's work identifies seven values levers: working on interdisciplinary teams; gaining funding; experiencing internal and self-testing; designing around constraints; navigating IRB mandates; internalizing leader advocacy; and internalizing team member advocacy. Through these practices, values become articulated, seen as personal and interesting to team members, and become routinized and normalized as a part of technical practice (Shilton 2013, 390).

This project differs from Shilton's work in several ways: first, this project looks at a different set of members of the design constituency, user experience (UX) professionals, who have a distinct role from engineers and other technical workers. Second, this project looks at UX professionals situated in an industry context, working at large sized technology companies, rather than in academia. Third, this project studies UX professionals who consider social values important to their work and have some expertise in attending to values. While Shilton's project focused on how technology practitioners come to see values as important and relevant, this project asks how practitioners who *already* see values as important and relevant to their work bring them into practice.

This work focuses on the expertise that UX practitioners have in conducting values work. I refer to UX practitioners as professionals in this dissertation. However, I note that expertise and experts are related but distinct concepts (Eyal 2013): expertise in UX skills and in conducting values work can be found among a broad range of people who may not all fall into the formal category of being a UX professional. I use the term "UX professional" as a bounding mechanism to study the expertise of values work among a particular set of technology workers (experts).

The term profession has been used by practitioners to draw boundaries around particular occupations to help support claims of authority over certain forms of work practice (Novek 2002). Analytically, UX work might be better described as a form of expertise than a formal profession. As described by Wilensky, a profession is "based on systematic knowledge or doctrine acquired only through long prescribed training," and set of professional norms, often evidenced through licensing or certification processes (Wilensky 1964). In contrast, UX practitioners tend to come from many different backgrounds. Their expertise tends to be determined more through mastery of certain craft than formal licensing or certification, such as mastering a shared set of human-centered design practices and practices of advocating for users. However, as a political project, UX practitioners engage in boundary work to identify themselves as a more formal profession. There are shared spaces through which UX practitioners learn the techniques and norms of UX, including: industry conferences, related academic conferences on

human-computer interaction, UX-focused meetup groups, and professional associations like the User Experience Professionals Association (UXPA) and AIGA (the American Institute of Graphic Arts, which now presents itself as the professional association for design). The work done by these groups to advocate for UX as a profession draws boundaries around UX expertise, perhaps to try to help elevate the visibility and worthiness human-oriented work of UX practitioners in comparison to technical engineering work, since UX and design practitioners often feel that they do not have the same voice or seat at the table as engineers when it comes to issues such as privacy (Hemmings, Le Pichon, and Swire 2015). In studying UX practitioners' expertise in conducting values work, I am doing similar political and boundary work by referring to UX practitioners as UX professionals.

This project also builds on other work studying values work expertise by other actors in industry, such as Bamberger and Mulligan's interview-based studies with an emerging group of privacy professionals, corporate privacy officers whose portfolio includes addressing issues related to technology and data privacy (Bamberger and Mulligan 2015). While Bamberger and Mulligan frame their research as an effort to understand "privacy on the ground" rather than exclusively in legal texts, the privacy professionals they studied worked at the executive level, or work in managerial and supervisory capacities. As technology companies face pressure to address social values and ethics issues, many have begun to hire or assign people in the role of "ethics owners," people holding responsibility for addressing ethics by overseeing integration of ethics across the organization, across multiple divisions or hierarchies (Metcalf, Moss, and boyd 2019). But rather than studying these "ethics owners" who occupy executive or managerial roles in the organization, I choose to study frontline UX professionals.

In contrast to the privacy and ethics managers and owners, the UX professionals I study are closer to the "front lines," or actually "on the ground" as they do not work in an executive, managerial, or supervisory role. Generally working at large technology companies, the UX professionals I study often work on a team with other UX professionals, or belong to a UX team but are also embedded within specific product teams in the organization. Their work activities include conducting user research, running usability studies, creating design tools like personas, producing prototypes and wireframes, or designing aspects of a system's interface. Focusing on UX professionals provides an opportunity to understand how values work is practiced through different modes of action as compared to the work as envisioned and structured by formal ethics owners. This work takes on a more materialist lens (Burrell 2012, 10–17), studying the practices and artifacts of UX professionals' values work, rather than a conceptual or theoretical analysis of ethical reasoning in the technology industry. My sensibilities in studying UX professionals in particular is informed in part by HCI's "turn to practice," studying the material practices of designers and contexts of interaction, rather than just developing new design theories and techniques in laboratory settings (Kuutti and Bannon 2014). It is also informed in part by prior research on work that shows gaps in workers' understanding of their work practice and management's conception of their work (Zuboff 1988; Orr 1996). For example, Orr's account of copy machine technicians' repair and maintenance work in the field found that everyday repair work looks quite different from the technician's perspectives as compared to the corporation's perspective as detailed through artifacts such as the formal service documentation and official diagnostic procedures (Orr 1996, 110). Similarly, values work as enacted by UX professionals may similarly lack visibility or be distinct from what is imagined by those at the top of the organization.

In seeking to understand UX professionals' values work practices in particular, this project builds on prior research that has studied UX professionals' practices more broadly, which has found that UX professionals' use of design methods and tools sometimes differs from the ways in which human computer interaction (HCI) researchers imagine design methods and tools to be used, and found that UX professionals' work is both technical and social. As this project involves the development of potential new values in design methods and tools for practitioners' use, it is important to first understand existing UX values work practices. Several prior studies investigate how tools and methods developed in a research setting get adopted (or do not get adopted) by practitioners. For instance, Matthews et al. study how UX professionals perceive and use the practice of personas, finding that while research advocates using personas for both design and communication activities, professionals mostly use personas for communication, not design, purposes (Matthews, Judge, and Whittaker 2012). Gray studies UX designers at a range of organizations to understand what types of methods—including project development, communication, design analysis, user research, and design prototyping—are reported as being used in practitioners' work, as well as practitioners' expectations about which methods new designers should be trained in (C. M. Gray 2016). He finds that some methods are used in ways different than traditional framings in HCI research literature. However, Gray's work identifies a cultural norm amongst UX professionals, that "competence in UX practice is less about the methods themselves, and more about how the designer thinks about the methods as tools to answer the right questions" (C. M. Gray 2016, 4050–51). In a broader study by Gray to identify design competencies among UX practitioners broadly, he finds that practitioners have to learn how to navigate corporate cultures and bureaucracies, be able to pick up new design tools and use them to communicate ideas (rather than having technical competency in a specific set of tools), utilize analog design skills like sketching, and find strategies for self-learning (C. M. Gray 2014).

Prior research has also studied the politics involved in UX professionals' practices, including how they construct the category of "user" and the politics of user centered design practices (Woolgar 1990; Wilkie and Michael 2009; Garrety and Badham 2004). Goodman et al. study interaction design practices situated in commercial practice, discussing the need for academic design researchers to study practitioners' work, for providing examples about how interaction designers might validate their work as "good" or "bad," what language and terms come into play, or appraising who is a "good" or "bad" designer (Goodman, Stolterman, and Wakkary 2011). Friess studied the role of personas in UX professionals' discursive strategies and decision making processes, finding a broader range of discursive strategies that did not utilize personas, including using designers' personal opinions and storytelling mechanisms focusing on ones' self or a hypothetical generic user (Friess 2012). Rose and Tenenberg focus on UX professionals' communicative practices, conceptualizing UX as a "rhetorical space" where UX professionals deploy different rhetorical strategies (Rose and Tenenberg 2016). They outline five sets of rhetorical strategies utilized by UX professionals, including: strategically deploying user research and data to make an argument; presenting designs to others or utilizing design language; drawing on professional expertise by utilizing interpersonal skills; drawing on failures and successes from organizational memory to make UX design work visible; and making compromises with others (Rose and Tenenberg 2016). Nafus and Anderson discuss the politics that corporate researchers engage in, such as framing their ethnographic work as studying "real" people outside the organization, which allows for new qualitative insights but also has to work within engineering and marketing frameworks of practice and knowledge (Nafus and Anderson

2006). These studies show how general UX and user research work is not just the "technical" work of research and design, but is also deeply social and political. This suggests that UX values work is likely social and political as well.

Recent work by Gray et al. has begun to investigate how UX practitioners navigate ethical issues in their work, focusing on designers' everyday conceptions of ethics. They present three case studies, each created from interviews and observations of a different UX professional including two designers who work at design agencies or consultancies, and one who works in-house at an enterprise business-to-business company (C. M. Gray and Chivukula 2019). Presenting the concept of *ethical mediation*, Gray et al. write that designers' ethical practices shape and are shaped by their individual practices, by organizational practices, and by the knowledge and reasoning built through education or professional societies which might indicate ethically-correct behaviors (C. M. Gray and Chivukula 2019). This project builds on Gray and Chivukula's work by studying UX professionals' conceptions and experiences of attempting to conduct values- and ethics-oriented practices working as in-house UX professionals in corporate settings. This project also surfaces how UX professionals do values work beyond the confines of their organizations or in collaboration with others.

Methods and Data Overview

This project is organized into two key sets of methods: qualitative interviews with UX professionals and field observations at UX meetup events; and design methods for researcher reflection and data analysis. Activities related to each method were conducted in parallel in order to iteratively conduct research, analysis, and design.

Abductive Analysis; Concepts and Frameworks

The methodological framework for this project draws on Timmermans and Tavory's approach of "abductive analysis," an approach that builds on grounded theory for finding theoretical insights in qualitative research (Timmermans and Tavory 2012). Rather than grounded theory's inductive approach that attempts to set aside preconceived theoretical ideas during the research process, abductive analysis emphasizes that "researchers should enter the field with the deepest and broadest theoretical bases possible and develop their theoretical repertoires throughout the research process." (Timmermans and Tavory 2012). Abductive analysis uses grounded theory's methodological steps of qualitative research including taking detailed field notes, precise transcriptions, theoretical sampling, coding along various dimensions, and memo writing. However, these practices are conducted against a backdrop of existing theory, and researchers move back and forth between inductive and deductive forms of reasoning, moving closer to and further away from their data in an iterative process. "Induction looks for the corroboration of generalizations, patterns, outliers, and salient themes in the data, while deduction suggests a reanalysis of existing data or new data-gathering rounds. […] The recursive and iterative nature of abductive analysis not only generates but also culls and narrows possible theoretical leads."

In conducting analysis, I moved back and forth between the data and existing theoretical lenses to see where existing frames fit, and to see what data seemed to challenge those frames and provide something new. Early in the project, two sets of theoretical lenses shaped how I began to think about UX practices and experiences described in the data: sociotechnical imaginaries and critical technical practice.

Sociotechnical imaginaries provide a lens to think about the work and practices to create and maintain collectively held futures. Jasanoff describes sociotechnical imaginaries as

"collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of advances in science and technology" (Jasanoff 2015, 6). Jasanoff argues that the lens of sociotechnical imaginaries are able to address issues of difference and power that are wrapped up with technologies, and how these vary across time and space. (Jasanoff 2015, 29–31). Dourish and Bell's discussion of ubiquitous computing, an HCI-adjacent field, suggest that many technical research projects in these fields are themselves in pursuit of creating and instantiating a particular sociotechnical imaginary located in the proximate future (one that imagines a world of "seamless" interactions across human and technical systems across time and space) (Dourish and Bell 2011). In other cases, the imaginaries promoted by corporate rhetoric or advertisements are inherently contradicting, which Harmon et al. describe as "impossible futures." (Harmon, Bopp, and Voida 2017). These ideas of sociotechnical imaginaries seem amenable to think about the practices of design—both speculative design and everyday UX design practice—as an orientation toward trying to construct or maintain certain visions of the future.

The theoretical framework of **critical technical practice** was foregrounded in my early analysis as a lens for understanding how technical practitioners critically reflect in a way that can affect their technical practice (Agre 1997b). Agre's critical technical practice outlines a set of specific steps, consisting of: identifying dominant metaphors in a discipline or field, identifying what those metaphors leave out or marginalize; then inverting those metaphors, centering what was previously marginalized at the center of the design. While Agre originally presented critical technical practice to artificial intelligence researchers, it has predominantly been taken up by critically oriented HCI researchers. Critically oriented HCI seeks to use design methods to conduct critical analysis and engage in "reflection on underlying values, assumptions and dominant practices in technology." (Khovanskaya, Baumer, and Sengers 2015).

Agre also discusses the need for a shared language or "vocabulary" in order for critiques to be legible from one technical practitioner to another, noting that that shared language could be that of a shared technical practice. "A critical technical practice will, at least for the foreseeable future, require a split identity – one foot planted in the craft work of design and the other foot planted in the reflexive work of critique" (Agre 1997a). This served as an initial lens through which to analyze critically oriented values work conducted by UX professionals.

Later in the project, the theoretical concept of **infrastructures** became useful as a lens to understand ongoing relations and practices needed to maintain systems, that was not well accounted for in discussions of sociotechnical imaginaries and critical technical practice. Star and Ruhleder's question of "When is an infrastructure?", rather than "What is an infrastructure?," asks researchers to pay attention to the work, relationships, and practices done in the "background" that maintain and support sociotechnical systems (Star and Ruhleder 1996). A seemingly stable system–whether that be a technology product or a corporation—only appears stable because of the work and practices that people are doing to maintain and support it, which are referred to as practices of infrastructuring (Bowker et al. 2010). The practices, processes, and tools used in infrastructuring are themselves values laden and political.

The conceptual lens of infrastructures helps provide several insights into values work. Values such as "privacy" or "fairness" might at first glance seem stable, but are only stable because people are doing work to create and maintain a particular conceptualization of those values (such as by taking actions, writing papers, or building systems that operationalize those

values in particular ways). The lens of infrastructures brings attention to practices of conceptualizing values and making values visible to others.

Qualitative Methods

Several considerations go into this study design. The scope of my project is to look at UX professionals' understanding of their own practices, examining their role across organizations, rather than look at the work of UX professionals within a single organization. The goals of this research project involve understanding the breadth and diversity of UX professionals' values work practices, and how UX professionals interpret understand these practices and their meanings (such as how and why they use particular strategies, tactics, or framings). These research questions are best answered through qualitative methods that allow for rich descriptions of practices and reflections. More broadly, these questions relate to trying to understand the practices, relationships, and cultures of UX professionals (Tracy 2013, 6–7; Weiss 1994, 9–10).

As an interpretive qualitative project, this means that the project pays attention to: (1) self-reflexivity—the positionality and ways of seeing the world that I bring as a researcher; (2) context—recognizing the importance of the background of the scene where the qualitative research takes place (Tracy 2013, 3–4); and (3) thick description—that the meaning of actions does not arise from mere documentation of behaviors, but rather from interpreting the meanings of actions within their sociocultural particulars (Geertz 1973). I speak towards these aspects across the rest of this chapter, reflexively describing my methods and positionality, then providing details that inform context and thick description of where and when I conducted this research.

Entry Points to The Site

Studying UX professionals' understanding of their own practices, rather than the work of UX professionals within a single organization, is complicated for two reasons. First, the culture of secrecy that permeates the technology industry makes direct observation of UX professionals engaged directly in their work within corporate settings difficult. While I was able to get a tour of several interviewees' office work areas, I was unable to directly observe UX professionals' work practices at large companies. Second, designers' professional practices, including their values-related practices, extend beyond the individual workplace. Some of these practices include sharing stories and resources at local "meetup" events, or sharing and learning about resources in online settings. These networked practices across sites suggests looking for entry points into these networks, rather than searching for a particular bounded location (Burrell 2009). This led me to conduct interviews with UX professionals and conduct observations at meetup events where UX professionals from different organizations come together to meet each other and learn from each other.

Interviews with designers provide an entry point to understand their experiences in the workplace, while participant observation is used at publicly accessible events attended by design and UX professionals. I attended a range of meetups in the San Francisco Bay Area that were either centered on UX, design, and social values, or on technology and social values. These meetups usually included a series or panel of speakers, some time for discussion or Q&A, and then time for networking with other attendees. Meetups tended to take place on weekday evenings for several hours, generally hosted where in downtown San Francisco, usually in office space provided by a technology company or technology-related organization. Meetup events that I chose to attend had to focus on some type of social value (such as privacy, trust, or ethics).

Some were specifically targeted towards UX and design professionals, while some meetup events were more broadly advertised and attracted people from a range of job types.

In addition to the meetups, I attended several trade shows in the Bay Area that included panels or discussions related to social values, to get a broader idea of the ways in which technology companies more broadly were publicly discussing values and ethics. These include Salesforce's Dreamforce 2018, Internet of Things (IoT) World 2018, and Sensors Expo & Conference 2018.

To further extend my understanding of practices, I also collected artifacts, tools, and resources that interviewees and informants mention (such as digital toolkits, Twitter accounts, and books), to provide an entry point into the networks of material resources that circulate, inform, and support UX professionals' practices.

Interviews and Recruitment

For interviews, I conducted purposive sampling, recruiting people who self-identified as UX professionals, who work at large technology companies, and who saw themselves as interested in or already engaging in doing values work, due to the project's scope focusing on how values work is conducted by UX professionals (and not on how values come to be seen as relevant to UX professionals). This included recruiting people who attended meetup events discussing UX design and values, had a degree in a field that includes thinking about social aspects of technology, or self-identified as "thinking about social implications of their work."

I further bounded my inquiry by recruiting UX professionals who work at technology companies that are not in highly regulated sectors in the U.S. (excluding finance companies subject to consumer finance protection laws; and health, medicine, and education companies subject to health data privacy and educational privacy laws). I am interested in UX practices related to values that occur outside legal compliance processes, thus I excluded highly regulated industries where I suspected legal compliance processes might dominate. I also bounded my inquiry by recruiting UX professionals who work at established (beyond the startup phase) companies, as these present a more mature organizational context that may be more likely to have UX teams, and may have done some organizational thinking about addressing values and ethics.

Interviews took place between Summer 2018 and Summer 2019. I recruited people in several ways, initially asking for referrals from people in my own professional network, and talking to people I had seen attend a meetup related to design and values issues. From early interviews, recognizing that several interviewees described using Twitter as a source to learn about values issues and hear from diverse perspectives, I also posted several tweets recruiting UX professionals who fit the criteria. I avoided using the term "ethics," or specific values such as "privacy" in my recruitment materials, as UX professionals might not conceptualize their own work using those terms, or these terms might suggest that I was interested in practices of formal ethical reasoning or formal privacy law compliance programs.

Given the prevalence of the term "social implications" in public discourse to discuss issues relating to values and ethics of technology, I used that term in my recruitment materials. On Twitter, I wrote "UX folks - I'm looking to chat with people who've tried out different ways to think about (potentially negative) social implications of their products, for about an hour for a research interview project." For emails, I wrote messages similar to "I'm doing a research project interviewing engineers and designers (including UX designers and user researchers) to understand how they think about social implications of technology in their work." In addition,

after each interview, I asked if participants would be willing to share a short recruitment blurb with my contact information to other UX professionals who they thought I should talk to. These blurbs said "We are interviewing UX professionals to understand how they think about and discuss social implications of technology in their professional practices." I used similar language to these messages when asking people in-person if they would be interested in participating. I provide a more in-depth overview of the interviewees and their backgrounds in the following section.

Interviews stopped at a point of saturation, where the types of practices and challenges discussed by interviewees began to match the experienced described by other interviewees and by those at meetup events. However, as the goal of the project is to understand the diversity of practices related to UX professionals' values work, it is possible that there are additional practices, challenges, and experiences not captured by the diversity of this interview sample.

Conversations were not scoped around particular values, rather I allowed interviewees to discuss what they considered as being important or relevant to addressing social implications. Sometimes this led to discussion of specific social values such as privacy, accessibility, or fairness. Other times, values were discussed as a more complex and entangled set of politics, such as ensuring diversity and inclusion among both the companies developing technologies and the user base. Supporting the well-being of end users (particularly workers who are the end users of enterprise systems) was referred to often. And at other times, values concerned a set of politics about reducing potential to stakeholders caused directly or indirectly by technology products.

I conducted interviews either in person or via Zoom video conferencing. Interviews generally lasted about an hour, ranging from 52 minutes to an hour and 43 minutes. Topics of conversation included discussing the interviewee's professional history, discussing an experience (or multiple) when an issue related to a social implication of technology came up in their work, and a discussion of what (human and non-human) tools and resources they utilize in their own thinking or practice related to values. At the end of interviews, I collected demographic information from interviewees, either verbally or using an open-ended questionnaire form. With interviewees' permission, interviews were audio recorded and transcribed, although a couple asked that I not record and take handwritten notes instead.

Data Overview

Starting Where You Are: The San Francisco Bay Area

I conducted my dissertation research at the University of California, Berkeley, located in Berkeley, California, collecting data between Spring 2018 through Winter 2020. Berkeley sits on the east side of the San Francisco Bay, along with Oakland and other cities. About 12 miles away on the west side of the Bay sits San Francisco at the tip of a peninsula. Moving south along the peninsula are other cities associated with schools and technology companies, including Menlo Park (Facebook), Palo Alto (Stanford), Mountain View (Google), Sunnyvale (Apple's newer "Spaceship Campus"), and San Jose located at the south end of the Bay, about 50 miles south of San Francisco and Berkeley. The cities in this region are physically connected via freeways, bridges, and a disparate set of local and regional public transit agencies. But they are also connected by the flow of technology company workers.

Traveling on BART, one of the main rapid transit rail systems, or walking down Market Street in San Francisco, it was not uncommon for me to see any number of technology corporate logos on people's backpacks, jackets, sweatshirts, and employee badges dangling from waistlines, or on the advertisements that adorned the station walls and sidewalk billboards.

Most of the people who I talked to live and work somewhere in this geographic area. For those interviewees who live and work elsewhere in the United States, their companies still have offices (if not headquarters) somewhere in the San Francisco Bay Area. Many of the meetup events that I attended took place at event spaces at technology companies (although some were also held at offices of advocacy organizations and university spaces). While the events were generally planned and run by volunteers, corporate meeting and event spaces served as hosts, including spaces at companies such as Google, Slack, Uber, Adobe, LinkedIn.

Reflecting on this project, I am struck by how much my knowledge and landmarks of the Market Street area of San Francisco area is based on the location of technology companies' offices – Yelp is here, LinkedIn's offices are around the corner, Salesforce and Google's San Francisco office are up the street, Uber has a secondary office over there, and so forth. My knowledge of San Francisco geography through technology company offices seems strikingly normal, as if it is "natural" that these companies are all within the same geographic area.

Yet the presence of the technology companies in such a geographically concentrated area is not a "natural" occurrence. Others have written about the history of the technology industry in the Bay Area and Silicon Valley, noting the role of universities, social and cultural connections among workers, and the growth of the software and digital services industries (Orr 1996; Saxenian 1994). Business-friendly policies, such as tax breaks offered by the city of San Francisco in the early 2010s, have helped encourage the development of new technology company offices within the city of San Francisco. Though this has not been without controversy, as critics point to widening inequalities, a broadening income gap, and lack of affordable housing in the area.

Interviewees

I interviewed 12 people who self-identified as UX professionals who think about the broader social implications of their work between July 2018 and August 2019. These interviews form the bulk of the data analyzed in this project. Five have the role of "designer" (including titles like "product designer" or "user experience designer"), three have the role of "researcher". One has the title of accessibility engineer, but works under a UX team. One is now a product manager but was previously a designer at the same organization. One is a UX research consultant. And one is the organizer of a UX meetup (who also works professionally in a UX capacity, but our discussion focused on their meetup activities). When introducing quotes from people, I refer to them based on their job title. At some larger organizations, UX roles are split into "researcher" and "designer" roles, where researchers study and interact with users, and designers work on creating the user interfaces or other user-facing aspects of the systems and products (although the boundary between these roles can also be fluid).

The gender diversity of interviewees includes eight female, three male, and one nonbinary participant. Eight interviewees live and work in the San Francisco Bay Area, two in New York City, one in San Antonio, Texas, and one in Toronto, Canada. The ages of interviewees ranged from 26 to 52, although most were in their 30s.

At the time of the interviews, a plurality of 6 interviewees worked for one of two enterprise business software companies, large corporations with over 10,000 employees each.[7] 2 work for a consumer-focused educational technology (EdTech) company (the company sells products and services to students, rather than to schools – this means that it is not subject to

[7] Number of employees and age of companies are sourced from crunchbase.com in June 2020.

federal student privacy laws, and not subject to my exclusion criteria of "highly regulated industries") that has between 500-1000 employees. One interviewee works for a social media platform and one works on a web browser product. All organizations are mature beyond the startup phase, the youngest organization represented being nine years old. Beyond the interviewees who work at technology companies and organizations, one interviewee runs their own UX research consulting business, and one organizes a series of UX-focused meetup events. The latter two interviewees have also had prior experiences working at technology companies; however, I interviewed them in their capacities as a consultant and meetup organizer.

Of the interviewees working for companies, their time at their current organization ranged from as little as eight months to as much as seven years. Most (at least 7) have worked at their current organization between 1 to 4 years. Interviewees also had a range of lengths of experience working in the technology industry more broadly: Three had 10 or more years of experience, while nine had between 2 to 9 years of experience. Some interviewees drew on their past experiences, as well as their current job, during our conversations.

In reporting on interviewees' experiences and quotes, I provide pseudonyms for each interviewee, and give broad descriptions of the types of organizations and products that they work with, in order to protect their identities as agreed on when we met.

In addition to the interviews with UX professionals, I talked to other types of technology professionals and stakeholders who self-identified as thinking about social values and technology to inform the background of this project and situate UX professionals' work among other forms of technical practice, including a UX intern, sales engineer, manager, and an employee at an advocacy group.

Interviewees' Professional Backgrounds

Given that I focus on UX professionals who already see values as a part of their work practice, I briefly provide some context on interviewees' professional backgrounds and how they began to see values as relevant and central to their work. The UX professionals that I interviewed reflected a diverse array of paths into their current positions.

A few interviewees discussed having technical backgrounds, such as working as a programmer or getting a computer science and engineering degree, before later shifting into design and user experience. However, overall, the interviewees represented a broad range of backgrounds and trainings before entering into a UX role. This included completing undergraduate degrees in anthropology and political science, or completing Master's or PhD work in fields such as psychology, art history, and information studies. Another interviewee came to UX from an earlier video and film production career, which led them into developing internet video technology systems, which then allowed them to move into UX.

The interviewees I recruited all already see addressing values as related to their work. While this research project focuses on practices that UX professionals conduct once they see values as relevant to their work, it is worth noting that interviewees pointed to a wide range of experiences that allowed them to see values as relevant in the first place. Several interviewees' perspectives changed while working in the technology industry. One interviewee who had been working in the technology industry for about 10 years noted that an experience at a previous job at a company that created software for managing business travel led him to start thinking about potential social and environmental harms related to the technology products he worked on:

> So [COMPANY] had a hackathon once and somebody came up with this sort of gamified version of business travel where you got points for amount of miles traveled and different

> continents that you visited. And another person came up with an integrated way to purchase carbon offsets for all of your frequent travel. And it really struck me—wait a minute, so this one person is gleefully trying to game-ify travel to get people to do more of it, **and this other person is "let's think about this for a minute. Why do we need to do that and could it possibly be bad for our air quality?"** And that was even on what I thought was a fairly innocuous app. That was a thing that lodged in my mind pretty early on.

Another interviewee discussed his perspective as changing along with the company's shift in recognizing responsibility they had for addressing social harms resulting from use of their platform:

> So I've been at the company for about seven years now and I think, I definitely feel like my perspective has not necessarily…. it's aged in a similar way with the company. I feel when I look back on myself with my thinking about what we were doing in the first two years, I feel personally like I was very naïve. I was aware of the [harmful platform-based] behavior and I was embarrassed by it. […] And so there were definitely aspects of that I didn't like. But you know honestly in my head it-- I never really made the connection that "oh wait, we can fix this." Like we can do something about this. And we should.

In addition to shifts resulting from specific incidents at work, some noted that their ideas changed over time by working in the technology industry, talking to others who foregrounded thinking about values in their work, or learning about new technology startups in San Francisco that felt wrong, "crazy," or "bizarre," with one interviewee saying "you start making friends there and meeting people there, you're like 'oh wow people are working on some stuff that I don't necessarily want to work on.'" Drawing these comparisons made her start reflecting on her own work more over time, in ways that she did not at the beginning of her career.

Others spoke to a range of personal and educational experiences that have made them more aware of social values in their work. For instance, one interviewee described herself as having "a slew of learning disabilities." This helped attune her to issues of accessibility and ability in her work. Another interviewee noted how her partner grew up in a different geographic and socioeconomic area of the U.S., which helped attuned her to differential experiences that people have with technologies. Some interviewees who had completed college or graduate work in social science or humanities programs noted that their experiences reading critical theory, or reading about harms related to technology development and use influenced their thinking about social values in practice.

Observations

In addition to interviews, I attended a range of meetup events in the San Francisco Bay Area to help understand the broader values conversations taking place among UX professionals and other technology professionals outside of individual workplaces, as well as to observe how UX professionals engage with values issues. These observations occurred between spring 2018 and winter 2020. They included attending 6 events aimed at UX professionals (such as by indicating design, UX, or user researcher in the title), and 6 events aimed at technology professionals interested in privacy. Each of the meetup events was part of an ongoing series of organized conversations and meetings. The 12 meetup events I attended were organized by 5 different groups -- I tried to attend multiple events hosted by the same organizing group when possible. Meetups were organized by a range of people and organizations – some by a local professional

association for designers, some by groups of volunteers, and some by groups of volunteers who had financial support from other organizations to host a meetup. All the meetups I attended featured either a speaker, series of speakers, or panel of speakers, usually followed by some type of Q&A or discussion.

In addition, I attended three trade shows in the Bay Area to better understand how technology companies might publicly frame discussion of values: Salesforce's Dreamforce 2018, IoT World 2018, and Sensors Expo & Conference 2018. I attended trade shows whose schedules indicated that they would have a speaker or panel discussing something related to social values (such as privacy or ethics).

At these meetup and trade show events, I took pictures (when allowed), and took jottings while listening to panelists and speakers, particularly paying attention to how panelists and speakers would frame their discussion of values issues, and any strategies or practices that they mentioned.

When possible, after conducting interviews in person, I would write down jottings—short phrases, quotes, and keywords related to the conversation (Lofland et al. 2006, 90)—writing down additional details about the location and setting of the interviews, ideas and points that seemed important, or other details not fully captured by the audio recording, like people's reactions to something I said. Similarly, after attending meetup or tradeshow events, I would pause before heading home to write down some early analytical ideas as a well as a running list of what I had seen and heard from my jottings during observation (Lofland et al. 2006, 90–91).[8] Jottings from interviews were appended to the end of interview transcripts. Jottings from observations were integrated with the early analytical ideas, and with the photos and running list of events. These were integrated into typed field notes. The data analyzed includes the interview transcripts and the field notes.

Positionality

Reflecting on my own role as being the research instrument, I was able to leverage my background to navigate UX and design meetups. As an Asian American male in my 20s, I physically and visually fit into the mix of appearances of people attending these events. Furthermore, having received an undergraduate degree partly focusing on human computer interaction, and having had previous experience going through the hiring process for an interaction designer position, I could use my understanding of UX language when talking with people. In addition to professionals, meetup attendees sometimes included students from local colleges enrolled in design, information, and other degree programs, who wanted to learn more about values issues in technology, sometimes allowing me to frame myself as similarly coming from a university and wanting to learn about these topics.

My technical training from my undergraduate degree gave me a place to start relating to people, even though I lacked industry UX experience. I was familiar with many of the tools and practices used or discussed by UX professionals – human centered design, needs assessments, rapid prototyping, wireframing, paper prototyping, personas and scenarios, heuristic evaluations, using Photoshop and InDesign, and so forth. Even though my knowledge base was

[8] Several hotel lobbies near Market Street in San Francisco served as a setting where I could write these jottings. It was also through this experience that I became aware of the phenomenon of "privately owned public open spaces" (POPOS) in downtown San Francisco. https://sfplanning.org/privately-owned-public-open-space-and-public-art

predominantly from the early 2010s,[9] it provided me an entry point into the community. Through these interactions, I was both a participant and observer at these meetup events. I could attend UX meetup events, speak in the language and terms of UX, and start to talk with potential interviewee subjects.

Challenges and Limitations

One of the challenges and limitations to this work is the culture of secrecy among technology companies, and getting access to people who are willing to discuss their experiences. Part of this is likely due to technology companies having policies in place to guard against corporate espionage or the leaking of proprietary information to maintain a competitive advantage. Part of this may also be due to technology companies being wary of having negative press coverage about their products or practices. The culture of secrecy in the technology industry was visible through my research. Most meetup events are held in office spaces offered freely by technology companies. But to physically access these spaces, attendees often have to sign a nondisclosure agreement covering any information learned about the products being created by the host company if that information could not have been known by other means (these are not specific to meetups; these nondisclosure agreements are often presented to all visitors in order to enter the office spaces of many companies). In addition, it was not uncommon to have to submit my name in advance to be on a guest list and be escorted in a group with other attendees by an event organizer who also worked at the host company, to ensure that we went straight from the security desk to the event space. Some technology companies have even created spaces for hosting public events in areas separated from the secured work area, so that guests never have to enter a secured zone where employees work. While I was able to get a tour of several interviewees' office work areas, these dynamics prevented me from being able to directly observe UX professionals at large companies, meaning that my discussion of UX practices is based on interviewees' conceptions and reflections on their own practices. However, interviews allow me an opportunity to talk to interviewees who have reflected on their practices and strategies, and understand what these practices mean to them. Conducting individual interviews outside of the workplace also provides interviewees with more freedom to discuss things that they may not feel comfortable discussing in workplace settings, such as expressing frustrations, or discussing the emotional aspects of their work.

My interview sample is limited by people who were willing or able to talk to me, as well as by what they were willing to share. When talking to people at meetups about my project, many people indicated interest in the potential findings, though when asked if they wanted to talk for a research interview, several indicated that they would need to talk with their manager or press office before talking with me. Even among people who I talked to and recorded showed an awareness to norms of corporate secrecy, sometimes pausing in order to think about how to discuss a prior experience while obscuring details to make the product or organizations at play harder to re-identify. Some interviewees paused at points in the interview to consider their phrasing, saying things like "I'm trying to work out how to say this in a way that is still confidential" or "I should be careful about answering this." Several times, interviewees discussed experiences or controversies at a level of detail that they then asked me not to report on, or asked me not to audio record and report on certain parts of our conversation, which I have respected.

[9] Including having skills using the PHP language, and in manually creating CSS workarounds for cross-browser compatibility that are no longer needed in most web projects!

At other times, interviewees justified being able to provide me with details, because the details concerned information that had already been made public by the organization, or the experience was concerning a product that had already been released. It seemed that several interviewees expressed some feelings of precarity in their professional position--that violating norms of corporate secrecy might lead to consequences to their professional position and job.

Interestingly, while much attention in academic and industry research is given to issues around artificial intelligence (AI) and machine learning (ML) ethics[10], few interviewees discussed values and ethical issues related specifically to AI and ML systems (although AI and ML systems sometimes came up as a topic of conversation at meetup events). This is possibly due to sampling, where the people I talked to do not work on AI or ML related products. It may also be due to the ways in which AI and ML systems are designed and worked on, where UX professionals may have less exposure to those AI and ML components of a system compared to data scientists or other engineers. It may also be due to interviewees' self-censorship related practices of corporate secrecy, where interviewees did not feel comfortable discussing experiences related to AI and ML systems that are not publicly known (or conversely, some AI and ML systems might be very publicly known and discussing them might make it easier to re-identify the interviewee).

Qualitative Data Analysis

My process of data analysis included both inductive and deductive forms of coding, following the framework of abductive analysis (Timmermans and Tavory 2012). In a first round of coding several forms of exploratory coding were done directly on Word documents containing transcripts, jottings, and field notes. This included using descriptive coding to note and identify topics present in the data (Saldaña 2013, 88), process coding to note and identify practices and actions in the data, using verbs ending in "-ing" as codes (Saldaña 2013, 96).

The transcripts and field notes were then loaded into the qualitative coding software Atlas.ti for a second round of coding and analysis that utilized both inductive codes based on themes from the first round of coding, and deductive codes based on existing theoretical frameworks.

Drawing on ideas from critical technical practice and infrastructures, I developed set of codes to categorize the processes and practices identified in the first round of coding as a technical practice, a social professional practice (a social practice done by a UX professional), or a social organizational practice (a social practice done by an organization). A code identifying "levers," was informed by Shilton's concept of values levers, or practices that make values visible for technical action (Shilton 2013). My interest in understanding how different sociotechnical imaginaries might be promoted and maintained led to a set of codes around "justification," focusing on the ways in which UX professionals articulated and justified their arguments for addressing values.

In addition to these theoretically-informed codes, focused coding provided a range of codes corresponding to categories that emerged from the first cycle of coding (Saldaña 2013, 213). These codes included categories related to different types of practices: information seeking, resistance, emotional work, volunteer work, finding allies. The codes also included aspects of

[10] For instance, the growth of the ACM Fairness, Accountability, and Transparency (FAccT) conference and community in recent years, as well as AI & ML ethics programs or funding initiatives by companies including Microsoft, Google, Facebook, Amazon, and Salesforce.

participants' experiences and conceptions of their work: success, partial-success, failure, responsibility for values, and skepticism.

After this round of coding, I wrote memos based on quotes and text related to groups of codes. For example, a memo on emotional aspects of values work included quotes labeled "emotional work," "volunteer work," "success," "partial-success," and "failure." In these memos, I tried to describe some of the background for the quoted text, and relate the quotes to possible theoretical concepts—sometimes finding some theoretical approaches useful at describing the data, and sometimes finding that the data did not fully fit with a theoretical lens. These memos went through an iterative process, as new ideas from the data emerged, and as the data fit (or did not fit) different aspects of the theoretical lenses I was using.

Throughout the data collection and analysis process, I also used memoing in several ways (Lofland et al. 2006, 210). I used theoretical memos to write short analytical documents trying to explore particular themes (such as when did people talk about values as emerging from the design process versus use versus a static artifact). I also used theoretical memos to summarize. the content of an interview, organized thematically rather than the chronological order of the discussion. I also wrote operational memos to reflect on my own positionality and experiences.

Design Methods for Reflective Inquiry and Data Analysis

A second, parallel method in this research project uses design research methods as a form of reflexive inquiry. Recent scholarship in STS and related fields has discussed how engaging in design practices can provide a method of inquiry into understanding and opening up the politics and material practices of design. Engaging in design practices similar to those that practitioners use to make products, with reflexivity about the designer-researcher's positionality, can surface politics and values related to material design practice that are often black-boxed when looking at a designed artifact (Dumit 2017; Ratto 2011; Rosner 2018). Design can also be used as way to formulate arguments; practices such as critical making, adversarial design, or speculative design consist of designing an artifact with an explicit set of politics in order to critique, contest, explore or propose different arrangements of sociotechnical systems as a way of learning about the politics of design practices and material artifacts (DiSalvo 2012; Ratto 2011; Vertesi et al. 2016). This project takes these perspectives on design, and utilizes design as a research method as a form of reflexive inquiry.

This project uses the practice of speculative design as a way to conduct reflexive inquiry on interview and fieldwork data, and as a way to understand the politics of values work practices. Developed by design researchers, speculative design uses artifacts to create alternative worlds (not necessarily futuristic worlds) to ask questions about possible sociotechnical configurations of the world (Dunne and Raby 2013; Coulton et al. 2017; Pierce et al. 2015). Through the creation of speculative design artifacts and reflecting on them, the researcher asks what sociotechnical context surrounding the artifact would be necessary for the artifact's existence—what practices, norms, forms of social and technical organizations, infrastructures, and values would allow for this artifact to exist in the world? Viewed through an STS lens, the practice of speculative design uses the practice of design to create, contest, provoke, and explore possible sociotechnical imaginaries (Jasanoff 2015).

In addition to forms of textual coding and inductive qualitative analysis, I use speculative design to reflect on and further interrogate empirical data resulting from the interviews, fieldwork, and artifact analysis. In this way, creating designs works similarly to memoing, but by using the practice of design rather than the practice of writing. For instance, I created speculative

designs to interrogate designers' values work practices by creating artifacts like fictional corporate values statements and internal company memos as a way to interrogate the politics of the tools and strategies discussed by interviewees and informants. These designs help surface the potential limits of resources and strategies by exploring how they might work in different assemblages (e.g., how might a particular resource be utilized in an organization with different types of values commitments). By asking what sociotechnical context surrounding these artifacts would be necessary for their existence, these speculative design exercises can provide insight into the broader assemblages implicated in designers' practices—how their practices are entangled with other institutions, artifacts, and stakeholders inside and outside of their organization. Creating yet-to-be-realized design concepts also begins to explore and propose potential future ways that values work might be conducted.

Through the following chapters, I call these designs *reflective design fictions* or *reflective speculative designs*. They are presented in the text, highlighted in sections with a different colored background. Each fiction is presented in a section with relevant themes, and serves two purposes. First, they help show part of my process of analysis of interviewees' practices. Second, they serve as a brief break from the empirical data, inviting the reader to think through the themes presented in another (potentially speculative) setting or context.

The creation and form of these fictions varies. Most started as ideas that occurred to me during the process of coding, where I would write down some textual ideas for a design or create a quick sketch by hand or using PowerPoint slides, and make a notation of this in a code in the interview transcript or field notes. Others occurred to me while writing memos, or in discussing early themes with colleagues. Later on, I returned to those early ideas, and created higher fidelity versions of them, sometimes using PowerPoint, other times Photoshop, or an HTML mockup. Some took the form of stories of fictional characters navigating their own corporate structure, and artifacts like emails and Slack conversations help tell those stories. Others took the form of fictional products or interfaces, like a fictional dashboard that tracks values-related work. Often the initial design inspirations arose from the question "how can I depict a certain type of practice and politics from the data in the form of a design or story?" In the process of creating these reflective design fictions and reflective speculative designs, new ideas about the politics of values work came up for me, which in turn iteratively influenced my coding and memoing processes.

Unlike other research through design techniques that use design as an intervention or probe to provide insight into a particular situation, I use design as a tool to analyze empirical data. This shares some similarities with techniques such as creating design workbooks, collections of exploratory design proposals that explore options for design. The *practice* of creating these conceptual designs allows new insights to emerge: "through the multiplicity of design ideas they contain they implicitly suggest important issues, approaches and options that might be considered in designing for a given situation." (W. Gaver 2011, 1551) However, while many conceptual design techniques like workbooks focus on exploring design spaces from a designer's or author's point of view, I use speculative design and design fiction to analyze and "stay close" to the experiences reported by interviewees. This use is similar to Khovanskaya et al.'s "design briefs," using design to engage and reflect on ethnographic insights during formative stages of analysis (Khovanskaya et al. 2017). However, Khovanskaya et al.'s design briefs were used as part of a collaborative and communitive process between ethnographers who conducted field work and designers who did not have direct access to field sites. In contrast, my reflective design fictions are based on my own empirical fieldwork and interviews, thus the

insights from the designs come through form my own reflective practice, rather than in communication with another researcher or designer.

In using design as an analytical method, I recognize that "design" has rhetorical power and its own histories and politics (Sims 2017; Rosner 2018; L. Irani 2018). By reflectively engaging in design practices and creating design artifacts similar to what UX professionals do, this project aims to use design as a lever to open up and explore the politics of the practices of UX professionals, complementing the knowledge gained through textual analysis of interviews and observations.

Background: Cultural Touchstones

Before reporting on findings from the data in the following chapter, I first provide some context about where and when this research took place. Most interviewees lived in the San Francisco Bay Area, where there have been public debates about the relationships between technology companies, public services, and civic life. During the course of the project, a range of public scandals around technology companies and worker activist actions occurred, some serving as cultural touchstones that interviewees referred to in their discussions. And I provide some contextual background about how my interviewees perceive their role and work as UX professionals broadly, before discussing values-specific practices in the following chapters.

A broad range of cultural events surrounding social values and technologies took place during the time I conducted interviews and field work. Various controversies, events, and pieces of media were explicitly referred to by interviewees and by meetup participants, or informed discussions that people were having about values and technology. Controversies related to the actions of technology companies spanned a range of social values issues. The pressure applied to technology companies during these controversies also varied, sometimes coming from external sources such as the news media or public opinion, and sometimes coming from internal worker organizing efforts.

After the U.S. 2016 presidential election, new concerns arose about the role of disinformation campaigns on social media platforms such as Twitter, Facebook and YouTube, and the ability for political disinformation to affect election outcomes as well as the ability to have shared civic understandings of current events. This emerged both as a topic of academic research (Starbird, Arif, and Wilson 2019) and public pressure for companies to take some type of action against disinformation.[11]

Also related to the 2016 election, Facebook was criticized for allowing millions of users' profile data to be shared with the data consulting firm Cambridge Analytica (via a quiz app utilizing the Facebook API that provided the user's and the user's friends' data to Cambridge Analytica and affiliated organizations). Cambridge Analytica reportedly used these data while consulting with the Trump Campaign.[12] Concerns included personal data being shared without explicit consent (when a user's friends' data are shared without the friends' knowledge or consent), data being used for unexpected purposes (purposes beyond the quiz), and potential harms that could result from the use of the data (for emotional and psychological profiling by Cambridge Analytica).

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[11] https://www.cnn.com/2017/10/09/opinions/social-media-platforms-spreading-disinformation-opinion-morgan/index.html; https://www.washingtonpost.com/business/facebook-twitter-and-the-digital-disinformation-mess/2019/10/01/53334c08-e4b4-11e9-b0a6-3d03721b85ef_story.html

[12] https://www.vox.com/policy-and-politics/2018/3/21/17141428/cambridge-analytica-trump-russia-mueller; https://www.vox.com/policy-and-politics/2018/3/23/17151916/facebook-cambridge-analytica-trump-diagram

With the rise of visible actions taken by white supremacist groups, such as a rally in Charlottesville, Virginia in August 2017, several technology companies responded by taking steps towards limiting means of support to white supremacist and hate groups. These actions included Apple Pay and PayPal stopping payments to white nationalist groups, actions by web hosts and content delivery networks like GoDaddy and Cloudflare to drop certain hate group clients.[13] However, the Southern Poverty Law Center still notes how many hate groups are able to make use of payment, web hosting, and advertising services of major companies.[14]

During increased immigration deportations, detentions, and family separations among migrant families by the Trump administration, many technology company workers contested their companies' relations and contracts with the Department of Homeland Security (DHS), Customs and Border Patrol (CBP), and Immigration and Customs Enforcement (ICE), for contributing to the inhumane treatment of migrant families. In 2018, Microsoft employees signed an open letter to their chief executive regarding Microsoft's contracts with ICE for data processing and AI services[15]; Salesforce employees wrote a letter to their CEO regarding the company's contracts with CBP for several cloud products[16]; Amazon employees wrote a letter to their CEO regarding the sale of facial recognition software to law enforcement and sale of Amazon Web Services to Palantir, a data analytics company that provides services to DHS[17]; and employees at Palantir wrote a letter to their CEO raising concerns about the relationships that Palantir has building software and conducting data analytics for ICE.[18]

In 2018, Google workers also protested Google's contract with the Department of Defense over Project Maven, a project developing improved analysis for video obtained by unmanned aerial vehicles, protesting the company's involvement in creating military and warfare technology.[19] Beyond the letter, some employees resigned in protest, and Google eventually announced that it would not renew its contract with the Department of Defense.[20]

In 2017, a sexist manifesto written by a Google engineer argued against the company's diversity and inclusion initiatives. The worker was fired,[21] but continuing events related to sexual discrimination and harassment at the company led to a staff walkout in 2018 to protest, raise awareness, and call for changes to improve the workplace culture, provide pay and opportunity equality, increase transparency, and create clearer and more inclusive processes for reporting sexual misconduct.[22]

In addition to actions taking place at individual organizations, a group titled the Tech Workers Coalition formed as a coalition of workers, labor organizers, and community organizers to support worker activism and education efforts towards social justice and workers' rights.[23]

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[13] https://www.theverge.com/2017/8/17/16163960/hate-groups-banned-godaddy-cloudflare-facebook-squarespace
[14] https://www.splcenter.org/hate-and-tech
[15] https://www.nytimes.com/2018/06/19/technology/tech-companies-immigration-border.html
[16] https://www.theverge.com/2018/6/25/17504154/salesforce-employee-letter-border-protection-ice-immigration-cbp
[17] https://www.theverge.com/2018/6/22/17492106/amazon-ice-facial-recognition-internal-letter-protest
[18] https://www.washingtonpost.com/business/2019/08/22/war-inside-palantir-data-mining-firms-ties-ice-under-attack-by-employees/?arc404=true
[19] https://www.nytimes.com/2018/04/04/technology/google-letter-ceo-pentagon-project.html
[20] https://gizmodo.com/google-employees-resign-in-protest-against-pentagon-con-1825729300; https://www.theverge.com/2018/6/1/17418406/google-maven-drone-imagery-ai-contract-expire
[21] https://www.vox.com/identities/2017/8/8/16106728/google-fired-engineer-anti-diversity-memo
[22] https://www.bbc.com/news/technology-46054202; https://www.latimes.com/business/technology/story/2019-11-06/google-employee-walkout-tech-industry-activism
[23] https://techworkerscoalition.org/

Beyond worker-led actions, technology companies and outside organizations began to take public actions to highlight some type of commitment to addressing social values. A range of companies introduced new ethics initiatives around artificial intelligence (AI) and machine learning (ML) systems, such as Google's People + AI Research (PAIR) group[24], Microsoft's creation of responsible AI principles,[25] and Salesforce's AI Ethics principles[26].

Outside of individual companies, other actions included the creation of the nonprofit organization "Center for Humane Technology" co-founded by former Google design ethicist Tristan Harris – this organization joined existing Bay Area organizations such as Mozilla and the Electric Frontier Foundation in advocating for a range of social values that should be addressed by technology companies. The Partnership for AI, a multi-stakeholder group started in 2016 by Apple, Amazon, Facebook, Google, Microsoft, and IBM (but has grown to include additional companies and non-profits), works towards finding and developing best practices for using AI systems in ways that consider social values and weigh costs and benefits.[27] Beyond the Bay Area, the formation of new advocacy organizations and research institutes, such as the AI Now Institute at NYU[28] began to build a broader community and set of resources for thinking about issues related to technology, social values, and ethics. In 2018, several organizations including the Institute for the Future and Omidyar Network released the Ethical OS toolkit, a set of checklists, scenarios, and strategies to help technologists think about the potential harms and negative social impacts of their products.[29]

In the context of law and regulation, the E.U.'s General Data Protection Regulation (GDPR) came into effect in May 2018, creating new responsibilities for companies collecting and processing data, and new rights for data subjects living in the E.U. related to data privacy. While a European regulation, the law affected U.S. companies that collect data from European users. Furthermore, the California Consumer Privacy Act (CCPA) was passed in 2018 and came into effect in 2020. These laws required companies to comply with new privacy-related statutes, re-organizing the practices of companies, including re-writing privacy policies, changing data collection and use practices, and creating processes to comply with new rights for people to request access to or request deletion of their data.

Culturally, the television show *Black Mirror* was referenced by many people as providing examples of how technology could go wrong. The dystopian science fiction anthology show became available to view in the U.S. in 2014, depicting stories of negative societal outcomes using near-future technologies. In addition, a range of books related to technology, social values, or ethics were brought up at meetup events or in interviews as resources that helped inform people's thinking, often highlighting social harms or inequalities related to technology design, deployment, and use. A sampling of these books, ranging from popular press to academic books, is detailed in Table 4.1 below:

[24] https://pair.withgoogle.com/
[25] https://www.microsoft.com/en-us/ai/responsible-ai?activetab=pivot1:primaryr6
[26] https://einstein.ai/ethics
[27] https://www.partnershiponai.org/faq/
[28] https://www.omidyar.com/blog/pursuit-fair-and-accountable-ai-why-we-invested-ai-now-institute
[29] https://ethicalos.org/

Title	Author(s)	Year Published
Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor	Virginia Eubanks	2018
Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass	Mary Gray and Siddharth Suri	2019
Technically Wrong: Sexist Apps, Biased Algorithms, and Other Threats of Toxic Tech	Sara Wachter-Boettcher	2017
Future Ethics	Cennydd Bowles	2018
Ruined by Design: How Designers Destroyed the World, and What We Can Do to Fix It	Mike Monteiro	2019
Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds	Arturo Escobar	2018
Tech Humanist: How You Can Make Technology Better for Business and Better for Humans	Kate O'Neill	2018
Mismatch: How Inclusion Shapes Design	Kat Holmes	2018

Table 4.1. Books meantioned by interviewees or discussed at meetup events as helpful to informants' thinking about values.

This network of artifacts and cultural touchstones points to a broader cultural discussion in the U.S. about technology, values, and ethics among a wide range of actors, including academic researchers, regulators, technology workers, company management, writers and content creators, and technology users and consumers. This suggests that the conversation about technology and values expands significantly beyond UX professionals. At the same time, these events and touchstones have influenced the practices of UX professionals—many interviewees spoke of books and other media that have shaped their thinking, or pointed to worker-led actions at other companies as inspiration for their own work. Recognizing these connections shows that the practices conducted by the UX professionals I talked to are not isolated behaviors, but are related to and influenced by broader cultural concerns about the relationships between technologies and social values.

I now turn to practices and perceptions of UX work related more explicitly to incorporating social values into professional work practices. The following chapter, Chapter 5 lays out the groundwork of values work, describing the social values that arise in UX professionals' work and mapping out the practices they conduct in relation to different actors and stakeholders. Chapter 6 then analyzes the power dynamics present in those practices. Reflective fictions are presented throughout the next two chapters; Chapter 7 reflects on the politics of using design as a method of analysis, and the politics of speculative design practices more broadly.

Chapter 5: Configuring Values Work

Conducting values work not only involves technical user experience (UX) design and research practices, but also involves navigating the social and organizational landscape where UX professionals work. In a telling moment early in the project, I was talking with Genevieve, a senior product designer at a large enterprise software company, at a coffee shop near her workplace. In our conversation, she described her experiences and frustrations navigating the politics and culture of her company.

> Genevieve: It feels like everything is much more shrouded in mystery and there's always these people you didn't know existed doing the same thing as you. Or like doing it differently or have a certain opinion about what you're doing and will try to like stop what you're doing, but you can't find them in time to loop them in. It's rough. […] Have you ever seen *The Princess Bride*? […] Remember when they're in the swamp with the rodent of unusual size? It feels like that. [*laughs*]. Like everything is misty, and there's weird growling noises. [*laughs*] It's really hard to figure out where you're going. And there's like quicksand and shit.
>
> Richmond: That scene always scared me as a kid
>
> Genevieve: Yeah! [*laughs*]. That's kinda what it feels like professionally right now.

This chapter provides an overview of UX professionals values work practices within large technology companies: what types of values problems emerge, what are the practices of attending to values, and what are the social or organizational relationships in which these practices occur. UX professionals' practices used to address values can shift across multiple modalities, and the responsibilities for addressing values issues may be spread across an organization such that UX professionals are only given partial responsibility for values. These practices suggest how UX professionals work to configure the distribution of responsibility for values in their organization: by addressing values within existing UX work, by creating more space for UX values work, by promoting that others to adopt UX perspectives and practices on values, or by promoting politics and influencing organizational strategy.

Prior research studying UX and design work shows that the work of UX does not only consists of the "technical" practices of conducting user studies, analyzing designs, and creating new designs. UX work also involves social practices. Rose and Tenenberg detail rhetorical strategies used by UX professionals, finding that some strategies utilize technical registers; however they also find many rhetorical strategies that utilize social and organizational registers, such as referring to UX credibility and expertise, drawing on past organizational actions, or tactically compromising with others' perspectives (Rose and Tenenberg 2016). Moreover, prior research shows that UX professionals' expectations of the competencies of new UX designers largely pertain to embodying a set of cultural norms around empathy for users, listening to people, and adapting technical methods based on those considerations (C. M. Gray 2016).

This project considers the range of technical and social practices related specifically to UX professionals' values work. This is of particular importance for informing design-based methods for addressing values. While researchers in HCI and adjacent fields have developed

many values-based design methods and tools, such as value sensitive design or a variety of card decks and values elicitation activities, most of these methods and tools are imagined to be integrated into UX professionals' technical practices, without deep consideration of their existing social practices or the social and organizational structures that UX professionals work within.

Gray et al.'s research on ethical mediation begins to look at the ethical practices of designers situated in organizations. Gray et al. present a framework discussing how a designer's actions are mediated by (a) their individual practices, (b) organizational practices, and (c) applied ethics (C. M. Gray and Chivukula 2019). These three forces act on each other, constraining and extending each other in different ways. Building on this starting point, the analysis in this chapter discusses a more complex set of relationships between individual and organizational practices. While Gray and Chivukula's analysis tends to focus on designers' individual actions, this chapter discusses both individual and collective actions undertaken by UX professionals. This chapter also includes a broader set of actors in its analysis, including the role of technical artifacts, as well as actors that exist outside of an organization but still relate to UX professionals' work.

This chapter first provides background on the handoffs analytic framework that I utilize in my analysis. It then discusses how values work occurs as a part of everyday UX practices—everyday practices referring to a sort of status quo, where UX work concerns the design of products and services. However, there are limits to what can be addressed through product design-based approaches. UX professionals' values work thus also utilizes practices that seek re-design organizational cultures and practices, to re-configure how values work is conducted in their organizations. These re-configuration practices see promise in UX- and human-centered perspectives on values issues, a viewpoint that is not always shared among other organizational stakeholders. Attempts at re-configuration reflect alternative arrangements of values that these UX professionals seek. The chapter outlines three ways in which UX professionals attempt to re-configure values work by focusing their efforts on changing aspects of their organizations (as compared to changing aspects of the product).

The Handoffs Framework

In order to analyze how the function of the organization might change through UX professionals' actions, I turn to the handoffs framework developed by Mulligan and Nissenbaum, which provides an analytical set of tools to understand the political and values implications of re-configuring a sociotechnical system to achieve the same function in a new way (Mulligan and Nissenbaum 2020). For instance, Mulligan and Nissenbaum use the handoffs framework to analyze how the same function of 'letting a user securely access a smartphone' can be configured using a user-generated passcode, fingerprint, or facial recognition. Each shift in this configuration generates political implications, such as the transferability of access, authentication is viewed as a binary or probabilistic quality, and the agency of a human user to select what inputs go into a passcode (Mulligan and Nissenbaum 2020). I use handoffs to analyze different configurations surrounding how technology companies address values issues, from the viewpoint of UX professionals. In particular, I see how these different (re)configurations create new arrangements for UX professionals' agency in addressing values issues within their organizations.

Mulligan and Nissenbaum's framework consists of several parts. First, is the *function of a (sociotechnical) system*. The sociotechnical systems that I am concerned with are large technology companies (from the viewpoints of UX professionals). The particular function of these companies that I am interested in is to **address values and ethical issues related to**

technology products and services that the company offers. This is one among many functions that a company has, and it may not be their primary function. However, this research studies people who believe that this *should* be one of the functions of technology companies, and work towards enacting this as one of the functions of their companies. Prior research shows that configuring responsibility for this function in technology companies can take many forms—such as creating professional roles at the executive or strategic level where someone is in charge of a portfolio related to values and ethics; using regulation like the E.U. General Data Protection Regulation to force company actions; or having external reviewers conduct human rights impact assessments of organizations. This chapter investigates how responsibility for the function of addressing values and ethical issues could be "handed off" to UX professionals and configured in different ways. What are the politics of (re)configuring values work around UX professionals?

Mulligan and Nissenbaum term different parts of a system that might hold responsibility for its function as *components.* Components than *act on* one another through different *modes of action*. They also note that a researcher can define different scopes of the *system* or assemblage being analyzed—perhaps encompassing a single artifact or product, or encompassing a broader ecosystem.[30] Comparing different configurations of components, even if completing the same function, can help surface the politics embedded in and promoted by each configuration.

The assemblage that I analyze reflects components that UX professionals identified in their interviews, some components existing within the companies and organizations they work in, others existing beyond the boundaries of the organizations. I identified seven main components of this assemblage from the perspective of UX professionals (Figure 5.1). These include:

1. The UX professionals
2. Technical artifacts and systems (that their organization creates and sells)
3. Users and stakeholders of the technical artifacts and systems
4. Teammates and other UX professionals within the organization
5. Other stakeholders in the organization
6. The organization itself
7. People and artifacts outside of the organization

In my conception of the component of "the organization itself," I am generally referring to workers' social imaginary and imagined community of the organization, rather than the organization as a legal entity. Organizations are complex amalgamations of people, artifacts, and processes. The UX professionals in this study work for mid- to large-sized organizations. The ones working at enterprise business software companies work for large corporations with over 10,000 employees. The other UX professionals work at organizations ranging in size from several hundred to several thousand employees. Most of the organizations also employ people across multiple locations in the United States, and a few companies have international presences as well. However, there is still a sense that UX professionals belong to an organizational community, despite these organizations' large sizes and geographic diversity. In this sense, the entity of the organization is not necessarily a legal one, but rather a form of imagined community (Anderson 2006). Anderson discusses nations as an "imagined political community," as a sense

[30] I use "assemblage" rather than "system" to describe the sociotechnical system that I analyze, to prevent confusion with the "technical artifacts and systems" that are a component of the assemblage that I study. I use the term "technical system" to refer to technical artifacts that are components of this broader assemblage.

of national community or identity can exist even if all its members never meet or know each other, having some set of finite (even if porous or elastic) boundaries (Anderson 2006, 6–7). In a similar sense, the large organizations that these UX professionals work for represent imagined communities.

The organization, as imagined by its workers, is also a form of social imaginary. Taylor describes "social imaginaries" as the way large groups imagine their social surroundings (such as through stories and images), and how these common understandings make common practices possible and give them legitimacy (Taylor 2004). Among workers, the organization is seen as a unit that embodies particular norms and values—including maximizing financial profit, but often also doing "good" in the world, for some definition of good. These can be instantiated through more formal articulations of corporate values, or through a range of organizational practices and processes. Nevertheless, these imaginaries are real (as in not fictional), and the social imaginary and imagined community of the organization represent "the organization" as a component of the assemblage in this analysis. It can be acted on by other components in the assemblage, including by UX professionals. In acting on the organization, UX professionals take actions towards changing organizational processes, policies, and structures.

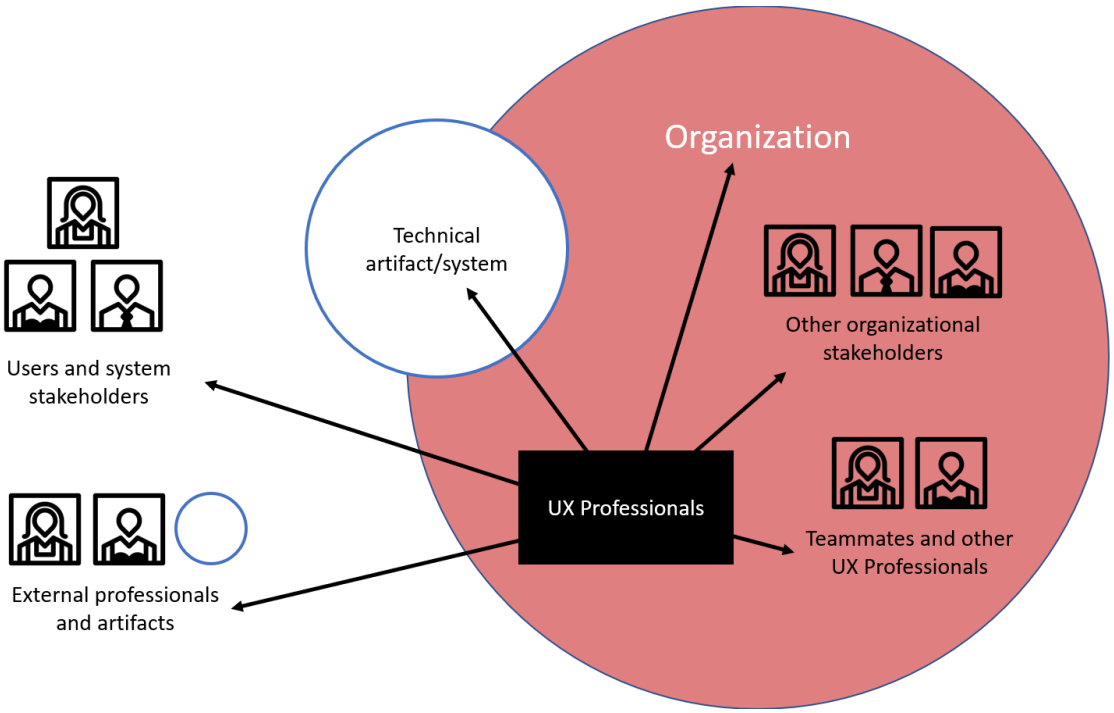


Figure 5.1. A visual representation of the components of the assemblage analyzed in this chapter.

The assemblage that I am investigating is complex—the seven components listed above may not be exhaustive, and the components can interact which each other along relationships not depicted in Figure 5.1. For instance, government and regulatory institutions are not discussed as direct components that UX professionals interact with. This may be in part because relationships with government institutions are mediated within companies—UX professionals may interact directly with company lawyers, and the lawyers interact with government institutions. Discussion of direct interaction with other aspects of the technology industry's political economy generally did not come up in conversation, such as the networks of distribution chains, investment firms and

shareholders, or subcontracted labor. It is possible that UX professionals do interact with these other components, but not as a part of their regular work, or they may see these interactions as separate from values work. Or, UX professionals' interactions with these components may be indirect and mediated. However, the goal of this chapter is not to exhaustively document every possible relation in this assemblage. Instead, my analysis centers UX professionals' view of this assemblage, and their practices of directly *acting on* (and acting with) other components in the assemblage.

Throughout the remainder of the chapter, I analyze how UX professionals attempt to configure this assemblage in different ways in order to conduct values work. Each configuration utilizes a different combination of components, and different modes of action.

Defining the Values Problem

As discussed in Chapter 1, in this project I discuss social values as conceptions of what is good, proper, important, or desirable in human life (Friedman, Kahn, and Borning 2008; Graeber 2001). The sources of values that I discuss are multiple, including myself as a researcher, the UX professionals I interview, the organizations that they, technical artifacts and systems, and broader social norms (Shilton, Koepfler, and Fleischmann 2014). My focus is on the ways in which values arise as a part of situated lived experiences, rather than identifying a set of universal values or frameworks that the interviewees find important (Le Dantec, Poole, and Wyche 2009). Moreover, I use JafariNaimi et al.'s view of values as hypotheses, to use values to "examine what the situation is, what the possible courses of action are, and how they might transform the situation." (JafariNaimi, Nathan, and Hargraves 2015, 97). My investigation is mostly concerned with how UX professionals use values as a lens to try to take certain actions within their organizations.

I did not scope my interview guide to cover particular values, and I allowed interviewees to discuss what they saw as relevant to thinking about social implications their work. Within interviews, a range of values were referred to, including privacy, accessibility, diversity, inclusion, and economic and racial equality. Other times, values emerged as a more general set of politics focused on avoiding harming people through technology products. These discussions were often situated and entangled. For instance, while the value of "accessibility" was mentioned by several people, each of them situates and instantiates that value in different ways—for one interviewee, accessibility might be about conforming to a set of accessibility web standards, while for another interviewee accessibility might be about needing to go talk to a diverse group of users about their experiences. At other times, values might be entangled, where values held by different stakeholders conflict, such as values held by users versus values held by a company's executive leadership. The "location" of values issues varies as well—some concerns are about the values embedded in the design of a technical artifact; other concerns might be about how values are expressed during a particular use of a system. Acknowledging that values become conceptualized and instantiated in multiple ways, this chapter focuses on the practices conducted by UX professionals in the name of these rich conceptualizations of values.

An "Everyday" Configuration of UX Values Work

Values work occurs as a part of everyday UX practices of conducting user research, creating designs, or raising potential user-centered concerns about a product. I use the term "everyday" to refer to technical and social practices involved in the design and production of technology products and services that represent a sort of status quo for UX professionals.

Several interviewees described the general role of a UX professional as being the person who brings up issues or tries to point out potential problems with products in the course of their work. One example comes from Matthew, a staff product designer who works on a web browser product:

> Matthew: That's a lot of times the role of the UX designer, in trying to think through all the possibilities. Like especially anytime someone says that "oh, well that's the way it works" or "that's the way it has to work" or "that's the way we've done it forever." And those are assumptions to question.

Some explicitly connected the UX role of pushing back and raising questions about products as a potential opening for raising values issues, such as this statement from Isabel, a UX research consultant who formerly worked in UX at an eCommerce company.

> Isabel: But I think that sometimes it's maybe easier for UX people [to raise ethical issues] because we're supposed to be raising issues, that's kind of one of our jobs. And usually if it's an issue, maybe it's something that was revealed during actual sessions with participants, and there's some kind of evidence or background to support it.

Across interviewees, there was an understanding that UX professionals advocate for users, and in the course of doing this work, they can also bring attention to or address values issues.

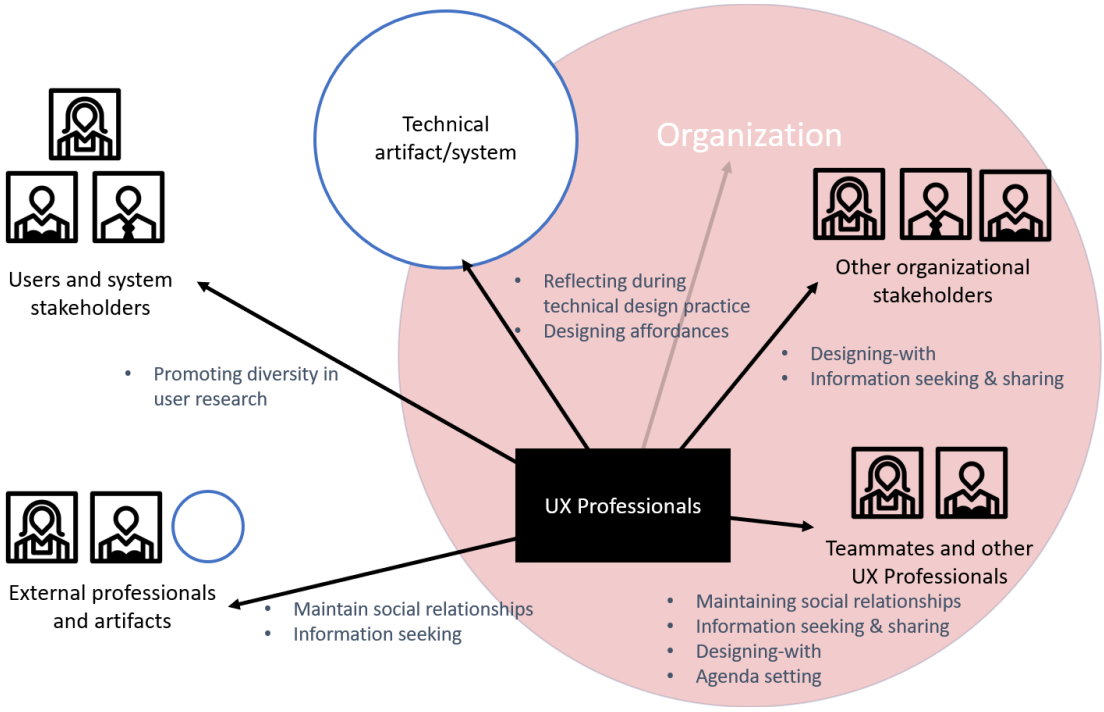


Figure 5.2. Configuration of everyday UX values work, including the components of the assemblage that UX professionals act on, and the modes of action UX professionals use in these relationships.

In this everyday configuration of values work, UX professionals act on technical artifacts, users and stakeholders of the system, teammates, other organizational stakeholders, and people and artifacts outside the organization. In these relationships, they utilize modes of reflection,

designing affordances, promoting diversity, information seeking and sharing, designing-with others, agenda setting, and managing relationships.

Acting on Technical Artifacts

Sometimes the relevance of values emerges while **reflecting during technical design practices.** Prior values levers have found how individual technical practices can help trigger values and ethics as central to product functions, such as "dogfooding" or imagining one's self as a user (W. Harrison 2006; Shilton 2013). One of the candidate levers described in the lab study in Chapter 3 involved "imagining designs as real," where participants surfaced discussion of values by taking conceptual or fictional designs and imagining their potential implications if they were real. Interviewees discussed similar actions in practice. Keri, a lead UX designer at a business software company discussed her reflections while creating a design exploration of a chat product using the visual design and prototyping tool Sketch. Keri was working on designing a notification to encourage existing users of the platform to try out the new chat features, potentially by playing on people's fear of missing out. She reflects:

> Keri: We haven't really decided on what notes they're going to hit, but that was about the first time I really felt like "oh this is the dark side of UX, right? This is getting into how do you make people like tap into the base fears that we have as humans, to make them use the product?"
>
> *[I ask Keri how she came to think that it was the "dark side of UX"]*
>
> Keri: It was while I [was] designing the screen in Sketch. We, as a practice--I think most people do this--you write in real messaging, right? So I'm designing the discovery screen. What does the discovery screen literally say? And what does it show you? And you know there's so many different ways that that message can go. And I wrote down something along the lines of, the headline message was like "see what your co-workers are doing in this chat app, or talking about this chat app." And the call-to-action was like "join them." And that's when I thought about "wow this message, it's tapping into that feeling of FOMO, that feeling of missing out as a way to drive someone to take action and join their co-workers in this product." It was as I was writing out the micro copy on the UI.

Even though the UI was just a prototype exploration, Keri put in "real" text and messaging (as opposed to placeholder lorem-ispum text) as part of her technical practice. This allowed her to imagine this future instantiation as "real", and reflect on some of its ethical dimensions—how it might be manipulating users.

UX professionals can act on technical artifacts and systems by **designing affordances**. The UX professionals indirectly act on users and stakeholders of the systems, by constraining or enabling their actions via the design of a technical system (though users and stakeholders still have the agency to adopt and re-appropriate systems in various ways). Several interviewees discussed designing interfaces or interactions in ways that aligned with particular values. Matthew, staff product designer for a web browser product discussed how he worked with the legal and policy team to design an experience for new users of the browser to understand privacy in a way that goes beyond reading a legalistic privacy policy.

> Matthew: We don't do a click-through kind of thing like on iTunes: "Here's the thing, it's 500 pages. Here you go, good luck with that, but click agree." […] After you install

> [BROWSER], we open it [the privacy policy] as one of the two tabs that open. There's the tab that first opens when [BROWSER] opens and then the privacy notice is the second tab. And then we designed the privacy notice in a very specific way to tell you the most important thing and let it be there for you. Of course, the default is most people have some task in mind. They install [BROWSER] and then they're like "oh privacy notice, great" and then they click, right? But actually, a lot more people do look at it or at least spend a little bit more than like two seconds on it, than just having it as a link for you to go to.

Matthew's comments note ways in which addressing privacy through a user experience lens, by surfacing important privacy information to users outside of the sign-up process. Notably, this perspective complements a regulatory compliance approach, represented by his description of the iTunes click-through process of accepting its privacy policy. Matthew's acting on the artifact of the web browser by designing the experience when a user first opens the browser provides one way to promote the value of privacy.

Acting on technical artifacts by designing affordances does not have to be one-off design solutions. At a meetup event on UX and trust, one of the speakers talked about how design patterns represent norms in UX, using the "hamburger" icon to represent a menu that can be clicked on as one such pattern. In discussing privacy, this speaker suggested that a new set of privacy design patterns may be emerging, such as social websites like Facebook and LinkedIn creating tools for users to view their profiles from the perspective of others on the platform. Acting on technical artifacts by designing their interfaces or interactions work well when the values problem is conceptualized as being (at least partially) located in the technical artifact. In the privacy policy example, the artifact is designed to provide notice to users about the system's data collection and use practices.

However, these technical design practices can seem partial when the nature of the values problem is contested. Keri, a lead UX designer who works at a business software company, discusses how a project to design an interface to promote worker and employee wellbeing faced pushback by a client whose managers used the software. This concerned the messages displayed in "empty state" of the system, when workers finished a set of tasks assigned to them.

> Keri: I had heard from someone else, that there was an effort a while ago to make empty states in [PLATFORM PRODUCT] more friendly, and so they created a bunch of different variations of that empty state. Like a sort of friendly illustration with some message under it, right? And one was a coffee cup and the message was "hey, you're all done with your tasks today, go grab a cup of coffee," or something like that. And they actually got a complaint back from [CLIENT COMPANY] where some executive saw it and was like "I do not want people to be going and getting cups of coffee." So that was an example of where the message to the end user didn't resonate well with the person who was their manager and is buying [PRODUCT NAME]. Like people who are in control of the contracts that we [have], they did not like that message.

Here, there is a mismatch in the ways that workers and managers use and relate to the system. The way that Keri's co-workers wanted the pro-workers values to be expressed was in conflict with values held by the managers using the system. Implementing these design changes is made more difficult given that the managers, not the workers, are the people who are making the decisions about whether or not to purchase the software created by Keri's company. Keri noted that if she were the designer on this product, she would probably re-design the empty state

message to say something more "neutral" such as "you're all done with your tasks for today, high five," though this perhaps might not encourage the same worker-centric values of the other design proposals.

Acting on and with Users & Stakeholders

UX professionals, particularly user researchers, act on and with users and stakeholders of products through modes of user research in order to learn information. This includes a range of user research practices such as interviews, participatory workshops, ethnographies, surveys, and usability testing.

When thinking about surfacing and addressing values as part of user research practices, most user researchers and UX professionals pointed to **promoting diversity in user research** as a way to surface and avoid potential harms. Isabel, a UX research consultant, ties her practice of recruiting diverse sets of people for user research to thinking about how to surface and avoid potential harms.

> Isabel: But I think more recently like in the past couple of years I've started more formally thinking about like "hey wait a minute, what are all the ways in which this thing I'm working on like could eventually cause harm?" Or "if we're designing for a type of person, does it exclude other types of people?" So that's something that I feel like most companies don't really spend too much time thinking about, and that's how we end up getting products that seem cool maybe for one type of person and then they don't work for other types of people. And yeah, so I think that as a researcher it's something that I need to pay you know, even practically speaking when I'm doing recruiting and stuff like that, I don't want to-- I want to make sure I'm recruiting the right types of people, and like nice diverse sets of people. And sometimes through the research process you learn that something that you think is gonna work really well just like doesn't accommodate a certain segment of the population very well, which is always really interesting.

Isabel later mentions that a for a "diverse sample," she tends to think about gender, age, race and ethnicity, and sometimes location (such as urban, rural, and suburban). In thinking about diversity in user research, diversity is being promoted by user researchers, as a value whose source comes from the user researchers. The goals of surfacing these values varies. One values goal is including diversity as a procedural or process-based value, that a well-designed product includes a diverse set of people in the user research process. A second values goal is that with more diverse data, user researchers can promote a broader set of user needs; values in this lens are about the promotion of certain things important to the users. A third values goal is that with more diverse data, user researchers can help avoid harms to diverse populations, particularly if a design solution helps one set of users but harms a different set of users; values in this lens are about the avoidance of harms.

A common description of doing this work to increase diversity in user research is that it requires *individual initiative* by the user researchers. Laura, a senior user experience researcher at an educational technology company, states the following:

> Laura: When you're doing the recruiting to find out from people what they need and want, you have that autonomy to do so [to recruit a diverse sample]. *You* have the power to do that.

Laura, reflecting on the work she does to try to include diverse samples in her research, in her case this involves including indigenous populations in the U.S. as research subjects. She places responsibility with individual user researchers who have the autonomy to recruit specific and diverse populations to understand their desires and needs.

Acting on and with Teammates

UX professionals act on and with each other as teammates through modes of **maintaining and building social relationships**. Cecilia, user researcher at a business software company, discusses how her team culture has normalized the bringing up issues relates to values, ethics, and power.

> Cecilia: I feel the culture of my team has also shifted. By culture of my team, I mean specifically the design team I'm on. It feels a very much normal part of our team culture now to bring this kind of stuff up. Even some of our executives will talk about it to some degree. At first when I started working there, I really didn't know what was okay and not, and I hadn't heard anyone talking about it in a more official forum. Like maybe I knew of one or two friends who I could go in the corner and talk about it with. I wouldn't necessarily have felt comfortable bringing it up in a team meeting or to as many different people. […] Also definitely just from being there longer, I have more relationships with people, and I know more who I can talk to about stuff.

Over time, Cecilia has been able to build and maintain relationships among her team that has led to shared understandings and comfort in being able to discuss values-related issues. Other interviewees also discussed having a good team culture that is collaborative and open to discussion, and that notes that on her team, the team members have input into the hiring process, to try to help build and maintain that team culture.

Teammates also **seek and share information** about values-related issues and practices among and with each other. Matthew, a staff product designer for a web browser product discusses how his UX team has started a book club, and how they have read several books related to ethics and technology, including *Technically Wrong, Future Ethics,* and *Ruined by Design*. Matthew discusses how several thought exercises from the book *Future Ethics* have helped him in his work to think about potentially harmful scenarios, and to consider other stakeholder points of view. The book club in Matthew's organization primarily uses conversations over Slack. The book club presents a form of community-building to think about values issues related to technology by engaging collective information seeking.

Another mode of action is **designing-with** teammates**,** doing design work in collaboration with other UX professionals. For instance, common UX design techniques like creating personas, scenarios, or interface mockups can be used to address values issues. Cecilia, a user researcher who works at an enterprise business software company, advocates for values that promote the wellbeing of workers, the end users of the products she works on. She describes a side project to create a set of personas that address different workers' conditions.

> Cecilia: We did try doing these — [do] you know the Microsoft personas that are for accessibility?[31] […] So we tried doing something like that around workplace power, labor

[31] The Microsoft Persona Spectrum discusses a range of abilities and situations that might be considered under their inclusive design principles. (Microsoft Design 2016, 34–42). These can be found in the Microsoft Inclusive Design Toolkit, https://download.microsoft.com/download/b/0/d/b0d4bf87-09ce-4417-8f28-d60703d672ed/inclusive_toolkit_manual_final.pdf

> stability, whatever. Different things related to how you might be negatively affected or affected differently by workplace technology depending on different factors. […] That was a side project with some people on my team that had buy-in from the head of our team and stuff. It was supported, it was this side thing we worked on for a month. And then we got busy and never launched it more broadly or really finalized it.

Though framed as a side project, Cecilia's team used the UX practice of creating personas to try to explore and emphasize issues related to workplace power and worker well-being. These imaginative, open-ended and exploratory practices conducted by Cecilia and her team (with personas) make use of existing design practices to voice new possibilities by foregrounding a set of values and perspectives that they see as overlooked or undervalued. They foreground the values important from a potential worker's point of view, rather than from a manager's point of view. These fit in with prior work articulating how beyond solving values problems, design can be used to explore how values relate to people in specific situations, and be used to speculative and present critical alternatives that embody other values (Wong and Mulligan 2019).

At the same time, using design to explore people and situations, and to speculate on new possibilities and critical alternatives, does not necessarily mean that values issues get addressed. The ability to do these technical designing-with actions as a group can be precarious. For Cecilia's team, the design explorations were a side project that got left behind as priorities shifted towards other job responsibilities. The precarity of these alternative designing-with practices is related to the organizational dynamics, which can quickly shift workers' attention, time, and resources towards other priorities.

Teams also work together to try to help **set agendas** that foreground certain values. Genevieve discusses an internal team pact about what types of design features they will implement regarding the types of data that managers (team leaders) can see about their workers (agents).

> Genevieve: One of the things that we've kinda agreed to as a team is that we're not going to design any sort of metric stuff for a team leader that the agent can't have about themselves. And that's been pretty successful so far.
>
> Richmond: And why do you feel that is important?
>
> Genevieve: Because you don't want somebody making a decision about your job, using information you don't have access to. It's not fair. You also then can't fight back if you're terminated inappropriately. Which I don't think happens very often in these jobs because they're people getting paid minimum wage, or sometimes less. They don't have benefits, they're on contracts. They're paid very little and they are expected to bear under a lot of stress both from angry people yelling at them and the kind of metrics they have to go in on. If you lose a call center job, you probably just go get another one or a different service job, and you can't really fight back about it.

Genevieve's team is concerned about the potential unfairness of managers being able to see data and metrics about workers, that workers cannot see about themselves. Their hope is that with equal visibility over the same data, workers may be better able to advocate for themselves. The team has encapsulated this concern into an agreement to not design features that do not have this equal visibility, setting an agenda advocating for these values.

Acting on and with Other Organizational Stakeholders

In the course of everyday UX values work, UX professionals also act on and with other organizational stakeholders by **designing-with** them. This mode can take on some different meanings when acting on other organizational stakeholders. Designing-with here is not necessarily about directly designing a product, but rather using design collaboratively as a way to explore potential values issues or harms. However, the goal is to leverage this surfacing of harms to then affect the design of a product.

For instance, Matthew, a staff product designer for a web browser, discusses some of the thought and design exercises that he finds helpful from the book *Future Ethics*, which he read with his organization's UX book club group.

> Matthew: So for instance two really good ones are, in fact I just cited them on another thing, are "the front-page news story test": would you be okay with this information being on the front page in the newspaper? Would you be okay with it? Or what would this do for [ORGANIZATION]? Would this look good, would this boost our reputation or not?
>
> The other one is this Veil of Ignorance. If you're designing a system, would you be perfectly happy being any piece of this system? So you know, we're the makers of the software. Would we be just as happy to be the user of the software, or the whatever, whichever thing in this system? If the answer's no, wellllll, you might want to rethink what it is that you're [doing]. Those are some ways to bring up those conversations.

In addition, Matthew points to value sensitive design tools that he found online, such as the Envisioning Cards which provide a set of activities and questions that surface different aspects of values (Friedman and Hendry 2012), as being useful prompting discussions with others about values. Henry, lead user experience designer at an educational technology company, describes an activity similar to Matthew's front page news test, called a pre-mortem.

> Henry: Before you start building the thing, you basically bring everybody into a room and say "okay the product failed horribly. Not only did it fail horribly and it didn't do it we wanted it to do but it also is a PR black eye on the company for some reason. Let's figure out why."

These designing-with practices allow UX professionals to surface discussion of values with other people and teams in the organization. Several, such as the pre-mortem and front-page news story test are situated in thinking about values and harms from the perspective of the company through a public relations lens. These ask participants to think about what types of future harms might cause reputational harm to the company. Some of the other techniques, like the Veil of Ignorance or Envisioning Cards try to situate values through the lens of stakeholders—people who might relate to the system through use or through other types of direct or indirect relationships, similar to value sensitive design's focus on situating values in a range of stakeholder experiences.

UX professionals also act on other organizational stakeholders through practices of **information seeking and information sharing**. UX professionals, sometimes in cooperation with their managers, may bring in other internal organizational experts to learn about specific values issues. For instance, Britney and Genevieve both discuss how conversation about different issues within their UX teams led to their managers bringing in internal experts. Britney's team was in response to privacy and the E.U.'s General Data Protection Regulation (GDPR):

> Britney: I only know that stuff that I just said because people are talking about GDPR within the company, and because the director of our team brought this lawyer to our team meeting to have this conversation with us. She said, "I'm gonna talk about GDPR," and all the researchers cheered. [*Chuckles*] She's like, "This has never happened." [*Chuckles*] […] My boss's boss invited this lawyer to come talk to us because so many of us had been asking questions, wondering if what we were doing was compliant, or if we needed to approach something in a different way, or trying to start up new research initiatives or use new methods where we haven't yet considered the privacy implications or compliance. She was like, "We need to get this lawyer in here to help have this conversation."

Genevieve's team's discussion concerned sexism and diversity in the workplace:

> Genevieve: Shortly after I was hired, that whole thing about the Google Memo broke out.[32] And in our 1-on-1, I was like "[team VP's NAME] have you ever seen anything like this happen at [our COMPANY], or do you think it could?" And he was like "I've never seen it, but of course it could. It could happen anywhere." And I really appreciated that conversation and him not being stupid about it. […] And then I guess he'd had that conversation or a version of it with a couple other people because the next week during our little team meeting, he brought it up. […] And then we had a conversation as a team and that led to him bringing in somebody from HR to talk to us about what it looked like from their perspective and what we should do if we ever see something like that.

These represent information seeking practices, by bringing in subject-area experts within the organization to talk with the UX teams.

UX professionals also work to share information with other organizational stakeholders. One interviewee, an accessibility engineer working on a UX team also describes creating tools for other parts of the organization to use to increase their products' accessibility, such as creating checklists that are short and easy to use, or automatic software tests for engineers to use.

Acting on and with People and Artifacts Outside the Organization

Interviewees describe **managing and building relationships** with people outside of their organization as a way of improving their own values work. Interviewees discuss professional conferences as places to build and maintain relationships with a community of other people who are also interested in values issues. Ellie discusses the annual Eyeo festival in Minnesota as one of these venues, and how it served as inspiration for creating a Bay Area UX meetup group.

> Ellie: I decided to found this group about a year ago because I had attended the Eyeo festival […]. It's about data visualization, and journalism, and social justice, and design, technology and art. There was a lot of other folks who were similar to me, in the sense that they use data and design. I was really inspired by that community, and they were like, "yeah, this seems really cool." I guess I felt supported by Eyeo. Feeling like there was a community in other spaces, so that's why I decided to start the meetup.

[32] A memo written by a male employee in 2017 argued that there were fewer female employees in engineering and leadership roles due to personality differences in gender, and argued against diversity and inclusion efforts. (Wakabayashi 2017)

Ellie finds Eyeo a community of people where she can meet and talk with others who think about data and design through lenses that include discussion of social values, such as social justice, privacy, and security.

Similarly, EPIC (Ethnographic Praxis in Industry Conference) is mentioned several times among participants as a community of user researchers who often discuss social values issues. It came up in conversation several times when I met people at a user researcher meetup, several people having attended the 2019 conference. Nova also discussed going to EPIC as a college student working on an anthropology degree, and how that community in part motivated them to do work in the technology industry, applying skills learned from anthropology. Henry also describes the conference as a venue he enjoys compared to other UX conferences.

> Henry: I am a big fan of the EPIC conference. I've been to that a couple of times. So if you've been to any user experience-specific conferences, you'll pretty quickly realize that they are the same goddamn talk from the same goddamn people every time and it's all focusing on tools and it's all focusing on, "how do we empathize with individual users?" rather than "actually, no, how do we not cause Donald Trump to be elected and society to tank?" [*chuckles*] But I find in more ethnography- or research-focused conferences those conversations *do* happen and they are attended by a lot of software types as well. So that's been useful; that's fulfilled the need that I didn't realize was going to be fulfilled by going to such a conference.

Henry finds the community at EPIC to be one asking questions that go beyond the immediate interface and immediate users of systems, welcoming broader discussions about the broader social dimensions of technology products.

Interviewees discussed **information seeking practices**, searching for existing tools and guidelines related to values outside of their organizations. For example, Matthew mentions finding value sensitive design through a footnote in a book, showing me his deck of the value sensitive design envisioning cards and some journal articles that he downloaded during our interview. Jerry, in setting up internal accessibility guidelines at his organization, described searching for the World Wide Web Consortium's accessibility standards online. Others report finding new books, resources, and design activities through Google searches and Twitter. Twitter was mentioned by many interviewees as a source of information that helped them develop their sensibilities and learn from others' perspectives, such as social justice activists, technologists who talk about ethics or academics. Nova provides an example of using Twitter in this information seeking way:

> Nova: I follow a lot of academics and a lot of activists of different sorts. And I think that like it's really helpful for getting new lenses. Like I started following a lot of indigenous people and then started to learn a lot more about indigenous things. And I don't claim at all to know a ton from those tweets, but I also love that people link to their own work or other people you should follow. And I kind of feel attached to a hive mind in both a good way and a bad way from it. At the moment that's where I get my outside-of-work thought moments and feelings of support in my work. I don't even really post much. It's mostly just like taking in other people's wisdom.

As another resource, Henry points to a set of questions posed by graphic designer Milton Glaser, trying to surface reflection on a designer's ethical responsibility in the products they design.

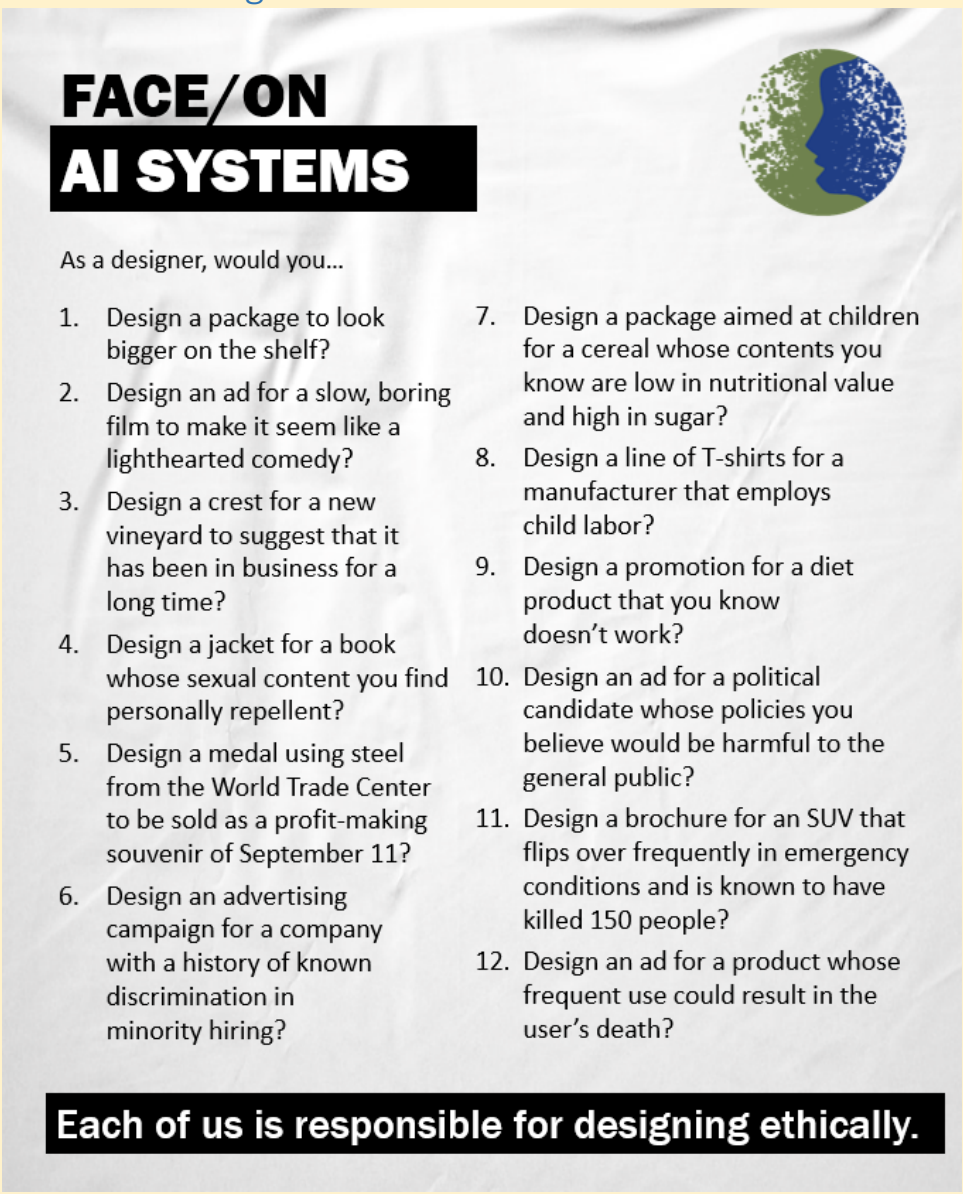
> Henry: There is an essay somewhere by Milton Glaser, called “the road to hell.” Which I'm sure you can find online. It's got a series of questions in it that are being posed to graphic designers; this is before user experience design was a thing. And they're sort of increasing levels of problematic ethics. So like number one “would you design a cereal box - you know that's full of sugar - to look like something nutritious and healthy?” On down to “would you design or mislabel a drug bottle or something like that, or work for the Department of Defense or something?” And I've had some fun in design interviews, you can question where or finding out where their line is.

These resources can be useful for UX professionals to draw on, but the resources also have their own politics and framing of values, which may get adopted into UX professionals’ practice.

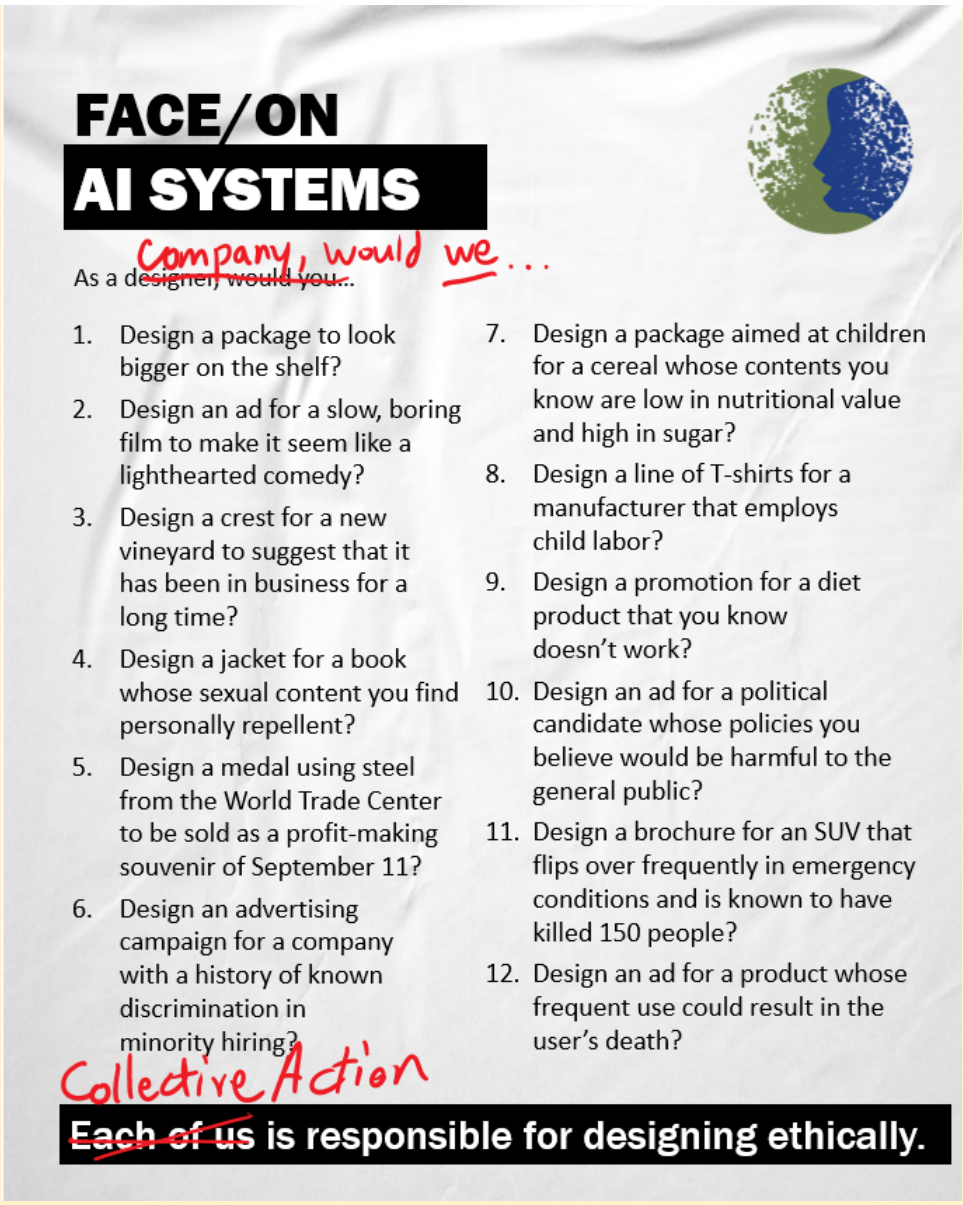
. . .

In the next section I present the first of several reflective fictions, reflecting on themes and experiences just discussed. These fictions were created as part of my data analysis process, as discussed in Chapter 4’s “Design Methods for Reflective Inquiry and Data Analysis” section. Each reflective fiction is marked with a different colored background, and presents a description of the fiction and a brief analytical discussion. These fictions also serve as an invitation for the reader to think through the themes of configuring values work in another (speculative) setting.

Reflective Fiction: Design Ethics Poster



This reflective fiction features a poster that is distributed within the fictional company Face/On AI Systems, as part of an internal initiative to promote thinking about values and ethics amongst its workers. The poster says, "As a designer would you…" and then has 12 statements highlighting potential harms. They start off seemingly innocuous, like "design a package to look bigger on the shelf?"; working up to "Design an ad for a product whose frequent use could result in the user's death?" And at the end of the poster is a statement, "Each of us is responsible for designing ethically."



After some time, an employee at Face/On has used a marker to re-write some parts of the poster. Crossing out the starting line, "As a designer would you…", replacing it with "As a company would we…". And at the end they cross out "Each of us" and replace it with "collective action."

Design Fiction Discussion

The questions on the poster are based on an essay by (real life) designer Milton Glaser, sometimes called the "Road to Hell" questions. Henry, the interviewee who works for an education technology company, mentioned using these questions to think about the ethical dimensions of his own work. These "Road to Hell" questions seem like they could be useful provocations about how a designer might be implicated in the potential harms caused by a product. But these questions also place responsibility for making ethical decisions with individual designers who have a lot of agency within the bounds of their everyday work practices. While this may be truer of designers who work at design agencies and consultancies, UX professionals working in large corporations have to directly interact and contend with other

organizational stakeholders and decision makers. The scribbled version of the poster imagines that an employee in the organization is making a similar critique, arguing that there is also an institutional or group responsibility for addressing these issues.

The shift from individual to collective responsibility also raises another question—who is the collective, and how should responsibility be distributed among that collective? Is it UX people? Is it ethically-minded technologists? The organization at a whole? This suggests that responsibility for values may include actors, components, and processes that exist beyond everyday UX work. Thus, this fiction highlights that there are limits to asking individual UX professionals to address values as a part of their everyday work.

Re-Configuring and Handing Off Values Work

Even though UX professionals conduct values work in the course of their everyday practices, they face a range of challenges, often rooted in UX professionals' positions in organizations where they lack decision-making power, or rooted in how the organization conceptualizes values work differently than the UX professionals. These challenges lead UX professionals to work towards changing how values work is configured in their organizations, seeking to (re)design their organizations, compared to the "everyday" work of designing of products and services. Each of these re-configurations represent different ways that responsibility and authority for conducting values work can be handed off to various organizational stakeholders. UX professionals seek to create changes in their organizations to bring about these alternate arrangements. While I describe these three re-configurations of handoffs separately for analytical clarity, all three simultaneously exist and sometimes overlap with one another.

One re-configuration focuses on **making more space for UX values work.** This re-configuration hands responsibility and authority to UX professionals to conduct values work. While UX professionals see themselves as advocates of users and stakeholders, they also note challenges in doing this UX work within their organization. Several interviewees discuss frustrations around trying to get other organizational stakeholders to see the value of UX, design, and user research. There are also frustrations in a power dynamic where these UX professions are often not given decision making power or seen as having a lot of expertise. Isabel, a UX research consultant discusses an example of user researchers' perspectives not always being valued or listened to while at her previous job at an e-commerce platform.

> I can think of an example from when I was in house at [E-COMMERCE PLATFORM] and the chief marketing officer wanted to change [the names of the subscription plans] […] to reflect whatever he had going on in his mind. And I objected to one of the names because it was a very confusing name based on conversations I'd had with our merchants. […] And so I brought this up as a major concern and he was kind of like "oh that's good to know, but whatever, we're gonna do it anyway." And me and the other researchers were really angry because we felt like we've done this work. We're like "hey we have a good reason to think this is a bad idea."

While UX professionals feel that it is their job to learn about and advocate for users, and surface potential problems and issues about products with other organizational stakeholders, Isabel's experience points to the idea that UX professionals often do not have the decision-making powers over final product decisions. Isabel was overruled by a Chief Marketing Officer; other

interviewees often describe decisions made by product managers or by upper management that they do not agree with.

Keri, a lead UX designer at an enterprise business software company discusses what she sees as the lack of ability for UX professionals to be involved in processes of problem definition, finding that others on the product team define a problem, and look towards UX to find a solution to that particular problem.

> Keri: It tends to be when Product is saying "okay is this something that we're trying to solve because the customer is important enough," or "we've heard from enough customers that now we're going to like productize the solution." […] That's usually the moment at which UX gets involved. And then we're briefed on "here's the customer problem" and "this is the user story," […] **but there's little room for like "now UX, what's the right way to solve this?" So they've done a lot of the problem distillation.**

While idealized versions of the design process include a range of stages, including discovering and defining what the problem is before developing and delivering some type of solution,[33] UX professionals often do not have the agency to complete all these steps themselves, but are sometimes excludes from certain steps (such as Keri not being involved in problem discovery and definition), or that even when going through the process, decision-makers may not follow their recommendations (such as Isabel being overruled by the chief marketing officer). These challenges lead UX professionals to re-configure values work by creating more space and legitimacy for UX values work than what currently exists.

A second re-configuration involves **getting others to adopt human-centered perspectives for values work.** This re-configuration hands off responsibility for conducting values work to other organizational stakeholders, but in a way that reflects UX professionals' perspectives. UX professionals' user-centered perspectives and practices towards values provide an alternative to other legal compliance or engineering requirements-based approaches to values. Rather than seeing values like privacy, security, and accessibility, as a set of external rules to comply with, a human-centered perspective recognizes the lived experiences with these values. This re-configuration utilizes the professional identity of UX professionals as being human centered. At a meetup discussion panel on designing responsibility, one panelist who worked at a large software company described designers as being "an advocate and defender" of the end user. Several people describe UX work in contrast to other forms of technology work. At the same meetup panel on designing responsibly, another panelist who worked at a large software company drew a comparison, saying that other technology workers serve the calendar of product release cycles, while designers "serve a higher purpose" to advocate for people.

Similarly, interviewees described how they see UX work and UX knowledge as complementary to other forms of technical work. Britney, a user researcher at a business software company views UX professionals' connection to users and people as being a useful resource for adding to the ethics conversation:

> Britney: UX people are uniquely situated to help lead or just really contribute to the [ethics] conversation, I think, because we are the closest to the uses of our products. Our products can be used in so many different ways, but we actually talk to people to

[33] E.g., the "double diamond" design process - https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond

> understand how they want to use it and how they are using it, because that's part of the job.

Britney conceptualizes issues of ethics and values as occurring in the everyday lives of people user her company's products, meaning that the perspectives and practices espoused by UX professionals can play a useful role if they are more widely adopted by others in her organization.

A third re-configuration involves **changing the politics and influence strategies of organizations.** This re-configuration hands responsibility for values work to the organization itself. Many interviewees recognized that there are limits to addressing values issues through technical design practices. For example, Britney notes that some values problems arise through use, and that those problems may not be best addressed through direct design of a product.

> Britney: We can't just say our product is benign because we can see, as UXers, that users are doing all kinds of things with our products that we didn't expect or anticipate or intend. What that means is that even outside of the design of the product, we need these other mechanisms to ensure that they're not being used to harm people.

Similarly, Henry, a senior UX designer at an EdTech Software company notes that addressing values issues through design decisions is limited, in part because the values problems they are seeking to solve are not solely technical.

> Henry: As to whether design decisions are something that can influence how good a product is or whether these ethical concerns are addressed-- yeah I think design decisions can influence that, and they may at least partially address some things. I doubt that a design decision is going to be the solution for every glaring ethical issue. I think a lot of them are people problems. And even though the tech sector really loves to reframe problems in terms of things that tech can solve, it's just not feasible really.

Technical design can more readily address the "potential" aspects of values issues, where the values problem is located in the artifact. Technical design can be less effective at addressing "performed" values issues, where the values problem emerges in situated use. Recognizing these limits of technical design, some UX professionals work towards changing organizational practices, processes, and politics by re-configuring how values work is conceptualized and executed by the organizations they work for.

In the remainder of the chapter, I outline the practices and modes of "acting on" that UX professionals discuss using in working towards these three re-configurations of values work.

Re-Configuration 1: Making More Space for UX Values Work

Recognizing that organizations do not always give high status to UX work and UX knowledge claims, interviewees discuss practices that help create more space or gather more resources to conduct UX values work, and to present that work as legible and legitimate to other organizational stakeholders. In re-configuring values work in this way, UX professionals act on other organizational stakeholders, and on people and artifacts outside of the organization. In these relationships, they utilize modes of advocacy, making values visible, information seeking, and maintaining social relationships.

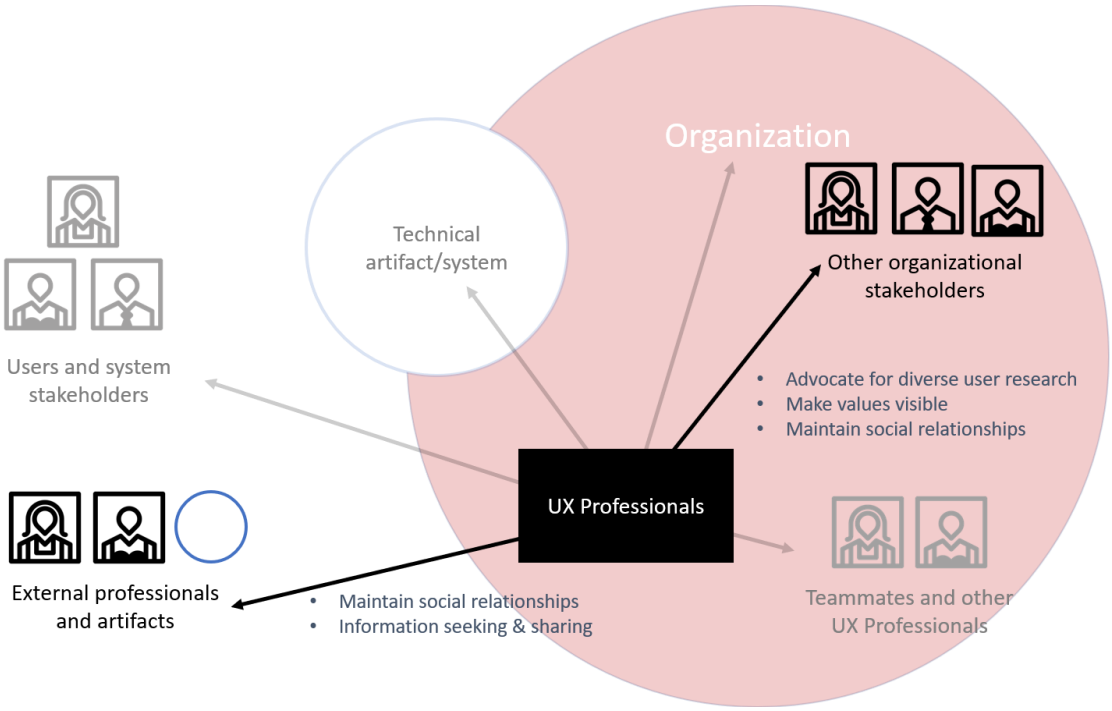


Figure 5.3. Components of the assemblage that UX professionals act on, and the modes of action UX professionals use in these relationships when re-configuring the assemblage to make more space for UX values work.

While conducting user research with diverse populations is a part of everyday configurations of UX values work, interviewees report needing to **advocate for conducting diverse user research** with other organizational stakeholders. UX research consultant Isabel describes how she finds herself pushing for, or advocating for gender inclusion on user research screeners.

> Isabel: Sometimes I'm working with a recruiting firm who uses their own kind of canned questions. And one thing that's come up a lot recently is for gender they're only giving the options of male and female. And so there have been a few situations in the past year or so where someone's giving me a screener like that and I've had to go back and say "well actually we should probably have some more options than this," and I advocate for having male, female, non-binary, other, with the ability to specify whatever you want it to be, and then prefer not to say. Or also not even asking gender questions if it's not relevant to whatever we're studying.

In this account, responsibility for advocating for conducting user research with diverse populations falls on the individual user researcher.

The values implications of conducting user research becomes more complex in an enterprise software space. In these cases, companies creating enterprise software are selling their products to other businesses whose employees use the products. The end users and the clients/purchasers of the products are different people whose needs may be different, but the enterprise software organization often prioritizes the needs of the clients/purchasers. User researchers discuss needing to advocate for doing research with end user stakeholders, not just client/purchaser stakeholders. Cecilia and Genevieve both work at a business enterprise software company, as a user researcher and senior product designer, respectively. They both discuss a

similar pattern, that product managers (PMs) often focus on the needs of customer clients, while the UX professionals advocate for focusing on the end users.

> Cecilia: Product managers tend to talk to customers. As in higher-ups in the companies [who buy the software]. And they tend to be on the same page. Like they want GPS tracking. They want automated performance evaluations. They are the ones who— they don't care. I mean that's a little harsh, but they're not thinking about all the problematic labor dynamics. They're, in fact, implementing them because they want to save money or whatever. So I feel as a researcher, we talk to the users. We talk to the workers. The product managers and a lot of people on the business side aren't necessarily talking to those people.

> Genevieve: The product managers get feedback from users, but it's usually customers, AKA the VP of IT or whatever. And when I talk to a couple of those customers, they have fundamentally incorrect ideas about their workforce and what their workforce needs to do.

The user research practices discussed by Cecilia, and Genevieve touch on gathering diversity in who they study, though this is about diversity of relationships that people have to the systems and platforms rather than diversity of identity characteristics. These UX practitioners advocate for interacting more with those who have an end-user relationship with the system, rather than those who have a purchase and management relationship with the system.

This values advocacy for increasing diversity in user research also occurs within a set of organizational power relationships. The UX practitioners note that product managers and the organization are financially incentivized to meet the needs and desires of client customers, which often do not align with the needs and desires of the end users. This mismatch in internal organizational priorities presents a barrier to fully doing this values advocacy work.

UX Practitioners sometimes try to **make UX values work visible and legible** to create space for UX values work by justifying arguments about social values in business or economic terms that might resonate with other organizational stakeholders. Britney, who also works at an enterprise software company notes her attempts to reframe a concern about a product that might not be best for end users (the client's workers) in business terms.

> Britney: It's like whether to push for the adoption of a product that maybe doesn't yet meet the needs of its users and whether we should force people to use one version of a product versus another, because our goal is that everyone is using one version of this product. If switching to that version of the product means significant loss in productivity for end users who are in positions at their companies where a significant loss in productivity could have a substantial impact on their income or their ability to keep their job or their reputation within their company, then perhaps we shouldn't be forcing this product on them. To some extent, I've been able to raise those issues in product conversations.

Instead of framing her concerns in terms of harms for the worker end users, Britney frames it as a potential loss in productivity or reputational risk for the client organization, in order to be legible to other stakeholders in her organization, like product managers.

Interviewees also **maintain social relationships with product managers**, who are often empowered to make product decisions, as part of creating space for UX values work. Laura, a

senior UX researcher at an education technology discusses needing to maintain a working relationship with PMs as a way to try to get decisions made that align with UX goals.

> Laura: Product is ultimately who decides. […] Having a working relationship with them, being able to understand each other, know each other, get along with each other. You don't have to be like buddies. I don't think that is always important, but I think just respecting one another and what job you have to do, and what job they have to do. And then that allows you to understand what they're looking for and what information they need, and also how they're going to process whatever thing you bring to them.

For Laura, maintaining a respectful relationship with PMs helps her plan how she will frame the arguments and data that she presents to PMs, in order for them to receive it a way that creates space for her to do her work and makes her work seem valuable to the PM.

Other re-configuration practices to make more space for UX values work center on acting on and with people and artifacts beyond the organization. Some interviewees help UX professionals **build and maintain social relationships by creating new spaces for UX professionals** to interact across organizations. Nova discusses their experience previously trying to host a series of meetups in order to build a community of people based on their perspectives thinking about ethical issues in technology.

> Nova: Outside of work I had briefly started doing an intersectional design research meetup thing with a colleague of mine. Because we were inspired by-- I had hosted an [ethnography meetup]. […] I had hosted them a year or two ago that was on doing international research. And like especially in the Global South and what the ethics of that was. And he and I really connected over that. And so we had done a couple and started to think about what would it look like if we could create kind of a decentralized cross-tech company coalition, of like trying out different ways to change our product teams' perspectives. That kind of petered out cause life got really busy.

For Nova, this meetup served as an attempt to build relationships with other designers thinking about ethical issues, to attempt to create a cross-company coalition. However, over time Nova found that they were unable to perform the maintenance labor needed to continue this group over time, highlighting the ongoing work needed to maintain relationships over time.

UX professionals also conduct **information sharing and seeking** practices to find ways to help them create more space for values work in their organizations. Ellie, a meetup organizer, discusses how she frames her UX meetups as venues for attendees to share case studies with each other.

> Ellie: I try to speak in general terms where people can share as many best practices as possible. I found that a lot of people are trying to do this at their own companies, but they tend to be pretty siloed. […] It's like hey, give us an example of a time which we can talk about this. Because a lot of them might not have talks already prepared. That's the other thing. The case study is pretty easy to do. Also, it helps so much for our community, because people aren't thinking in terms of "hey, what could go wrong?" "What's an example of this working well, versus not well?" or something like that.

Ellie feels that case studies are easy for potential speakers to put together, often using materials they have used for other talks. This can be also useful if a speaker works at a company that has

tighter control over what its employees can talk about in public, as they would have already cleared this material with their employers. And Ellie feels that case studies can be accessible and useful for attendees to help understand potential risks and harms related to technologies, by seeing illustrations of other real-world examples.

Through practices of acting on and with organizational stakeholders, and external professionals, UX professionals learn about and deploy strategies to try to create more space for UX values work within their organizations. This re-configuration hands off more responsibility for attending to values to UX professionals.

Re-Configuration 2: Getting Others to Adopt Human-Centered Perspectives for Values Work

UX professionals perceive that perspectives which focus on humans' and users' lived experiences and are central to the design process can contribute usefully to organizational values work. This is contrast to other forms of values work, such as compliance with legal requirements or adherence to a set of human rights laws, which look to the law as the source of values rather than to users. Working to re-configure organizational values work to utilize UX perspectives and practices, UX professionals act on other stakeholders in their organization. In doing so, they utilize modes of making values visible and legible, advocacy, and managing social relations.

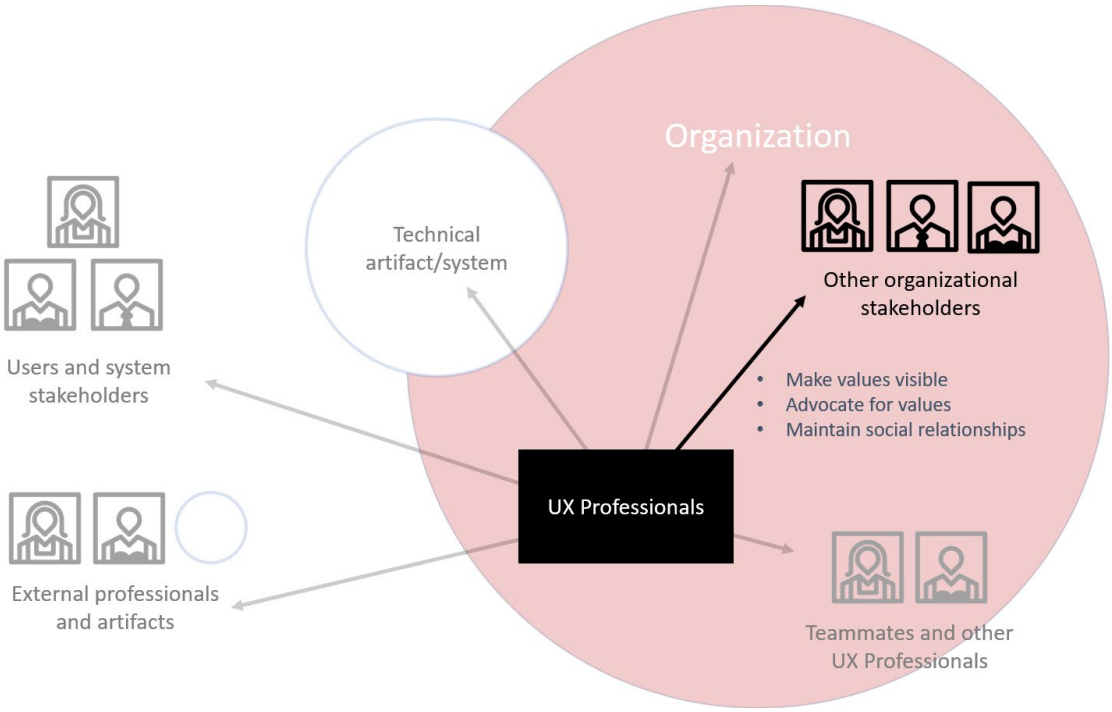


Figure 5.4. Components of the assemblage that UX professionals act on, and the modes of action UX professionals use in these relationships when re-configuring the assemblage to persuade others to adopt human-centered perspectives on values.

In this re-configuration, interviewees point to the challenge of how some other workers in their organizations either view their technologies as neutral, or do not see values and ethics as relevant

to their work. Nova, senior designer for an enterprise social networking product describes this challenge as being about not knowing how to help co-workers go from "unseeing to seeing."

> Nova: [For example, if we say] "we're gonna tweak the button from this to that," people don't really see the connection with how this is political. And maybe that small thing isn't political. But the overarching or context in which it is, is political, in which it exists. And I don't have a good answer. This is a thing that's really haunting me. *I don't know how to go from unseeing to seeing.* I feel like I've made that shift through a course of years, and a degree in anthropology, and a lot of self-work into this. And I don't know how to bring others along for that when they're only interested in doing it a few short times, but aren't really interested in bringing in those lessons.

Nova cites their own background in anthropology as helpful for allowing them to think about the politics and broader social systems in which technical products and systems sit. But they are unsure how to help bring that lens of making values and politics visible to other co-workers. Nova later states that this is difficult in part because the politics of how something is used is often removed from the decisions made by people in the organization, thus Nova asks "how do you make that emotionally real" for others?

Other interviewees echo this idea of co-workers being distant from or not seeing the potential harm or negative outcomes that result from an artifact's politics. Britney, a user researcher at an enterprise business software company notes how people in her organization tend to focus on positive use cases, without seeing negative potential cases.

> Britney: There's all kinds of case studies and customer stories about organizations that are trying to do good, and how they're doing good, and how they're leveraging the product to do good. I think on the other side of the coin, there's not really a lot of conversation about, "Well, how could this be used for evil?" I think really up until recently. Because I think there is this sense within the company that our products are benign. That's definitely a big part of the conversation right now, is "That's not really a thing [that our products are benign]." *[Chuckles]*

Britney comments on needing to help convince people that products can be used in nefarious ways, but that that does not absolve the company from not doing anything. Both Nova and Britney's comments highlight their recognition of the ways their products can be used and adopted in potentially harmful ways, but express a desire for others in the organization to share similar perspectives, so that they begin to have a conversation about the types of potential harms their companies' products might cause.

Faced with these challenges, interviewees discussed several ways of **trying to make values visible to other stakeholders from human-centered perspectives.** One way to do this is to conduct trainings and onboardings. Jerry, a former designer but now in a product manager role, has been working on creating documentation and an onboarding presentation to help teach other teams about accessibility principles, building on the World Wide Web Consortium's (W3C) accessibility web standards and guidelines.

> Jerry: So in some ways the [W3C] guidelines were actually a nice thing to work from. Because the whole point of those guidelines is, they abstract away a lot of details around accessibility. So in other words, you never really have to understand everything about the disabled community and the diversity of disability to make your product accessible, if

> you follow the guidelines. And so in some ways that was a little bit of a shortcut for us. Now along the way, once you start trying to teach that stuff to other people, you kind of have to start to dig in and understand all of the underlying things. And so that's kind of like where I'm at now, is trying to explain a lot of the things that led to the principles.
>
> […] I think one of the most interesting things that I've talked about with other people that they didn't really think about before is the—and I used this phrase earlier—the diversity of disability. People's brains often go straight to blind people with a screen reader when they think about accessibility. From establishing an accessibility practice standpoint it's actually not terrible because screen readers kind of cover your bases in a really broad way. And so if you can work with a screen reader you can work with almost every other assistive technology.
>
> But I think it definitely is a limited perspective on who our users are. And I think when you start *opening people's eyes* to like-- well color blindness is a disability that affects how people interact with the product, and so is dyslexia, and you know so is temporary things. Like, you have a newborn and you're holding her in one arm and you're trying to look for help for something with the other hand. And so I think that range there, I think it's been something that people don't think a lot about that doesn't manifest itself in the guidelines directly, but is kind of implied. But yeah that's been an interesting point to kind of bubble up and *help people come along for the journey and understanding those people as users.*

Jerry uses the W3C accessibility guidelines as a starting point: if other designers and engineers in the organization just follow those, then they will create more accessible products. However, he hopes that the guidelines can be used as a scaffold or starting point to help people understand disability less as a set of compliance measures to follow, and more as a set of diverse, situated human experiences. Making the value of accessibility visible in a user-centric way involves educating co-workers about a more complex conception of accessibility beyond a simplistic binary between abled and disabled bodies.

Informants also **advocate for addressing values and ethics issues from human-centered perspectives** issues by bringing them up in one-on-one or team meetings. At a meeting for designers in Spring 2018, one speaker talked about creating inclusive artificial intelligence, telling designers "even if you're not an engineer, advocate for inclusive and representative data sets," and to be a champion of that. This idea focused on an individual responsibility for UX professionals to speak up in the name of values from user centered perspectives.

Other speakers at designer meetup events appealed to a professional identity when doing this work. At a Spring 2018 discussion panel on designing responsibly, one UX professional who works on a collaborative document file sharing and editing product described designers as an advocate and defender of the end user, noting that audience members should not "fall into a trap" where the UX person in the room does not feel "empowered" to speak up on behalf of the users. She cited graphic designer Milton Glaser's quote that design is about going "from an existing state to a preferred state," but then noted that the term "preferred" is squishy. In her view, the role of the UX person is to ask "preferred for whom," introducing the end users' perspectives into the conversation. These meetup speakers emphasized the practice of advocating for values in a way that gets other organizational stakeholders to think about values in a human-centric way.

Nova similarly discusses surfacing discussion around diversity and inclusion, prompting others to think about a broader range of gender diversity, and to think about end-users (not just corporate customers and clients) during their work.

> Nova: More recently it's been doing a lot of this diversity and inclusion work, and just trying to focus efforts on pushing that conversation forward wherever I can. Mostly it's been about gender so far for me, and like trans and non-binary stuff. But yeah. And then in terms of my product team itself, I guess a lot of it happens in these one-on-one conversations where it's like "well have you considered thinking about end users in this equation?"

In these cases, Nova advocates to think about values from end-users' points of view. Practices of making values visible and advocating for addressing values from user- and human-centric perspectives are partially modes of action that are utilized in everyday configurations of UX values work. However, these practices also help re-configure organizational values work, by attempting to get other organizational stakeholders to start conceptualizing values and potential values problems in ways that align with UX professionals' human-centered perspectives.

Another practice to convey human-centered perspectives on values to others involves **managing social relationships by bringing along other organizational stakeholders for user research sessions**. Isabel describes her experience bringing along people from product teams at a previous UX job with an eCommerce company.

> Isabel: When I was at [E-COMMERCE PLATFORM] we did a lot of in-person research because I was on the team that was related to selling in retail stores and farmers markets and stuff like that. So we went to a lot of places physically and bring people from a [product] team along. And so that helps because it they can see it firsthand, then they understand that these are real issues. […] If they come to the sessions and they actually see people have those kind of problems, they know that you're not just making things up. Like they know that these really are problems that they can see. And so I think kind of indirectly that's something that helps.

Bringing other organizational stakeholders on user research visits is more than just information sharing and making users and values visible. It is also about managing a relationship with other organizational stakeholders by showing the legitimacy and relevance of UX expertise, to show that Isabel and other UX professionals are not just "making things up" about user problems. In managing these relationships by showing that UX expertise on users reflects real problems, it lays the groundwork for other organizational stakeholder to think about values and potential problems from user-centered perspectives.

This second re-configuration of values work hands off responsibility for attending to values to a combination of UX professionals and other technologists and organizational stakeholders. UX professionals enlist others in doing values work, such as engineers or product teams or PMs, in a way that promotes a human-centered perspective on values. This includes training and educating others in the organization, and showing the legitimacy of UX professionals' human-centered ways of knowing. Handing off responsibility for attending to values in this way differs from, compliance-oriented approaches to values, which do not require as much human-centric perspectives because the values problem has already been pre-defined exogenous to the design process.

Re-Configuration 3: Changing the politics and influence strategies of organizations

Recognizing that design practices are insufficient for addressing all values issues related to technology design and use, some UX professionals work towards changing organizational practices, processes, and politics by re-configuring how values work is conceptualized and executed by the organizations they work for. For instance, Britney, a user researcher, discusses how her enterprise software company has non-technical mechanisms through which it can utilize to promote certain values: having policies about who they sell and do not sell do; monitoring clients' uses of the platform; and specifying harmful uses in contracts with clients.

> Britney: I think there are a lot of different ways that we [the company] can exercise that influence. On one side is, "Are we going to sell our product to organizations that we know have, as their main goal, the violation or discrimination of vulnerable people?" I mean, if something comes up later on—say we sell our product to an organization that doesn't have that as its main goal. I do think that we have a responsibility to lightly monitor what's happening in the news and [see] any potential risks that are coming up that mean that someone who is using our product might be using it to do harm. And that we should have within all of our contracts a way to get out of that contract if we find that that's the case.

While the business and organizational processes might at first glance seem beyond the job responsibilities of UX professionals, interviewees discussed their attempts to create and enact changes within their organizations to better address or promote certain values.

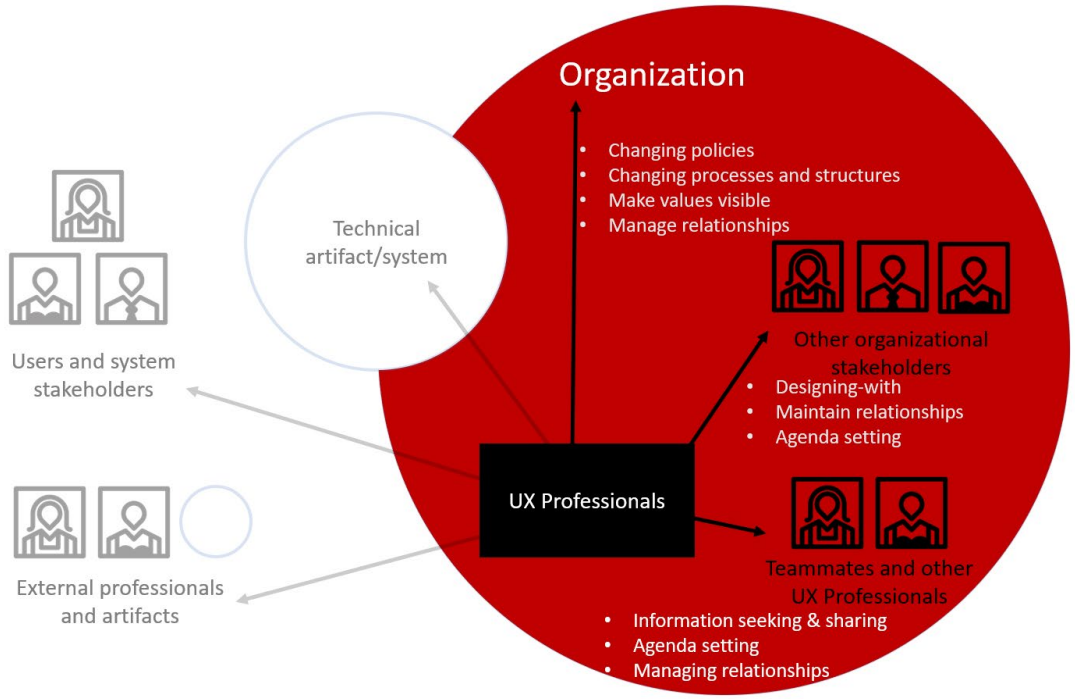


Figure 5.5. Components of the assemblage that UX professionals act on, and the modes of action UX professionals use in these relationships when re-configuring the assemblage to change organizational politics and strategy.

In doing this work, UX professionals act on teammates, other organizational stakeholders, and the organization itself. They utilize modes of designing-with, information seeking, agenda setting, managing social relationships, making values visible, and use policy- and process-modes of action.

UX professionals utilize several practices among teammates in strategizing how to approach the re-configuration of organizations. UX professionals conduct **information seeking and sharing** practices. Britney, a user researcher for an enterprise business software company notes some of the concerns she has over potential harmful uses of her company's platforms. These harms range from client organizations who use their platform but treat their workers unfairly, to harms might stem from the types of business and work done by the client organizations. For instance, in recent years there have been questions raised by technology workers about the values and ethics responsibilities of platforms that provide services for organizations such as hate groups, weapons manufacturers, militaries, and organizations detaining migrants at the US border.[34] Facing a similar situation in her organization, Britney finds it useful to talk through her concerns with other UX professionals at her organization, in order to learn their perspectives and strategies, such as how they successfully influenced leaders in the company in the past. Learning about these perspectives and experiences can help Britney reflect on her own potential courses of action.

Information sharing and seeking occurs face-to-face, but also through internal forums and social networking tools such as Slack. These provide a platform for conversation and a channel for either expressing concerns and grievances, or for learning about issues raised by others. For instance, Francine, an accessibility engineer who works on a UX team at an enterprise business software organization, noted that her organization's internal social network includes a channel dedicated to airing of grievances. While the conversation ranges across a broad set of topics – including complaints about the types of food available in the office kitchen, conversation can also include discussion about ethics and issues that customers are facing. Keri, who works at the same organization also mentioned learning about issues through the internal social network, including worker-led petitions raising ethical concerns about one of the company's clients.

UX professionals also discuss conducting **agenda setting work** with teammates to collectively write letters expressing disagreements with their companies' management. Francine, an accessibility engineer on a UX team at a business software company was concerned when a client organization that had been publicly criticized over their ethics of their recent behaviors[35] asked for assistance in customizing some of their accessibility features. Francine noted that this caused a lot of conversation for a week among her team, and that she and a co-worker had strong feelings against helping this client. They drafted a letter that they were planning to post on the

[34] E.g., https://www.theverge.com/2017/8/17/16163960/hate-groups-banned-godaddy-cloudflare-facebook-squarespace;
https://www.nytimes.com/2018/06/19/technology/tech-companies-immigration-border.html;
https://www.theverge.com/2018/6/25/17504154/salesforce-employee-letter-border-protection-ice-immigration-cbp;
https://www.theverge.com/2018/6/22/17492106/amazon-ice-facial-recognition-internal-letter-protest;
https://www.washingtonpost.com/business/2019/08/22/war-inside-palantir-data-mining-firms-ties-ice-under-attack-by-employees/?arc404=true;
https://www.nytimes.com/2018/04/04/technology/google-letter-ceo-pentagon-project.html

[35] This case was similar to some of the concerns that have been raised about the responsibilities of platforms that host or provide services for client organizations that have caused harms in the past, such as hate groups, weapons manufacturers, militaries, and organizations detaining migrants at the US border.

company's internal social media site. While they were eventually prevented from doing so by their company's management, their intention to post the letter internally represents an act of protest that tries to shift or re-set the organizational agenda.

Modes of acting on and with teammates also involves **relationship building through worker organizing practices**. Genevieve notes that she has been involved in some basic employee organizing in order to contest some of the harmful actions done by clients using her organization's software platform. Cecilia also notes that her own thinking about acting on values and ethics has started to shift to see a need for more formal relationship building with employees through forms of collective action.

> Cecilia: I think recently my thinking has shifted to much more of the need for collective action and just organizing with employees. The business is not gonna do those things. So we have to find other ways to exert pressure and influence decisions. But I don't know. This is pretty recent, and I haven't really reconciled that with my job as a researcher

The move towards collective action and employee organizing leverages the mode of maintaining relationships towards more collective ends. It also begins to shift responsibility for surfacing, bringing attention to, and addressing values issues from individual UX professionals or individual employees, to a more collective voice. This also recognizes that the organization often does not have a financial incentive to address values issues—in Cecilia's enterprise business software organization, the organization has a financial incentive to reduce harms or promote values that are central to the client stakeholders who are purchasing the product, but less of an incentive to respond to harms or values that are central to the end-user stakeholders. Cecilia's hope in collective action is in part to help leverage collective employee relationships to contest the current politics of the organization. At the same time, Cecilia recognizes that these practices involved in reconfiguring organizational values seem different than everyday UX work, and feels the need to "reconcile" these potentially divergent sets of practices.

To re-configure organizational politics and strategies, UX professionals act on other organizational stakeholders, including other workers, managers, and executives. UX professionals can **design-with** these stakeholders by **using design activities to try to help shift others' politics and thinking about values and harms**. Henry also discusses a more involved design activity centered around "Black Mirror brainstorming," a workshop activity he used with co-workers to imagine worst case scenarios around their products by placing them into a fictional episode of the dystopic sci-fi anthology series *Black Mirror*.

> Henry: The product that you're working on right now, or about to design, or about to build is going to feature prominently in the next Black Mirror episode. And it's going to be the cause that everything […] is the way things are in the Black Mirror episode. So start thinking about different characters that might intersect or interact with your product in some way, whether they meant to or not. You know different plot points, and think about things like what this product does to change the socio-economic landscape. Does it reinforce existing inequalities? Does it make them worse; does it introduce new ones? That kind of thing. And at the end you're supposed to have either a script or a poster title card type thing for this episode. And it's supposed to start get getting the broader product development organization—you know not just the designers, but all of the other stakeholders—on board with this kind of thinking.

Henry discusses leading this activity at work with a range of organizational stakeholders: his UX manager, some product managers, content strategists, a director-level person, and other designers and engineers. These designing-with practices attempt to help people think about potential harms and values issues in speculative, yet situated ways. The worldbuilding and storytelling of the Black Mirror episode activity through different characters' interactions with products also helps situate values in people's everyday experiences, similar to critical design futuring practices such as design fiction and pastiche scenarios (Coulton et al. 2017; M. A. Blythe and Wright 2006).

Henry frames his intent of using the Black Mirror activity as being closer to re-configuration 2, getting others to adopt more human-centered perspectives on harms in the design and engineering process. However, Henry notes that these designing-with activities did not lead directly to product changes:

> Henry: The couple of times we've tried it, I haven't actually seen it work. Well at least meeting those stated goals [of leading to product changes]. I think people are pretty good at imagining nightmare scenarios, but they are also pretty likely to be willing to dismiss them.

Henry notes a bit of a disconnect: people were able to come up with potential harms pretty easily related to their products, but those did not lead to changes in the products' design. However, Henry is more optimistic that these design exercises could be more useful for changing organizational politics (re-configuration 3) by building relationships and consensus with other organizational stakeholders.

> Henry: I've found such exercises to be of very limited value for the actual design process. Where they *are* useful sometimes is building consensus, and I think that's exactly what the ethics conversation needs. It needs everybody, all the stakeholders on board. And designers on their own have only the power that they're able to get within their organization, which typically is not much.

Part of Henry's comments speak to his viewpoint that designers and UX professionals often lack the social power and influence needed to enact change on values and ethics issues. Henry's discussion of how the Black Mirror brainstorming activity can be useful brings up a new purpose or use of design. Black Mirror brainstorming at first glance seems to be about using design to explore people and situations, or using design to speculate and imagine critical alternatives; it is not about directly solving a problem or supporting end users. Henry's comment that these exercises can be useful to "build consensus" provides a potential new purpose for design – a tactical way to maintain relationships and set agendas. In Henry's case, it is about maintaining relationships and setting agendas with a broader group of stakeholders in his organization, including managers. Compared to maintaining relationships and setting agendas with organizational stakeholders in a face-to-face or verbal mode, designing-with can create spaces where stakeholders can contest and form new political orientations.

UX professionals also **maintain social relationships with a range of organizational stakeholders**. Some forms of managing relationships attempt to bridge siloed conversations about values within the organization. People at several organizations discuss their knowledge of siloes – that there are other groups in their organization think about and discussing values and ethics, but they are not in conversation with each other. Britney, working at one enterprise software company discusses this at her company:

> Britney: Definitely ethics in AI is a huge part of the conversation. I think people within my company are helping to lead that discourse across the industry, but it's a working group that's on its own doing this thinking about ethics. It's not necessarily a culture of considering ethics as every part of every feature that gets shipped.

Nova describes a similar research-based group at their organization that thinks about ethics but is separated from making everyday design decisions. The tension between industry researchers who conduct academic-like research and product development has a long history in the technology industry (Hiltzik 2000). Nova's discusses some of their relationships with the researchers—rather than seeking to find immediate product implications from the academic-like researchers, Nova has worked on building and maintaining relationships with these internal researchers in order to better learn about how to approach these issues from perspectives including anthropology and HCI, describing them as "thought partners."

Beyond maintaining lateral relationships with other teams and workers in the organization, interviewees discuss maintaining vertical relationships to influence product managers (PMs) and company executives. Frustrations expressed by interviewees tend to focus on misaligned incentives, that PMs and executives focus on financial incentives over potential values and ethics issues, or that they focus more on the potential positive aspects of the product, rather than potential harms. Genevieve, a senior product designer describes her perspective based on her discussions with executives and PMs at her company:

> Genevieve: One of the ways that the executives we talk to really want to look at it is in a positive way. Like instead of thinking negatively, "what shouldn't we be doing?", "what contracts can we cancel?", [executives think] "what can we be doing to help or to promote social good" and "aren't we really good at that?" And like that's nice, but-- I think this comes back to being a product designer too, right? Where a lot of the time what executives or your product managers want is new feature sets, and what you want because you've talked to users and you've seen them struggle to use your product, is to just fix basic bugs or add in basic functionalities so the thing is usable.

Genevieve in part ties the differences in perspectives between executives and product managers, and UX professionals to the professional responsibility of UX professionals to learn about and advocate for changes from a user's perspective, rather than a business perspective. As PMs are in charge of products, often coordinate engineering, UX, and business teams, it makes sense that UX professionals would feel that PMs and other managers or executives come to a product with a different set of perspectives and goals. However, this sense that there is a difference in perspective informs several interviewees' practices in trying to manage upward relationships with PMs and managers as a tactic to affect change in organizational politics.

Relationship management thus consists of managing lateral relationships with other co-workers and other teams, as well as vertical relationships with managers and executives. These relationships are managed and maintained in order to find useful allies in potential changing organizational politics and strategies—such as finding thought partners, connecting with other teams trying to do ethics work in the organization, or working together to try to set organizational agendas to gather more attention and resources for values issues.

Another mode of action utilized by UX professionals to change organizational politics and strategies is **agenda setting.** UX professionals act to conceptualize values in particular ways that give them importance to agendas of others in the organization.

One form of agenda setting occurs when UX professionals tie their values work to corporate values and mission statements, using these statements as a way to carve out a space for promoting their values work. At a design-focused meetup event in Spring 2018 which focused designing responsibly, the panel of speakers—4 UX professionals from enterprise software, design software, education technology, and financial companies—spoke about trying to relate their individual values to their team and group values, and to the corporate values. One panelist noted how she finds that values can be tactically useful in resolving small conflicts, to try to get team alignment.

In interviews, UX professionals provide an ambivalent stance towards agenda setting with corporate values. Cecilia, a user researcher at an enterprise software company finds referring to company values as a useful way to facilitate conversations about values issues.

> Cecilia: I do think that it's helpful [to refer to company values] because it gives some like, "okay, we all are already agreed on these things." Like that's definitely helpful to tie it to the company values. That happened for me with something recently that wasn't directly tied to my work, but was tied to broader like to our company's software. That was, I feel, a huge part. I wouldn't call it fully a success, but that was definitely very integral to it going as far as it did and getting as much response as it did. Even some of these smaller things, even that example with the GPS tracking [and workers' privacy]. I think I did speak to some of our values in those conversations. It's definitely a helpful — it definitely facilitates it a little bit. I then it still gets to the question of when push comes to shove, how much are people actually willing to do?

While Cecilia sees company values as a way to help open up conversations, and put her interpretation of values on the broader agenda, she notes that this does not necessarily guarantee that actions will be taken to address those values. Corporate values and mission statements can help create spaces for UX professionals to advocate for values. There is often interpretability in these values and statements, allowing UX professionals to practice agenda setting, by trying to conceptualize, define, or operationalize these values and statements in particular political ways that they want the organization to adopt. However, values can be interpreted in other ways by organizational stakeholders as well, sometimes challenging their usefulness.

A second practice of agenda setting occurs through UX professionals' efforts to speak to the broader organization through venues such as company-wide town halls or other events. Genevieve, a senior product designer at an enterprise software company, was involved in writing an open letter to her company's management, critiquing the company's relationship with a client organization involved in causing harms to migrant populations in the U.S. She was invited to discuss the issue more broadly at a large company meeting, which she used as a platform to advocate for further work on this issue:

> Genevieve: We have these executive planning meetings every year. Anyone who goes to one of those will give a little report back on it. So we were asked to do a quick 10-minute recap of what happened: what we did with this open letter that the four of us co-wrote, and what's happened afterwards, what kind of meetings we've been having, what we saw as the next steps. And during that we gave a very strong call to be like "you should talk about this with your team." "You should have conversations with your team about the social impact of your work, and whether it's being used for harm or could be used for harm, and what can you do about it."

These opportunities provide a platform for them to share their perspectives and advocate for action with the broader organization.

To re-configure organizational politics and strategies, UX professionals also find ways to act on the organization itself, or the social imaginary of the organization. These practices particularly arise when harms cannot be mitigated by design solutions, as some harms occur during the deployment and use of a technology. Several interviewees discuss **working to change their organizations' policies**, such as contracts, terms of use, and service agreements as a way to think about managing values issues that emerge in use. Genevieve, a senior product designer, discusses trying to adjust her company's master service agreement with clients to prevent hate groups from using their platform.

> Genevieve: We're also trying to get adjustments made to the master service agreement. Which is the contract that customers sign before getting to use [PLATFORM]. It already has language in there saying that if you're a hate group, as identified by the Southern Poverty Law Center, you can't use [PLATFORM]. And we do actually enforce that. And we're trying to get more language put in there such that we can cancel or suspend a contract if we find that you are an ethical risk.

Genevieve works toward re-configuring the organization's politics by working to change the organization's mater service agreement. This work is done on top of Genevieve's normal work, and she goes on to describe some of the burnout that she feels after going through conversations with executives that she needs to convince. Nevertheless, affecting change in an organization's external contracts, terms, and policies, can help address harms related to performative values that arise in adoption and use, because of the ongoing relationships that platform companies have with their customers. For Genevieve and other interviewees, these ongoing relationships can also provide a useful starting point to address values and harms when design decisions seem ineffective. The mode of design can enable or constrain a customer to act in particular ways through a system's affordances. In comparison, affecting clauses in service agreements allows the customers to act however they want, but also then allows the company to terminate its services if customers act in ways that do not abide by the company's policy.

Another mode of action acting on the organization to re-configure politics and strategies includes attempts to **change or modify internal organizational processes and structures**. These changes also serve to **make values visible** to the organization. For instance, Genevieve, who has been involved in changing her organization's master service agreement, also wants her organization to adopt an "ethical pre-sales process" to assess ethical risk. She discusses finding frameworks like the Institute for the Future's EthicalOS toolkit[36] and sets of questions that she thinks could be a potentially useful resource for her organization. Similar to her attempts to enact changes in the master service agreement, Genevieve's push to adopt and ethical risk assessment focuses on harms that could emerge from a customer's or client's use of her company's platform.

Henry, lead user experience designer at an educational technology company similarly seeks to change internal organization processes to think about potential risks, but focuses on harms that might emerge from the design features of a product. Henry wants to create an internal review process, that considers the types of ethical harms that might emerge, comparing it at first to an institutional review board.

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[36] https://ethicalos.org/

> Henry: My goal would be for it to be a stakeholder that has to sign off on new stuff [products or features]. Now I have very little hope that this would actually happen but you know that's the pie in the sky dream.

While Henry acknowledges that this type of internal change might be optimistic and not fully be enacted, he has given thought to the different processes and forms of organization that he thinks might still be useful and achievable.

> Henry: I think the first step in any kind of review like this is going to be some sort of expert analysis. So even in normal product development before we do stuff like usability testing, somebody is going to audit it on some kind of level, whether that's a heuristic analysis or just somebody who really knows what they're doing going through it trying to find any red flags. So I'm imagining that this kind of organization would be more like that, at least in the beginning. Surfacing concerns, warnings, that should be addressed before any kind of approval goes out for further testing on a wider scale. Like definitely before you build something, but definitely also take these concerns into account when you design and when you do your preliminary user research.

Henry considers how new ethical review processes could build on existing product development processes such as user testing, but adding a more intentional antagonistic perspective to try to surface potential concerns or harms of the product before it goes into further development. Henry also notes that implementing such a process would require cooperation from a broad range of organizational stakeholders, including people from product, UX, engineering, legal, and possibly trained ethicists, in part to make the recommendations resonate with the company's management.

Beyond creating new team structures, others are beginning to look at alternative organizational structures as potential mechanisms to surface values and ethics. For instance, at a user researcher meetup event in Winter 2020, one attendee suggested that incorporating an organization as a Benefit (B) Corporation could provide a model for addressing potential harms. Because a B Corporation includes thinking about different forms of social or environmental impact, not just financial profit, it potentially allows UX professionals to point to an organization's charter as a way to align addressing harms with the organizational mission. The attendee also suggested that finding alternative forms of employee governance, such as having a mechanism to get workers onto an organization's board, could provide alternative structures that would give greater voice and weight to their concerns.

Re-configuring organizational politics and strategy also involved UX professionals **managing their relationships with organizations as a whole, by making careful choices as individuals about where they work,** and how they might negotiate their entrance into an organization. These decisions are made with values or ethics perspective in mind, as a way of using individual choice to try to affect organizational change.

One practice that focuses on the mode of managing relationships is the choice of where to work. Henry, lead UX designer at an educational technology company, expresses that his decision to work in education technology, after working in financial technology and other products, was made because he considered it less harmful.

> Henry: I think one of the most important ethical calls that you can make as a designer is where to work. And so after a lot of bouncing around I finally ended up in EdTech because it's not perfect but it is, I think anyway, probably one of the less harmful places to work in consumer technology in the Bay Area. And you know it says something that

> you have to you know lower the bar to you know "less harmful" rather than "helpful" [*laughs and sighs*].

Others described their calculus of turning down potential job opportunities, including Keri, who is currently a lead user experience designer at an enterprise software company.

> Keri: I'm reminded of a couple of job opportunities. […] And in both cases, it was around essentially a gap widening product. Like the names of the product had the word 'luxury' in it. [*laughs*]. One of them said "this is a service for ultra-high-net-worth individuals." And they wanted people to come in and they are building basically the TaskRabbit platform that enables and controls human beings who then act as the automation. Like these are the people who literally do the work that makes someone else who has a ton of money, their life easier. And in the end, I was like "I'm not really interested in participating in something like that."

Keri's considerations take into account how different system stakeholders might relate to the service offered by this organization. Keri considers who are the users, who benefits from the system, and relates that to a broader set of systemic inequalities. Recognizing that the service is built on a set of invisible workers through practices of ghost work (M. L. Gray and Suri 2019), Keri declines to pursue a job with this other company.

These interviewees are in a position where they have some choice in where to pursue employment opportunities. Given this position, they can act on organizations by not building relationships with them, or leaving them. The values at play here focus on the values that individual UX professionals hold, and some try to choose places of work that align with their individual values, and avoid places of work that do not. However, the thought process may not just include thinking about whether their individuals match a company's corporate values, but also include a deeper consideration of the values expressed through the design and use of a company's products.

When accepting a job, UX professionals may also try to manage their relationship with the organization through the job offer negotiation process. When being hired at their current job, Nova talked about the power that they had during negotiations in order to try to push the organization to take further steps in relation to diversity and inclusion.

> Nova: So I got the job offer. I was like "okay I know I'm supposed to negotiate." […] And what I was thinking about was: well, the office doesn't have an all gender bathroom. And that's really important to me as a non-binary person. And maybe I'll ask for that. I don't know how to do this. So I ended up negotiating for them to build one and it's like 95% built. Supposedly it's built. I don't know, it looks done to me. But supposedly we're still waiting for an inspection. But they did construct something new for me. So that was kind of how it started getting on the radar of my manager and then my GM.

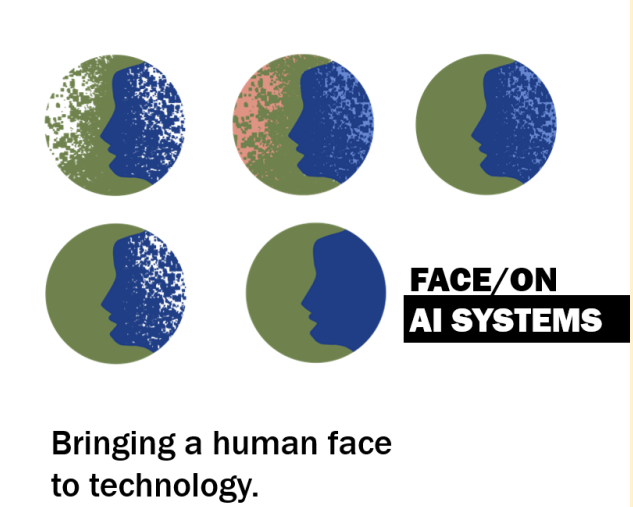
Nova's focus on values here lie in aligning their personal values with the values of the workplace. Through job negotiations, Nova was able to enact change in the organization to build an all gender bathroom, aligning with Nova's desire for greater gender inclusivity in the workplace.

Altogether, the practices of UX professionals acting on the organization shows that the technology company itself exists as a site where values can be surfaced, addressed, and contested. These reflect an attempt to re-configure the organization itself, to try to adopt a

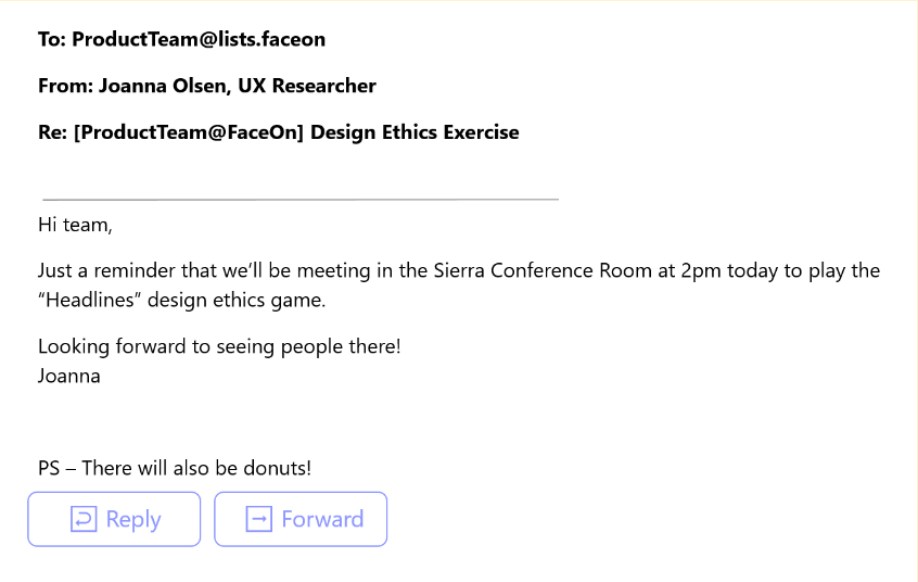
different set of politics or strategies regarding values. Most of these practices foreground workers' values and the company's values, rather than a focus on users' or stakeholders' values.

The re-configuration of changing organizational politics hands off responsibility for attending to values with the organization itself. This re-configuration recognizes the limits of design-based values interventions, and highlights how organizational processes, policies, and structures can also attend to values. UX professionals view that organizations should have some responsibility for attending to values, and their values work includes finding ways to influence the design of these organizational processes, policies, and structures.

Reflective Fiction: Face/On AI System's Design Activity



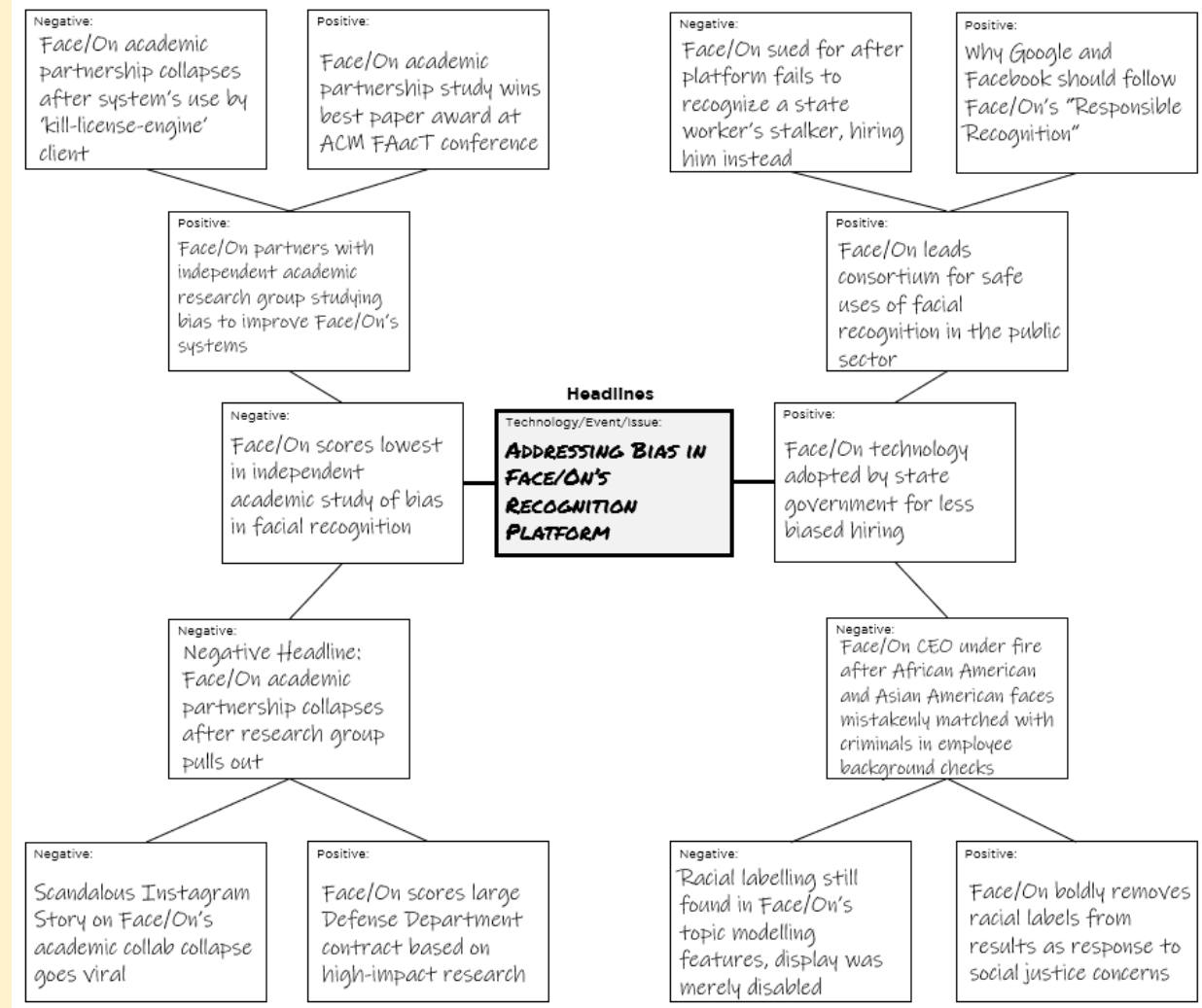
This reflective fiction discusses a designing-with activity at Face/On, a fictional company that provides an artificial intelligence platform used for facial recognition services.



Joanna Olsen, a UX researcher at Face/On has been searching online for design-based activities that help surface discussion about ethics and values. Finding one called "Headlines," she sets up a design

workshop where folks from the product team can come participate in the activity together. The goal of the activity is to create several different chains of news headlines that feature different stakeholders, as a way of trying to surface potential harms from different perspectives. Joanna wants to use the workshop to focus on issues and practices related to potential biases in Face/On's facial recognition product.

The first part of the activity asks participants to write down potential stakeholders of Face/On's platform on index cards and share them on the table. The group comes up with a variety of stakeholders.



The next step in the activity has participants fill out a template, creating fictional news headlines moving from the middle of the chart outward, creating alternating positive and negative news headlines, including some of the stakeholders from the previous step. The headlines created by the participants range from discussing potential collaborations with academic researchers, having the system being adopted by state governments to try to minimize bias in hiring decisions, and several secondary and tertiary effects of those actions.[37]

Feeling like they had a successful conversation and discussion, Joanna likes the idea of creating a "Responsible Recognition" research group in partnership with academic researchers, inspired by some of the headlines from the activity. It seems like a potential constructive activity. Knowing that Face/On has an internal special projects group that gives out funds to side projects like these, Joanna puts together a proposal.

[37] The headlines in this figure were created with the help of R. Stuart Geiger and Jesse Benjamin.

To: joanna.olsen@faceon

From: Brett Davis, Senior UX Manager

Re: Responsible Recognition Proposal

Hi Joanna,

Thanks for your great work putting together the "Responsible Recognition" proposal to fund some joint research with the social computing group at UC Berkeley. Unfortunately the special projects group doesn't have the funds to support the project financially right now.

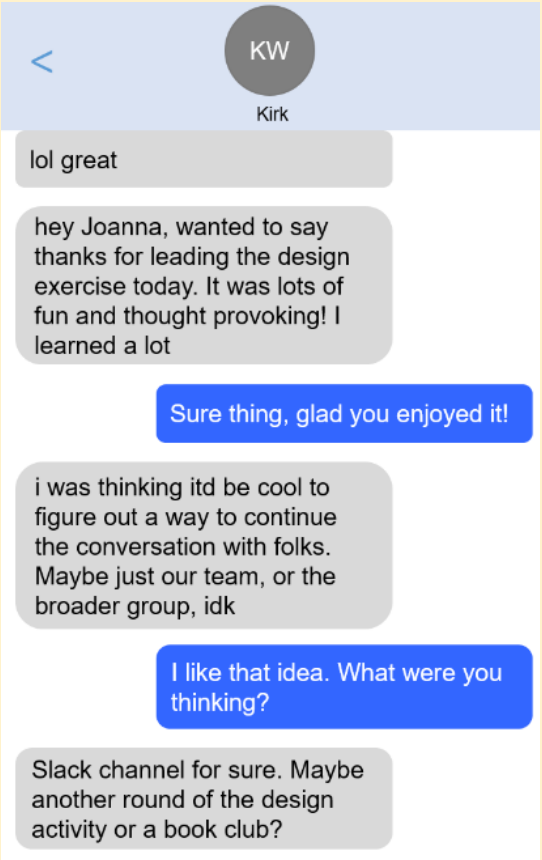
We can still meet with them, maybe host them here for some meetings, but unfortunately there probably won't be any funding for that kind of research for at least a couple quarters – not until we get through the launch of the big stadium security project.

Sorry that's not the best news, happy to chat about how you might modify the proposal in the future for better chances.

Best,
Brett

Reply Forward

Joanna receives an email from her manager, which is supportive of her endeavor, but delivers the news that now is not the right time to fund a project like hers, as resources are currently being directed towards another project.



While disappointed, Joanna also receives a text message from Kirk, an engineer who attended the "Headlines" workshop. Kirk was inspired by the activity, and wants to find ways to continue having similar conversations with co-workers, suggesting starting a slack channel or book club.

Design Fiction Discussion

This fiction help reflect on several aspects of interviewee's discussion of their practices with other people in their organizations. The use of a design activity in the fiction is inspired by Henry's description of using a *Black Mirror* brainstorming exercise. The "headlines" activity itself is an early version of an activity that I developed for students to identify and discuss ethical issues related to emerging technologies, and is itself inspired by and helps synthesize some of the themes from the interviews.

The fiction is inspired in part by in Henry's experience with trying to use a "Black Mirror Brainstorming" exercise in his organization, noting how it didn't lead to any product changes or changes in the product development process. Similarly, in the fiction, the headlines activity doesn't lead to any changes in Face/On's actual product. At the same time, Henry expressed some hope that exercises like the Black Mirror Brainstorming exercise might help build some consensus in the organization about the importance of thinking about values and ethics. In the fiction, I try to suggest ways that Joanna's headlines activity might serve purposes that are not about designing products, but about coalition building or helping others see values in human-centered ways, such as the texts with Kirk to try to continue these conversations in another way. This perhaps reflects the second type of reconfiguration, getting others to adopt human-centered perspectives on values, as Kirk (an engineer) begins thinking about values issues in new ways after this activity.

The activities in the fiction also lead to Joanna attempting to re-configure organizational strategies and politics by advocating for funding a research group with academic collaborators. However, this attempt does not succeed. Depicting this as a failure was influenced by interviewees Genevieve and Cecilia, who talked about doing side projects related to values issues (such as creating personas that foreground a spectrum of different types of power relationships in the workplace), but other pressing concerns happened, and they didn't finish those projects. This is reflected in the fiction through Joanna's proposal of a research project, that gets sidelined due to other organizational priorities

Overall, this set of reflective design fictions try to shed light about how conversation, contestation, and teaching about values and ethics can happen within the organization in ways that go beyond making technical design choices in a product. These types of practices are hidden perhaps if we only look at the values inscribed in artifacts after those artifacts are created and produced. Articulating these ideas through design helped me recognize different forms of re-configuration work that UX professionals were doing, including attempts to get others to adopt human-centered perspectives on values, and attempts to change organizational politics and strategy.

The themes from this reflective fiction also begin to suggest new roles for design in values in design research. Values-centered design methods, like value sensitive design, tend to frame design around "solving problems" – if we find the "right" set of values, we can build systems that adhere to those values. Increasingly, researchers have advocated that forms of speculative design done as a part of the technology design process can help in doing this identification work, that speculative design and design fiction can help surface the values and harms at stake. Design solutions can be then created to address those values and harms.

However, the reflective fictions also point to another potential purpose or goal of design activities in the workplace outside of the product design process. Instead, it can help with education and coalition building, potentially helping to change other workers' or the company's perspectives and politics on values.

Conclusion

Using the handoffs lens allows an investigation of different configurations of values work, each of which assigns responsibility for addressing values in different ways. Importantly, these configurations and re-configurations are occurring simultaneously; they are not discrete states. This suggests the question of how to configure responsibility for addressing values within technology companies is still an open and ongoing one. This allows UX professionals who have the desire or initiative to work to shape these configurations at their organizations, in a way that creates a seat for UX professionals and their human-centered perspectives on values at the organizational "table" where values get discussed and addressed. Re-Configurations 2 and 3—getting others to adopt human-centered perspectives and changing organizational politics and influencing organizational strategies—reflect that UX professionals' re-configurations are not about taking all responsibility over values issues. While UX professionals see themselves as partially responsible for values issues, they also identify others in the organization who should hold responsibility, such as product managers and executives. UX professionals' re-configuration practices seek to change the politics and practices of these other organizational stakeholders who they view as being partially responsible for addressing values issues.
at several organizations are working to shape these configuration

Prior research has explicitly advocated for giving UX professionals larger roles in conducting privacy work due to their technical and design expertise, able approach the concept of privacy by seeing it as situated and contextual in stakeholders' experiences, as opposed conceptualizing privacy as just a set of deductive legal compliance measures (Mulligan and King 2011; Wong and Mulligan 2019). These calls shift responsibility for addressing values to include frontline UX professionals, not just lawyers and managerial privacy professionals. Design methods such as value sensitive design implicitly suggest that UX professionals should be given responsibility for addressing values and ethics, by equipping them with a set of practices, methods, and lenses to approach values. In other words, this prior work advocates for re-configuring organizations to "handoff" the functions of addressing and values and ethical issue to UX professionals (at least partially).

However, the handoff analysis suggests that handing off responsibility of values and ethics issues to UX professionals is more complicated. The calls in prior research tend to focus on values work that arises in everyday UX practices, such as integrating practices like value sensitive design into existing UX workflows. The handoffs analysis of multiple (re)configurations of values work reveals how UX professionals' practices to address values exists beyond everyday UX work. This broader set a set of social and organizational relationships and modes of action that need to be similarly considered when advocating for giving UX professionals responsibility for values and ethics work. UX professionals should be supported socially and organizationally, as well as through technical design practices.

Moreover, UX professionals' ability to act is influenced by their positionality within the assemblage. Even if acting collectively with other UX professionals, other components of the assemblage—such as managers, other teams, the organization, or external stakeholders—can act

on UX professionals, enabling or constraining their actions, or presenting barriers for UX professionals' actions. These constraints and barriers include financial and market incentives for the organization, or needing to convince others in the organization about the relevance of thinking about values.

Furthermore, UX professionals' choices in their mode of actions have different implications about how values problems and solutions are framed. For instance, consider where the sources of values come from. Looking to clients and user represent one source of values that is also amenable to capitalistic impulses and economic justification (i.e., aligning products with user values will allow the company to sell more product). Other times, the source of values might come from technical standards or legal statutes, such as when complying with accessibility standards or data protection regulations. Looking to humans and stakeholders more broadly (beyond paying customers) as a source of values implicitly relies on human rights that we have a shared (though often unstated) commitment to, such as human dignity. The "source" of values varies among UX professionals' modes of action—in part because some can more quickly lead to action by other organizational stakeholders. Justifying values work by highlighting customers as the source of social values can enroll financially-motivated stakeholders into addressing values, but not all values problems are easily amenable to this type of economic framing.

Modes of action may also vary in their scope and timescale of action. For instance, changing organizational policy documents such as corporate contracts may have longer-lasting staying power and affect a broad range of products, while designing a technical affordance may only affect a single product and have less staying power if that affordance is easily overwritten in a new release of the product. Furthermore, some modes of action have a narrower scope, focusing on values that are "centrally" salient, such as how the design of an interface may directly affect the social values that are expressed by the technical system. Other modes of action have a broader scope, addressing values that may be "peripherally" salient,[38] such as when values problems are caused by indirect use. For instance, some UX professionals are concerned when the enterprise software they create is purchased by a client organization that causes harm to people. The software is not directly causing harms, but indirectly supports the organization causing harms. Modes of action to change contracts and service agreements to exclude hate groups and other harm-perpetuating organizations from using the software provides a way to address peripherally salient values problems.

The lens of handoffs also begins to surface a tension about individual versus collective responsibility. Many values in design research tools are framed around an imagined individual designer who has the agency and authority to speak up about values issues. This is reflected in Milton Glaser's "Road to Hell" ethical questions that Henry uses, and are examined in the first reflective design fiction in this chapter. Across the configurations, UX professionals report a range of individual and collective actions in conducting and re-configuring values work. This leads to potential new design opportunities for researchers, to design values in design tools for a range of different collectives. Collective responsibility for values work could fall among UX professionals within one organization, or a range of people invested in values in an organization, or even spanning workers across organizations. This adds more nuance to the question raised in Chapter 2 regarding who does the work of design in values in design? Chapter 2 suggested looking at design led by design authorities and design led by other stakeholders. This chapter suggests that we might additionally ask whether the work of design is being done by individuals

[38] The language of "centrally" and "peripherally" salient values draws on Shilton et al.'s discussion of dimensions of values (Shilton, Koepfler, and Fleischmann 2014).

or collectives. If being done by collectives, we may further probe to ask what the makeup of that collective is.

UX professionals' reported practices lead to a consideration of how their values work aligns with the concept of critical technical practice. Agre's critical technical practice consists of both a set of technical steps (identifying dominant metaphors in a discipline or field, identifying what those metaphors leave out or marginalize; then inverting those metaphors, centering what was previously marginalized at the center of the design) (Agre 1997b). Moreover, Agre writes that a critical technical practice must engage with the dominant forms of technical practices that are being critiqued: "Technical work is performed in and by communities, and a critically engaged practitioner cannot hope to found an alternative community in which everyone shares the same critical premises and methodologies. As I worked my way toward a critical technical practice, this was the part that I found hardest: maintaining constructive engagement with researchers whose substantive commitments I found wildly mistaken." (Agre 1997a)

Everyday practices of UX values work, such as reflecting during technical design and promoting diversity in user research recognize who and what are left at the margins in existing practices, and attempt to bring those at the margins closer to the center of UX professionals' technical practices. Similarly, re-configuration practices of making more space for UX values work and getting others to adopt human-centered perspectives on values consist of actions that try to bring UX forms of values work from the peripheries of the organization to the center. Like Agre's discussion of critical technical practice, these actions put forth forms of (UX-based) technical practices as an alternative way of doing values work. Advocating for these practices requires social work as well, such as making values work visible and legible to other organizational stakeholders.

However, some UX values work practices, particularly those focusing on re-configuring organizational politics and strategies, seem to fall beyond the bounds of critical technical practice, as they are not innately tied to forms of UX professionals' technical practices. Here, the lens of infrastructures studies helps provide insight. The social forms of work done by UX professionals—such as making values and values work visible, agenda setting, and maintaining and managing social relationships—are creating social infrastructures to help re-configure how values work is done. Building and maintaining social relationships, along with the spreading and teaching of human-centered perspectives on values act as attempts to create new norms and communities that have the capacity to act on values issues in ways that align with UX professionals' perspectives. Agenda setting and making values work visible and legible are ways to give UX professionals license to continue doing this work within the organization. In doing this work, UX professionals' infrastructural work is promoting an alternative sociotechnical imaginary of the organization and how it addresses values in a way that includes UX- and human-centered perspectives, both through its technical output and in its organizational politics and strategies.

Chapter 6: Power and Soft Resistance in Values Work

In the previous chapter, I discuss different modes of action that UX professionals either have utilized or encountered in the course of doing "values work"—the practices that they employ in the name of surfacing, addressing, or attending values—within various configurations and social relationships. Values work occurs as part of everyday configurations of UX work. But UX professionals also re-configure how values work is done in their organizations: by making more space for UX values work; by getting others to adopt human-centered perspectives and practices related to values; and by working to re-configure the politics and strategies of the organizations they work for.

In this chapter, I discuss the power dynamics involved in conducting values work: the affective experience of doing this work, and what happens when this work both succeeds and fails. I first discuss the emotional labor involved in conducting values work. I then analyze values work as a form of soft resistance, recognizing a modality of resistance that is critical of aspects of technology companies and product development processes, but is "firmly rooted in many of the same social logics that shape the categories they seek to escape" (Nafus and Sherman 2014). Nevertheless, this perspective allows us to see forms of resistance from within existing systems, rather than from an idealized outside position (Lindtner, Bardzell, and Bardzell 2018). The chapter then reflects on how this soft resistance is represented through tensions between skepticism and hope about the possibility for technology organizations to actively use values-centric practices.

Similar to the previous chapter, reflective design fictions are interspersed throughout the chapter. These designs were created while analyzing interview and field work data, as a way to think through and analyze themes and the politics of interviewees' practices. Each fiction is presented in a section with relevant themes, and serves two purposes. First, they help show part of my process of analysis of interviewees' practices. Second, they serve as a brief break from the empirical data, inviting the reader to think through the themes presented in another (potentially speculative) setting or context.

Values Work & The Positionality of UX Professionals

Prior researchers have used various terms to describe technology workers who attempt to surface discussion or motivate action around values and ethics issues. Metcalf, Moss, and boyd describe "ethics owners," where "'owning' a portfolio or project means holding responsibility for it, often across multiple divisions or hierarchies within the organization," either in a formal position or as a personal mission (Metcalf, Moss, and boyd 2019). The majority of Metcalf et al.'s group of ethics owners who they talked to have some aspect of ethics ownership within the boundaries of their formal position and have supervisory responsibilities, are team leaders, or principals. Shilton, studying academic engineering research teams, uses the term "values advocate" to describe someone whose formal position it is to think about and surface discussion of values (Shilton 2013). However, Shilton points to the potential of other team members and team leaders to conduct values advocacy work as well.

In contrast, UX professionals tend to work closer to the front lines. While the UX professionals who I interviewed do values work, most lack the formal positions of Shilton's values advocates or the company-wide portfolio of Metcalf et al.'s ethics owners. This chapter thus investigates accounts of values work, but conducted from positions lower down within the organization.

As detailed in Chapter 5, UX professionals conduct values work in the course of their everyday practices, by utilizing modes of reflection, designing affordances, promoting diversity in user research, information seeking and sharing, designing-with others, advocating for values, making values issues visible, agenda setting, and managing social relationships. However, they face a range of challenges stemming from a lack of decision-making power in the organization, or stemming from differences in how the UX professionals and the organization conceptualize what values work looks like. These challenges lead UX professionals to work towards changing how values work is configured in their organizations. Several interviewees discuss their work and frustrations in trying to get other organizational stakeholders to see the value of UX, design, and user research. UX professionals promote human-centered perspectives and practices towards values, which provide an alternative approach to values work compared to legal compliance or requirements-based engineering approaches. Rather than seeing values like privacy, security, and accessibility, as a set of rules to comply with, a human-centered perspective recognizes the lived experiences with these values. Beyond seeing UX approaches as being valuable for values work, many interviewees recognized that there are limits to addressing values issues through technical UX practices. Recognizing these limits of technical design, some UX professionals work towards changing organizational practices, processes, and politics by re-configuring how values work is conceptualized and executed by the organizations they work for. This chapter re-examines these modes of actions by paying attention to how power is implicated in UX professionals' practices.

Emotional Dimensions of Values Work

Of the UX professionals conducting values work who I interacted with, their description of their work practices sometimes included discussion of strong emotional components, such as discussing feelings of frustration at challenges and failures, while still needing to manage and regulate one's emotion in order to maintain professional and social relations. Compounding this, a lot of the work around values advocacy is viewed by the UX professionals as extra or additional to normal work tasks, which limits the visibility of the work.

I draw on Hochschild's concept of emotional labor, labor which "requires one to induce or suppress feeling in order to sustain the outward countenance that produces the proper state of mind in others" (Hochschild 1983, 7). To the extent that Hochschild focuses on emotional labor in corporate and professional jobs, she focuses on workers that have face-to-face (or voice-to-voice) contact with the public, workers who are required to produce an emotional state in a customer or other person, and workers whose employers exercise a degree of control over their emotional activities (Hochschild 1983, 147). UX professionals differ from these categories in some respects. While some researchers do have face-to-face contact with users and external stakeholders, most emotional labor practices related to values work occur internally within the organization. Furthermore, emotional labor is not an explicit requirement controlled by UX professionals' employers. Yet through enforcement of social norms, UX professionals do sometimes need to conduct emotional labor as a part of doing values work. I first describe emotional and affective dimensions of values work, then describe the emotional labor of regulating those emotions in the workplace.

Voluntariness of Values Work

UX professionals already work to legitimate their practices and forms of knowledge as useful to the organization. Some values work is formalized within organizations, for instance there is often a formal team responsible for addressing issues of accessibility and making sure that products comply with accessibility standards. Increasingly, responsibility for privacy and security has been allocated to dedicated teams. However, much of values work that seeks to address broader politics and harms is done beyond the boundaries of everyday UX work, often in informal ways—sometimes with implicit or explicit approval from the organization, but sometimes done without approval or in opposition to the organization. Affective dimensions arise in this work sometimes due to the need to navigate the precarious- or risky-seeming nature of unsanctioned values work, or sometimes due to frustrations stemming from doing unrecognized or uncompensated labor.

Several interviewees describe initially doing this work of making values visible to others as feeling "risky," in part because it is uncertain whether or not that is within the bounds of what is seen as legitimate or appropriate UX work. For instance, Cecilia, a user researcher at an enterprise business software company, felt this way when she started her job.

> Cecilia: When I started my job, I did feel more nervous to even raise any of this stuff. Like I remember the first time that I raised, "are we automating people out of work?", it felt a little bit risky to bring that up. But now, that doesn't feel risky, at least in the settings I'm talking about, even with the head of my team or whatever. […] I'm not actually putting any pressure on people. It's almost like releasing a little bit of the steam or something.

Cecilia feels more comfortable now in raising issues related to values and potential harms among teammates, even feeling like she needs to go further. However, other interviewees still voice feeling uncertainty in their values advocacy actions. Britney, a user researcher at an enterprise software company, discusses this as caution when trying to surface values and ethical issues with people beyond her UX team.

> Britney: If it's a meeting in mixed company with product and engineers and sales, product, data science—then I definitely feel more like I choose my battles carefully and my words even more carefully. Because I do feel like I need to speak in business-y, product manage-y lingo. Also, I'm new. I've only been here for a year. I'm starting to feel more confident bringing things up. And my boss talks about this too, that we're like tugboats. Part of picking my battles is part of this longer-term strategy to move product in a certain direction slowly over time. I think I can bring stuff up, but I have to be really careful about how I bring it up. I think I have to be really thoughtful about my approach

The tugboats metaphor is hopeful, that a careful picking of battles can move product decisions over a longer period of time. At the same time, there is an understated caution expressed by Britney about what might happen to her professionally if she tries to move too fast or overstep her role in the eyes of other stakeholders in the organization.

Adding to feelings of riskiness is when making values visible and advocating for values is done in opposition to the organization, such as when UX professionals feel that their organization is not living up to its stated values. Francine, who works at a company that creates business software, discussed an incident where she and other co-workers learned that one of her

company's client organizations was involved in perpetuating harms against migrant families at the US-Mexico border. The client organization reached out to ask for help to improve the accessibility of their installation of the business software made by Francine's company. Francine and a co-worker had strong feelings against helping this client because of their involvement at the border, and decided that this was an issue that was worth speaking out about.

Francine and a co-worker drafted a letter that they planned to share, noting how this violated their personal individual values. When I asked why they framed it this way, Francine noted that they were unsure "how empowered" they were when conducting these actions, and felt that the safest way to frame their advocacy was through their individual beliefs.

Other UX professionals take on more formal volunteering duties to do values work and values advocacy, inside or outside of their organization, but formal volunteering roles present forms of emotional work as well. Nova, a senior designer for an enterprise social network platform is involved in their parent company's diversity and inclusion initiatives in a voluntary capacity.

> Nova: There's maybe six different official work streams. And then I have a bunch because I do a lot of unpaid labor around diversity & inclusion stuff. And that's another like six work streams. And it's just like pushing the ball a little bit in all of them further along, but never enough to really feel like it's making that much of a dent in any of them.

Nova's diversity and inclusion volunteer labor involves things such as providing workshops in the office to talk about workplace grievances, or helping to implement a diversity and inclusion track at a customer conference. Nova describes this volunteer work as "piecemeal," and in the quote above, expresses frustration that it is difficult to see changes made on a day to day level.

Values work is emotional and affective in part because it is often done in unsanctioned ways that may be in tension with existing organizational practices, leading to feelings of uncertainty or precarity about how much license one has to advocate for values. It is also affective in the sense that a lack of recognition of these practices as labor and work can lead to mental exhaustion and frustrations. Frustrations can also arise from a lack of visibility in resulting changes from this work due to its slow, piecemeal nature.

Ongoing Values Work as Affective

The ongoing and often repetitive nature of values work also presents affective dimensions. Emotional frustrations can compound when a UX professional feels that they need to bring up the same issue repeatedly.

For instance, one values work practice discussed in Chapter 5 involves advocating for conducting diverse user research, such as studying both direct and indirect stakeholders. Nova, a senior designer for an enterprise social network platform, discusses their frustrations with this type of experience. They describe a situation where their team was working on a tool for moderators, and their product manager wanted some user research with moderators, the direct stakeholders. Nova pushed to also do research with end-users—a set of indirect stakeholders—to understand their viewpoints on the moderation process. Advocating for doing this additional research work can be difficult when managers and decisionmakers primarily value the perspectives of direct stakeholders over indirect stakeholders. In this case, Nova felt ambivalence. While they were glad that that their manager was open and responsive to talking with indirect stakeholders, Nova also felt frustrations as they felt that they had already brought up this issue repeatedly.

> Nova: My product manager was like "you know Nova, thank you so much for bringing that up. Like I just hadn't thought about how end-users would be affected by this." It's nice like they're thanking me because it's often a thankless job. But I'm also just like, I just want to bang my head against something hard. Like cause every single effing conversation is like this. Where it's like "oh yeah I hadn't thought of it that way," and like, *I have been telling you*.

Nova's ongoing advocacy work goes beyond advocating for conducting diverse user research, but also for greater diversity and inclusion in the workplace. Nova wrestles with the energy it takes to constantly be the person advocating for and surfacing values issues, though notes that they continue doing this due to personal motivation.

> Nova: I feel like what often happens with me is I'm providing the stimulus *every single day* of "have we considered this?", "have we done that?", etcetera etcetera. I don't really see others, beyond maybe a couple individuals here and there, who are bringing up that stimulus on their own. And most of the time nothing gets done even when I do bring it up. So sometimes it's hard, like "why do I even bother?" But I also just would feel so awful if I didn't bring it up because at the end of the day the reason why I'm motivated is to make more diverse and inclusive spaces.

Nova also discussed forms of mental exhaustion they experienced. Nova sings "just keep swimming" from *Finding Nemo* when describing their need to keep doing this work, but they also describe some of the toll it has taken on their non-work life.

> Nova: In the past, like school and my first job, I very much still turned to critical theory and books and all these things for gaining perspective. But I've kind of reached a point where so much-- Like my work life is not even always super intellectual, but it still feels intellectually exhausting. And I just have a really hard time concentrating and reading. I think in part cause I have to context switch so much at work, that I just do not have the patience right now for books. And I feel sad about it.

Nova is motivated to individually keep raising values issues for their co-workers to attend to and address. But this emotional labor remains less visible and compounds over time due its ongoing nature, and rather than being compensated, Nova bears the costs of exhaustion. This aligns with Neff's research of a longer history of internet technology companies shifting (often economic) risks away from collective responsibility onto individual workers (Neff 2012).

Regulating Emotions

A re-occurring values work practice discussed in Chapter 5 involves UX professionals' maintenance of social relationships with other organizational stakeholders. Yet interviewees discuss emotional frustrations in doing this work, particularly when trying to get other organizational stakeholders to see the value of UX, design, and user research. They expressed frustrations of being in a position where their roles are not always seen internally as having a lot of power or expertise, such as when user research recommendations are not followed by product teams or product managers, or when UX professionals have to fight for resources to conduct user research. Given this background, moderating and regulating emotions becomes a part of maintaining social relationships with other organizational stakeholders, as UX professionals work to politically navigate their organizations.

Isabel, now a UX consultant, discussed her prior experiences working as a user researcher at an eCommerce platform, and the emotional toll of being viewed as a "Debbie downer," or the person who is constantly bringing up problems and issues, even though that is technically within the scope of her job.

> Isabel: I think as a researcher you sometimes get the reputation for being a Debbie downer or negative because you're usually bringing problems to the team. You know you're there to point out issues, and figure out how users are interacting with something, and the ways in which that could not be working very well. And so everyone I've worked with always says they love research and they love the researchers, but then when it actually comes to giving the bad news it's not always so great. Whereas as a consultant I can go in, give the bad news and leave. [*laughs*] And luckily usually they tell me to come back and they hire me for more projects, so it's not like they don't [like] bad news. It's like medicine, right? They need to take it but they don't like it. [*laughs*]

For Isabel, navigating to try to avoid getting the reputation of being a "Debbie downer" user researcher is one of the distinguishing differences between her prior experience as an in-house user researcher, and her current external consulting position. She feels that her current position allows her to be more critical without worrying as much about how people will react to her surfacing of problems. While Isabel discusses the idea of being a "Debbie downer" as a general risk of being a user researcher, other interviewees touched on this theme in discussing specific values work practices.

Nova, a senior designer for an enterprise social network platform, talks about having to do their own emotional regulation, trying to stop themselves from expressing anger at work, and putting in additional effort to try to understand where others are coming from.

> Nova: But usually I feel I'm having to bite my tongue from getting really angry. I'm like "how are we not [thinking about that]?" […] I guess I explicitly spend a lot of my time studying, or reading stuff on Twitter [*laughs*] or whatever. I'm trying to expand my worldview in that way. And that's not how others do. So I've been trying to do more of the long game approach of being really deeply understanding where they're coming from, and where they're at in terms of like understanding.

Nova's emotional labor comes through in trying to refrain from showing their anger, and trying to be more understanding of those who disagree with their perspectives. In effect, trying to produce a calm state of mind in others. While Hochschild's discussion of emotional labor focuses on how emotional labor itself is commercialized and sold as part of a service (such as the work of flight attendants), Nova's emotional labor occurs internally within the organization. Rather than enforcing emotional labor through formal rules and training (as Hochschild discusses), Nova's emotional labor is required by social norms of interaction within the organization, in order for Nova to effectively conduct values work with other workers.

A lack of regulating emotions can lead to failures in conducting values work. Francine, an accessibility engineer who works on a UX team at a company that creates enterprise business software used to work on a team that conducted accessibility reviews of products. Francine felt that in doing this work, her team was sometimes labeled by others in the organization as the "accessibility police," as they had oversight power to force other engineering teams to make accessibility-related changes in their products before a release. She described what they were doing as "enforcers," but there was a lot of pushback on this approach from other parts of the

organization. Genevieve, a senior product designer at the same organization also discusses the perception of the accessibility team among some co-workers:

> Genevieve: You used to have [accessibility] reviews every release. So like for every set of features that might get released every four months, the accessibility team would review it and they would have the power to actually block you from releasing things, or mandate that you change things in the design so that it was accessible. And they'd do this with engineering too. And usually what they're looking for is color contrast and a screen reader being able to read everything on the screen.
>
> But a lot of designers really hated that and felt like it was the "accessibility police" who didn't understand the constraints they were working in and dumbing down everybody's designs. One person told me that he felt it was unfair to be making a worse design, like dragging down the design by having to center on the "lowest common denominator."
>
> And I was like, man. I sent him a link to the inclusive design personas, and was like "I understand this looks a lot nicer on your screen and on your phone and in your portfolio and on Dribble, but you're not designing a poster. You're designing a tool for people to use to do their job." So obviously I have a very strong point of view on that. I think accessibility is really useful.

While Genevieve is sympathetic and appreciative towards the accessibility team, she also later describes how others in the organization viewed them as a "kind of a pain in the ass." Eventually, this conflict led to a formal reduction in power. Whereas before the accessibility team could mandate changes in product features, their power was reduced to providing recommendations and consulting. Francine noted that they now focus on trying to do education and consulting with teams, creating tools and checkpoints, but they do not have the same type of oversight power like they used to. Genevieve notes the difficulty brought on by this new reduced set of powers.

> Genevieve: They [the accessibility team] do reviews, but they're voluntary and the team has been told that they're not allowed to provide any design feedback. Only feedback on accessibility. Which is kind of impossible to do; that line doesn't really exist clearly.

The case of the accessibility team suggests a failed attempt at values work due to unsuccessfully regulating emotions while managing social relations with other organizational stakeholders. Without the emotional and performative work to be seen as "helpful," the perception of the accessibility team as "accessibility police" ultimately led them to have less power to mandate design changes to improve accessibility.

Across these examples, the labor of regulating emotions emerges in the maintenance of social relationships with other organizational stakeholders, so as not to be viewed as a "Debbie downer," "police," or "pain in the ass." The need for emotional labor presents a set of paradoxical outcomes. Engaging in this work is invisible, where the individual pays the costs of exhaustion, such as in Nova's case. However, not regulating emotions well can be detrimental, such as at Francine and Genevieve's organization where an inability to perform in a "nice" way led to a reduction in the accessibility team's ability to address issues.

Hochschild, drawing on Illich, describes performing niceness as "shadow labor," or unseen efforts that do not formally count as labor but are crucial to getting other things done (Hochschild 1983, 167). Niceness is also gendered as feminine, viewed as being deferent to

male-coded practices. Of the 12 UX professionals I talked to, 3 were male and 9 were female or nonbinary. While I make no claims that this is a representative sample of UX professionals who explicitly do values work, it is worth noting that emotional labor and shadow labor often falls on non-male technology professionals to conduct.

Reflective Fiction: The Ethics Work Tracker

This is a screenshot of a speculative Ethics and Values work tracker. Someone can use this tool to track work tasks related to raising discussion and addressing values at the workplace. Each square represents a day and darker squares indicate more "contributions" to values and ethics work.

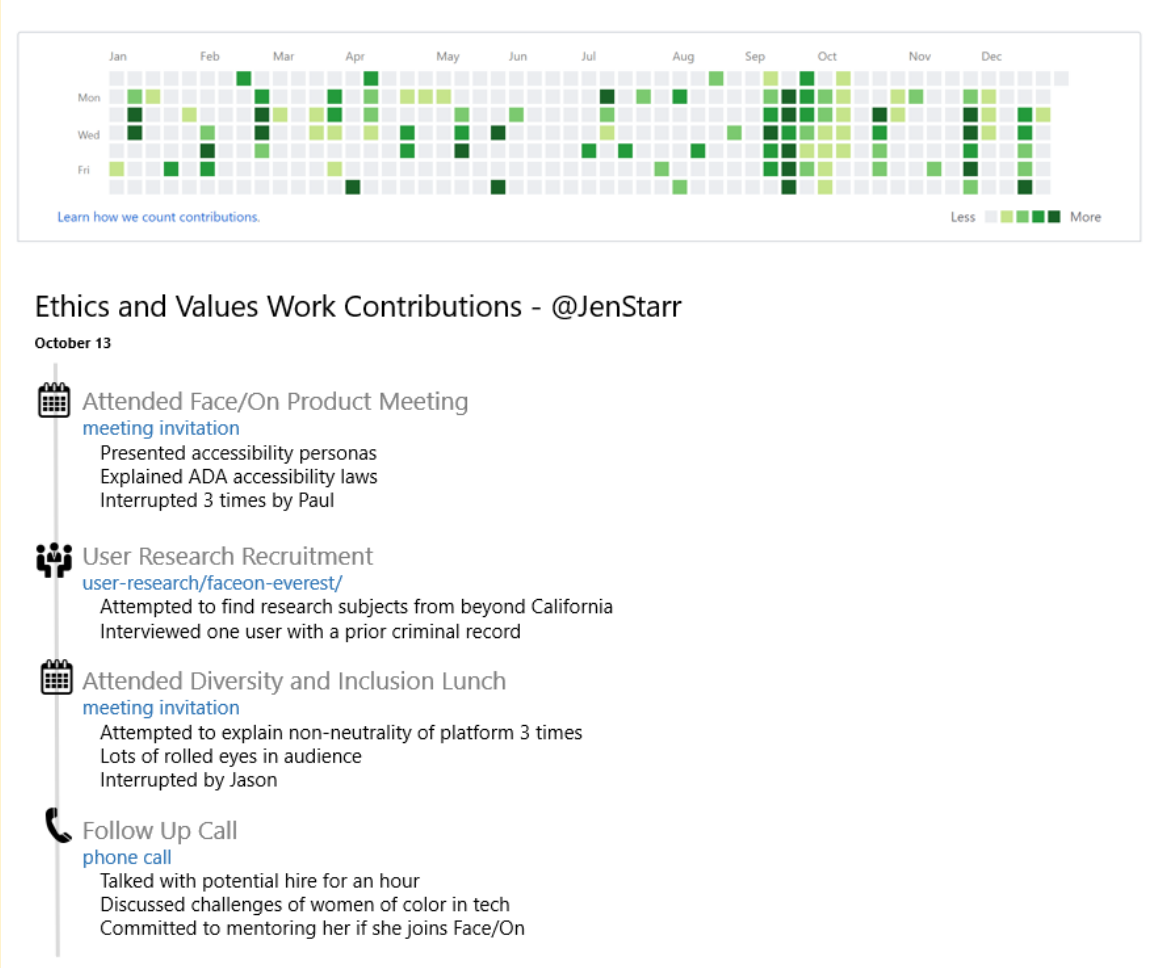


Figure 6.1: This screenshot shows a profile page for a user, Jen Starr, who works at the company Face/On, which creates an online platform that provides data processing services for facial recognition services.

The profile page shows the details of (fictional) user researcher Jen Starr for one day, where she tracks things like attending a product meeting where she presented a set of user personas around accessibility, but she also had to explain ADA accessibility laws to co-workers. She notes that she got interrupted 3 times by Paul. Later she records tasks related to user research recruitment. Then she attends a diversity and inclusion lunch, where she tried to explain the non-neutrality of platforms multiple times, only to face rolled eyes and another interruption. At the end of the day she spends time talking to a woman of color who has been offered a job at Face/On but is undecided about joining a technology company. Jen

shares her experiences and challenges, and offers to mentor the new worker if she chooses to work at Face/On.

In creating this speculative tracker, I wanted to ask about and explore what forms of unrecognized labor are involved in doing values work. This was inspired in part by Laura, who works at an educational tech company, and talked about creating an "ethical debt tracker" using bug tracking tools. She keeps a list of the times she wanted to add or change a feature that had some values implication, but was told that they couldn't do it now, and they'd try to incorporate it later. Laura wants to have this record so she can bring up those issues again in the future. Relatedly, Nova, who works at an enterprise software company, mentioned that they are involved in their organization's diversity and inclusion initiatives, but immediately said that they are unpaid for that work. Nova also discussed the ongoing labor they do to probe and educate their manager on what diversity and inclusion means during meetings. Both Laura and Nova are grappling with forms of unrecognized labor that they're doing, and this speculative tracker asks what might it look like if some of that work was explicitly tracked and recognized. And what additional politics might get embedded if it were made visible in this way. This form of measurement of "ethics and values work" is potentially problematic in its own right. The grid graphic adapts a visualization used by GitHub which records the technical contributions someone makes to a coding project, but tries to adapt that model of tracking to a different form of work.

Reflective Fiction: Ike the Icon

Ike the Icon is an animated hamburger-style menu icon, who sits in the bottom corner of someone's desktop. Similar to Microsoft's Clippy, Ike uses pattern recognition to recognize when users conduct certain actions in order to try to assist them. However, instead of detecting things like someone writing a letter, Ike monitors a series of software programs (such as emails, product management software, and prototyping tools) to detect when people might be conducting problematic design decisions, and provides links to resources (either internal or external to the organization) to help address those issues. Ike supposedly helps values advocates by being delegated the emotionally-fraught work of being the "Debbie downer" who constantly brings up potential ethical issues.

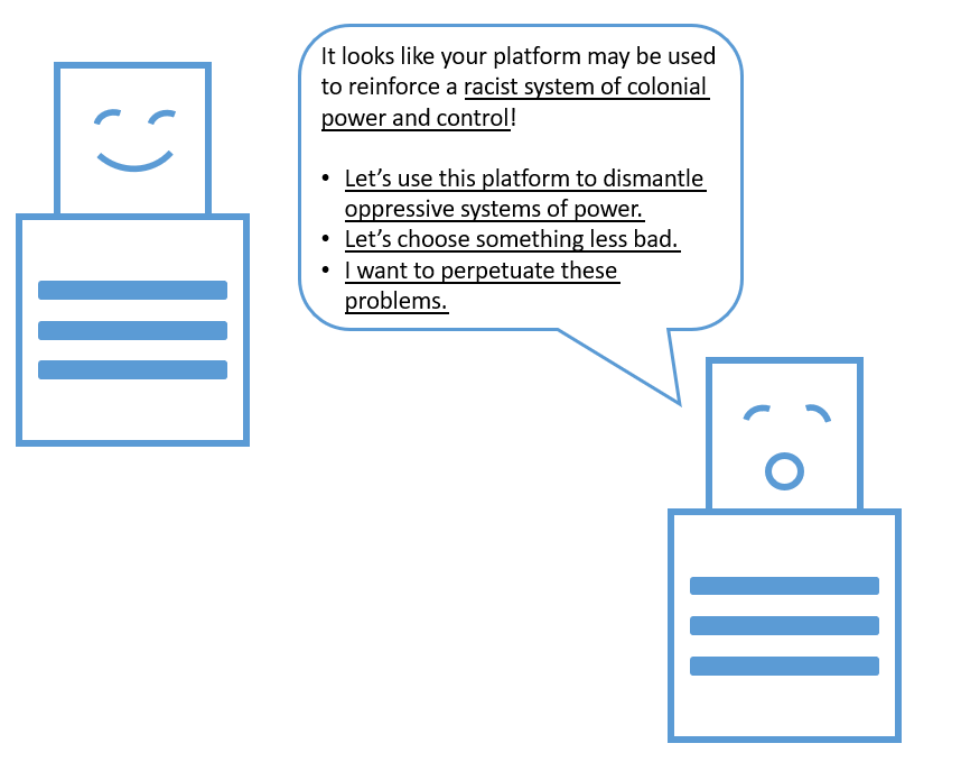


Fig. 6.2. Ike the Icon in a passive state (left), and an active one (right).

Ike the Icon may seem ludic at first, and in some ways tries to relieve some of the pressure for the right person to be "in the room" and tries to help alleviate some of the emotional labor required of UX professionals and values advocates being the "Debbie Downer," constantly bringing up issues. Ike not only draws inspiration from Microsoft's Clippy, but a range of chatbots, such as the "hey guys" Slackbot, a custom program that can be installed in Slack to automatically suggest gender-inclusive language whenever someone sends a message with the term "hey guys" in it (Haughey 2018).

How Ike works is left ambiguous for the viewer to speculate on the implications of possible ways it could be implemented (W. W. Gaver, Beaver, and Benford 2003). Perhaps Ike is limited to trying to find patterns in written code, or Ike might be more ubiquitous, responding to messages that people send in emails or chat channels, or perhaps it's a relatively simple chatbot like the Slack "hey guys" bot. Ike the Icon is not necessarily a fully automated solution, it is possible that clicking on the links connect the user to another human to engage in a conversation or consultation.

Ike helps surface several issues. First, juxtaposing the (at least partially) automated work of Ike with the accounts of UX professionals' work in trying to surface values issues helps draw attention to the forms of voluntary and emotional labor done by the human professionals. Secondly, Ike is presented as a potential "solution" to the emotional and voluntary labor conducted by UX professionals, handing off responsibility for surfacing values problems from UX professionals to an automated tool. It thus raises a set of questions about the implications of configuring values work in this way. Perhaps most people would see it as a nuisance and try to click away (like Clippy). Might the repetitive nature of Ike actually help change minds over time? What type of language might Ike use to be most effective at driving change—or conversely, there might be economic incentives to deploy Ike as supposed evidence of paying

attention to ethics, but not actually driving any change. Is Ike able to do the same type of resistance work that UX professionals do?

Automation tends to re-configure work, rather than replace it. What is the role of a values advocate in this new configuration? On one hand, displacing some of the surfacing tasks that require emotional labor to Ike might be welcome for some advocates. Working with values advocates, Ike could help triage certain problems, perhaps directing workers to common design patterns for common problems, or escalating to a values advocate for a more complex problem. However, this perhaps makes it more difficult for values advocate to do the face-to-face work of finding organizational allies and getting buy in from a range of stakeholders to address ethical issues. A semi-automated tool might place more responsibility for ethics in the hands of legal compliance and risk management, rather than with UX professionals. At the same time, an automated tool may not address some of the social practices of values advocacy work, such as the building and managing of social relationships among UX professionals and other stakeholders.

Values Work as Soft Resistance

The previous chapter discusses a broad range of practices conducted by UX professionals in the name of addressing values. I return to some of these practices to analyze them as a form of resistance, where there is resistance against current technical and organizational practice, attempting to shift these to focus on certain conceptions of social values and ethics. Implicitly, this resistance is also about resisting how values work is currently done (or not done) by values advocates and ethics owners, and advocating for an approach to values that involves UX professionals' knowledge and practice.

This analysis builds on other research that studies resistance from lower positions of power. While UX professionals generally have well-paid positions and work for technology companies that give them some social status, within their organizations they often lack power. UX knowledge is not always viewed as legitimate or important, UX professionals tend to work further down in the organizational structure, and other stakeholders like product managers have decision-making power over design decisions. In discussing resistance practices, I generally refer to strategies and tactics using de Certeau's distinction: strategies are tools of institutions and the powerful, who can create and manage broad spaces and environments; tactics are tools of the weak, or those who must operate in spaces that they did not create and do not control (de Certeau 1984, 35–37).

I focus on values advocacy practices that seek to create change from within organizations, given the project's scope on studying work practices. I do note that some people who I talked to are also engaged in groups like the Tech Worker's Coalition or other political advocacy and organizing groups that seek to create change from outside technology companies, though these experiences are outside the scope of this project.

When looking at resistance practices within organizations, I draw on the concept of "soft resistance" as articulated by Dawn Nafus and Jamie Sherman in the context of Quantified Self users, describing:

> Soft resistance happens when participants assume multiple roles as project designers, data collectors, and critical sense-makers, rapidly assessing and often changing what data they collect and why in response to idiosyncratically shifting sets of priorities and objectives. […] We posit this resistance as "soft" as a way to capture both how such resistances are always necessarily partial, firmly rooted in many of the same social logics that shape the

> categories they seek to escape, and how the rapidly shifting nature of these categories matches the partial mutability of algorithmic categories as used in big data. (Nafus and Sherman 2014)

Similarly, many of the tactics used by UX professionals are similarly partial, in that they challenge certain norms around their organizations or the product development process, but often are rooted within a broader logic of the role of the market or the usefulness of technology. UX professionals also can assume and shift between multiple roles—as a technical professional, as a values advocate, as a researcher, as a designer, allowing them to make arguments from different positions about what values are important and why.

Metcalf et al. discuss three dominant logics among Silicon Valley ethics owners. First is *meritocracy*, the idea that hiring "the best people" who want to do the right thing will lead to ethical decision making; Second is *technological solutionism*, that tools like toolkits and checklists and best practices can be created that will lead to a technical solution and an ethical product; Third is *market fundamentalism*, that the ethical solutions worth pursing should add economic value according to the market, and that less profitable approaches are not worth pursuing (Metcalf, Moss, and boyd 2019). At some times, the resistance practices by UX professionals critiques these logics, while at other times making use of these logics, suggesting a "soft" form of resistance.

The softness described by Nafus and Sherman is not just about partiality, but also about the softness of material used in resistance, in their case data and processes of meaning making around them, writing: "Both QS practices and big data algorithms share Cheney-Lippold's sense of softness—a readiness to evolve what constitutes meaning as it unfolds."(Nafus and Sherman 2014). Ethics in the technology industry may be similarly describes as being soft in the sense of having a readiness to evolve what constitutes ethics as it unfolds. Findings in prior work have found that the practice of ethics in the technology industry are not based on formal ethical frameworks or ethical reasoning processes developed in philosophy, but rather an individual's gut feeling of what is right or wrong (C. M. Gray and Chivukula 2019). While this has been critiqued, this softness in ethics potentially serves as an entry point for resistance and contestation of how ethics and values should be practiced.

Using the perspective of soft resistance, I return to and introduce several values work practices. For each, I summarize the practice, provide an example, and discuss what each practice critiques or resists, as well as what dominant technology industry logics the practice utilizes or leaves constant.

Making Values Visible Rhetorically

UX professionals' values work includes making values issues visible in conversations and meetings with other organizational stakeholders. This is done using several tactics. For instance, Britney, a user researcher at an enterprise software company, discusses her attempts to frame a concern that a product that might not be best for the end users of the product (the workers of client organizations who buy software from Britney's company) using business terms, making the issue visible as a financial or reputational risk:

> Britney: I care about those end users being able to do their jobs and do their jobs well, and support their families, and also not have a horrible time using our product while they're doing it. [*Chuckles, sighs*] Like to have a good experience during using this

> product that they have to use for 90 percent of their workday. They don't have a choice. It's not like they chose to log into Facebook or something. They have to use this product.
>
> […] But that reasoning isn't gonna motivate product managers. So a lot of the argumentation that I do is around, "well, if we do this, we've already seen that we may get some negative feedback and even negative press, negative social media-ing, on this small scale. If we roll this out more widely, it's a risk that we're going to get a lot more negative feedback. And what that means is that we're losing trust with these companies. Trust has always been our number-one value, even more so than equality. This is a significant reputational harm or reputational risk."

Britney's concern is about the end users' wellbeing. However, instead of framing her concerns in terms of potential harms for the worker end users, Britney frames it as a reputational risk for her organization, in order to make the issue visible to product managers. Britney draws on her company's corporate value of "trust" in order to make the issue visible. The resistance at play here is in Britney's use of corporate values and the legibility of reputational risk to try to get product managers to take action that will address a potential harm to end users. At the same time, this tactic makes use of market fundamentalism logic: not addressing this potential harm is a reputational and thus financial risk; addressing the potential harm is the better market strategy.

Similarly, Laura, a senior user experience researcher at an EdTech company notes that user-centered justifications do not necessarily make issues visible in ways that lead to product actions, but financial arguments can.

> Laura: We'll know that [a design recommendation] it's right, but we can't necessarily say "this is good for the user." That answer only lasts so long, it only works so much. But then when you have that opportunity where it's like "okay this is bad for the user" I can say that, but I can also say like "it's also making us lose money." And when you say it's making you lose money, then [the product team] they're like "okay, now let's talk. Now we'll have this discussion." And so it's tying it back to the revenue dollars. I feel like there's people thinking about the social implications of the stuff that we make, but we're not always the people who make the decisions ultimately.

Laura makes social values about potential benefits and harms to visible in conversations with product teams, but similarly uses market logics to make these visible and legible. These rhetorical tactics of making values visible utilize existing market logics, but try to suggest alternative distributions of economic costs and gains that benefit the needs of end-users. These rhetorical practices utilizing financial and reputational work help to make more space for UX-led values work, by justifying and making it legible to other organizational stakeholders.

Making Values Visible Through Metrics

Another practice of making values issues to other organizational stakeholders is to tie values to metrics that can provide legibility and legitimacy. The organization of work within technology companies are often organized around different types of performance metrics, such as Objectives and Key Results (OKRs), or Key Performance Indicators (KPIs). Sometimes these can be seen as barriers to doing values work. Britney, a user researcher, views her company's metrics as hindering UX work, because she finds that existing metrics are not related to users having good experiences.

In contrast, Nova's experience with their organization's metrics suggest potential opportunities for forms of tactical engagement. In describing a team meeting, Nova brings up the idea of utilizing the rhetorical power of OKRs to help address diversity and inclusion issues.

> Nova: So we were making recommendations and one of those recommendations was to explicitly include cultural outcomes as part of the OKRs, because my [product] org, not necessarily all of [PARENT COMPANY], is trying to be much more OKR focused. But most of them are like bullshit metrics. […]. But they're saying culture is important. There's no metrics around like workplace culture and how it looks like. And they seemed really receptive to making that an explicit objective with key results that you could put under it. So that was cool.

Similarly, at a user research meetup event, attendees discussed how work at their organizations is organized around OKRs, one attendee suggesting that they need to find ways to "be in the room" where decisions are being made around defining the OKRs and other metrics. What was left unstated in this conversation were the lack of compensation, energy and time costs incurred, and emotional labor required when being the individual in the room doing this work.

Several participants discuss measurement tactics they use to increase the legibility of values issues among others in their organization. Laura, a senior UX researcher at a consumer EdTech company, discusses creating an ethical debt tracker by logging social issues in Jira, product management software that allows tracking of bugs and issues.

> Laura: The other thing that we do here and I've done sometimes in other places, but not always because it doesn't always get maintained or kept up, is a debt tracker. Like what did we find out that we didn't actually take action on? What did we design that didn't actually get built? And then bringing that back to the team and being like "hey y'all, remember that stuff we didn't make?" […] I've done these things in the past where we keep a backlog in Jira of things we know are really important. And we bring it up over and over and over again. Here my manager, the manager of the UX research team really liked that idea. There might be somebody else who was doing it on another business unit, and so she was very encouraging for that.

Nova, senior designer on an enterprise social networking product discusses the potential of using bug tracking software in their organization to try to capture attention for social and ethical issues.

> Nova: We do like bug bashes and stuff to like find bugs in our product. So I'm trying to be inspired by that to maybe think of like social bugs and stuff. And like misusing it.

These tactical engagements with measurement and bug tracking provide critiques and contestation over what counts as an objective and key result, or what counts as a bug, expanding these metrics to also consider values and ethical issues. Given technology companies' orientation of work around these measurements and metrics, these engagements can help make values and ethics more visible and legible to other stakeholders within the organization. At the same time, it potentially places values and ethics into logics of measurement—they become things that can be "measurably" improved, quantified, optimized, and accomplished. These tactical engagements with metrics help make space for UX-led values work, by making it legible to other organizational stakeholders. These practices may also help shift organizational politics and strategies around values by subtly re-orienting work priorities.

Promoting Diversity in User Research Practices

As discussed in the previous chapter, a common practice of values work among user researchers is expanding the types of people who they talk to, to promote diversity in users that are researched, instead of just talking to the users or clients that their organizations want them to focus on. User research is already an accepted practice in technology companies, but user researchers attempt to tactically expand and diversify the people they include as "users." This diversity serves as a way to surface potential harms that can have differential impacts on different groups of users. However, doing this work takes more time and resources compared to doing user research with a narrower group of users, such as the most common or most profitable group of users.

Laura, a senior UX researcher working for a company that creates consumer educational software, discussed trying to recognize and expand her interview pool to notice and include people from tribal communities.

> Laura: For example, last week I did a round of interviews with students about how they write a thesis statement. And you're going through the recruiting, like the thing that people have answered [on] the survey to screen [participants]. […] So I saw Diné College. Diné College I know is one of the tribal colleges in this country, it's on the Navajo Nation. So I called that out to our research associate who does all the recruiting for us and I was like "hey look, this is a person we don't usually get to hear from." So when we talk to that person, we have a referral program and referral bonus, which allows us to say "hey if you get us more people, we will give you this bonus." We'll incentivize them to get more people into our pool so that when we send out that initial screener, more people who fit that demographic will be in our pool.
>
> So it's just paying attention. And there's certain things I think you have to really pay attention to. And I don't always do a good job of it. But that experience taught me a big lesson of like spending a little bit more time on looking at who I'm recruiting and when. Because you're if you're lucky you'll catch something that allows you to broaden your scope of who you get to talk to and you look at.

While Laura wanted to continue working to include more research subjects from tribal colleges, she faced some push back from other stakeholders in her organization:

> Laura: But when I came out and was talking about it, even our product marketing person who *does* think we should help people and care about people, he was like "yeah, but we can't make a marketing strategy specifically to them because there's not a large enough population of them to warrant us to spend that money."
>
> I was like [*sighs*] "okay cool. Well, way to kill the buzz." [*laughs*]. But it's true because we are a private company. We are not a non-profit dedicated to advancing the education of indigenous people in this country. Nor should we claim to build a product that's going to end some kind of plight in that community**.** So I think in the moment I'm like "argh, that was so cynical, dammit." But then I think to myself, it's true though. Because unless we talk to all of them and really understand them, and spend time dedicated to them, we shouldn't market specifically towards them. We should try to figure out what group do they align with the most. Is it rural students? Okay, that then broadens the population, makes the business case a lot more easy to fight for, and also we're not making a claim that we cannot live up to.

In part, Laura's attention towards tribal communities is informed by her Master's degree, which involved thinking about information systems for indigenous communities. Laura is also reflexive about the limits of technological solutions in solving problems of inequality, noting that a technology is not going to solve the "plight" of indigenous people. As a form of soft resistance, Laura tries to find ways to consider the positionalities of indigenous and tribal communities, even as others in her organization do not see a business argument for doing research and marketing with those communities. Instead of categorizing her work as being about students in tribal communities, Laura considers using the category of rural students instead, to make a business case. The tools that Laura has at her disposal as a user researcher involve bringing in tribal and rural students into the ecosystem of educational technology in the subject position of users and consumers.

Other user researchers discuss tactically expanding their research pool to include stakeholders in different roles. Particularly for enterprise software companies, product managers might want user research to focus on the needs of their clients, who are often managers at the client organizations. However, several user researchers push for talking to the end users, often workers at these client organizations. Genevieve, a senior product designer working on an enterprise software product, and Nova, a senior designer working on an enterprise social media platform, face similar issues and try to expand who they talk to.

> Genevieve: The product managers get feedback from "users," but it's usually customers, AKA the VP of IT or whatever. And when I talk to a couple of those customers, they have fundamentally incorrect ideas about their workforce and what their workforce needs to do.

> Nova: What I'm doing a lot of work and right now is around community management and moderation stuff. And so I was having a meeting this afternoon where people wanted to talk to the moderator about this particular feature we've started internally implementing. […] They weren't gonna talk to end-users at first. And so I had to kind of justify why in my research approach I thought it'd be important we talk to end-users. Cause even though moderators are the ones using the tool, the end users are the ones actually experiencing that effect in whatever community or group they're in.

These efforts critique the definition of who counts as a user, but the broader subject position of "the user" is held constant. For Laura, this means trying to expand to students from tribal communities. For Genevieve and Nova this means talking to end-users, not just managers at client organizations. However, expanded definitions of who gets included as a user still enrolls these people into the broader market and technological solutionism logics in the technology industry. The practice of advocating for diversity in user research helps create more space for UX professionals to do values work as a part of their everyday practices.

Making Values Visible by Tactically Presenting User Research

User researchers make values visible by presenting user research to other organizational stakeholders. This involves tactically thinking about how they present narratives about their products and users. Cecilia, a user researcher for an enterprise business software company, discusses working on a product that is used to help manage contract workers. When presenting her research to others through recommendations and reports, she works to reframe dominant

narratives around contract laborers as being unskilled and cost-saving, to instead foreground narratives of skilled contract labor.

> Cecilia: I was going into it [the research] thinking everyone's just gonna say they use contractors to save money, they're just trying to not pay people. And then I found there's actually a lot of other reasons why people use contractors. Sometimes just because the people have really specialized skills that they don't need all the time, and they actually pay those people. It actually costs them more to use a contractor. […] I guess it's a bias of mine as a researcher, but the narrative around contractors doesn't have to be about encouraging people to get rid of their full-time workers and save money by getting contractors. I think there's small things in terms of the narrative in my research that I can do or in my recommendation.

This soft resistance practice aims to critique and expand the definition of who gets included and counts as a potential "user" in user research. For Cecilia, this means re-defining perceptions about who contract workers are. While these efforts critique the definition of who a user is, the broader subject position of "the user" is held constant—across all these efforts, there is still someone who takes the role of the user in relation to a commercial product. The expanded definition of who gets included as a user still enrolls these people into the broader market and technological solutionism logics in the technology industry. This practice helps attune other organizational stakeholders to human-centered perspectives on values that UX professionals advocate by foregrounding the role of users and their experiences.

Designing-With in Expanded Ways

UX professionals attend to values when designing-with (doing design work) in collaboration with teammates. These practices of designing-with often expand on or subvert existing UX design practices that are viewed as legitimate practices. Cecilia, a user researcher at an enterprise business software company, discussed the existing use of personas when thinking about users, particularly a set of personas developed by Microsoft around accessibility, providing a spectrum of different types of ability. She and teammates tried to come up with a similar set of personas that might help probe issues around workplace power as a side project. The project was ultimately unsuccessful due to shifting organizational needs; as a "side project," it did not get finished when the UX professionals were needed to work on other organizational priorities and projects. However, this is a tactic of trying to expand and repurpose personas, a common UX design technique, to try to drive more attention towards the power dynamics and spectrum of conditions for laborers.

Genevieve, senior product designer at an enterprise business software company similarly discusses using personas to foreground the value of accessibility, using a publicly available toolkit from Microsoft.

> Genevieve: [Microsoft's accessibility personas] are really cool. They're barely personas by the actual definition of the term, but what it is, is it's basically a matrix of people with a variety of kinds of disabilities: Temporary, situational, and permanent. So like you could have a temporary physical disability if you sprained your wrist. And the same things that are going to benefit someone who is like an amputee are going to benefit somebody who can't use their arm temporarily because they sprained it or they're holding a baby or something. So it's this idea of when you design for maximum

> inclusivity, you actually create a better experience for everybody. And disabilities aren't permanent, we can kind of move throughout them.
>
> So I did a version of those using [MY COMPANY]'s service personas. Like a temporarily disabled agent, and a permanent, and a situational, as a way of trying to educate customers on accessibility and why it's important to both use our design system which has accessibility baked into it and to figure out what other things they could be doing in their workplace at large.

Genevieve takes the personas that her company already uses to think about service workers, and explicitly adds in new dimensions to show a spectrum of ability, as a way to promote thinking about accessibility among those in her organization and the client organizations who interact with the personas.

These attempts to center thinking about values and their diversity across different people and situations in personas try to expand the conceptions of who "users" are by adapting design tools that are already used to conceptualize users and viewed as legitimate. In this way, the existing practice of generating and using personas in the design process is being expanded and subverted to foreground thinking of particular values. At the same time, the subject position of user itself is not critiqued, there is still a relationship between a commercial product and its user. Practices of designing-with allow UX professionals to incorporate values work into everyday UX practice, and to share design representations like personas with other organizational stakeholders to promote human-centered perspectives on values issues.

Designing Affordances Subversively

UX professionals can address values issues by designing particular affordances when acting upon technical artifacts. Genevieve considers ways she could try to propose or design features in their enterprise software explicitly in ways that might be more worker-friendly, rather than employer-friendly:

> Genevieve: So we've been asked to design a kind of out-of-the box dashboard for […] managers to use to see information about their workers. And the usual metrics are time to completion on a case, amount of time you spend on the phone. There's always a CSAT [customer satisfaction] score, customer satisfaction of the person that agent was helping. So when we did our explorations of that, we tried to think about not just what are the metrics that the team leader wants to see, because they're reporting up to somebody and it's all about efficiency. But also how are some ways we can use that experience to basically teach them to be less shitty managers. There was one exploration we did around being like "hey, could we use this data to say 'people who are allowed to take a break every so often perform better'?" or stuff around that kind of thing.

Later in the interview, Genevieve also discusses a desire to subvert design recommendations to try to include pro-unionization features:

> Genevieve: I do think all the time though about what are some features I could pitch to product managers to build that are essentially unionization features. But we could call them something else to try to camouflage and make [them] look like "team collaboration and efficiency" or something.

At the moment, these musing by Genevieve are more speculative than implemented tactics. She uses the UX process of design explorations, which are meant to explore different potential solutions to a problem. Here however, Genevieve introduces not just different technical solutions in the explorations, but proposes alternative design outcomes that embody alternative pro-worker and pro-unionization values. This type of exploration also suggests a practice similar to critical and speculative design. Genevieve's values-oriented design explorations represent a "values fiction"—the use of existing technologies that embody an alternate set of social values (Dunne and Raby 2001). At the same time, this mode of resistance fits within the broader logics of technological solutionism, the idea that a re-configured product will lead to a different, more worker-supportive outcome. Designing affordances subversively is a way of incorporating values work into forms of everyday UX work practice.

Using Organizational Values to Create Spaces for New Forms of Values Work

Another mode of action utilized by UX professionals to re-configure organizational politics and strategies is agenda setting. UX professionals act to conceptualize and enroll social values as a part of the agenda of the organization itself.

One form of agenda setting occurs when UX professionals tie their values work to corporate values and mission statements, using these statements as a way to carve out a space to conduct values work in a way that allows them to bring their perspectives and expertise on values issues to the forefront. Britney, user researcher at an enterprise business software company describes using corporate values as a lever for her to start bringing in social justice topics in work conversations.

> Britney: For things that help, I think sometimes referring to our values. It often involves negotiation of what those values mean and how they should be interpreted. I do think having that value of "equality" has meant that I can broach some subjects that I may not feel comfortable broaching in other companies that don't have that focus.

Nova, who works on an enterprise social media platform, discusses how their organization has tried to include diversity and inclusion work into product processes by treating it "like a product."

> Nova: At [PARENT COMPANY] there's been this huge push for diversity and inclusivity. And there's a lot going on internally around that. And on our internal review, there's actually a section at the top to talk about how you've been promoting the inclusive principles at [PARENT COMPANY]. And you're supposed to mention it somewhere in your review. […] And we're supposed to be treating it like a product. Like a product that we can deliver on. Which I have qualms about. But also I'm like ok, this is a thing we're doing, and I think it's important we're doing that.

While Nova feels qualms about treating diversity and inclusion "like a product," Nova also discusses how it has created space for them to do values work. Beyond their formal UX work, Nova engages in a broad range of workplace activities around diversity and inclusion:

> Nova: I don't even know all the stuff that I do. It's like literally workstreams. But I host events in the office. Like I hosted a [bathroom] party to celebrate the opening of this [gender neutral] bathroom when we thought it was opening. That was also just like a gender education event. I spoke on a panel at our internal LGBT employee resource

> group summit […]. I get together every other week with a group of people in the office who do D&I stuff, diversity and inclusion stuff, and I'm starting to help create a new group specifically for [PRODUCT] around this area. I posted little workshops in the office to talk about workplace grievances. So lots of just piecemeal things, but I haven't had like a holistic vision. Oh I guess I helped implement a diversity and inclusion track at a recent customer conference.

Nova ties their ability to conduct these broad range of actions to the company's broad and publicly stated commitments to diversity and inclusion.

> Nova: But because [PARENT COMPANY CEO] and [PARENT COMPANY] more broadly have had this diversity and inclusion focus, and being like "this should be at the core of everything we do," I feel it's given me a lot of leeway to be able to be like "I'm acting in line with company principles."

This provides an interesting tension. Treating diversity and inclusion "like a product" frames diversity and inclusion as an end state that can be delivered and achieved, rather than an ongoing set of practices and relationships. At the same time, framing values like diversity and inclusion "like a product" perhaps gives the work being done towards addressing these values greater visibility and legitimacy.

Nova and Britney both critically question what practices could be included under corporate values like "equality" or corporate principles like "diversity and inclusion." These values and principles create a space within which UX values advocates like Nova and Britney can contest and bring new interpretations their companies' values and principles, using them towards the pro-worker and pro-gender diversity goals that they have. Not only does utilizing corporate values create space for UX values work, tactical engagement with corporate values can help UX professionals accrete power in the organization by rhetorically aligning their work with their organization's stated goals. By instantiating corporate values in ways potentially different than how the corporation views those values, UX professionals have the potential to re-configure the organization's politics and strategies around social values.

At the same time, tactical engagement with these principles means that not all aspects of the corporation's perspectives are contested. Nova's organization wants to treat diversity and inclusion "like a product," suggesting that diversity and inclusion should take place within the logics of technical solutionism and market fundamentalism. Nova is not fully comfortable with this, but nevertheless sees the stated commitment by their parent organization as an opportunity to have leeway and space to take action.

Successes and Failures: Tensions of Skepticism and Hope

The values work reported by interviewees and discussed at UX meetups represents tactics to re-configure technology organizations from positions within – and often from "below," given that they are frontline workers (rather than managers or executives), and that UX work is not always given the same prestige or legitimacy as other forms of technical work. Soft resistance tactics in UX values work makes sense, as UX professionals are not in a position to contest and critique all aspects of their organizations. Soft resistance recognizes what Lindtner et al. describe as "subjectivities of intervention that do not fall into these more familiar frames of what counts as technological counterculture," such as the figure of the individual masculine renegade whose work is directly oppositional and antagonistic to dominant technology cultures (Lindtner,

Bardzell, and Bardzell 2018, 16). Indeed, UX professionals' practices of soft resistance utilize some of the very logics and cultures that they are simultaneously critiquing.

Soft resistance also highlights the partiality of resistance—there is not an idealized external position from which to critique and enact change. The desire to re-configure organizational practice and politics from within while facing challenges of power dynamics, is reflected interviewees' tensions between feelings of hopefulness and opportunity, and feelings of skepticism. This reflects a grappling with the idea that values work is partial. While it can succeed in creating some changes, there is also not a way to fully escape or transform the institutional and economic forces working against them.

The lens of soft resistance surfaces the role of intentionality in partial forms of resistance. UX professionals are not able to resist and critique everything all the time, and have to intentionally and tactically decide when and how to bring up values and ethical issues. Laura, a senior UX researcher at a consumer educational technology company describes this in terms of choosing which hills to fight and die on, saying "the hills you die on are the big ones." For Laura, these hills are ones where she has amassed data and evidence to back up her position. In this case, Laura discusses a debate about whether her company should create features that help "solve" students' problems by doing work for them (such as generating essays), and whether they should create features that help students develop research skills. While Laura wants her company to not create the "solving' feature and instead develop more skills development features, she only has the data to make the first argument.

> Laura: And that's where I think [user] research does play an important role. Because then I can go and talk to students and […] tease out "do they want someone to do it for them?" A lot of times what I'm finding is they don't. So that's really easy to take back to the team and say "they don't actually want us to do that for them, because that doesn't work or help them." So then I'm able to make the case for it. And then you know the hills that you die on are the big ones. It's the big like "I don't think we should generate this for students." But I might lose the battle that says "we [shouldn't] find resources for them without them having to go through the research process." […] I might not win that battle. And their researching skills and those things might take a hit. But I will win the battle of "we can't generate this; we can't just do it completely for them." So it's kind of like playing with whatever you can at the time.

Laura also discusses working with other allies in the organization, such as designers, to make arguments based on priorities:

> Laura: We'll get to that stage where the product person and the developer are sitting in a room and they're like "we can't finish all this in one round. So we're gonna do it in four rounds." It's like "aw crap," you know that round three and four might not happen. But if you can advocate for what's the most important to the user, like what features are the most important to the user, and relegate things down that maybe are improving some of the interactions or those animation[s] or like the smaller things. But the information that the person needs, the new information that you maybe have to add, that takes the precedence. And you only can do that if you've done the research, and the designer and you have worked together to basically know "this is the thing that's the most important, so that has to be in version one no matter what."

The picking of battles recognizes and works within existing development practices and market pressures. Within this framework, there is a limited amount of time and limited resources before

the release of the next version of the product. Working within this framework, Laura thus has to choose which issues to surface, picking the ones that she feels that she has the most support for from user research data and from other allies in the organization such as designers.

In choosing battles, some interviewees describe moments of success, such as Nova describing being able to see same changes based on their diversity and inclusion advocacy work within their organization:

> Nova: I get a lot of positive feedback about how I've changed folks' view on gender. I openly use they/them pronouns in the office which I guess you could see as political. It definitely feels more normal now, but it is political and was political especially when I started using it. And yeah, I just thought of another like three projects that I do that are related to it. I advise on a lot of trans-related like "oh we're thinking of doing this feature" and I end up getting looped into the conversation and providing perspective. It's weird to have other product teams who give a shit about that sometimes.

However, not all forms of resistance and values work succeed. Francine, who works at a company that creates business software, discussed an incident where she and other co-workers learned that one of her company's client organizations was involved in perpetuating harms against migrant families at the US-Mexico border. The client organization reached out to ask for help to improve the accessibility of their installation of the business software made by Francine's company. Francine and a co-worker had strong feelings against helping this client because of their involvement at the border, and decided that this was an issue that was worth speaking out about.

Francine and a co-worker drafted a letter that they planned to share, noting how this violated their personal values. When I asked why they framed it this way, Francine noted that they were unsure "how empowered" they were when doing this. She noted some co-workers pushed back, saying that by not helping this client, they might be harming workers with disabilities. While Francine felt her immediate manager was supportive, the issue got raised to upper management. Francine recounted the response back from a chief officer of the company as basically "do your job," and that not working for this client would "open a can of worms" – what if anyone could stop work based on their personal values?

In the end, management hired an outside contractor to help this particular client. Francine had mixed feelings—on one hand she was glad she didn't personally have to help this client; but at the same time, she was frustrated that it silenced acknowledgement of the problems that she and her co-workers saw. Their goal wasn't solely about not working for the client, but also to communicate the concerns they had around human rights violations, which got silenced.

Skepticism and Hope in Re-Configuring from Within & Below

Given the successes and failures of trying to re-configure how values work is done from the positionality of frontline worker within organizations, interviewees reflect tensions between feeling skepticism and hope in their ability and capacity to enact changes. There is a hopefulness that their actions can lead to positive change. At the same time, there is a range of concerns that stem from working within the system: the potential detrimental professional effects that doing this work might have, whether or not their actions will lead to meaningful change, and the costs of invisible and emotional labor that are required to do this work.

Throughout our conversation, Cecilia, a user researcher at an enterprise software company, would discuss how she would bring up values issues regarding various projects, but

also worried about whether or not she went far enough in trying to address these concerns. Through several excerpts of the conversation, Cecilia discusses one piece of business software that would allow employers to track the GPS locations of employees, and she was concerned that employees would not have any autonomy or choices about whether or not to share that data with their employers.

> Cecilia: Even with these things like the GPS, I guess I was sort of hoping, "Oh, if I keep bringing this up, it will be on people's minds and maybe it will push things in a certain direction." Even right now talking about it, I'm like, well maybe I should have tried harder to push. I had some thoughts about it. Can we tell people that their tracking is on so they know, or can we have it default to a less granular setting? But I didn't push for those things or make them formal recommendations. […]
>
> Cecilia: I think raising the conversation with more people and having more people be thinking about it and being forced to navigate the tension of these things—it feels that's helpful. Cause then it at least raises the conversation as opposed to it just getting completely glossed over or just not even being a thing. […]
>
> Cecilia: Maybe also having these kinds of conversations can be an organizing tool as well. If a lot of people are starting to talk to each other about these concerns, that is part of getting people to potentially take a bigger collective action about it. […]

Cecilia raises a distinction between surfacing values issues and addressing them. She notes that surfacing values does not necessarily lead to the addressing values, feeling that perhaps she should could do more to try to take action on addressing values. Yet while Cecilia is conflicted about whether or not she could have done more to try to push for changes in the GPS system, she is still hopeful that having conversations and bringing up the issues with others in the organization can lead to bigger change over longer periods of time.

Tensions between hope and skepticism also arise in UX professionals' discussion of their choice of work. Chapter 5 discusses how choosing where to work (and not to work) provides one way for UX professionals to affect organizations' politics by 'voting with their feet' and working for organizations whose stated values align with their own. Henry reflects on having the power he has in being able to choose where to work, having had a bad experience working at a peer-to-peer lending company which he now reflects on as a "misguided" decision. Yet at the same time, he is aware that choosing to still work in the technology industry could still potentially cause harm to others.

> Henry: I think one of the most important ethical calls that you can make as a designer is where to work. And so after a lot of bouncing around I finally ended up in EdTech because it's not perfect, but it is, I think anyway, probably one of the less harmful places to work in consumer technology in the Bay Area. And you know it says something that you have to lower the bar to you know "less harmful" rather than "helpful" [*laughs and sighs]*. But yeah. So I'm in EdTech because I think it's potentially okay as a tech product.

UX professionals face individual decisions about what companies to work for. Henry provides a partially hopeful account, seeing the decision of where to work as an important ethical call for individual UX professionals. But more skeptically, leaving or not working for a specific company or project does not always solve the broader values problem, as companies can generally find someone else to hire instead. Francine expresses hope and faith in activist workers

at her company who push back and hold leaders accountable, such as writing letters voicing their concerns about the company's contracts with clients who workers view as harmful. However, she expresses concern about what will happen if those people leave for other jobs, worrying that if these activist workers leave, then there might not be anyone left who would push back against some of management's decisions.

Skepticism and Hope in Organizational Re-Configurations

UX professionals may choose where to work in part based on how organizations work practices or public statements align with their individual beliefs and values. This makes them attuned to how their employers enact those values, particularly when organizations instantiate those values in ways different than how the UX professionals view them or desire them to be. This is reflected in interviewees' hopes and skepticisms in organizationally-led values and ethics initiatives.

Interviewees expressed mixed feelings about various corporate initiatives related to social values and ethics. Cecilia thinks her enterprise software company rhetorically supports ethics conversations, but only to an extent.

> Cecilia: I think there's support for having these conversations, but I don't know honestly what it would be like if there was a specific thing that I really wanted to go after—*this* thing we shouldn't do, or we shouldn't do this way. That would be a lot tougher sell in terms of someone actually supporting me on that and people being responsive to that. I think it's a little bit removed, a level of abstraction of "oh yeah, we care about the humans, and we're happy to talk about that, but that's separate from our business." [*laughs*] I think that's my cynical take.

Others are more deeply skeptical of corporate values and ethics initiatives, seeing them as public relations or ethics washing overtures, rather than actually grappling with the ethical issues. Genevieve describes displeasure with the executive officer at her enterprise software company who is in charge of issues surrounding equality and diversity. She describes a presentation made by this executive at an industry conference:

> Genevieve: He did a product demo of some voice technology that [CLIENT COMPANY] had wanted […] Shortly after that, I found out that [CLIENT COMPANY] workers were on strike over that exact technology, and I didn't know that. And not only did we not say anything about that during the keynote, but the messaging around that was very much around "equality" and "putting the customer first" and "empowering [CLIENT COMPANY]'s workers" and how good [CLIENT COMPANY] was to their workers. It was just this really obvious, gross, union bashing, PR stunt that felt really awful to be part of. And again that's powered in part by the products that I worked on.

Many interviewees acknowledged that a struggle they face is that they work for organizations whose goals are to make money. Britney describes this in relation to the product managers at her enterprise software company:

> Britney: Then on the product side, PMs, they're just trying to sell something. [*Chuckles*] They're just trying to sell a product. They're trying to meet these goals that have been set out for them that have to do with, "Is their product going to sell?" I haven't had that many interactions with PMs that suggested to me that they have tools to think about these [ethical] questions.

Others concede that in picking their battles, some values issues are more difficult to advocate for because there is not a clear return on investment or large enough market segment for the organization to justify using resources on that issues (such as conducting user research with underserved populations who make up a small part of a user base).

Yet even within this business environment, interviewees expressed hope that new projects and initiatives might find at least some partial success. Henry expressed excitement and hope over creating some type of internal ethics institutional review board for making product decisions given the interest of co-workers, though he notes that it might be a hard sell to his company's executives.

> Henry: I'm actually in the middle of starting with a couple other folks, an ethical product design—we're actually internally at least calling it an inquisition [*laughs*]. Really though, my goal would be for it to function a lot like an IRB. Where any new product or feature should consult. […] There are a lot of folks who are interested in participating, so that's actually not the hard part. I think the hard part is going to be convincing, [the] director, VP, C [suite] staff, that this is an important thing we should take seriously and should actually be vested with a certain amount of power over things like approvals and consultations.

Organizational re-configurations can also be fragile, and not necessarily lead to long-lasting change. Jerry's experience with his social media company's community health team reflects this. The community health team was created to address issues like racial bias that were occurring on the platform, but he noted that it relied on volunteer work, and that the resources it garnered was in part dependent on how the company leadership viewed the team.

> Jerry: So for a while we had essentially three people on staff [assigned] to this, just general issues around community health. Initially they were specifically working on racial profiling, but it was a product manager and a designer and a copywriter. And then we would find kind of engineering resources here and there to help them build things. But that was the staffing for a while. And then that kind of got dissolved a little bit once the company kind of shook up a little from the leadership changeover.

Fragility points to the ways in which the values work conducted by the UX professionals is not just about individual practices, but is also affected by the shifting organizational environments in which they do this work.

. . .

Addressing values and ethics issues is always partial, whether done through technical, social, or organizational processes. The tensions between skepticism and hope recognize while actions by individuals or by organizations may be helpful in some regards, no single action will solve all values and ethics problems. Moreover, the tensions point to the ongoing nature of this work, and the emotional and affective aspects in recognizing that there is no position that is completely outside capitalism and institutional power from which to critique or press for addressing values and ethics issues. At the same time, recognizing that there is no external position through the lens of soft resistance opens up a space of actions that UX values advocates can take from their current subject positions.

Reflective Fiction: Anchorton Consulting

Following a world building perspective (Coulton et al. 2017), the fictions on the next two pages involve 3 different companies that exist in the same fictional world, to view it from multiple "entry points":

- **InnerCube Sensing**: InnerCube creates data analytics platforms for offices and workplaces with embedded IoT sensors. InnerCube's clients are other companies who want to instrument their offices. The end users of InnerCube's systems are the clients' employees.
- **BiggeCon**: A company that operates customer service call centers and is one of InnerCube's clients
- **Anchorton Consulting**: A company that provides "human management solutions"

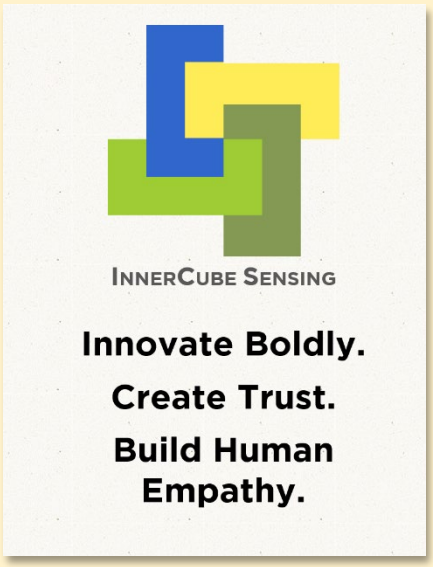


Figure 6.3. A poster of InnerCube's 3 corporate values

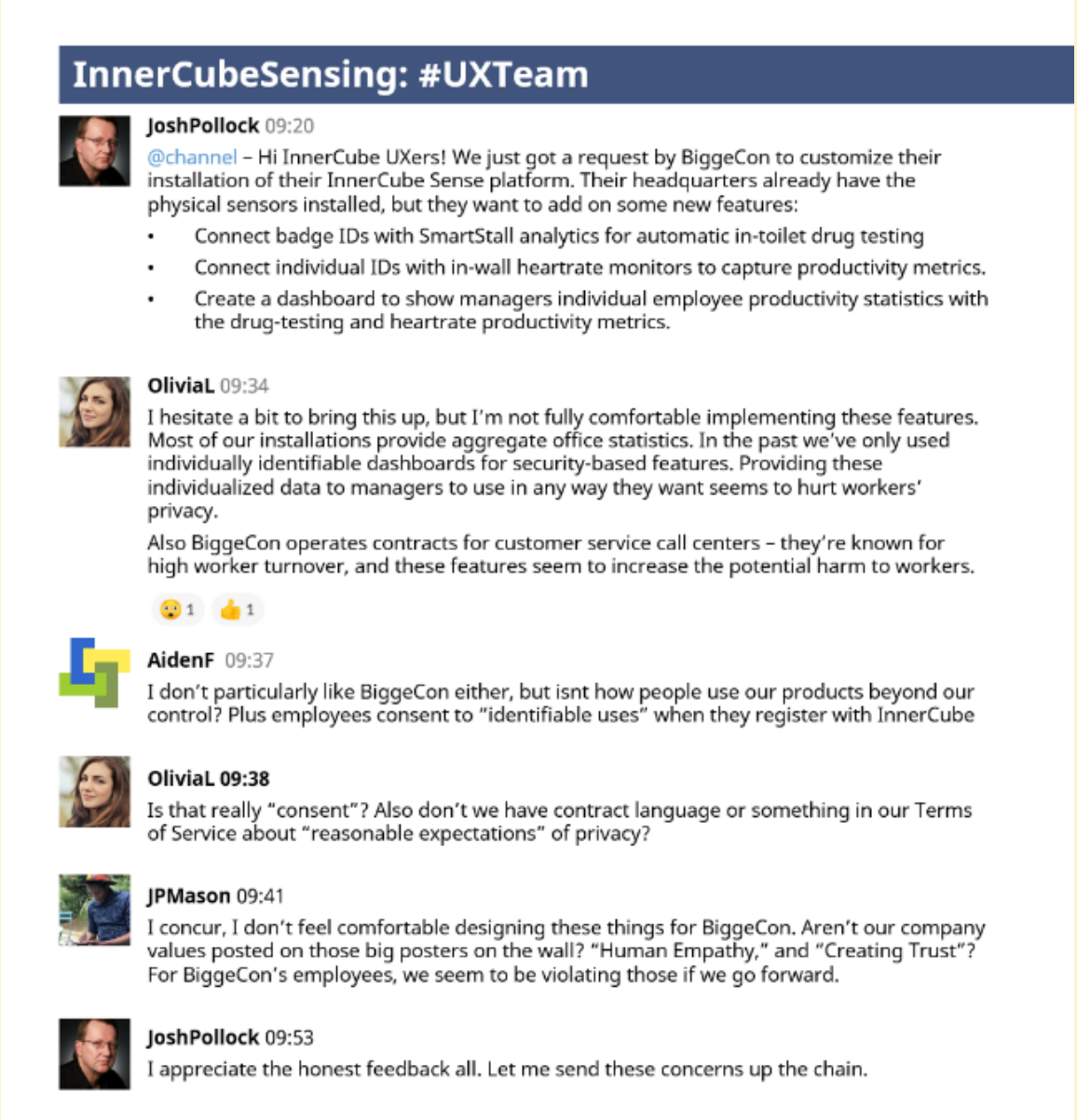


Figure 6.4. On an internal forum, a UX team working at InnerCube discusses potential concerns about implementing new personally-identifying data analytics features for their client BiggeCon. UX Lead Josh Pollock notes that he'll raise these concerns with InnerCube's senior management.

To: Joshua Pollock, UX Lead @ InnerCube

From: Gary Green, InnerCube VP of Diversity, Inclusion, and Risk

Re: BiggeCon Project Questions

Josh—

I appreciate the concerns that your team members have about BiggeCon. However, allowing any worker to not work on a project due to their personal objections risks a slippery slope. The project already underwent a legal review, and everything will be GDPR compliant.

I'd ask you to communicate with your team that our company's values of "human empathy" also apply to empathizing with the needs and desires of our clients, who are in this case BiggeCon and their leadership team. With "create trust," we're seeking to build trust with our clients, as well as maintaining our trust with the public. Taking a public position on BiggeCon's and other client's actions by refusing to work with them risks looking political and partisan in the eyes of the media. Imagine if BiggeCon was a political organization? I could see us getting called in front of Congress in no time.

That being said, we're looking at 2 potential options offered by Anchroton Consulting to help mitigate your team members' concerns, and meet BiggeCon's needs: Anchorton's **eTask Auctions** or **eStaff Contracting** services. Either of these should help us complete the project without having to play all this out in the public eye. I'll update you once I talk with Tom and the other VPs.

--Gary

Figure 6.5. Gary Green, an InnerCube Vice President, emails a response to Josh Pollock about his team's concerns. Gary reframes the corporate values in a different way than JPMason does (in Fig. 6.4), and suggests two services from a services contractor, Anchorton Consulting, to address the situation.

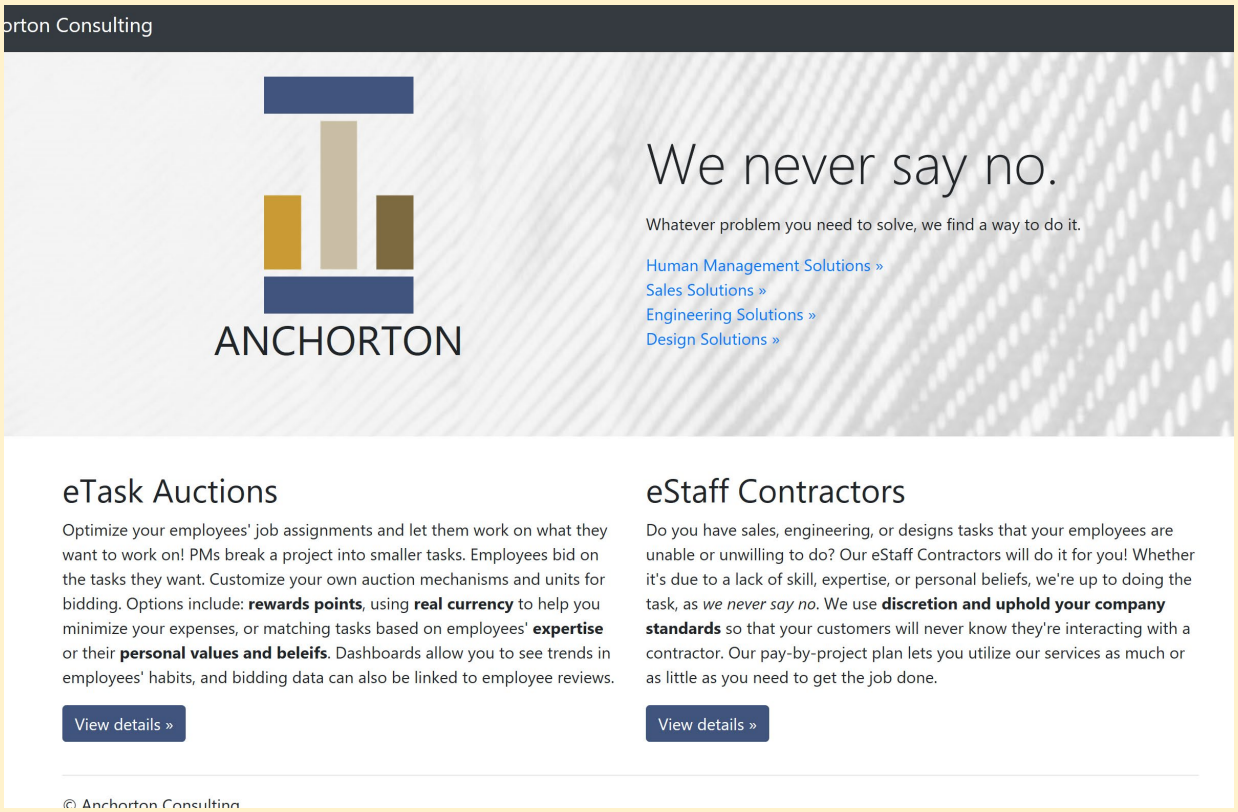


Figure 6.6. Anchorton Consulting's website. Anchorton is a company that specializes in "Human Management Solutions." Anchorton highlights two services that would nominally solve the InnerCube problem: that some of InnerCube employees object to implementing a solution for their client, BiggeCon. If InnerCube utilizes eTask auctions, employees could bid on what tasks they want to (or do not want) to work on, so that those without ethical qualms could work on the BiggeCon project. With eStaff Contractors, InnerCube would contract out the BiggeCon project to Anchorton to complete. Notably, while these services address Gary Green's view of the problem (in Fig. 6.5), these "solutions" do not address the original concerns about privacy and BiggeCon worker conditions raised by OliviaL (in Fig 6.4).

Like InnerCube Sensing, many of my interviewees work for enterprise software or platform companies; and their clients are other businesses—they do not directly sell products to end users. This may result in situations, like in the fiction, where meeting a client's needs (BiggeCon) has the potential to harm end users (BiggeCon's workers). These interviewees already had pre-existing interest in thinking about the social and ethical implications related to their work, and discussed some of the barriers and challenges to surfacing or addressing those in their workplaces. A variety of tactics that interviewees used to try to bring up social issues of their products are highlighted in Figs. 6.3-6.4, including appealing to corporate values, discussing potential harm to end users, or looking to legal contracts that specify inappropriate uses of a product or service.

Anchorton acts as what I might term an "ethics strikebreaker." They problematically try to frame concerns about technology values and ethics as a problem of individual technologists' personal values and beliefs, rather than social ones. By doing so, Anchorton's solution to addressing technology values and ethics problems is simply to find another technologist who has different personal values to do the work. This undermines potential collective understandings of values and ethical issues related to technology development. This bypassing of ethical technologists also potentially renders many of HCI approaches to technology ethics (e.g., ethics

education, values elicitation tools for technologists, methodologies like value sensitive design) as less powerful and impactful.

Anchorton is also meant to aurally seem similar to Pinkerton, a private security agency which conducted strikebreaking and anti-union efforts in the U.S. in the 19th century. Figs. 6.5-6.6 reflect the frustrations—and sometimes failures—that interviewees experienced when trying to surface values or ethics implications with management. Sometimes others in the company will interpret corporate values in alternative ways or see values and ethics as a "slippery slope" (Fig 6.5).

One interviewee discussed a situation where their team did not feel comfortable adapting their software for a particular client because of a recent controversy where the client organization caused harm to its users; management found a contractor to do the job instead. The interviewee was ambivalent, noting that they were glad not to violate their personal values by working to support the client, but were unsatisfied that their initial concerns about the client's harmful practices were never addressed or discussed. Other interviewees stated a desire for collective action, which might more forcefully surface values and ethics issues. These stories inspired Anchorton, which takes the contracting-out solution a step further. Anchorton acts as an ethics strikebreaker, using the friendlier term "Human Management Solutions." eTask Auctions pits workers' interests against each other, to get those who are less concerned about social implications of technology to bid to work on projects like BiggeCon. eStaff Contractors outsources the ethically questionable work to Anchorton subcontractors. In both cases, the underlying ethical concerns about BiggeCon's potentially harmful uses of sensing analytics are never addressed. Anchorton also promises public discretion, inspired by interviewees discussing how values and ethics in their companies are often addressed through a public relations lens.

These fictions highlight a moment of values contestation that may not be apparent when looking at a system from an end user's perspective: designers who speak out against a problematic use of their product, but their concerns get dismissed and obfuscated by management. The negative outcomes from this scenario do not arise from some evil intent of engineers or designers nor a problematic technical system, but rather from the organization's arrangement of power and the encompassing industrial structures of financial reward.

Conclusion

Soft resistance brings attention to modes of resistance that are partial, but also make use of some of the broader logics that are being critiqued. Through this mode of resistance, UX professionals critique and provide alternative definitions of who counts as users, of corporate principles like "equality" and "diversity and inclusion," and of metrics like Objectives and Key Results (OKRs). At the same time, in order to do this critique, the arguments that UX professionals deploy sometimes make use of the existing logics of market fundamentalism and technological solutionism.

This partiality is not done because of willful ignorance or lack of recognition of these logics. Indeed, several interviewees feel ambivalent about engaging in these logics, like treating diversity and inclusion "as a product." However, to get traction and visibility, soft resistance tactics can help create a toehold to begin attending to the values issues that the UX professionals advocate for. Practices of soft resistance may also bring hope to UX professionals that changes from within organizations are possible, even when trying to convert a skeptical and potentially hostile audience.

Furthermore, "soft resistance" does not equate with ineffective practices. As Nafus and Sherman write, "'Softness' in soft resistance is not ineffectiveness but a powerful mutability capable of calling into question who gets to do the aggregation and how. [...] We have suggested too that the "resistance" in soft resistance is not just rejection but has its own productive potential" (Nafus and Sherman 2014). There is sometimes a presumed "softness" in technology industry ethical practice, due to the lack of adoption of formal ethical reasoning or use of philosophical ethical frameworks in decision making. However, this mutability and malleability of the meaning of "ethics" allows for a broad range of tactical moves by UX professionals to engage in values work. Sometimes this involves making financial and business-oriented justifications for addressing values. Other times, this involves using existing technical design practices like personas, but subverting them to foreground thinking about values like accessibility. Or sometimes this involves using organizational principles to justify a wide variety of (not always sanctioned) actions that can be framed as advancing those principles. Moving amongst these practices, UX professionals can take on different roles—researcher, advocate, corporate worker, laborer, and so forth.

Thus, the lens of soft resistance opens up a broad range of tactics, practices, and positions used by UX professionals as ways to draw attention to and take action on values and ethical issues within the power structures and organizations that they work in. This collection of practices has the potential to make productive changes.

Chapter 7: Engaging the Politics of Speculative Design

Throughout this dissertation, speculative design methods have been deployed in several ways. This chapter reflects on the politics of these different uses of speculative design. In Chapter 3, I used speculative design first *to critique, speculate, and present alternatives*, by creating a set of fictional sensing technology products inspired by the world presented in the novel *The Circle*. These designs were created *by design authorities, for design authorities*, using design to explore and reflect on how different conceptualizations of privacy emerged from different sociotechnical configurations, by placing the same technologies in different sociocultural contexts. These designs were then re-purposed to be designed *for stakeholders*—professional students training to work in the technology industry—in order *to explore people and situations*, to understand how these professional students might use the designs in order to reflect on and discuss privacy and other values issues.

As shown through Chapters 6 and 7, during interviews and fieldwork I used speculative design as a reflective and analytical method, design *by a researcher, for that researcher*, in order *to explore people and situations* and *to critique, speculate, and present alternatives* based on the empirical qualitative data I was gathering through my research. This design work helped me explore and reflect on the practices and politics discussed by interviewees and informants.

At the same time, these uses of speculative design presented a set of political tensions. Sometimes this concerned what my intent was as a design researcher—why did I use design, and how did my practice of design express critique or lead to analytical reflection? Sometimes this concerned how the designs were received—how do people react to and (mis)interpret the designs? This chapter reflects on the politics of intention and reception of speculative design that emerged in this project. This builds on Khovanskaya et al.'s discussion of tensions when doing critically oriented design work in HCI: in order to present their critical work to the HCI research community, design researchers have to publish in normative venues and where their critical work may not be legible; or when engaging stakeholders, researchers may not want to immediately tell stakeholders that the design work is critical so as not to bias their reactions, yet risk that stakeholders will misinterpret the critical designs as proposals for real products and technologies (Khovanskaya, Baumer, and Sengers 2015).

This chapter starts by discussing the politics of intent in speculative design. First, it situates speculative design in two historical lineages: one drawing from critical theory, and one drawing from industry product development. I argue that like the values advocacy practices in the previous chapter, speculative design itself can be seen as a form of soft resistance. To be legible to technology researchers and practitioners, speculative designs critique certain logics in technology research and practice, while making use of and upholding others. I then reflect on my intentionality using speculative design as reflective and analytical method as a part of my empirical research. Design methods revealed practice-based and experiential knowledge that was not revealed in interviews. I find that creating speculative designs that foreground practices and organizations, or *organizational fictions*, helps provide insights and allows me to ask different types of questions than creating speculative designs that foreground products.

This chapter then discusses the politics of reception by presenting some of the unexpected, surprising, and potentially troublesome responses to these speculative designs when I have presented them to other audiences. Reflection on these encounters leads to considerations about the responsibilities that speculative designers have when presenting speculative design work, and new considerations about who design researchers might want to *design with*, and *design for*.

The Politics of Designers' Intentions

Two Historical Lineages of Speculative Design

Before discussing my own use of speculative design, I reflect on how speculative design work represents a critical practice. Speculative and critical design are often tied to a lineage of critical practices in the arts, humanities, and social science, such as critical theory. Yet speculative design, particularly in its adoption in human computer interaction (HCI), also draws on a set of futuring practices developed in the context of military planning and adopted by multinational corporations. These two lineages of speculative design are discussed briefly to consider the politics of speculative design practices, and to consider the work required to make speculative design critiques legible within HCI.

Speculative Design as a Critical Practice

Perhaps the most commonly told history traces speculative design through Tony Dunne and Fiona Raby, designers and researchers, who termed "critical design" in the late 1990's (Dunne 1999; Dunne and Raby 2001). In their original discussion of critical design, "critical" means a type of dialectic that uses the practice of design to lead to reflective discussion and debate on dominant cultural values; Dunne and Raby contrast critical design with "affirmative design", which supports the status quo or dominant worldviews (Dunne and Raby 2001). They predominantly discuss capitalism as the worldview they are critiquing and reflecting upon. Malpass, building on Dunne, describes critical design as 'post-optimal': a move away from using design for efficiency and optimization (Malpass 2016). Critical design works through an ambiguity caused by 'para-functionality'—where design artifacts make use of design conventions to seemingly be able to function or be utilized as a 'normal' product, while simultaneously seeming out of place, unusual, or unfamiliar, allowing "what was invisible and lost in the familiarity of the everyday" to be "made visible" (Malpass 2016; Dunne 2005).

While critical design artifacts use para-functionality to seem like everyday designed objects, Dunne and Raby suggest that this practice might be more amenable outside of commercial settings, such as in academia. Nevertheless, Dunne and Raby's practice of critical design is instigated by a critically-minded designer who creates an artifact that leads to discussion and debate among designers and the public.

Dunne and Raby's book is a call to designers to take on the individual responsibility of being critical, calling on academic designers to "exploit their privileged position to explore a subversive role for design as social critique." (Dunne and Raby 2001, 1:65) Dunne and Raby describe the public as having the potential to engage in critical thought, but only after the intervention of the critical designer. This draws some parallels to Horkheimer's formulation of critical theory as requiring "external agent – the critical thinker, or critical school of thought – [which] has the task of conveying such a [critical] consciousness to the working class" (Bottomore 2002, 17). Dunne and Raby's critical designer draws parallels to Horkheimer's external agent.

In the early 2000s and 2010s, Dunne and Raby shifted their terminology from "critical design" to the term "Speculative Design," in part to frame their work as a generative practice, writing that their interest is "in using design to open up all sorts of possibilities that can be discussed, debated, and used to collectively define a preferable future for a given group of people." (Dunne and Raby 2013) Like critical design, Dunne and Raby discuss speculative design as a practice that uses design artifacts to open up and explore alternate possible and plausible futures as a way of generating discussion about what a preferable future might look like. They also discuss speculative design as a practice outside of commercial design processes, writing that "once designers step away from industrial production and the marketplace we enter the realm of the unreal, the fictional, or what we prefer to think of as conceptual design—design about ideas." (Dunne and Raby 2013). The practices of speculative design and critical design are often grouped together, sometimes used interchangeably.

As Dunne and Raby have advocated, critical and speculative design practices have been taken up by academic HCI researchers. In HCI, researchers also trace speculative design through a range of other critical traditions from art and the humanities. Jeffrey and Shaowen Bardzell have written a series of articles connecting speculative design's insights that design can both perpetuate harmful ideologies and be a form of resistance to the history of critical theory, tracing critical theory from the philosophy of Marx and Nietzsche through the Frankfurt School to a broadening of critical theories in the 1950s and 1960s including semiotics, poststructuralism, feminism, and psychoanalysis (Bardzell and Bardzell 2013; Bardzell and Bardzell 2015). Pierce et al. link current speculative design practices to 20th century avant-garde approaches including Data, Situationism, and tactical media, and to activist design approaches (Pierce et al. 2015). DiSalvo et al. and Elsden et al. bring in connections to mid-20th century design and architecture groups Archigram and SuperStudio (DiSalvo, Jenkins, and Lodato 2016; Elsden et al. 2017). Elsden et al. also discuss the Japanese art of chindogu, of creating humorous and nonsensical practical tools and everyday gadgets as a predecessor to speculative design (Elsden et al. 2017). Others have cited practices from literature as pre-cursors to speculative design, including practices of literary criticism (Bardzell and Bardzell 2013) and practices of creating science fiction. Wakkary et al. write that "the practices of science fiction bring to design research the reasoning on multiple futures that challenge assumptions and the sociological, cultural, and political tendencies that under-lies our representations and considerations of design and technology" (Wakkary et al. 2015).

Speculative Design as a Corporate Practice

A lesser told history traces speculative design's adoption in HCI through corporate and military futuring practices, rather than through critical theory in the academy (Wong and Khovanskaya 2018). While speculative design may seem like an impractical, "out there" and "critical" practice, the tactic simultaneously leverages conventional design practices found in product development.[39]

The first ACM conference paper to introduce "speculative design" as a keyword is from the Research on Experimental Document (RED) Group, from Xerox PARC, published at CHI in 2000. This paper describes the group and their exhibit on the future of reading at The Technology Museum of Innovation in San Jose (Balsamo et al. 2000). The group was formed in 1997 and its goal was the following:

[39] A fuller discussion of this history can be found in (Wong and Khovanskaya 2018)

> [T]o create and study new genres focusing on opportunities offered by emerging media and technologies. Trained in such fields as architecture, computer science, engineering, product design, critical theory and theater, the eight members of this group had diverse experiences with a range of research philosophies and methods. One of the broad aims of the group is to develop a framework for the realization of our research charter. A related objective is to develop methods appropriate to our research objectives and a language for communicating the insights of our research to our colleagues at PARC and those in our various professional communities. (Balsamo et al. 2000, 207)

In short, the group was tasked with prototyping "new genres" (new forms of documents) as part of Xerox PARC's long term research and development strategy. Since these new genres were defined by not only their potential technical specifications, but also their social uses, the group was charged with devising methodology to explore and communicate a holistic vision of how technology could be, embedded into the sociotechnical contexts of the future. "Speculative design research" was one such methodology. When approached by the museum to install a temporary installation, the group chose to pursue the topic of reading both because it "afforded an opportunity for the study and creation of new genres" of document use and because it was relevant "to the core technology of Xerox": "[w]e [Xerox] make things [printers] that make things [documents] that people read" (S. Harrison, Minneman, and Balsamo 2001, 33). (Indeed, Xerox's corporate tagline at the time was "The Document Company.")

Though the specific organizational relationship between RED and the rest of PARC is not discussed directly, it is clear from these designs that RED interfaced significantly with the product development teams, finding ways to showcase early prototypes and give their input about what future to design for. Funding for the exhibit was also provided from a marketing division at Xerox (Balsamo et al. 2000). This exhibit was one way for researchers to engage with technology developers while generating hype for the company and their role within it. Research and development groups like RED at PARC provided an interface between corporate practices and speculative practices.

Industry research groups' practices are not the only form of corporate-based speculation and forecasting that has historical interfaces with speculative HCI practices. Scenario planning (or "strategic planning" or "scenario thinking") provides a process for thinking about, planning for, or decision making in a future with risk or uncertainties, often used as a part of futures studies. While working at the RAND Corporation, a think tank closely associated with the U.S. military, Herman Kahn developed scenario planning to think about potential outcomes of nuclear warfare during the Cold War (Kahn 1962). Scenario planning in the corporate world has origins in Royal Dutch Shell in the 1960s and 1970s, during a period of uncertainty about the future of oil prices (Wack 1985). Scenario planning identifies critical uncertainties and explicates multiple possible futures that could develop, helping to prevent failures of imagination. Importantly, scenarios have both a logical "plot line" and a narrative "story" (Weber 1996) – the plot provides a plausible logic underlying a narrative story about the future, not too unlike the para-functionality of speculative design artifacts. Scenario planning also tends to focus on deeper uncertainties or trends that may indirectly, but importantly affect dimensions of a particular phenomenon being studied; while originally used for oil prices and Cold War outcomes, scenario planning has been applied to a wide range of areas, such as the futures of work, pharmaceutical drugs, national security, or cybersecurity.

Scenario planning seeks to bring attention to the future's openness, contingency, and irreducible uncertainty, as well as expand people's conceptions of what may be possible or

plausible – not just probable (Wilkinson and Kupers 2013). Scenarios generally take the form of text, describing multiple possible futures around a given phenomenon. They generally include a number of fictional artifacts to help make those futures feel more real, such as fictional news articles, personas, websites, videos, or other artifacts from those worlds. Scenario planning is predominantly used today by companies and government organizations to understand the effect of potential futures on consumer and financial markets or on national security. However, there are also some new applications of scenario planning in research environments (Center for Long-Term Cybersecurity 2016). These practices persist today outside of academia. Several of the corporate Internet of Things trade shows and UX meetups that I attended for fieldwork featured futurists and consultants who use scenario planning techniques to advise corporate and government clients. The U.S. military's speculation around technologies includes practices of "science fiction prototyping" and threatcasting, using short science fiction graphic novels and comic books to formulate potential threats (Threatcasting Lab 2018; Cass 2018). These share a similar format to speculative design and design fiction research in academia, and sometimes are created in partnership with academic researchers.

Traditional scenarios in HCI work may at first seem different from the aforementioned practice of scenario planning, yet these practices also interface in several ways. HCI scenarios tend to focus on a user's interactions with a particular system rather than describing the world at large. Discussion of scenarios began to grow in the HCI literature in the 1980s and 1990s, applied to a wide variety of uses (and perhaps unsurprisingly accompanies a growth in literature expressing concern about the increasing fuzziness of the term "scenario"), four of which are described by Campbell as: scenarios to illustrate what it's like to use a system; scenarios to specify tasks for usability tests and other evaluations; scenarios as a tool to help design a system; and scenarios to help translate theories into practices (Campbell 1992). Within HCI, scenario practices were used across academic and industry research. Providing a link between scenario planning and HCI scenarios is John M. Carroll, who worked at IBM Research in the 1980s and early 1990s. In his book, *Making Use*, Carroll describes design scenarios in a similar way to scenario planning: "Scenarios are stories—stories about people and their activities", they have a setting, include agents or actors with goals or objectives (which sometimes change), include a plot through a sequence of actions and events, and are represented in ways that make a system's use explicit (Carroll 2000, 45–47). Carroll later specifically writes about scenario planning (using the term "strategic planning"), writing:

> Strategic planning is actually the deepest root of scenario-based design…Strategic management scenarios are employed to concretize the complex uncertainties that inhere in envisioning future opportunities and risks. They are used to expose hidden assumptions about the present and the future and to allow analysts to contrast entailments of alternate policies, each encompassing a constellation of assumptions and conjectures about the current situation and its likely course of evolution. They have been found to help with the enumeration prerequisite actions that would need to be taken in order for some envisioned future to occur (Carroll 2000, 321)

Relatedly, Carroll argues that "Creating and using scenarios pushes designers beyond static answers. … This emphasis on raising questions makes it easier for designers to integrate reflection and action in their own design practice." (Carroll 2000, 51) He specifically refers to examples of Kahn at RAND and Wack's discussion of Shell's scenarios to illustrate this point. In later work, Carroll connects the uses of scenarios in scenario planning, HCI, and in software

engineering, by arguing that their scopes are nested. That is, software engineering scenarios focus at the "keystroke command" level; HCI scenarios focus on a broader "day in the life"; and strategic planning scenarios depict an even broader "year in the life." (Go and Carroll 2004).

In this discussion of scenarios in both HCI and strategic management, Caroll underscores a commitment to imagining futures and questioning one's assumptions, but in service of designing more usable systems. Scenarios are posited as a tool that can help a designer, researcher, or analyst rethink their assumptions about the world (from how a country might react to a nuclear strike to how a person's needs might cause them to interact with a system in a novel way). Scenarios are speculative in the forward-looking, imaginative sense. While they may not be explicitly critically-oriented, they do serve to help people question their assumptions. Scenarios in this sense are a tool to help make decisions. The use of creating narratives, futures, and creating "reflections" is thus legitimated as a normative HCI practice in service of making a "better" design decision, generally by making a system more usable for a population of users or consumers. Left unsaid at this time was the type of reflective (and reflexive) practices espoused by later HCI researchers that recognize designers', researchers', and analysts' complicity in shaping and creating knowledge.

Speculative design and design fiction build on this tradition of HCI scenarios, but orient them towards more critical ends, such as Blythe's discussion of pastiche scenarios, using characters from fiction to build out a more expansive fictional world (M. A. Blythe and Wright 2006), or Nathan's value scenarios to surface discussion of long-term relations with technologies among both direct and indirect stakeholders (Nathan, Klasnja, and Friedman 2007; Nathan et al. 2008). Discussion of design fiction world-building and storytelling (Coulton et al. 2017; M. Blythe 2017) also implicitly draw parallels to and build on traditions of scenario world-building, plot, and narrative.

The Politics of Making Speculative Design Legible to HCI

These two histories lead to reflections on the politics of the intentions of speculative designers—how speculative design is both a critical project that captures designers' viewpoints, but also makes use of normative corporate product design practices. Reading speculative design as a critical practice through Dunne & Raby's writings and a history of criticality in the arts and humanities, speculative design's criticality comes from a critically oriented designer's creation of alternate futures or alternate worlds free from commercial constraints, seeing the future as multiple and uncertain, and not immediately focusing user needs. This work is done in contrast to dominant user-centered design approaches in HCI, suggesting a type of critical technical practice (Agre 1997a).

Tracing speculative design through a history of corporate practices, however, the politics of speculative design differ. Rather than being an inherently critical approach, speculative design is situated in a unique space blending corporate and academic research, utilized by Xerox PARC to divine "new genres" of technology use, highlighting the ways in which speculative design has been able to get purchase in corporate-shaped environments. Speculative design also builds on an HCI tradition of scenarios, which also has corporate origins—which while reflective in recognizing that an individual planner or practitioner has limits to their knowledge about potential outcomes, is not embedded with a set of politics that are critical about social values and systems of power.

From these reflections, speculative design as a practice is not necessarily indicative of a critically oriented design approach. Rather, it is a commitment to critical reflexivity—the

situated positionality of the researcher, commitment to a political stance, and a critical reflection on sociopolitical values—within a speculative, future-oriented practice that makes it a critical practice. However, wrapping this reflexivity in the language of innovation, speculation, and long-term futures in speculative design is what provides it legitimacy as a useful and valuable practice to the HCI community, as these qualities are already seen as valuable in the community, particularly in the corporate community. Khovanskaya et al. note how critically oriented HCI research often is evaluated through the dominant lens of problem-solving and often needs to be framed in ways that are legible to that HCI audience (Khovanskaya, Baumer, and Sengers 2015). Speculative design's focus on creating fictional products and utilization of scenario-like practices provides it legibility in HCI, which tends to be concerned about producing usable technology solutions to problems. Speculative design provides a critical practice.

Speculative design's use of dominant HCI practices, but repurposed towards other ends (such as creating provocative products or critical scenarios), make use of enough of dominant HCI tropes in order to be legible to a broader HCI community as a legitimate form of practice. However, because these dominant HCI practices have histories and politics stemming from corporate and military design, this legibility also allows the critiques made in speculative design to be easily re-appropriated by systems of economic and political power as solutions to problems. In a historical example of re-appropriation, Phil Agre's development of the computer program Pengi was meant to embody a critical alternative to dominant practices of artificial research (embodying ideas of situated action instead of planning and reasoning). However, Agre notes that the critiques that he and others were making did not change AI research practices, but rather became adopted and re-appropriated by the dominant military-focused AI research community as new solutions to problems arising from operating in "unpredictable" environments (Agre 1997a). Similarly, a set of speculative design sensing technologies meant to promote critical discussion of surveillance and power by being presented similarly to other mainstream (non-critical) technologies developed in HCI, can be easily re-appropriated to inspire the building of the very types of surveillance systems that the design is meant to critique.

Navigating the benefits and potential harmful re-appropriations of this legibility draws similarities to the tensions experienced by UX professionals discussed in the previous chapter, in tactically trying to decide when and how to make values issues legible while working within the logics of technological solutionism and market fundamentalism. Speculative design in HCI can be similarly considered a form of "soft resistance" (Nafus and Sherman 2014). In part it critiques the dominant HCI logics about designing for usability and efficiency, by repurposing design techniques as a way to ask questions, explore other social values, and propose alternate sociotechnical configurations of the world. At the same time, speculative design often makes use of some dominant HCI logics—such as presenting speculative work through the form of a product, system, or user study.

Explicit discussion of a designer's positionality and politics can be useful for articulating the critique within the confines of an academic space. These explicit discussions can help explain how the designs represent and propose new sociotechnical imaginaries, or contest current ones. Seen this way, speculative design can represent a careful tactical intervention within HCI spaces as a form of critical technical practice. However, the corporate history of speculative design practices and legibility to a mainstream HCI community also means that these designs can be easily imbued with current sociotechnical imaginaries, and thus are also easily legible to corporations and governments as potential solutions, rather than critiques or critical interventions.

This brief history of speculative design recognizes the tactical work that speculative design can do shifting between critical and affirmative modes of interpretation. Informed by this, I next reflect on the ways in which I used speculative design over the course of this project, and present some proposals and orientations for future speculative designers.

Speculative Design as a Method of Critical Analysis and Reflection

My use of speculative design in this project is embodied with a slightly different intention than just critique. In using speculative design as a method of critical self-reflection to reflect on and analyze empirical data emerging from interviews and field observations (Chapters 5-6), I intended to use the practice of speculative design as a way to surface new insights. Inspired by Khovanskaya et al.'s use of speculative design briefs based on empirical data, design can both "make tacit ideas and assumptions concrete, bringing them from the realm of tacit ethnographic understanding to the realm of the discussable." (Khovanskaya et al. 2017, 5381) However, while Khovanskaya et al.'s work focused on ethnographers collaborating with designers who did not have firsthand access to the field sites, I used design as a way to reflect on and analyze my own data. Over the course of coming back from the field, or reading and listening to interviews, I would try to convey some of the interviewees' experiences through a set of design fictions (such as the Headlines activity or Anchorton Consulting designs), try to examine the politics of artifacts similar to what participants brought up as influencing their work (such as the Face/On ethics poster), or create designs that drew on themes occurring in early analysis (such as the ethics work tracker emerging from an analysis of different types of labor and practices discussed by interviewees).

These designs were useful in two specific ways: first, the practice of creating speculative designs surfaced consideration of values and themes in a similar way that design practitioners sometimes reflected on values through design practice, providing greater insight into design as a reflective practice. Second, creating speculative designs based on empirical research data allows the designs to portray a broader range of practices and relationships that are difficult to portray when focusing on fictional products. This allows the design to more carefully construct and project sociotechnical imaginaries that recognize infrastructural labors, such as maintaining social and organizational relationships, and how systems of power affect these practices.

Reflecting on My Design Practice

Recent scholarship in STS and related fields has discussed how engaging in design practices can provide a method of inquiry into understanding and opening up the politics and material practices of design. Engaging in design practices similar to those that practitioners use to make products, with reflexivity about the designer-researcher's positionality, can surface politics and values related to material design practice that are often blackboxed when looking at a designed artifact and that may not be gleaned from interviews alone (Dumit 2017; Ratto 2011; Rosner 2018).

In using design as a research method, I recognize that "design" has rhetorical power and its own histories and politics (Sims 2017; Rosner 2018; L. Irani 2018). By reflectively engaging in design practices and creating design artifacts similar to what UX professionals do, this project aims to use design as a lever to open up and explore the politics of the practices of UX professionals, complementing the knowledge gained through interview and observational forms of inquiry.

UX professionals engage in everyday acts of speculation, through practices such as creating personas, mockups, and design explorations, or asking about the different possibilities that might occur through different use cases "what if this happens?" As one interviewee described it, "that's a lot of times the role of the UX designer, in trying to think through all the possibilities." Using speculative design in a reflective way similarly allows me to think through possibilities—but rather than thinking about the possibilities of product use, they allow me to think through different possibilities of how UX professionals' work can be configured and organized.

Reflective speculative design also provides another way of knowing and understanding UX professionals' practices. For instance, in Chapter 5 Keri described putting in sample copy in a speculative user interface (UI) mockup of a product caused her to reflect that she was trying to manipulate people into using the product, describing the experience as realizing that "This is like the dark side of UX."

> Keri: And I wrote down something along the lines of, the headline message was like "see what your co-workers are doing in this chat app, or talking about this chat app." And the call-to-action was like "join them." And that's when I thought about "wow this message, it's tapping into that feeling of FOMO, that feeling of missing out as a way to drive someone to take action and join their co-workers in this product." It was as I was writing out the micro copy on the UI.

Creating instantiations of speculative UIs similarly allowed me to surface values for reflection. The fictional ethics work tracker idea stemmed from interviewees' discussions of trying to integrate thinking about values into organizational metrics, and using bug tracking technology to track values issues. Thus, I tried to take a GitHub-like visualization for project management and apply it to values and ethics work. However, it was when I started trying to create detailed copy for the UI, trying to decide what types of activities might get recorded by this tracker, that the importance of emotional aspects of their labor became clearer to me, thinking about how a values advocate has to regulate their emotions when surfacing values issues with others who might be indifferent or hostile towards having that discussion. This process also helped me better understand how practices of everyday speculation, like creating mockups of interfaces, can help surface new values issues if the designer is reflecting while doing the design work.

Reflective speculative design also provided a window into practices that I could not directly observe. In developing email and slack message threads, for instance, I had to consider how UX practitioners might frame their statements to other organizational stakeholders, and consider the ways in which managers or others in the organization might respond. These are not meant to be caricatures, but are rather informed by the told experiences of interviewees. While my practice is situated differently—I have the power to control how managers and UX practitioners interact with one another when creating the design fictions—it made me more carefully consider the different types of relationships UX practitioners have with other organizational stakeholders, and the practices and modes of action they utilize in order to "act on" one another.

Presenting the speculative designs to audiences who interpreted designs in alternative ways, provided experiential knowledge around the work of making values visible and legible. Through one-on-one interactions, short talks, and public Q&A, presenting the designs provided an experience of trying to share critiques that surface values and make ethical issues legible to a broader audience, only to see some of that audience interpret the designs in a different way. I

found that I had to try to negotiate meanings and understandings with other people, regulate my emotions when responding to these alternative interpretations on the spot, and do agenda setting work in trying to lay the groundwork for people to understand the points I was trying to make. While situated in an academic context, rather than a corporate business one, my own creation and presentation of speculative designs helped highlight the role of social practices in discussion of values, and presentation of non-standard design proposals. My experiences also highlighted the work navigating the types of tensions that interviewees discussed, such as trying to present ideas in a legible way without being misinterpreted, or in placing some hopes in how design practices can lead to some forms of social change while still being wary about the extent to which it can have positive effects.

Basing Speculation in Empirical Data

The sociotechnical imaginaries presented in speculative designs are a view from a particular somewhere. A speculative design might help portray an existing sociotechnical imaginary, or portray a new one in conversation with an existing imaginary. Regardless, imaginaries do not come from nowhere; they are shaped and promoted by current practices, cultural artifacts, and systems of social and technical organization. Speculative design is an authorial practice (Pierce et al. 2015), which suggests that the sociotechnical imaginaries that get portrayed or critiqued by speculative design are ones that the designers already embody or are familiar with.

Indeed, speculative design has been critiqued for often coming from a privileged perspective, leading to several marked shortcomings and oversights. Tonkinwise points to a lack of discussion of race or class, an overly US and European focus, and an overt capitalistic aesthetic of fictional "products" (Tonkinwise 2014). Similarly, designers Luiza Prado de O. Martins and Pedro Vieira de Oliveira argue for speculative and critical design practices that better represent multiplicity and identify the ways in which differences and power discrepancies appear (Oliveira and Martins 2019; Martins and Oliveira 2016). Additional critical scholars call for greater recognition of local design practices, rather than assuming that only particular technologies (from the global north) are legitimate forms of design (Escobar 2018). Søndergaard and Hansen, drawing on Haraway, call for design futuring practices to "stay with the trouble," to think beyond privileged individual needs and consumption-based experiences (Søndergaard and Hansen 2018).

Creating speculative designs based on interview and fieldwork data allows a broader set of empirical experiences and viewpoints to be expressed in the designs, rather than coming solely from a designer's perspective and imagination. Furthermore, creating speculative designs that focus on practices and organizational relations allows exploration of situations and relationships that would be less visible when focusing on a product alone. Designing a speculative product foregrounds questions of direct use—how might someone use and interact with that product? However, the speculative designs that focus on UX practitioners' practices and organizational arrangements surface questions and situations that occur in the "background" of a product, looking at social and technical practices of design, navigating organizations, and ongoing maintenance work. The designs, based on empirical interview data, depict how the practices of addressing values are not just technical, but deeply social. It requires the maintenance of social relationships, agenda setting, ally-building, information sharing, in addition to technical tools, methods, and practices. These speculative designs serve as a form of "infrastructural inversion", analytically foregrounding relationships among people, practices,

artifacts, and structures that normally exist in the background of a situation or activity (Bowker 1994; Bowker and Star 2000).

Organizational Fictions: From Depicting Products to Depicting Practices and Processes

Reflecting on the politics designers' (and my own) intentions when using speculative design, I propose ***organizational fictions***—depicting a set of speculative organizational practices, rather than a speculative product. This provides several benefits. First, depicting fictional technology development practices and organizations may make the critiques embedded in the designs less susceptible to re-appropriation by dominant power systems (by avoiding product-centered design language) while still being legible to technically oriented communities. Second, as an analytical and reflective practice, depicting speculative processes instead of speculative products open up a new set of questions to investigate that center on organizational arrangements and practices, rather than on questions related to direct use of technology products. Third, the organizational fictions can act as a communitive set of artifacts. They can allow me to discuss and portray experiences in rich detail that evoke experiences similar to what interviewees described, while maintaining their anonymity.

While the designs created in Chapters 5 and 6 were created primarily as a way for me to reflect on my empirical data, they also potentially serve as artifacts to share with other UX professionals as a way to start conversations about work practices. The design fictions' content portrays experiences and situations similar to what interviewees discussed, or evoke tensions and politics that emerge from interviewees' discussion of their experiences. The design fictions offer a way for me as a researcher to circulate those stories and experiences, while maintaining anonymity of interviewees, given concerns about corporate secrecy that I encountered many times over the course of my research.

This culture of secrecy can make it difficult for UX professionals to share specific details about their work experiences with each other. Even at meetup events, case studies tend to be shared at a level of abstraction that focuses on design principles or general patterns, rather than specific details about a product, or specific details about the social and organizational labor needed to achieve those outcomes.

While the case study presentations I observed abstracted away the specific details of an experience based around a real-world example, speculative design can be used to provide rich and specific details placed in a setting that is fictional yet shares aspects with real-world experiences. In chapters 6 and 7, the *Face/On Headlines Activity* and the *InnerCube/Anchorton* designs represent organizational fictions as they depict a set of organizational practices, rather than a speculative product. These highlight the work of maintaining social relationships, setting agendas, and navigating organizational stakeholders.

Organizational fictions created by or shared with UX professionals presents a new type of design artifact, complementing the case study. Organizational fictions can help share rich detailed information about social and political UX practices, while avoiding potentially sensitive discussion about real-world products (sensitive in the sense that details about products may be covered under a non-disclosure agreement). This may allow for new practices of information sharing and information seeking among UX professionals across organizations.

Based on my experience, I present two design tactics that can help others in creating organizational fictions and embodying their politics of depicting speculative practices rather than speculative products.[40]

Design Tactic: Focus on stakeholders beyond users, and relationships beyond use.

In creating organizational fictions, designers can consider what types of relationships people have with technologies beyond use, and what stakeholders exist in a technology's political economy beyond users and consumers. This might include consideration of designer, engineers, managers, repairers, investors, product supply chains, and so forth. This opens up questions such as: What forms of work and infrastructures might be necessary to create and maintain a system across time? Who does this work, and how is it valued (or not)?

Several designs from chapters 5-6 depict organizational fictions that make use of this tactic. For instance, a reflective fiction in Chapter 5 portrays a headline-based design activity that the Face/On AI team uses to think through the social implications of their facial recognition product. As an organizational fiction, it never directly depicts the facial recognition technology product. Instead, it depicts the practices and artifacts of people surrounding that product. Through the fictional stakeholders and headlines activity, we see the types of values issues on the minds of designers and other workers at Face/On. Through the email messages, we also see how organizational stakeholders relate differentially to the facial recognition product, as designers, engineers, managers, and clients. The types of visibility that they have into the system and its potential use cases differ, and the priorities they set for addressing problems related to the system differ. UX professional Joanna's desire to conduct research in collaboration with academics to understand how to do facial recognition "responsibly" is in tension with the organization's current agenda of putting resources towards a client, a sports stadium installing facial recognition security system. The types of practices that these stakeholders engage in—making values visible, trying to secure approval and funding for research, and trying to influence organizational agendas—differ from practices surrounding use. These are not just practices of technical design, but also practices of trying to create social and organizational infrastructures.

Design Tactic: Depict harms that arise from systems of power and institutions, rather than from intentionally harmful products.

When creating speculative products to surface consideration of values and ethics, a common technique involves designing intentionally "evil" technologies where the harms of the technology (implicitly) arise from the malicious intent of its designers (Soden et al. 2019). However, organizational fictions' depiction of speculative practices points to a different source of harm: the systems of power in which the technology is embedded or adopted.

For example, one organizational fiction in Chapter 6 depicts UX designers who attempt to surface and address problematic social values related to an harmful use of their platform, but are stymied by their company management's desire to not lose a contract with a particular client; they are later are replaced by contractors or "ethics strikebreakers" who do the problematic work instead. This fiction highlights a moment of values contestation that may not be apparent when looking at a system from an end user's perspective: engineers and designers speak out against a

[40] See (Wong et al. 2020) for an expanded discussion of these and other design tactics, developed in a broader framework termed *infrastructural speculations*. The concept of infrastructural speculations was refined and further developed in collaboration with Vera Khovanskaya, Sarah Fox, Nick Merrill, and Phoebe Sengers.

problematic use of their product, but their concerns get dismissed and obfuscated by management. The negative outcomes from this scenario do not arise from the evil intent of engineers or designers, but rather from the organization's arrangement of power and the encompassing industrial structures of financial reward.

This tactic calls for a different politics of intentionality for speculative designers. It calls attention to systems of power and inequality of the past and present, and calls on us, as design researchers, to grapple with how those systems might persist in the futures we imagine. Notably, this tactic is *not* about creating grand futuristic dystopias. Instead, it seeks to recognize the current and past harms that people face in their everyday lives, surface the systems of power that (re)create those harms, and imagine how those assemblages might be (re)configured in the future. Creating organizational fictions can focus attention on how the institutions and power structures that exist today (often in the background) can be (re)configured in ways that *still* exert power in the speculative future.

The Politics of Reception

Design is not only political during practices of intentional creation, but it is also political when it is received by others. In this section I discuss ways I shared the speculative designs created as part of this project and how they were received in unexpected ways, reflecting the politics of these encounters.

Over the course of this project, I shared versions of the project's speculative designs with a range of audiences, including at academic conferences, public talks, and open house type events. I would start by providing a brief overview of speculative design—conceptual designs intended to surface reflective conversation about values, rather than proposals to implement—and then briefly suggest the types of issues the designs raised for me. Generally, audiences engaged with the designs as I intended—recognizing their conceptual nature, and using them as starting points to engage in conversations about social values and technologies, sometimes raising alternate viewpoints. For instance, at an academic conference presenting some of the tracking devices inspired by *The Circle*, an audience member after the talk came up to discuss with me alternate situations where increased privacy for some stakeholders could lead to greater harms, such as in cases of intimate partner violence. In general, the speculative designs projected an imagined world, within which viewers and I could discuss different configurations that could exist in that world which might have different values implications. However, there were two particular encounters where people engaged with the designs in ways that I had not anticipated, interpreting them with a different set of logics that did not necessarily recognize the designs as conceptual, speculative, or critical.

Two Encounters

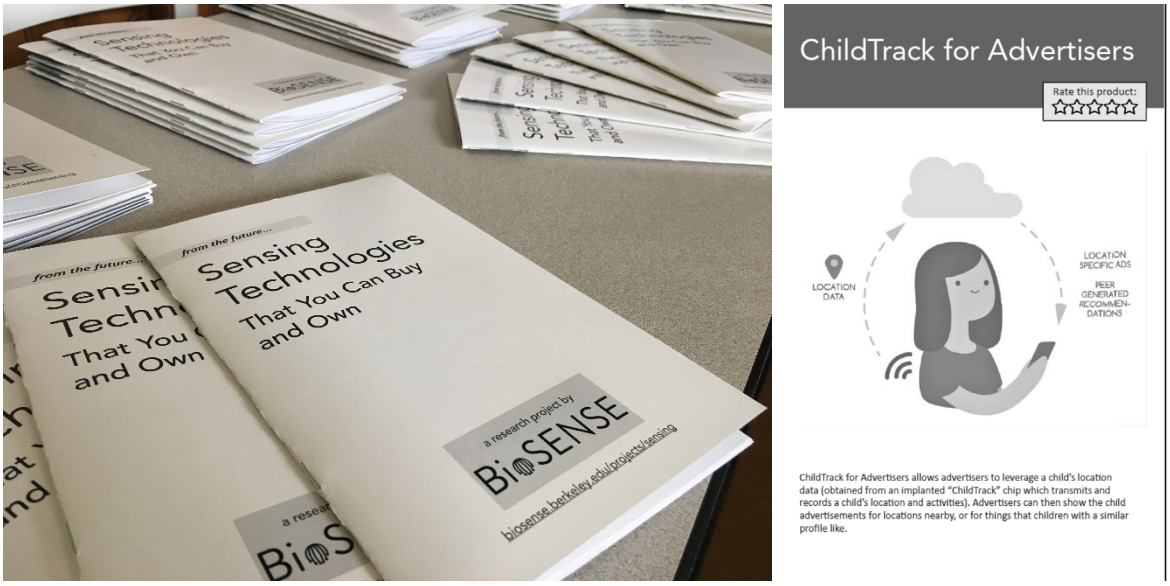


Figure 7.1. Copies of the speculative design product catalog zine (left), and an example page from the zine showing the "ChildTrack for Advertisers" design (right).

In the first encounter, I created a zine of fictional products using the speculative designs inspired by *The Circle* and discussed in Chapter 3 to share at an open house event held by our department at UC Berkeley in spring 2017, distributing them to about 30 to 40 people. Using the format of a catalog was in part inspired by other designers who presented speculative designs and design fictions in the form of fictional IKEA catalogs (Brown et al. 2016) or the Near Future Laboratory's *TBD Catalog* (Near Future Laboratory 2017). Prior work argues that catalogs of speculative design objects allow viewers to more easily imagine the products as everyday objects and consider the implications of their use. At the same time, I wanted to include some indicators that these designs were imagined and fictional, rather than products to be made, so I included a "from the future" tagline on the cover of the booklet, had a description of speculative design on the first page, and printed them with a grayscale zine aesthetic, rather than a glossy colorful advertising sheen.

The designs helped spark a range of conversations with visitors to the event, such as how data might be unknowingly shared with healthcare providers, or another visitor finding humor in the idea of using an implant to track a spousal partner. However, there were a number of people who also thought that these fictional products were prototypes under development by people in the department. One family viewing the ChildTrack design, which posits a type of implantable tracking chip for children, compared it to the implanted chips in their pet cats, which allowed the cats to go in and out of the house through an internet-connected kitty door, while keeping racoons outside. The mother of the group seemed to be alright with implanting the chip in the cats, but not in children. Conversely, the father of the group noted that he was wary about putting a chip in the cat at first but has come around, so perhaps it would not be too bad to put a chip in a child's arm – plus, he postulated, maybe it could be used to play music or operate other things, just like something out of science fiction. Then their young son came over to me, held out his arm, exclaiming, "chip me!" These were not the reactions I was expecting. Perhaps the event's location or the format of the presentation of the designs clouded their speculative nature,

allowing some people to believe that they were prototypes of products under development. Despite by attempts to create a space emphasizing the fictional nature these designs, people may have come to this university event expecting to see new futuristic technologies in the process of being developed.

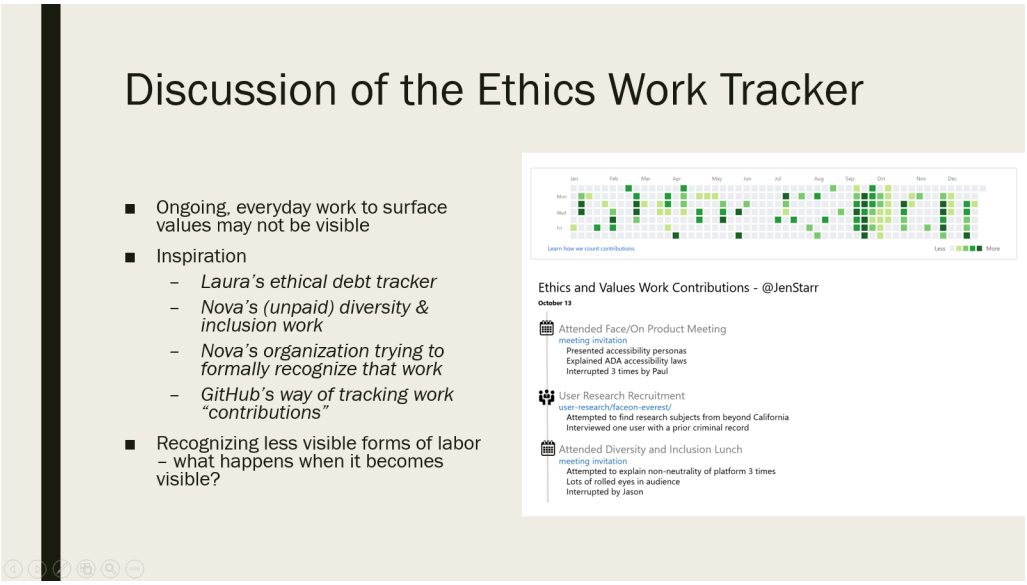


Figure 7.2 Slide from the presentation I gave in 2020

Similarly, at a talk I gave at UC Berkeley to the School of Information community in winter 2020, I presented a number of reflective fictions inspired by interviews with UX designers, including a version of the "Ethics Work Tracker," from Chapter 6. The goal of this design is to surface questions about the types of labor done by UX professionals, and to perhaps raise questions about the implications of quantifying and measuring this work in different ways. After the event, an audience member discussed the design with me, saying that in her role at a research center, she would love to have this type of tracking system to help assist them in their diversity and inclusion initiatives. It was a stressful moment for myself in trying to figure out to respond, as I was not sure if this audience member understood the speculative nature of the design and had a different set of politics, or if they did not recognize the design itself as speculative and conceptual. This was unexpected for me in this setting, given that I was speaking at a research talk among an academically-interested audience and I spent part of the talk framing and explaining speculative design. From my position at the front of the room, it felt that the audience felt a similar awkwardness as I felt—that most people bought into the speculative nature of the design, and were similarly trying to understand if this audience member had a different set of politics or did not recognize the design as speculative. In a follow up discussion, I believe that this audience member did not view the speculation itself as conceptual, and instead viewed the design as a useful prototype and expressed a desire to bring a tool like the Ethics Work Tracker into their own practice.

The Fragility of a Speculative Encounter

These unexpected reactions provided a moment for reflection on my role in shaping people's encounters with speculative designs through the design process as well as the presentation of the design. On one hand, from an ethnographic research perspective, these moments of breakdown

provide useful insights into a situation. Consideration of why these encounters did not work as I hoped, reveals something about the social norms and politics of how people receive and interpret new technology. On the other hand, from a design research perspective, these moments of breakdown prohibited me from engaging viewers in conversations about the social values implications of the designs.

Ideally, speculative design opens up a liminal world in which the entanglements of real and fictional are explicitly drawn upon. This conceptually draws on Barad's ontology of entanglements, in which phenomena in the world are emergent through the "mutual construction of entangled agencies" rather than as external, pre-existing things to be defined and observed (Barad 2003). Rather than viewing the "real" and "speculative" as separate pre-defined realms, they can view them as inherently entangled and mutually co-constitutive. The sociotechnical imaginaries that surround technologies are inherently both real—through experiences, practices, and forms of social relation—and speculative—through shared visions about what the future should look like. Speculative designs are useful because they can both interrogate and articulate new sociotechnical imaginaries providing rich scaffolding for the exploration of how values may be implicated in different worlds. Yet these worlds are experienced and informed by the experiences of the designers, interviewees, and viewers.

Speculative design can embody a politics of agonism, that contestation and disagreement are necessary and integral to democratic and political change (DiSalvo 2012). The designer and the speculative design itself serve as a provocation to start discussion about values and politics; however, this discussion ideally works if the stakeholders interacting with the design share the same liminal space.

Viewing speculative designs in this liminal space however, is not a given. The reaction by some people to the designs as actual products suggests the fragility of speculative encounters. Maintaining a space where viewers can both recognize the fictional nature of the designs, and engage with them as if they are real is tricky. To create this space, Elsden et al. argue for more experiential designs encounters, where viewers or participants can come to an experience knowing that it is speculative, yet participate in activities where their lived experience allows them to engage with the speculative world with real world stakes (Elsden et al. 2017). However, not all speculative design work is amenable to that type of experiential configuration.

Speculative designs often utilize an aesthetic that Dunne terms "para-functionality," or the use of normative design conventions to give the appearance of a product, while also seeming slightly out of place, unusual, or unfamiliar (Dunne 2005). This helps a viewer take a speculative concept and imagine it as a part of everyday lived experience. This can be seen in prior speculative design work, for instance using the design convention of an IKEA catalog to show data-enabled home goods that seem slightly out of place with current expectations (Brown et al. 2016). The zine of speculative design fiction products that I distributed was intended to utilize this para-functionality, evoking the aesthetic of a pamphlet or product guide, but to also seeming slightly out of place due to its zine aesthetic and the designs themselves. Similarly, the Ethics Work Tracker is meant to suggest the aesthetic of software development and management tools, but apply those tools to a type of labor that does not quite seem to fit.

However, para-functionality can unintentionally foreclose the liminal space, encouraging people to interpret the design as an actual or proposed product. Several viewers of my designs seemed to interpret the designs in this way. In addition, others have discussed how the press or popular media have found speculative design projects and interpreted them as products in development, such as Auger and Loizeau's Audio Tooth Implant (2001)—a speculative

implantable chip embedded in a person's tooth—which was discussed by publications like *Wired* and *The Sun* as a product in development (Auger 2013, 20–22).

Making use of current design aesthetics may also implicitly adopt the politics of those design aesthetics, focused on using commercially designed products as solutions to a wide range of (often non-technical) problems. As Irani discusses, this type of design solutionism, often encompassed in the term "design thinking," is enwrapped in the politics of the imaginaries of American capitalism and nationalism, and the politics of valuing certain types of creative design labor over other forms of manufacturing and maintenance labor (L. Irani 2018).

These risks suggest that speculative designers should explicitly reflect, discuss, and present their politics, and carefully frame and present speculative encounters. Some speculative design research in HCI understates the role of the designer's politics, implying that the designers' implying that designers' intent and politics matter less than the types of reactions or effects that the designs garner. It is disingenuous, and perhaps deceptive, to allow viewers to continue in the belief that a speculative design exists as an actual product in development. The position of the designer—their positionality, their politics, and intent in the design—should be explicitly reflected on during the design process, and communicated with the design, whether as part of the design itself or as part of meta-textual commentary that accompanies and surrounds a design. This also suggests that designers should attempt to correct misunderstandings about the speculative and conceptual nature of a speculative design at the end of an encounter, particularly if viewers have been unintentionally deceived about the nature and intent of the design (similar to the practice of debriefing participants in research studies that involve deceiving participants).

Speculative design often relies on humor and irony (for instance there is a slight dark humor and irony in attempting to track and quantify one's emotional labor), but humor and irony are culturally situated, which might also serve to gatekeep who is able to see the design as an ironic speculative concept (Kozubaev et al. 2020). Debriefing activities may need to involve explaining the culturally situated humor of speculative design—the use humorous or ironic products—without assigning blame on viewers. The unexpected reactions to my fictional implantable chips or fictional ethics work tracker were not "wrong" receptions or reactions, but a debrief should convey that my designerly intent in creating these designs was not to propose a real product or solution. Moreover, unexpected receptions to speculative design may serve as a useful form of breakdown for design researchers to probe. What social contexts or prior experiences led viewers to receive the designs in that way? Perhaps had I inquired further, I may have learned more about problems arising the in the family's life in which the implantable tracker makes sense as a design solution; or the woman's experience at her research center may allow her to see the ethics work tracker as a reasonable tool. Debriefs of speculative designs can potentially be used to better convey the designer's intent, but also open up opportunities to better understand the politics of a viewer's reception.

Moreover, newer speculative design research, such as in Søndergaard and Hansen who draw heavily on feminist theory and the notion of 'staying with the trouble,' calls on designers to reflect on their positionality and the focus of their design work (Søndergaard and Hansen 2018). Knowledge creation, including design work, represents a view from "somewhere," rather than an omniscient view from "nowhere" (Haraway 1988). Speculative design, by being situated in the future or in alternate fictional worlds, can appear apolitical and without current consequences. However, the range of responses to the designs presented in this research help shed light on how speculative design is situated "somewhere"—both in the politics that the designer brings to the artifact, and in the politics that viewers bring.

As I have co-written with colleagues, "[O]pen and transparent reflection on one's stance and position as a designer can be useful as a means to make the criteria [to evaluate] the design work explicit. This in turn makes the criteria not only open for designers themselves to acknowledge and understand their position, but also provides potential reviewers with criteria by which they can evaluate, compare and judge the work." (Kozubaev et al. 2020) In the article, the co-authors and I propose a set of questions that can serve to help speculative designers do this reflective work:

- How were decisions made, who was included and what questions were (deliberately) left out? Whose futures get represented as legitimate in design, and whose do not?
- Who are the designer-researchers in a particular project, and what expertise and politics do they have? What politics (in the broadest sense) were reflected on in the process?
- Why was a particular future created, what (implicit or explicit) politics are suggested through the authors' and designers' perspectives?
- What types of privilege might the designer-researcher have, and what structures of power might the design artifacts be supporting or contesting? (Kozubaev et al. 2020)

Communicating the result of such reflection with viewers of designs can improve encounters with speculative designs, by helping designers and viewers share the same liminal space opened up by the designs.

Politics, Criticality, and Speculative Design Imaginaries

Viewers bring their own politics and experiences to their receptions and interpretations of speculative designs. Individuals interpreting the speculative designs I create in unintended ways is not, on its own, a monumental concern. However, it can be a source of greater concern when the speculative design work, rooted in critique of systems of power, is turned to support those systems of power.

This is not unique to speculative design. Artist Dena Yago describes creating a corporate forecasting consulting company staffed by critical artists, and how their critiques of power through trend reports became useful cultural capital for the corporations they critiqued, while not leading to any change (Yago 2017). In this vein, interviewee Henry, UX designer at an educational technology company, describes his concerns that surfacing a problematic unintended use of a product could lead the organization to see it as a new market opportunity. This leads Henry to think that if others will come to his preferred outcome independently, and on different grounds, then it might be better to stay quiet. He provides a hypothetical example about a flashcard app:

> Henry: Let's say that a gigantic unintended use case is people putting in answers to take-home tests onto flashcard decks and sharing one with each other. And let's say that a major hallmark of a flashcard deck that was created for the purpose of cheating is that it's got super long flashcards. The content is just enormous because people are just cutting and pasting stuff in. So something as simple as adding a character limit to a side of a flashcard [would solve that]. Let's say we say something like "well let's introduce this Twitter-style character limit so that flashcards are nice and bite-size and concise" and everybody goes "yeah okay." Which by the way they would never do, they're going to pick any decision to death. But let's say they said "okay yeah, sounds good, let's go with that." At that point, first of all count your lucky stars.

> But if the thought ever occurs to you that "well, you know, the cheaters are not going to be supported here," **don't say anything.** [*Chuckles*] Because they're gonna go "what about the cheaters? You didn't think about the cheaters." […] **It would open up, well "why shouldn't we support cheaters? We're just building a neutral tool here. If the cheaters are paying customers, why shouldn't we help them out?"** That's what I like to call market driven educational technology, market driven pedagogy.

Henry's strategy of omission attempts to prevent his values-based critique (that the flashcard app should have length limits to prevent cheating use cases) from being re-appropriated towards profit-based ends (that cheaters might present a valuable new market segment to design for). One potential path forward for Henry might be to capture the attention of audiences in the company with greater or other forms of power than those on the product team—such as the legal team, a risk management team, or the company's board. However, it is not clear that speculative design represents the best mode for interacting with those stakeholders. For example, while a speculative design that showcases a product helping cheaters may help make potential harms of the product visible to those in the company with power, it is possible that such a design may be received as an actual product proposal rather than a conceptual and ironic critique.

Speculative design, while often embedded with critical perspectives on power, can be re-appropriated to extend political and economic power. After creating the initial set of design fictions inspired by *The Circle* in 2016 (Chapter 3), I was surprised to find how some products we had imagined "speculative" were close to being realized several months later, such as news about Swedish and US companies having employees volunteer to have RFID chips implanted in their hands in order to facilitate micropayments and open doors (McGregor 2017; Holley 2018), or a 2017 advertisement for the Samsung Gear 360 camera features a design form eerily similar to our fictional camera sketch. While it is highly unlikely that a direct link exists between these products and our speculative design work, these similarities serve as reminders that critical conceptual speculative design artifacts could be easily re-appropriated by systems of economic power and re-purposed as commercial products for mass use.

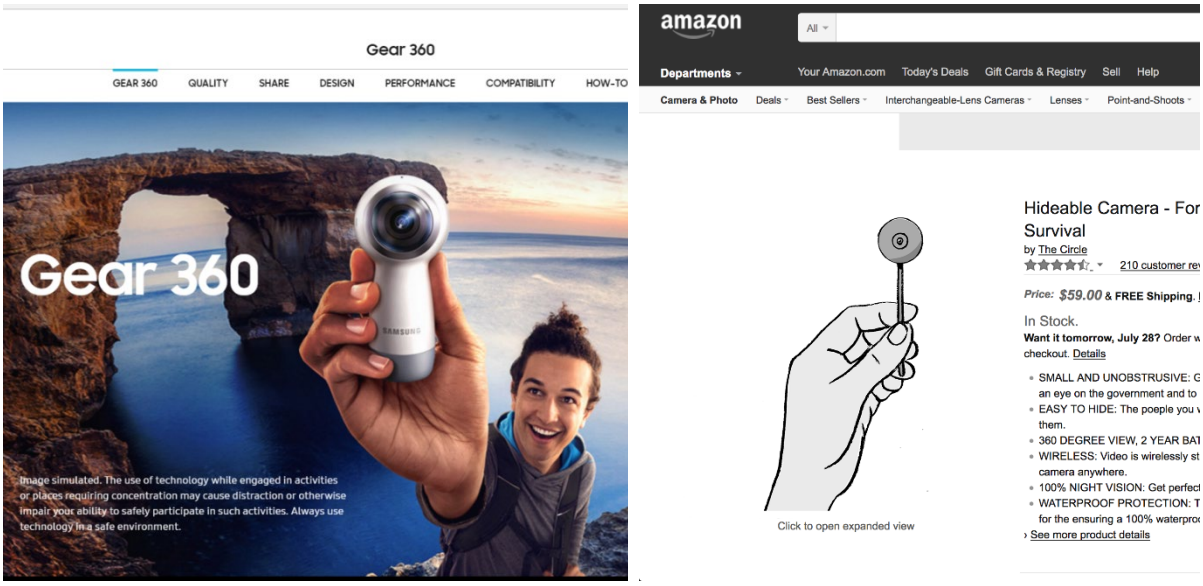


Figure 7.3. The design form in a 2017 advertisement for the Samsung Gear 360 camera (left) is similar to our fictional version of the SeeChange camera created in 2016 (right)

Re-Thinking Design By, With, and For Whom

Beyond being reflexive and upfront about a designer's politics, speculative design researchers can be more precise about thinking about with and for whom speculative design is done, and to whom the designs should be legible. Classic speculative design work presumes an expert designer—potentially working with other experts—designing to spark conversation for (not quite clearly defined) broad general audiences and "public debate":

> Designers should not define futures for everyone else but working with experts, including ethicists, political scientists, economists, and so on, generate futures that act as catalysts for public debate and discussion about the kinds of futures people really want. (Dunne and Raby 2013, 6)

While optimistic, calls for speculative design to open up public discussion do not account for the ways in which those discussions can be shaped or re-directed by powerful actors or by existing sociotechnical imaginaries focused on market-based technological solutionism.

Speculative design uses design as a way *to critique, speculate, and present alternatives*. But rather than doing this design work by experts for the public to debate, speculative designers can more judiciously consider with whom design is done, and for whom. This mirrors a move more broadly in HCI: rather than designing for a general user, research has articulated a broader and more complex set of relationships and subject positions that people have, such as non-user, maintainer, repairer, manager, and so on (Baumer et al. 2015; Baumer and Brubaker 2017; Houston et al. 2016). Participatory design and co-design research have allowed more diverse groups of stakeholders to have more prominent roles in the design process. And attention to issues of labor and justice has led to design projects to help serve collectives, laborers, and underserved populations (L. C. Irani and Silberman 2013; Dombrowski, Harmon, and Fox 2016; Salehi et al. 2015).

Indeed recent speculative design research has shifted towards a more participatory stance, such as Tran O'Leary et al.'s work conducting design with African American communities that have historically faced disinvestment (Tran O'Leary et al. 2019), or Kozubaev et al.'s design workshops with residents in U.S. public housing communities (Kozubaev et al. 2019). Furthermore, recent speculative design research has used futuring practices in more specific, tactical ways than creating broad public discussion. Dejardins et al.'s *Bespoke Booklets* are co-designed with individual households as ways to co-imagine alternative futures at a highly local and situated level (Desjardins et al. 2019); Bennett et al.'s *biographical prototypes* emerged from a series of workshops with disabled activists to help position people with disabilities and their practices more centrally as a professional design practice (Bennett, Peil, and Rosner 2019).

Rather than conducting speculative design for broad public discussion—where designs need to be legible to many people—speculative design researchers can more carefully consider with who they design, and for whom they want their designs to be legible. Perhaps focusing on making speculative designs legible to a smaller, but more involved group of stakeholders—such as a household, a set of workers, or a specific community—designers can more carefully attend to the group's perspectives, and be more resistant to harmful forms of re-appropriation. Designers can also work more carefully and longitudinally with these smaller groups to make sure everyone understands the speculative and conceptual nature of the design work before initiating conversations about values. This can help the group share and engage in the same liminal space opened up by the designs. While the speculative designs presented in this dissertation were not created in such a stakeholder-centered manner, experiences with the

fragility of speculative encounters and the politics of receptions to speculative design suggest that future speculative design work stemming from this project could be done fruitfully with greater stakeholder involvement.

Chapter 8: Conclusion – Design for Infrastructuring Imaginaries

Recognizing the prevalence of initiatives to align technology with social values through design and "by design" (such as privacy by design, security by design, and governance by design), this dissertation has explored the current and potential role of design techniques in attending to values, and analyzed the current practices of user experience (UX) professionals explicitly seeking to surface and advocate for values within large technology companies.

The dissertation began by trying to understand the relationship between values and design practices, looking at privacy as a values case study. A review of human computer interaction literature about privacy and design suggested the importance of thinking about the *purpose* of design, *who does* the work of design, and *on whose behalf* is design work done. The review found that while design was often used *to solve a privacy problem* or *to inform and support privacy decision making,* design was less often used *to explore people and situations* or *to critique, speculate, and present alternatives* in relation to privacy.

In order to better understand how design could be used towards exploration, critique and speculation in service of values work, I created a set of speculative design fictions inspired by the novel *The Circle*, depicting a range of fictional products that suggest different sets of privacy harms. These designs help show how privacy is socially and contextually situated—the types of harms, threats, and stakeholders at play differs from one privacy situation to another, which in turn suggests different types of mechanisms and approaches to prevent or redress these harms. When the designs were shared with technologists in training (including people training to be UX professionals, product managers, and data scientists) in a laboratory setting, we found that the designs were successful as "values levers" surfacing and fostering reflection on values. The success of this design intervention in a laboratory setting sparked interest in understanding whether and how design approaches were used in values work within the technology industry.

To understand the practices and strategies of UX professionals who already see addressing values as a part of their practice, I conducted interviews, field observations at Bay Area meetups about technology design and values as well as industry trade shows, and created reflective design fictions and speculative designs as a way of reflecting on and analyzing the data.

Analyzing UX professionals' practices through the lens of the handoffs framework brings attention to the various modes of action that UX professionals use to "act on" and "act with" others within and beyond their organizations. I found that values are surfaced through everyday UX work practices as part of the product design process, such as creating personas, mockups, following technical standards, or undergoing a security or accessibility review. These practices showed how values can be addressed as a part of everyday configurations of UX work. More strikingly however, I also found UX professionals engaged in a range of other activities aimed at shaping the organization—rather than the product or system—to surface and advance values work. The activities involve "acting on" various stakeholders within the organization, and "acting with" peers outside the firm, to increase the visibility and legibility of values to other actors within the firm and get values on the corporate agenda. Activities include seeking out and sharing information, building and maintaining relationships and alliances, advocating for values,

making values visible, designing-with others, and changing organizational policies and processes. These practices are used by UX professionals to re-configure how values work is conducted at their organizations in several ways: by making more space for UX professionals' values work; by getting others in the organization to adopt human-centered perspectives on values; and by changing the politics and strategies of the organization regarding values. Each of these re-configurations represents a different way of handing off responsibility for attending to and addressing values. Some re-configurations hand off more responsibility to UX professionals to attend to values, while others hand off more responsibility to other parts of the organization (though in ways that reflect UX professionals' perspectives).

Moreover, the dissertation emphasized how UX professionals' values work practices occur within relations and systems of power. Many of the values work practices UX professionals described were largely invisible to the organization as a whole, emotionally fraught and draining, and often coded as more feminine tasks. UX professionals often engage in tactics of soft resistance, seeking to subtly subvert existing practices towards more values-conscious ends while maintaining their legibility as business as usual within the organization.

Together, these values work practices create social and organizational infrastructures to promote an alternative sociotechnical imaginary of large technology companies in a way that views these companies and their workers as more cognizant, proactive, and responsible for identifying and addressing social values, in particular reducing harms to users and other stakeholders.

The dissertation presents a set of speculative design fictions, some inspired by the novel *The Circle*, and others informed by the practices reported by UX professionals. In the latter set of designs, speculative design acts as a reflective analytical practice to help further understand the technical and social practices of UX professionals as documented through interviews. Speculative design is political both in how it represents designers' intentions, and in how people receive and react to the designs. Sharing these designs with others and seeing them interpreted in ways that do not recognize their speculative, critical, and reflective nature, raises questions about how speculative design can be re-appropriated or co-opted towards the very ends that are being critiqued and reflected upon. One approach to this dilemma might be to conduct speculative design work with and for specific groups of stakeholders, instead of for broad public discussion. Another approach might be to create *organizational fictions* that focus a designer's and viewer's attention more on practices and relationships, rather than traditional speculative designs that focus attention on fictional products.

This conclusion revisits the purposes of design in relation to values that are proposed in Chapter 2. Informed by the social practices of UX professionals involved in values advocacy, this chapter suggests a fifth purpose for design, *design for infrastructuring imaginaries*, to complement the social practices of values advocacy. I then introduce *Timelines*, a design activity that may be useful for infrastructuring imaginaries. I reflect on the politics of choosing design as a possible mode of action, and reflect on implications that this work has for values in design researchers, practitioners, and stakeholders.

Infrastructuring Imaginaries

UX professionals reported on engaging in values work as a part of everyday UX practices, such as designing interfaces and conducting user research. However, they also discussed practices that went beyond this narrow conception of technical UX work. They also engage in modes of seeking out and sharing information, building and maintaining relationships and alliances,

advocating for values, making values visible to others, designing-with others, and changing organizational policies and processes. We might label these social design practices. The values work of UX professionals includes shaping work practices and power dynamics within their organizations, as well as technical systems. UX Professionals' values work practices attempt to create and maintain the groundwork for new imaginaries to come to fruition by working towards: making more space for UX values work, getting others in the organization to adopt human-centered perspectives on values, and changing the politics and strategies of the organization regarding values.

Thus, values work includes creating infrastructures to promote an alternative sociotechnical imaginary—one in which technology companies and the people working within them are more cognizant, proactive, and responsible for identifying and addressing social values, in particular reducing harms to users and other stakeholders. By infrastructuring new sociotechnical imaginaries about technology companies, UX professionals are trying to reshape how the company sees its mission.

UX professionals' bottom-up work from positions near the bottom of organizations complements the work of empowered formal ethics owners operating at higher levels of technology companies to create organizational change. Metcalf et al. describe "If the purpose of the ethics owner is to be 'moved by ethics,' then ideally they work through this breakdown in order to help return their colleagues to improved everyday conditions," while navigating everyday corporate structures (Metcalf, Moss, and boyd 2019). While Metcalf et al. describe ethics owners' missions as developing strategies and infrastructures that operate within corporate logics, the UX professionals I talked to vary in their strategies—sometimes trying to operate within corporate logics, and at other times trying to push the bounds or attempt to re-define what can be considered within corporate environments.

UX professionals' work also parallels other efforts by outside stakeholders and company leaders to reshape how companies see their missions. For instance, the United Nations endorsed the "Protect, Respect and Remedy Framework," a set of guiding principles on business and human rights that views transnational corporations as having responsibility to consider and address the potential human rights impacts of their work (Ruggie 2008, 14–21). These principles reimagine and reshape companies by pushing companies to think about the broader contexts of their business activities—beyond investors and customers, businesses should think about their activities in the capacities as "producers, services providers, employers, and neighbours" and in their relationships with business partners, suppliers, government agencies, and non-state actors (Ruggie 2008, 17). Companies such as Salesforce have cited these principles in public documentation about guidance for using their products in ethical ways.[41] In 2019, CEOs of major U.S. corporations released a letter acknowledging that their companies have a "fundamental commitment" to a broader range of stakeholders than just shareholders, also including customers, employees, suppliers, and the communities where they work.[42] While these re-imaginings occur from the outside and tops of companies, UX professionals' re-imagining and re-configuring of companies comes from within and the lower frontlines of the organization.

[41] https://trailhead.salesforce.com/en/content/learn/modules/responsible-creation-of-artificial-intelligence/understand-the-ethical-use-of-technology

[42] https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

Design for Infrastructuring Imaginaries

The infrastructuring work of UX professionals includes using design as a way to build alliances, make values visible and legible to others, and to advocate for particular stances on values. The literature review of HCI research in Chapter 2 presented four purposes of design in relation to values: *to solve a values problem; to inform and support decision making about values*; *to explore people and situations*; and *to critique, speculate, and present alternatives*. Each of these design purposes were represented in the UX professionals' practices. For instance, complying with accessibility design standards uses design to solve a values problem around accessibility. Creating interfaces in business software that try to suggest actions or show data that promote workers' wellbeing uses design to try to inform and support managers' decisions about how they treat and relate to workers. The work of user researchers and creation of new types of personas that foreground accessibility or varied working conditions help explore people and situations. And speculative practices of design explorations, using activities like considering potential harmful news headlines about products, use design to critically reflect, speculative, and present alternatives. UX professionals' use of design in these ways represents a type of critical technical practice (Agre 1997b), where these professionals see critical reflection about the values implications of design practices as a part of their technical design practice.

However, the work of infrastructuring imaginaries does not fit neatly into the purposes of design identified in Chapter 2. These practices overlap somewhat with design to inform and support, or with design to critically reflect, speculative, and present alternatives. However, these categories do not fully capture the kinds of ongoing work needed to create and maintain the conditions and spaces that UX professionals believe are important for surfacing and attending to values. This form of tactical and ongoing management work represents another potential purpose of design: *design for infrastructuring imaginaries.*

With this purpose of design, design is not meant to be the sole mode of action—it can be used alongside existing social modes of action and other technical modes of action, complementing them rather than replacing them. UX designer Henry suggests this potential, noting how design activities like "Black Mirror Brainstorming" may not affect individual products, but might be useful for consensus building:

> Henry: I've found such exercises to be of very limited value for the actual design process. Where they *are* useful sometimes is building consensus. And I think that's exactly what the ethics conversation needs. It needs everybody, all the stakeholders on board. And designers on their own have only the power that they're able to get within their organization, which typically is not much.

The potential for design practices to be used here represents a form of design for infrastructuring imaginaries, in Henry's case, a way to build and manage social relationships among stakeholders beyond designers within his organization in order to amass more power to address social and ethical issues.

In the next section, I present *Timelines*, a design activity that may potentially be used by UX professionals and other stakeholders towards infrastructuring imaginaries and the type of consensus building work that Henry describes. The activity draws on existing practices in order to help UX professionals do the work of making values visible and legible to other organizational stakeholders. The activity also draws on infrastructural speculation techniques in order to foreground a range of practices, relationships, and experiences surrounding a product, rather than focusing on the product itself. I present the steps of the design activity, along with

how each step is informed by interviewees' practices, existing literature, or infrastructural speculation techniques. After presenting the activity I reflect on the politics of choosing to use design practices, including this activity, in values work.

Timelines: A World-Building Design Activity for Infrastructuring Imaginaries

In parallel with the empirical research and analysis presented in this dissertation, I developed a group design activity, in collaboration with Tonya Nguyen, to help participants probe values and ethics issues related to a particular technical artifact. The design of this activity was informed by prior work in design fiction, scenario planning, value sensitive design, and values in design, as well as the research interviews conducted for the dissertation.

Timelines represents another type of design-based output, in addition to the reflective fictions and speculations presented in this paper. As a design activity, *Timelines* can perhaps travel and be used in ways different from the design fictions. *Timelines* is not meant to "solve" values issues, but rather be used to help surface discussion, acting as a values lever that scaffolds onto existing practices, so that it can be legible to design practitioners. *Timelines* is presented here as a potential (and in some sense, speculative) future tool to use in Values in Design and values work as a way of helping to impart a different set of politics and perspectives among activity participants, to help them see values as something that is relevant to their work, and to see themselves or their organization as partly responsible for addressing potential values issues and harms. While the activity has been piloted with different groups of academic researchers and students, an analysis of how it might be used in industry practice settings or how effective it is at surfacing values discussions as compared to other levers and tools is saved for future work.

Timelines asks participants to: (a) create news headlines, to create a macro-level storyworld where the technology exists, and (b) create social media posts from various stakeholders' point of view. By thinking about possible worlds at both macro- and micro-levels in an approachable way through headlines and social media posts, *Timelines* helps participants connect changes at scale with the multiple and different micro-level experiences and impacts a single technology can have. *Timelines* can potentially be used in a variety of settings, ranging from classrooms, to workshops, to research studies, to industry. Naming the activity *Timelines* refers both to the headline storylines and "feed" of social media posts created by participants.

Developing *Timelines*

Several aspects from interviews informed the design of *Timelines*, including practices discussed by interviewees, some of which are highlighted here:

- The interviewees themselves often act as advocates, bringing up values issues during meetings and other points in the design process (to varying degrees of success; sometimes competing financial or other incentives mean that their concerns are not fully addressed).
- Some interviewees discussed tools that they have tried which correspond with existing research, such as Value Sensitive Design Envisioning Cards and scenario planning tools like the "implications wheel."
- Interviewees also mentioned a range of futuring activities, including: "Black Mirror" brainstorming, outlining an episode of the dystopian science fiction series based on one's own product; writing a product's press release and FAQ before the product has been

made, to imagine how the public might react to it; and imagining "worst case scenario" news headlines related to their product.
- Interviewees described techniques they use to understand stakeholder perspectives. Beyond conducting user research with diverse groups of people, interviewees also discussed reading news articles and following thought leaders, academic researchers, and social activists on social media to gain insight into new perspectives beyond what they might encounter in their own daily lives.

The design of Timelines incorporates some of these practices and ideas, in part to make the activity legible to UX practitioners, and to potentially help support their efforts as advocates surfacing values issues and creating sociotechnical infrastructures to see social values as relevant to important to a company's practices.

From a review of prior work and studying current Values in Design research and practice, we wanted our design activity to help people think about futures and values in four particular ways. The activity should help participants:

- Create rich fictional worlds, situated in everyday experiences and objects familiar to them, drawing from design fiction (Coulton et al. 2017; Wong, Merrill, and Chuang 2018);
- Identify both direct and indirect stakeholders, drawing from value sensitive design (Friedman, Kahn, and Borning 2008);
- Recognize how values are differentially expressed, experienced, and situated, drawing from recent work on conceptualizing values (JafariNaimi, Nathan, and Hargraves 2015; Le Dantec, Poole, and Wyche 2009);
- Analyze broader, shared societal-level effects of new technologies, including (potentially unanticipated) secondary and tertiary effects, drawing from scenario planning.

Over the course of a year, we play-tested iterative versions of Timelines with different groups and in varying environments. We have used this as an outreach, educational, and research activity, including:

- As an educational activity in two graduate-level courses relating to social aspects of technology;
- At multiple academic conference workshops that focused on thinking about privacy or ethics in emerging technologies;
- With an interdisciplinary university research lab studying sensing technologies to help them reflect on the implications of their research;
- With master's students in an information technology program as research participants to understand how the activity helps them surface and discuss values issues.

Throughout these sessions, we incorporated feedback to iterate on both the design of the activity and our facilitation strategies.

Presenting the Steps of *Timelines*

Each step is presented showing a slide that we use to present instructions to participants, along with an example of how one group used the activity, and a brief discussion of design decisions.

Step 0: Setup

Materials:

- 1 or more participants
- A large timeline triangle (Figure 8.1). On a large piece of paper or white board, draw a similar diagram
- Sticky Notes
- Index Cards
- Sharpies or markers

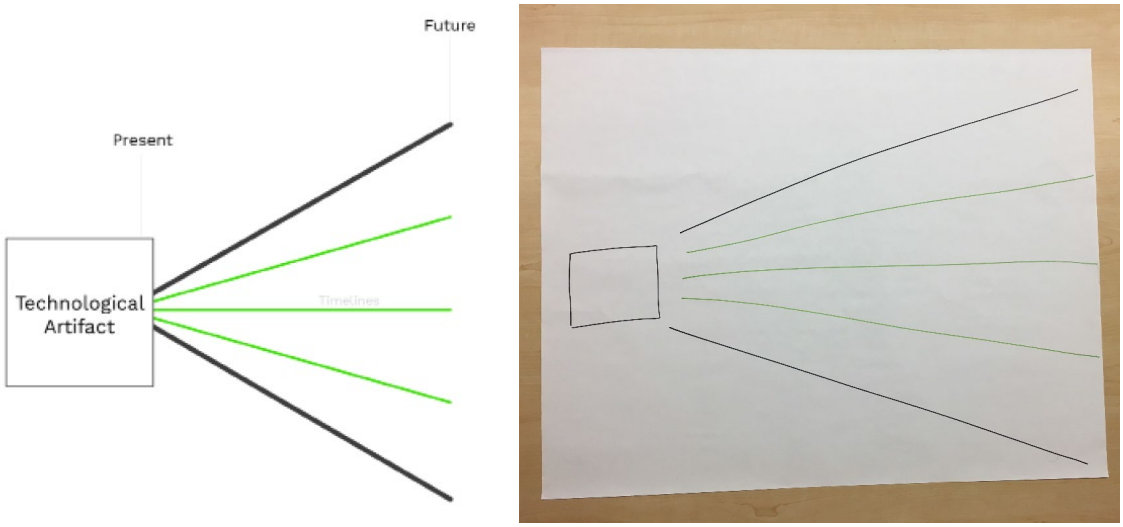


Figure 8.1. (Left) This triangle represents multiple timelines. The left side represents the introduction of a new technology or artifact. Going towards the right, lines indicate different possible stories about the artifact going into the future. Participants use a large version of the timeline triangle to create a storyworld around different ways an artifact gets used and adopted. (Right) The timeline triangle can be easily drawn on a large piece of paper or whiteboard, allowing the activity to be done in a wide variety of contexts.

Step 1: Choose an Artifact and Context

We start the activity by telling participants:

> "In today's activity, we will create a range of future stories surrounding a system or artifact, and explore those stories from different viewpoints. The goal of this activity is to think about possible futures, and critically reflect on the social values implicated by emerging technologies by looking at a range of stakeholders, contexts, and uses. Our goal is to explore and reflect on possibilities, we are not predicting the future."

Participants then decide on an artifact—a technology, system, or feature—that they want to explore. Some groups (such as a project team) may already have one in mind. In earlier versions of the activity, we had people choose an artifact without defining a context. Sometimes this led to talking about the artifact an abstract way. Including a context helps constrain participants' thinking in a useful manner.

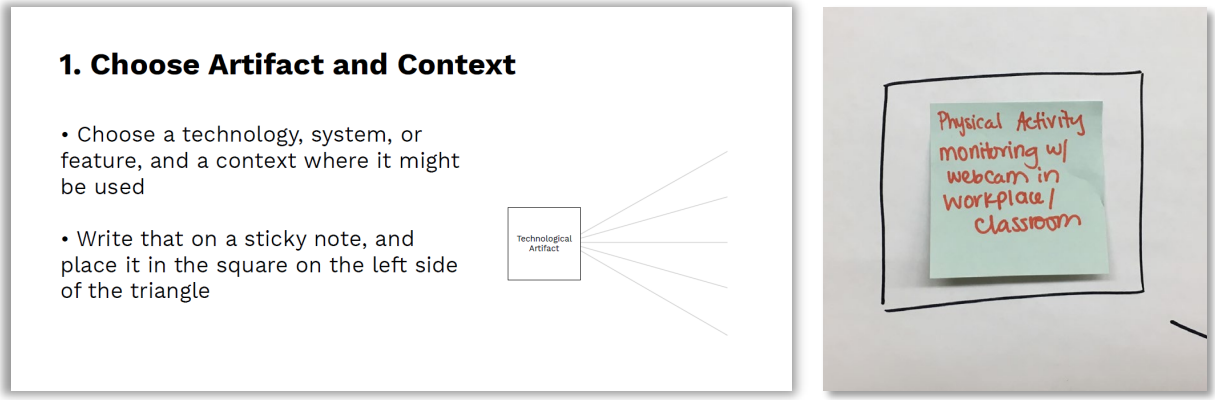


Figure 8.2. One group of participants decided to discuss a webcam that monitors a user's posture and physical activity in the workplace and in classrooms. This was based on a prototype technology that the participants had seen at an event several months earlier. This group consists of three graduate students in a professional-oriented information technology program; one has had prior professional experience as a UX researcher at a software company.

Participants do not need to choose a real artifact, or the specific product they are working on. However, an artifact or context similar to real products and contexts where they have expertise could be useful. In part, this is inspired by Nova's discussion of the difficulty of bringing up values issues directly with product teams:

> Nova: So you're putting them [values and ethics] on the table and making them [product teams] say "we are not going to focus on this," i.e., you're going to exclude this. That's part of the value of having it on the table. And what I'm trying do is like somehow finding a safe container where people don't feel invested in that like "I already built this, I don't want to touch it cause it's already like perfect." [Instead,] to be like "okay, you put in great work. Let's look at this thing sort of objectively if we can. See how we can break it." And then see what are the things that we can change based on this. "Oh, this isn't important for enough for us to change? Is that actually accurate?" That's the sort of self-reflection process where people are like "oh, this might not work."

Nova's goal is to get ethical and values issues considered more explicitly, so that product teams can make judgements about who is excluded or included more purposefully. However, Nova wants to find a way to sandbox that conversation, in order to get people to self-reflect without feeling defensive. The *Timelines* activity tries to facilitate this, by positioning itself as speculative and not necessarily being about a "real" product feature. The stakeholder positions and values issues surfaced in the activity are meant to help participants develop their own self-reflection process that Nova is trying to instill in their co-workers.

Step 2: Generate Stakeholders

On index cards, participants then brainstorm stakeholders for their artifact. This step draws on value sensitive design's focus on both direct and indirect stakeholders (Friedman, Hendry, and Borning 2017). It also tries to help surface relationships that people have with technologies beyond "use" (Baumer and Brubaker 2017), such as non-use (Baumer et al. 2015), maintenance and repair (Fox, Sobel, and Rosner 2019), regulation (Jackson, Gillespie, and Payette 2014), and

re-appropriation (Lindtner, Anderson, and Dourish 2012). At the end of step 2, we ask participants place the stakeholder index cards to the side; we'll return to them in a later step.

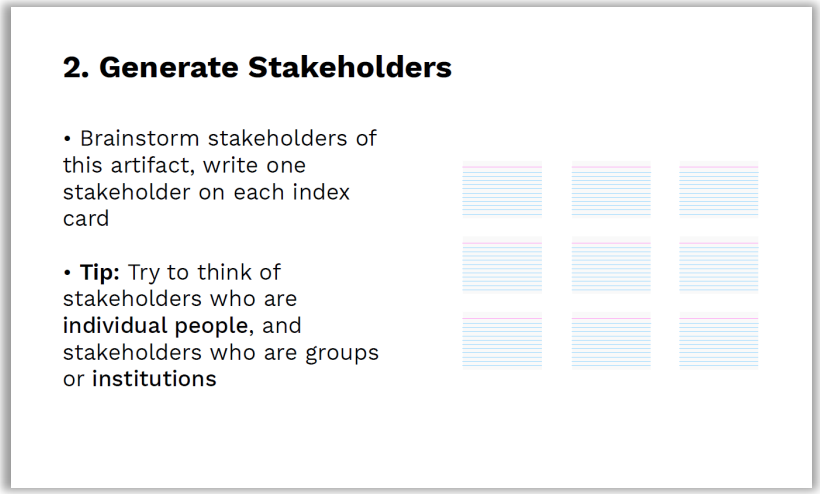


Figure 8.3. Splitting this step into an individual brainstorming stage and group sharing stage allows individuals to self-select what they want to share with the group. Earlier versions did not include individual brainstorming, but participants felt that this created social pressure to come up with a "good quality" stakeholder to share with the group.

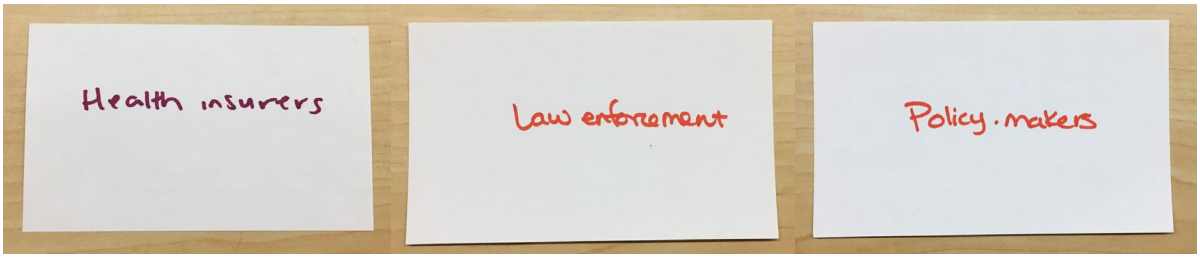


Figure 8.4. Participants are free to share, sort, and organize stakeholders in a way that makes sense to them. When done on a large table, participants sometimes engage in their own card-sorting exercise with stakeholders. In earlier versions, we asked participants to order stakeholders from more individual-based to group-based ones, but participants found this over-constraining. The participants in this group thought of over 30 stakeholders, including health insurers, parents, policymakers, law enforcement, and rival technology companies.

This step makes use of the organizational fiction design tactic "focus on stakeholders beyond users, and relationships beyond use."[43] Activity facilitators should encourage participants to think of stakeholders' diversity – both different types of users, and ways that people relate to technologies beyond use. Thinking about a diversity of users corresponds with user researchers' practices trying to recruit diverse samples. Thinking about uses beyond use corresponds with Matthew's discussion of the "Veil of Ignorance" exercise, that asks "if you're designing a system, would you be perfectly happy being any piece of this system?" ranging from user to designer to other subject positions.

[43] More broadly, the creation of a broad and complex storyworld in this activity follows several design tactics for creating "infrastructural speculations" (Wong et al. 2020).

Step 3: Brainstorm News Headlines

Next, using sticky notes, participants individually brainstorm potential news headlines related to their artifact. Asking participants to use the form of news headlines draws from several sources. Interviews show that reading current news articles, as well as speculating about "worst case scenario" headlines provides a way to think about values and ethics. For instance, Matthew discusses a "front page news story test" activity that he likes to use in his work. Moreover, news headlines are a form that most people are familiar with and can easily create in a short amount of time. Headlines also help participants think about potential large-scale events and shared effects of technologies that are still situated in forms of everyday life.

Figure 8.5. The goal of the headlines step is to try to avoid creating hyperbolic dystopic or utopic visions of the future, but instead focus on banal and everyday outcomes that can be both partially positive and negative (Wong, Merrill, and Chuang 2018). Reminding participants to create both positive or negative headlines helps encourage this.

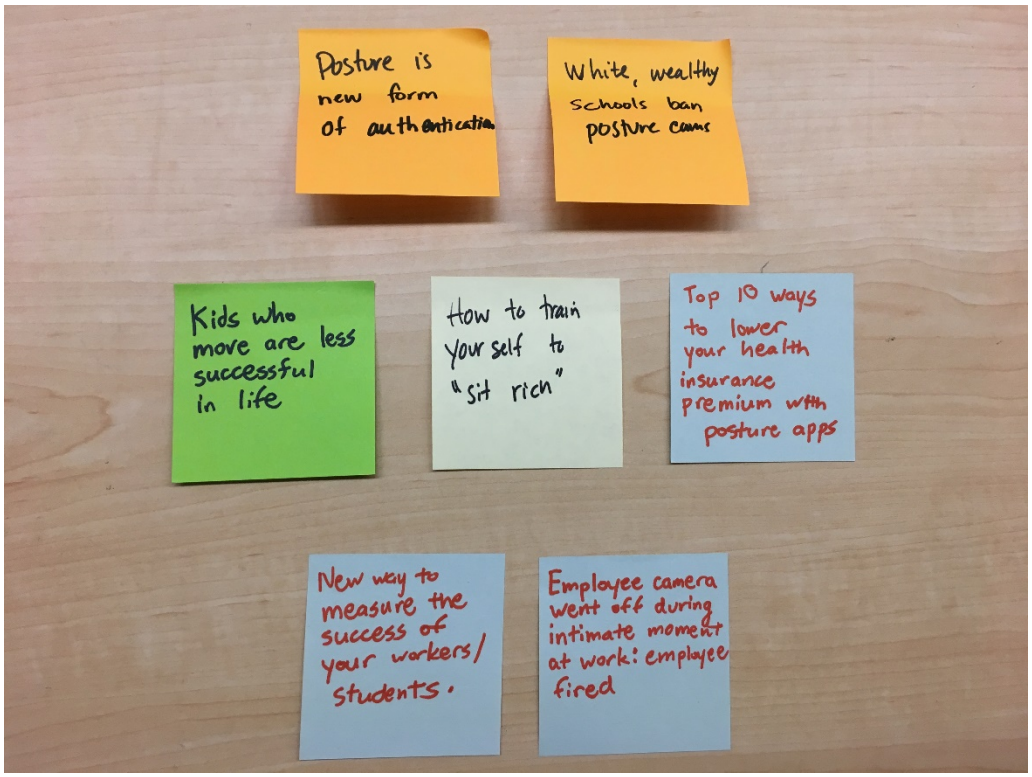


Figure 8.6. Sample headlines from the group thinking about a posture-monitoring camera and app.

Step 4: Place Headlines on the Timeline

Participants take turns to place their headlines on the large shared timeline triangle to create stories or chains of events related to the technology. This step draws inspiration from several sources. One source is the scenario planning "implications wheel" activity (Fahnestock, n.d.). The activity asks people to think of a positive and negative effect of a technology, then a secondary positive and negative effect following each of those, and so on. This helps surface secondary and tertiary effects, and creates worlds that are neither fully positive nor fully negative. Thus, we emphasize that participants create both positive and negative headlines.

A second source is design fiction's exploration of possible worlds through stories (M. Blythe 2017) and world-building (Coulton et al. 2017). The headlines each act as a different "entry point" into the speculative world of the artifact, highlighting a different event, conflict, or perspective. Organized into chains of events, the headlines begin to tell a number of narratives and stories about the artifact.

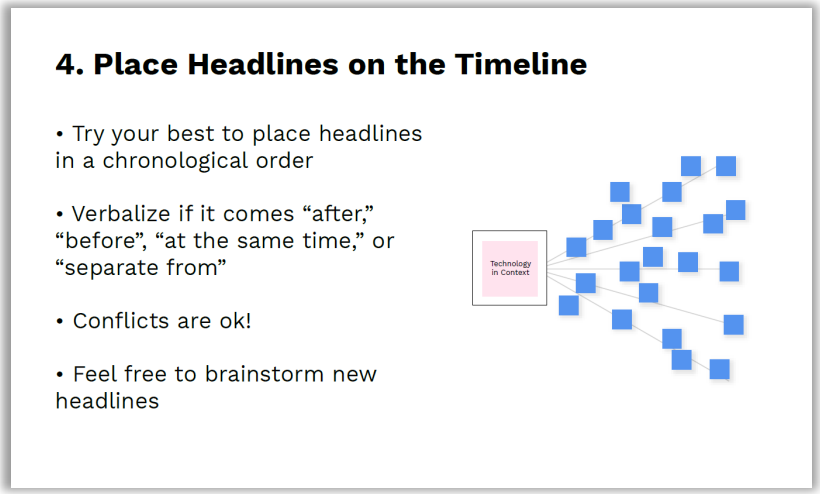


Figure 8.7. While headlines do not need to be placed in a "strict" chronology, placing them roughly in a logical order provides a useful, but flexible set of constraints and helps elicit discussion of secondary and tertiary effects, as well as potentially unanticipated outcomes. One earlier iteration enforced a strict order of events similar to the "implications wheel" which participants found too constraining, while another iteration required no ordering which made it difficult to surface secondary effects.

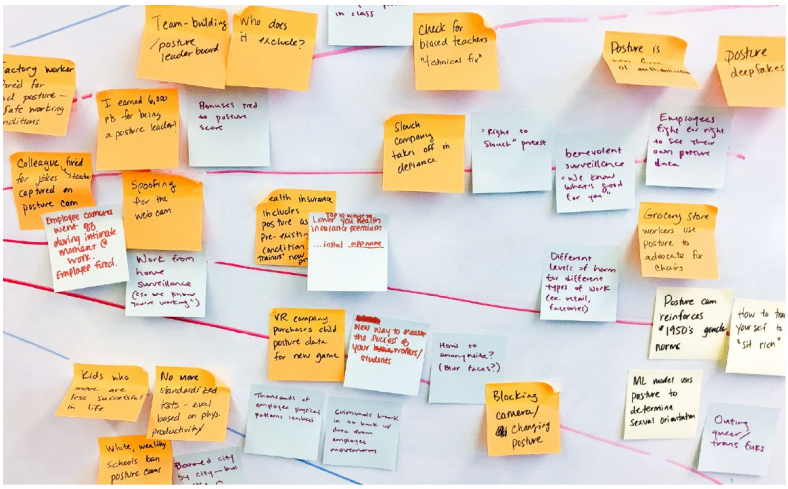


Figure 8.8. A sampling of what the timeline chart might look like with headlines posted

This step follows the organizational fiction design technique of "Depict harms that arise from systems of power and institutions, rather than from intentionally harmful products." Potential problems and harms should arise from the systems of power in which technologies get adopted and appropriated. An important reflection is that these multiple timelines actually occur simultaneously. Benefits and harms of technologies are experienced differentially as they are adopted and appropriated by different systems of power. This step of the activity tries to surface how multiple and seemingly conflicting stories and relationships can co-exist around the same product.

Step 5: Create Stakeholder Social Media Posts

Participants return to the stakeholder index cards from Step 2. Now that participants have created a broad imagined world from the headlines, they can consider that world from the situated points of view of different stakeholders.

Recognizing research that shows how values are experienced in specific, situated contexts (Le Dantec, Poole, and Wyche 2009; JafariNaimi, Nathan, and Hargraves 2015), and critiques that speculative work often creates worlds from privileged perspectives (Tonkinwise 2014; Søndergaard and Hansen 2018; Martins and Oliveira 2014), this step asks participants to look at the world they created from a broader range of perspectives. This surfaces different and potentially conflicting ways that stakeholders might interact with or be affected by the same artifact. While social media posts only allow for a short amount of text, and acknowledging that stakeholders may use social media in very different ways, it nevertheless provides a format that is familiar to most participants, and it provides an initial entry point for participants to begin having deeper discussions about differential experiences and impacts of technology.

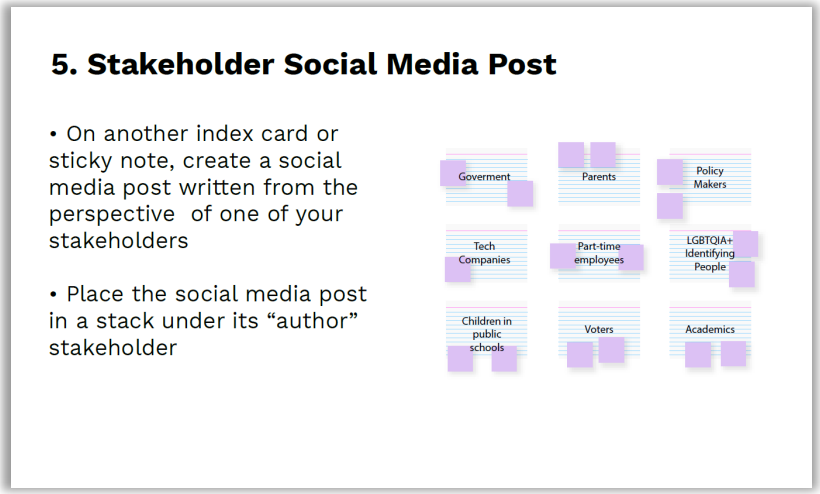


Figure 8.9. Writing social media posts authored by stakeholders asks participants to consider the subject position and experiences of stakeholders.

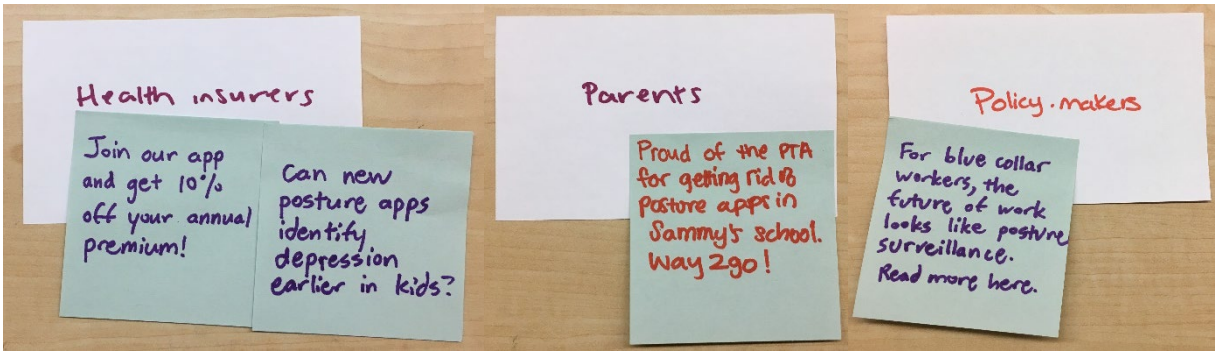


Figure 8.10. Here, a health insurer suggests that the posture app technology can usefully identify depression in children, while at the same time a parent sees the posture apps as a potential threat to children and celebrates when their child's school bans the technology measuring children's posture. Meanwhile, policymakers discuss how posture monitoring might disproportaionetly affect blue collared workers.

Together, creating headlines and social media posts from stakeholders can help create a fictional world that still seems real and lived in. When describing an early version of this activity to Nova, they thought about how this might help co-workers see ethical issues as more emotionally real.

> Nova: I think the problem with some of this [values and ethics] stuff is it's just not real for them [co-workers], because what's real is the pressure they're getting with the execs breathing down their necks to do something. […] What is emotionally real for people is the politics of the place that we're in now, and not the politics of the decisions that we make that are just so far removed. And so how do you make *that* emotionally real?

From Nova's perspective, the emotional pressures that co-workers feel comes from the immediate politics within the organization, what the goals of managers and executives are. Emotional pressures related to external stakeholders and end users are more removed, so an activity like *Timelines* that creates headlines and social media posts could make those stakes seem closer, more immediate, and real.

Step 6: Share-Out and Discussion

Participants then share their social media posts, and shift into a broader discussion to reflect on insights they have had going through the activity. A common reflection we have heard from participants is that while the stories are fictional or speculative, they are surprised to find that the issues they discuss—such as inequalities, biased algorithms, or systems of power—are present in existing systems as well. This suggests that the activity can be useful for helping people reflect on their current technical practices.

Optional Extensions and Adaptations

The preceding steps presented a general set of instructions for *Timelines*. However, the activity can be modified to focus more specifically on issues that a researcher, facilitator, or participants are interested in exploring. Each step can be extended or adapted using other design tools, and conceptual and analytical frameworks.

Figure 8.11. In a privacy-focused version of Timelines, participants had to incorporate a data privacy harm into their social media posts. This social media post uses the "aggregation" harm in relation to a health insurance company's data collection practices.

In one deployment, we wanted participants to explicitly discuss the types of privacy harms that different stakeholders might encounter or perpetuate. We created a set of "privacy harm cards", based on an existing conceptual framework (Solove 2003). When creating social media posts in Step 5, participants were asked to incorporate a privacy harm from a card into their posts. In a similar way, frameworks surrounding other social values such as accessibility, security, fairness, can be used to inform participants' social media posts. At other steps, facilitators can incorporate other existing design tools and kits, should they want to emphasize certain types of exploration.

- **Step 1: Choose an artifact and context.** Participants might use design toolkits like "Loaded Dice" (Lefeuvre et al. 2016) or "Tiles" (Mora, Gianni, and Divitini 2017) to come up with an IoT artifact. Or, participants might choose an artifact from speculative fiction (Wong, Van Wyk, and Pierce 2017; Fiesler 2019).
- **2. Stakeholder Creation.** Participants might make use of the Envisioning Card's Stakeholder suite (Friedman and Hendry 2012), or draw on characters and personas from popular fiction as stakeholders (M. A. Blythe and Wright 2006).
- **3-4. News Headlines.** The Envisioning Cards' Time and Pervasiveness suites can help ideation on how artifacts get adopted and used in different context. Or participants might incorporate scenario planning techniques to describe trends in the broader world that informs headlines
- **5. Social Media Posts.** Participants might incorporate conceptual and theoretical frameworks on specific values to inform social media posts, such as ones for privacy or for fairness (Mulligan, Koopman, and Doty 2016; Mulligan et al. 2019). Participants might also incorporate findings from empirical research with different stakeholder groups.

We have also experimented with facilitating adaptations of this activity in online virtual settings, so that it can be used with remote and distributed participants.

A Multiplicity of Uses

Timelines provides a useful integration of several theoretical perspectives for thinking about values and ethics in technology from multiple stakeholder viewpoints. It allows participants to: create rich fictional worlds in an approachable way by using headlines and social media posts; identify direct and indirect stakeholders; recognize how values are situated and differently experienced; and also think about broader, shared, social effects related to new technologies. The world-building activity helps participants think about both macro-level broad effects, as well as multiple micro-level situated experiences. The activity also draws on creating fictional artifacts -- headlines and social media posts -- that are legible to a broad range of researchers and practitioners. In order to allow *Timelines* to be facilitated in a wide range of settings, we designed the activity to be lightweight in terms of its materials. In a remote working setting, *Timelines* can also be facilitated online, using a combination of shared slide decks and other remote prototyping tools.

Moving forward, the Timelines activity can be utilized in different ways by researchers, educators, practitioners, and others. For instance, it might be used as an educational activity with both technical and non-technical students, as a training activity in an industry setting, as a probe to understand stakeholder concerns in research, or as a way for policymakers and non-technical stakeholders to think about values dimensions of emerging technologies. *Timelines* alone will not solve values and ethics issues, nor should the activity's stakeholder exploration be viewed as a replacement for empirical research with stakeholders. However, it could be a potential useful

piece in addressing a larger puzzle. By being adaptable, such as being able to focus on specific values or being able to integrate other existing toolkits and frameworks, *Timelines* serves as an adaptable activity that could be used in many settings as a tool to surface and elicit discussion of values and ethics related to technology development and use.

Within a practice setting, *Timelines* presents a tool to help support the work and labor of values advocates. The activity is meant to be legible to a broader organization as a type of design thinking exercise, similar to the "Black Mirror Brainstorming" exercise, news headline activities, or other design and brainstorming exercises. The activity's language of design aligns, at the surface level, with "design thinking" techniques, and the activity's use of headlines and social media posts make it familiar to people who may already be concerned with reputational risk and public relations, or to those who already see news headlines and social media posts as values levers.

However, the activity is also meant to allow values advocates who *facilitate* the activity to tactically surface conversations about values and ethics, which might be difficult to do in product meetings or other settings. When creating stakeholders, headlines, and social media posts, facilitators can push participants to more explicitly think about topics such as diversity, distribution of harms, privacy, accessibility, fairness, and so on. Facilitators can also try to help surface these issues during the share-out and discussion at the end. Like other practices of soft-resistance, *Timelines* helps with the work of centering values and ethics in a discussion, but does not necessarily critique the broader economic framework of corporate technology production. Its appearance as a "regular" design thinking activity allows it to be tactically used towards infrastructuring new imaginaries that center values and ethics, rather than just creating new products. The activity may help UX professionals who are values advocates to help engage and advocate for thinking about ethics and values, for helping them teach and train others that design decisions are non-neutral. At the same time, the activity is very partial as a design intervention—it requires labor in facilitating, as well as labor in doing work to keep conversations going beyond the length of the activity. *Timelines* also acts as a type of design intervention that Lindtner et al. call for, a stance where designers and researchers "notice other modalities of intervention in and through technology production and design that begin from a deep recognition that there is no 'outside the system.'" (Lindtner, Bardzell, and Bardzell 2018)

Re-considering *Timelines* with this perspective suggests potential tactical uses. It is perhaps unlikely that *Timelines* will be integrated into everyday design processes—while relatively lightweight and short, adding another step into a design process faces barriers given the economic and temporal pressures in the technology industry. While many values and ethics toolkits seem to focus on introducing design interventions into the design process, that may not be the only way to think about design interventions in this context. Rather than trying to get organizations to adopt design tool into their design and development processes, designers and researchers might think more tactically about how such design tools can be used to empower the work of existing values advocates while recognizing the corporate and economic power structures that they must navigate in their work.

What Does It Mean to Choose Design?

A long history of work has described ways in which the design of technological artifacts is not neutral—technologies help promote particular values and particular ways of order in the world. Similarly, the act of design is not neutral. This is perhaps clearly evident in the ways in which design can be used to create "dark patterns" to manipulate users into doing behaviors that are

valuable to the organizing designing the product, but may not be valuable to the user (C. M. Gray et al. 2018). Moreover, the ways in which we use design to frame and address problems has a set of politics—Sims describes these orientations as prescribing, publicizing, and proposing (Sims 2017); in this paper, the meta dimension of *design's purpose* attempts to capture design's multiple political orientations.

Design is not a discrete practice separate from the rest of society; rather it is situated in other systems of power that affect how design practices are conducted. In a historical and philosophical analysis, Sloterdijk discusses parallels in the development of 20th century product design logics and 20th century warfare logics (Sloterdijk 2009). In Dunne and Raby's original articulation of critical design, they note that it might be more difficult to conduct these conceptual design exercises in corporate settings, and perhaps it might be easier to conduct them in academic design settings (Dunne and Raby 2001). Lilly Irani discusses how discourses and practices of "design thinking" become entangled with practices of nation building via transnational practices of development, and discourses of innovation through individual entrepreneurship (L. Irani 2018; L. Irani 2019). Gürses and van Hoboken provide an analysis of the ways in which privacy governance and software development have changed due to the software industry's shift to agile development practices, creating new relationships between people and data, changes in the way software development works, and changes to how data is valued (Gürses and Hoboken 2017). And this dissertation situates UX professionals' design practices in the context of values work and within the technology industry's norms and practices.

It is also worth noting that design practices and the systems in which design is embedded are not static. Design practices have changed and moved over time. Design practices previously viewed as radical or critical interventions such as user centered design or participatory design (and to an extent, value sensitive design) have become adopted by much of mainstream HCI and design practice. It is likely that speculative and critical design practices, while still a practice on the peripheries of HCI, will move closer to the center of HCI practice (indeed, the ACM GROUP Conference on Supporting Group Work added a track for submissions of speculative design "design fiction" work in 2018). As design practices move and shift into new situated environments, their politics may shift as well. For instance, when participatory design was removed from the context of Scandinavian union workers and moved into a U.S. business context, participatory design took on new traits and political commitments (Asaro 2000).

"Values in design" aligns with the popularity of "design" in the contemporary moment, but it also recognizes the power in design. Design-based approaches to values in design should recognize design's multiple political orientations, its limitations, its dynamism, and the ways in which it is intertwined with other sociotechnical systems. These affect when, where, how, and by whom design can best be used in relation to values and ethics.

These explorations show that design's power is limited and not neutral. But also, design is not a panacea to address issues related to values and ethics. Any design approach or orientation contains a particular set of politics, and depending on where and when design is situated, certain design orientations may be more easily executed than others. In some cases, political, economic, or social approaches may be more appropriate than design. In other cases, design approaches outside of UX might be appropriate, such as software design using computational techniques (Abebe et al. 2020).

When thinking about "design," this dissertation surfaces considerations of what is design for, who does the work of design, on whose behalf is design done, and where and when is design useful. Design practices can be used beyond the product design and development process.

Design can be useful for agenda setting, ally-building, creating consensus, and other collective organizing work within organizations (and potentially by workers across organizations). Techniques, practices, and tools developed by researchers thinking about designers' solidarity (Rosner and Rosner 2020) or design for collective action (Salehi et al. 2015) may be useful in these settings.

Implications for Values in Design Research & Practice

In this section I reflect on potential implications that this research has for different stakeholders involved in values in design research and practice.

Values in Design Researchers

This research echoes the insight of Gürses and Hoboken, that beyond looking at technologies' consumption, adoption, and configuration, "inquiries into their production can help us better engage with new configurations of power that have implications for fundamental rights and freedoms" (Gürses and Hoboken 2017). Studying the practices of UX professionals who work at large technology companies and already see values as a part of their work provides a small window into the practices and configurations of production. This complements other values in design and adjacent research investigating practices of production, such as studying technologists' everyday ethical practices (C. M. Gray and Chivukula 2019; Shilton 2013) and research studying the practices of technology industry workers who help product and maintain technical products and services, such as content moderators and data scientists (Roberts 2016; Passi and Jackson 2018). While recognizing that practices of production are entangled with those of consumption and adoption, there is still opportunity for values in design research to study the practices and configurations of production of technical systems more broadly, including the study of UX professionals situated in organizations beyond technology companies, studying the roles of managers, customer service agents, worker organization efforts, and the tools and infrastructures that these workers utilize.

The dissertation also suggests a broader range for design methods in futures values in design research. Prior work has discussed design as a method of intervention to solve a values problem or design a system in a more values-sensitive way, as well as a method of inquiry, to elicit discussion and reflection on values with stakeholders. Beyond these uses, design can be used as a self-reflective method of analysis and inquiry. Through these uses, conducting design in a reflective way can help uncover the politics of the design practices themselves.

HCI Researchers & Educators

The dissertation raises questions about the purposes and ends towards which design is deployed. Common design approaches in HCI use design to try to solve a values problem, or to explore people and situations in order to elicit values. Design practices and tools tend to focus on the product design process—for instance, Value Sensitive Design presents a value-centered design process, and the creation of values toolkits and methods tend to focus on how they might be adopted into a product design process.

This dissertation opens up and suggests a new design space for HCI researchers and designers: design to infrastructure imaginaries. Rather than designing new tools and methods to be adopted into the design process, we can design for the people at technology companies who already see values as important and are already doing the work of values advocacy. The problems they face may be different than the problems of getting values in design methods

adopted. This may involve designing for collective action, or designing to help others see the non-neutrality of technology, or creating tools that can be tactically legible to executives and managers while still addressing the issues that values advocates care about. For instance, could a critical design technique be made tactically visible to a corporation by aligning with certain common corporate values? Engaging in this design space of infrastructuring imaginaries also suggests doing more participatory design work with and for existing values advocates, not just user and consumer stakeholders of technologies.

Studying the practices of UX Professionals advocating for values suggests the need for tools, practices, and structures that place responsibilities for values in collectives beyond the individual. Structures like the ACM's Code of Ethics and teaching HCI students about ethical decision making presumes that individual technology workers have the agency and authority to make or contest values and ethics decisions. This is not always the case. Design decisions may be made by management or other organizational stakeholders, or an individual's invocation of a shared value might be disputed by someone else's interpretation of that value. Even the individual decision to not work on a project might lead to the company responding by assigning someone else (whether another worker or a contractor from outside the company) to do the work instead. This suggests a need to design for collective responsibility for values and ethics, and educate HCI students about collective action and responsibility.

In addition to teaching the technical skills involved in HCI, given the amount of social work done by UX values advocates, we may consider providing more education around the social practices of UX professionals, such as how to navigate large corporations and get buy in to address the findings that come out of UX professionals' user research. This is particularly important if we have a commitment to helping develop public interest technologists (Manke 2019). UX Professionals who conduct values work could constitute one form of a public interest technologists, or public interest designer. This research suggests that the training of public interest technologists should include the development and teaching of social skills and practices, as well as technical ones.

UX Professionals & Values Advocates

The documentation of practices and challenges for UX practitioners already advocating for values and ethics suggests some potential ways forward for values advocacy, as well as potential scaffolds and footholds for values work to build on and get traction. These implications are necessarily incomplete. They are not universal, and responsibility should not fall onto a single UX professional or values advocate to enact all of these strategies. But these implications may provide the beginnings of a useful playbook or set of strategies from which to draw on.

Build on and subvert existing technical practices – UX professionals can introduce new politics into existing UX practices to help considering social values and potential harms in a way that is still legible to others in the organization. For instance, finding ways to expand the diversity of stakeholders depicted through these practices such as trying to recruit more diverse populations for user research, or incorporating values into these practices such as using personas that specifically map out a range of abilities.

Build and manage relationships with organizational allies to make values visible – there may be siloed conversations within organizations, conversations of values and ethics may be occurring outside UX teams among potential allies. This might include engineers, research and development divisions, data scientists, customer service agents, salespeople, and so on. Finding ways to build and manage relationships with these allies can help provide a more "united front"

when trying to show the Participants have used attending diversity and inclusion meetings, using internal forums and Slack channels, book clubs, and formal worker organizing as ways of trying to find and build relationships with these potential allies.

Appeal to corporate values and initiatives – while corporate values, diversity and inclusion initiatives, and ethics initiatives may sometimes be viewed skeptically, they can also provide toeholds for advancing values and ethics work and provide legitimacy for those actions. Nova talks about their push for gender diversity and inclusivity within their organization, and can back those actions up by pointing to how they advanced their organization's stated goals around diversity and inclusion. Corporate values are contestable, and others may interpret them in opposing ways, but some interviewees have found success in adopting similar language or arguing how their values work and advocacy work advances those organizational goals.

Use compliance mechanisms as intervention points – compliance with external regulations and standards, such as privacy laws or accessibility standards, provides a potential point of intervention to introduce socially-situated perspectives on these values, in addition to common compliance-focused perspectives. Other values advocate and ethics owners have used these techniques successfully in the past. For instance, US companies' compliance with the Federal Trade Commission and security breach notification statutes regarding privacy issues provided both an opening and latitude for privacy professionals to integrate thinking about a broader range of privacy issues at their organizations (Bamberger and Mulligan 2015, 68–73). UX professionals can similarly think about slipping in broader conceptions of values as a part of companies' compliance mechanisms. Matthew's organization tried to include additional tools to teach users about privacy beyond presenting the compliance-mandated textual privacy policy. Jerry's accessibility trainings acknowledge that merely following accessibility standards is a good start, but he aims to use the trainings as opportunities for "opening people's eyes" to teach others about the diversity of ability and the underlying social reasons why the standards are needed in the first place. Because organizations need to comply with these external regulations and standards, UX values advocates might be able to get more traction for their work if it aligns with and builds on compliance measures.

Use external reviews as intervention points – external audits and reviews of companies can similarly provide new intervention points. For example, the Global Network Initiative (GNI) is a multi-stakeholder group that seeks to protect human rights online, and includes a biannual independent assessment of members who are companies. The GNI's assessment includes investigating questions related to corporate governance ("How does the company train its personnel on freedom of expression and privacy-related risks?" including executives and frontline workers), processes taken to understand potential risks ("What processes or mechanisms does the company have to identify potential risks to freedom of expression that may be connected to products,… markets,…acquisitions and partnerships… [and] other business relationships?"), the role of workers ("How does the company ensure that frontline personnel can bring potential issues to the attention of the individual(s) responsible for due diligence?") and stakeholder participation ("Are external stakeholders consulted during an HRIA [human rights impact assessment] routinely informed about how the company has acted upon the findings of the HRIA?") (Global Network Initiative 2018, 15–16). Similar to using internal values and external compliance mechanisms as a scaffold or toehold for UX values advocacy practices, alignment with external review processes can help provide legibility and legitimacy for these practices. For instance, design activities or guided discussion of values and harms could help

form part of an organization's training, participatory design activities could constitute one form of consultation

Build and manage alliances with values advocates outside the organization. UX Professionals can also build and manage relationships with other values advocates outside of their organizations, to help learn from each other's experiences, tools, practices, and strategies. Meetups, professional conferences like EPIC, personal networks, and Twitter are some of the ways interviewees discussed finding people outside their organization doing similar work. Outside their own companies, UX professionals might find useful allies in business and research organizations that seek to promote values, ethics, and human rights within technology companies, such as the Global Network Initiative, Partnership for AI, AI Now Institute, or Mozilla Foundation. To help create change within organizations, values advocates can also learn from the work of other worker and labor activists, as many of the challenges that UX professionals face with regards to relations of power with management and executives mirror challenges faced by other workers.

Organizational Ethics Owners

Some organizations have "ethics owners," people who hold responsibility for ethics and values across multiple parts of an organization, and "oversees integration" of values and ethics "across the organization" (Metcalf, Moss, and boyd 2019). This might include roles such as Chief Ethics Officer, Chief Diversity Officer, Chief Privacy Officer, and so forth. Part of these ethics owners' work can help support and recognize the existing practices being done by UX professionals advocating for values.

Recognize bottom-up approaches to values work – while ethics and values sometimes take the form of top-down ethics checklists, UX professionals provide a set of complimentary bottom-up approaches and practices that can help recognize the situated experiences of values and ethics, understand how benefits and harms related to technologies are distributed unevenly, and practices to help "look around corners" and surface potential future threats and harms. While risk management approaches, such as scenario planning or forecasting attempts to do some of this forward-looking work, design and UX practices can do so in a way that is situated in an understanding of how users and external stakeholders experience and perceive values, ethics, and harms. UX professionals' human-centered perspectives on values can also be helpful when conceptualizing values issues as a form of consumer expectations. But beyond consumer expectations, these human-centered perspectives can surface potential harms or issues experienced by a broader range of stakeholders beyond direct clients and consumers. UX professionals' perspectives can also be useful in helping to surface existing situated and contextual problems related to values and ethics that emerge through varied adoption and use.

Look for and empower workers already doing values work – There may sometimes be some temptation to view technology company workforces as deficient in thinking about values and ethical issues. However, technical professionals in the organization, such as the UX professionals interviewed in this dissertation, are already attempting to do values work. Rather than re-inventing the wheel, ethics owners can help empower these workers, and involve them in the broader organizational processes around ethics, such as by providing resources, a platform for this work, or job titles and visibility. Inviting UX professionals who self-identify as doing values work to the table can help address values and ethics not just as a data or technical problem, but also as problem of contextual sociotechnical practices. For the value of privacy, networks of privacy professionals and specially trained employees across the organization have

been created to distribute expertise, responsibility, and accountability within firms (Bamberger and Mulligan 2015, 83). These distributed experts have responsibilities ranging from acting as issue spotters or triage personnel, to developing organizational-level policies. When creating organizational structures and programs for values and ethics more broadly, existing UX professionals may serve as qualified candidates for these staffing roles, with expertise in design-based and human-centered methods and practices to attend to values.

Create spaces for values work to gain legibility and visibility – UX professionals have found success in being able to make use of the interpretable flexibility of corporate values, mission statements, and other corporate initiatives to make progress on advocating for values by being able to relate their actions to these statements. By doing so, they make their efforts more visible and legible to the organization. Ethics owners can help by creating spaces and initiatives that can allow UX values advocates to build on. As shown in privacy, organizational policies and training can give privacy-minded employees a "language to express their concerns, a bully pulpit from which to speak, and an audience of senior personnel" (Bamberger and Mulligan 2015, 178).Providing key language around values and ethics (while still allowing those terms to be interpreted by frontline workers) can help legitimize and provide visibility for the values and ethical concerns UX professionals are already grappling with in their work.

Create ways to recognize and compensate this work – a lot of the UX professionals conducting values work do so within their existing technical practices and additional voluntary actions. As such, this work is often invisible, done on a voluntary basis, and contains emotional components. Finding ways to help provide material resources to support this work can provide one way to recognize and compensate these actions. In addition, UX professionals also note that their work is not always valued in their organizations– that there can be a struggle to get the resources and time to do user research, and to get traction behind the design recommendations that they present resulting from the user research. To the extent that these design and research practices can be oriented towards broader ethics goals, ethics owners might help advocate on UX professionals' behalf.

Concluding Thoughts

As technologies and the companies that produce and maintain them are increasingly looked to as sites of political contestation around issues ranging from privacy to sustainability to workers' rights to systemic racism, this dissertation seeks to better understand the role of UX professionals in surfacing and addressing values and ethics issues

This dissertation looks at this from two perspectives. First, from the perspective of design research, speculative design techniques can help design researchers interrogate the complex and ongoing entanglements among technologies, institutions, practices, and systems of power when gauging the stakes of the potential worlds we may wish to work towards (or avoid). Organizational fictions' focus on practices over products are pertinent as designers increasingly use modes of speculation to interrogate questions of broad societal concern, beyond moments of individuals' technology use or discrete product design.

Second, from the perspective of design practice in industry, UX professionals who already see themselves as conducting values work, engage in a range of both technical and social practices in order to make values visible and legible, and to shift corporations' understanding of their role in addressing values and mitigating potential harms. These practices sometimes take the form of soft resistance, deliberately introducing a new set of critical politics while still working within existing professional practices and corporate systems.

With this understanding, future research can help create methods, tools, and practices to help UX professionals and with infrastructuring imaginaries in their values work. Rather than using design to "solve" values problems by embedding particular politics into technical artifacts, a simultaneously both humbler and more radically re-oriented approach to design can strategically and tactically help support the work and goals of UX professionals in their values work.

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