Designing within Capitalism

Christine T. Wolf
School of Informatics & Computing, Indiana University – Indianapolis (IUPUI), USA
ctwolf@iu.edu

Mariam Asad
Sassafras Tech Collective, USA
mariam@sassafras.coop

Lynn S. Dombrowski
School of Informatics & Computing, Indiana University – Indianapolis (IUPUI), USA
lsdombro@iupui.edu

ABSTRACT

Why do social computing projects aimed at alleviating social inequality fail? This paper investigates this question through a qualitative interview study with 25 individuals working to address the problem of wage theft in the United States (US) context. Our analyses uncover failures at three levels or scales of interaction: one, failures at the individual level of technology adoption; two, relational failures (*i.e.,* the anti-labor worker/employer dynamic in the US); and three, institutional or macro-level failures. Taken together, these various failings point to larger, structural forces that negatively fate pro-labor projects' trajectories – *i.e.,* capitalism. Capitalism's incarnations in the US play a significant and at times harsh grip in steering the path of social computing design projects. In this paper, we untangle the relationship between capitalism and social computing, providing an analytic framework to tease apart this complex relationship, the lessons learned from our empirical data, as well as ways forward for future, pro-labor, social computing projects.

CCS CONCEPTS

• **Human-centered computing**;

KEYWORDS

social computing, social justice, wage theft, capitalism, neoliberalism, pro-labor

ACM Reference Format:
Christine T. Wolf, Mariam Asad, and Lynn S. Dombrowski. 2022. Designing within Capitalism. In *Designing Interactive Systems Conference (DIS '22), June 13–17, 2022, Virtual Event, Australia.* ACM, New York, NY, USA, 15 pages. https://doi.org/10.1145/3532106.3533559

1 INTRODUCTION

This paper examines pro-labor computing projects aimed at improving low-wage workers' conditions in the United States (US). We specifically focus on computing applications addressing *wage theft*, which is any illegal activity by an employer or manager that denies a worker benefits or wages [7, 17]. In the US, wage theft is a common issue among low-wage workers, particularly among people who are minorities and undocumented people (please see [17] for more information regarding this issue).

When we began this project, we anticipated learning complex stories about both the challenges and successes of pro-labor, wage-theft computing projects and hoped to identify best practices (if any) as well as areas where continued design efforts could focus and enhance these initiatives. During our interviews, however, informants shared their experiences with projects that were unable to achieve their initial goals – none of their projects were considered successful. Issues contributing to project failures included low worker adoption, tense relationship dynamics, poor education and outreach around labor and wages, and the lack of monetary or institutional (*e.g.,* legal) support for workers to pursue wage-theft claims. Taken individually, each issue is unfortunate, yet seems plausible given the difficulties of applied, social justice-oriented computing projects. Taken together, though, these various failings point to the larger structural issues that shape and constrain contemporary social computing projects; we must consider the broader socioeconomic systems in which these activities are taking place – *i.e.*, capitalism. Capitalism's manifestations in the US plays a significant and at times, harsh, role in shaping design work. We explore the relationship between capitalism and social computing design projects in this paper.

We use "capitalism" in a broad sense to refer to our shared economic language of the relationships between workers, employers, money, and markets in a system where private property ownership and wealth accumulation are considered the highest ideals. Critiques of capitalism question the unfettered pursuit of capital because of its adverse effects on society, like extreme wealth inequality, labor destabilization, environmental un-sustainability, and racism [28]. Even when the pursuit of capitalism is not unfettered and the wealth inequality is not extreme, capitalism is organized on the premise of extraction and alienation of labor; thus, human-centered design efforts aimed to disrupt this *status quo* must grapple with the intrinsic de-humanizing nature baked into this dominant economic system. A labor-informed, or pro-labor, praxis confronts – and fights against – capitalism's de-humanizing forces by centering workers, individual people whose dignity, care, self-determination, and flourishing are ambitions to be held in higher esteem than the accumulation of material goods.

There are many scholarly writings on capitalist ideologies about how markets should, do, and ought to work – but we are not economists, and a survey of such scale is outside the scope of this paper. Instead, to situate our work and notion of capitalism, as social computing researchers and designers, we follow the long-standing tradition of socially-informed design within CSCW and HCI and take up recent conversations around the politics of and

DIS '22, June 13–17, 2022, Virtual Event, Australia

ACM ISBN 978-1-4503-9358-4/22/06…$15.00
https://doi.org/10.1145/3532106.3533559

around design [3, 4, 8, 14, 16, 18, 40, 53, 55]. We take specific attention towards economic relations, particularly how capitalism shapes and constrains design practice – as a practical matter, as well as a prefigurative one.

In this paper, we explore the role that computing and design play in labor-informed critiques and challenges of living and working within capitalist societies. A labor-informed notion of capitalism becomes useful for designing social computing technologies aimed at alleviating socioeconomic inequalities and aligns with our field's renewed attention on how sociopolitical and socioeconomic relations impact technology adoption, use, design, deployment, and maintenance [8, 40]. Analytically, a focus on capitalism within sociotechnical contexts sheds light on how technology reinforces and reproduces certain socioeconomic inequalities and conditions [5, 15, 25, 31]. For social computing fields to fully contribute in building new, fairer and more equitable futures of work, we need to understand and account for capitalism's mechanisms of domination, how larger socioeconomic structures impact workers and their working conditions, and how capitalism figures into pro-labor projects' abilities and limits to intervene into contemporary workplaces.

We interviewed 25 pro-labor advocates, including project stakeholders and low-wage worker experts, to better understand their efforts building social computing projects to address wage-theft. The fuller picture must also include the voices of workers and their perspectives on these projects. We made efforts to reach workers in our study, but for reasons we discuss in this paper, were unable to include these perspectives in our empirical dataset.

In analyzing our interviews with pro-labor advocates, we identified three key levels where these pro-labor projects experienced sociotechnical challenges: 1) how these projects experienced individual adoption issues; 2) how economic ideological incompatibilities and political events impacted key social relationships within design collaborations; and lastly, 3) how pervading large-scale institutions shaped the possibilities of such applications. By using capitalism as a conceptual lens to better understand how these applications failed, this paper lays out for designers and other interveners ways to approach, think through, and devise better pro-labor strategies and tactics.

Our research makes several key contributions. First, we develop a labor-informed view or lens of capitalism situated for social computing projects. Second, we empirically demonstrate how a labor-informed analysis of computing projects connects and situates specific kind of failures experienced by these pro-labor projects; this contributes to an understudied area in work studies within DIS, CSCW, and HCI focused on social and economic inequality [17, 22]. Third, in our discussion, we develop design and research strategies and tactics that highlight the possibilities and limits of social computing interventions in addressing complex social and economic issues, like wage theft, within capitalist contexts.

This paper is laid out as follows. First, we outline key concerns of labor-informed critics of capitalism and how those concerns are relevant to current scholarly conversations within social computing and design-oriented fields. After examining this related work, we present our methods, followed by our findings. In our empirical findings section, we highlight three key levels of challenges these computing projects experienced that lead to the ultimate failure of these applications. Lastly, in the discussion, we provide design strategies for working to address worker concerns within capitalist context and a worker-oriented design and research agenda for the social computing community.

2 CAPITALISM AS A LENS FOR HCI

Capitalism is a broad term, which the *Dictionary of Economics* defines as: "The economic system based on private ownership of property and private enterprise. Under this system all, or a major proportion of, economic activity is undertaken by private profit-seeking individuals or organizations, and land and other material means of production are largely privately owned" [33]. Similarly, The *Concise Oxford Dictionary of Politics (CODP)* defines capitalism as: "A term denoting a distinct form of social organization, based on generalized commodity production, in which there is private ownership and/or control of the means of production" [11]. Interestingly, while Adam Smith is thought of as the father of capitalism, the word itself first gained popularity in critiques of the economic system – that is, Marxists were the first to use it widely [11]. The name itself reveals the system's core value – capital. The questions those of us interested in social justice ask are: the pursuit of capital at what and whose cost? Indeed, the Industrial Revolution in Britain sparked monumental socioeconomic changes that raised a "hotly contested debate on the relationship between democracy and capitalism" [11]. The unfettered pursuit of capital leads to unduly extractive relationships, economic instability, and ultimately economic inequalities – all of which hinder democratic goals of freedom, autonomy, and the possibilities that equal opportunity provides. We are not economists, as we have noted earlier. We are social computing researchers interested in issues of social justice and how design might intervene in contemporary systems of oppression.

Here, we take care to emphasize social *justice*, rather than "social innovation" language we might find in economic development or ICT4D discourses or those in recent "social good" tech campaigns. We follow the work of Dombrowski *et al.* [18] who articulate an agenda for social justice-oriented design for the social computing field. Dombrowski *et al.* turn to the work of political philosopher John Rawls and define social justice as the "ongoing – and always incomplete – attempt to balance the benefits and burdens of a social system such that they are fair of equitably shared" (p.657). "Social innovation" or "social good" are monikers often used in projects that purport to leverage technology to bring some social benefit(s), but these discourses do not typically make any explicit commitments to working on the problems of inequity in the social systems within which they operate. We, however, are not equivocal on this issue. We see our contemporary moment as one of "extended crisis," as critical theorist Lauren Berlant has articulated, forming a collective, pervasive crisis consciousness that we experience in increasingly intimate and cruel dimensions of our everyday lives [6]. Our extended, collective crises have caused this feeling of fever-pitch and we see this across many current events in the US – as feminist reformers Cinzia Arruzza, Tithi Bhattacharya, and Nancy Fraser note in their manifesto *Feminism for the 99%*: crisis is felt across the political spectrum and there has been a rise in right-wing movements, along with seemingly "progressive" or liberatory

movements that paradoxically reify the interests of capitalism. This is why it is imperative to make clear that we agree with their rally to "confront head on, the real source of crisis and misery, which is capitalism" [2] (p. 18).

So, how do we get from grand, conceptual understandings of economic markets (the definitions of capitalism we have laid out) and noble, heart-held goals (our pro-labor, social justice objectives) to insights useful for pragmatic, boots-on-the-ground social computing design work? We turn to J.K. Gibson Graham, critical theorists of capitalism, for guidance. In *The End of Capitalism (As We Knew It)*, Gibson-Graham [28] offers an important lesson – we must move away from thinking of capitalism as one giant, "global capitalism." In their book, they point to the problem of how socioeconomic discourse limits our collective imaginaries for understanding possible prefigurative futures and ways of being. When we talk about capitalism as a giant monolith, as *the* pervasive and *only* viable economic system, we further reify it – we make it that ever-stronger monolith. This makes it conceptually more difficult to imagine alternative futures.

What is the way forward? Gibson-Graham ponder this, closing with a number of pressing questions: "What if we theorized capitalism not as something large and embracing but as something partial, as one social constituent among many? . . . how do we begin to see this monolithic and homogenous Capitalism not as our 'reality' but as a fantasy of wholeness. . ." (p.260). These questions give us guidance – efforts to break down monolithic systems of oppression must start with the social specifics. Naming, documenting, and describing these specifics then provides sites where interventional efforts may cleave open, striving to make social change. In this paper, we do the work of naming, documenting, and describing these specifics as they relate to wage-theft social computing projects. In doing so, we aim to provide guidance to social computing researchers and designers interested in intervening within capitalist contexts.

In what follows, we first describe several key concerns of how capitalist systems deleteriously impact society, specifically calling attention to how computation plays a role; then, we describe how the social computing field has engaged with capitalism in recent work.

2.1 Capitalism as Unduly Extractive Relationships

When we refer to capitalism, we do so to invoke a common economic language for how the relationships between workers, employers, money, and markets are understood in a Western value system that preferences private ownership and wealth acquisition. The structures within capitalism – particularly the corporation as a social form – are essential for us to consider. Under capitalism, private companies are institutions that work relentlessly to outearn their competitors and gather wealth for shareholders by more efficiently extracting labor and in turn, increasing firm profits. The overly extractive nature at the heart of capitalism means that the convivial, cooperative assumptions that underlies much of social computing work [37] must be reconsidered. How and what do we design in projects where one stakeholder structurally benefits by exploiting the other? Social justice-oriented projects must account for power dynamics that organize the nature of employer/worker relations under capitalism [20, 48, 56–58].

2.2 Capitalism as Neoliberalism (i.e., widespread privatization and deregulation)

We also draw out how contemporary capitalism is deeply ensconced with neoliberalism, a sociopolitical framework that favors strong private property rights and unregulated or free markets and trade [32]. In *A Brief History of Neoliberalism* [32], historian David Harvey traces the roots of contemporary neoliberalism in the global events in late 1970s and early 1980s – namely increasing globalization and opening of China's economy, the election of Margaret Thatcher in the UK (whose agenda was strongly anti-union), and the election of Ronald Reagan in the US (whose agenda was also strongly anti-union, as well as pro-deregulation across industries).

One of neoliberalism's central harms is that it conceives of all human actions within the realm of the economic. Market logics take over every aspect of our social worlds – even the most personal, sacred, or sublime. Harvey describes this as neoliberalism's "creative destruction" because thinking of human action so narrowly destroys creative drive (p.3). Neoliberalism "holds that the social good will be maximized by maximizing the reach and frequency of market transactions, and it seeks to bring all human action into the domain of the market." Thus, we begin to feel the present-day inferno of the "hotly contested debate on the relationship between democracy and capitalism" seeded so many years ago, in the Industrial Revolution [11]. How do we make a "business case" for fundamental social goods such as anti-racism anti-sexism, and anti-poverty within a market-based logic? Social justice is too important to be left to the cruel and uninspired logics of economic markets.

Neoliberalism may feel like a totalizing eventuality, a hard reality that seems like a natural outcome of our current economic system. But Harvey notes that: "The capitalist world stumbled towards neoliberalism as the answer through a series of gyrations and chaotic experiments. . ." hinting that neoliberalism has taken hold as a seemingly commonsense logic of social order just as herky-jerkily as any other. But it doesn't have to be. Why can't we imagine something different?

2.3 Capitalism, Social Computing, and Design

The social computing field has recently begun to engage directly with the problem of capitalism, which we discuss in this section. While our field has long been interested in addressing socioeconomic inequalities and designing for social change, there has only recently been a direct call to examine closely the relations between design practices and the broader economic system they take place in, as Nardi and Ekbia [21] note:

"Our contention is not that HCI researchers and practitioners are unaware of the relationship between economy and technology; rather, that this does not typically figure in any deep way into our theories, practices, and designs. We in HCI face the reality of the larger economic system and its impact on our daily life and work, but we do not incorporate these understandings into our research and practice to the extent that we perhaps should." [21].

What role might design practices play in intervening in and changing the dominant economic system? Lindtner *et al.* [42] look

at the symbolic, transformative potential that design-making activities hold *vis-à-vis* global economic systems: "Making is simultaneously a symptom and a transformation of global processes of capitalism: while making feeds off of existing structures of power, it is also aimed at and specifically motivated by democratizing technology production" (p. 1392). Their case dealt with DIY making practices in China, but their point is instructive for our purposes here – we find ourselves turning to social computing design projects *because* of anti-worker, neoliberal pressures in the US (*i.e.*, we likely would not need to turn to self-help if we had strong pro-labor laws and regulations in place), but by intervening through these design projects, we hope to improve workers' conditions. This is what Lindtner *et al.* call the "utopian vision of making" [42]. But whether a project takes a utopic or dystopic turn depends on the stakeholders in the room.

Consider the work of Fox *et al.* [27] looking at the design of Internet of Things (IoT) infrastructure in public restrooms. In that work, Fox *et al.* introduce the concept of "managerial visions" which are employers' ideas about technologies like IoT and data. These ideas shape how employers see workers and their labor, as well as employers' expectations and norms around supervision and governance. The point to take from this work is that norms and bounds between worker/employer are in flux and continually drawn and redrawn through design practices, especially around new technologies like IoT. The important question to be asking during these design practices: do workers have a seat at the table? Do they have a meaningful say in project decision-making? These concerns are not new. Early studies in social computing, especially CSCW, were motivated by the Scandinavian tradition of participatory design (PD) in the workplace, whose democratic ideals held that workers ought to have a say in designing the tools and processes of their everyday working conditions [19]. In Scandinavian countries, the inclusion of workers throughout the design process was typically required by law or union contract [19]. PD approaches were especially useful in the early days of workplace computerization [36], giving rise to a dedicated ACM conference on Participatory Design in the early 1990s. But without the protection of PD by law or other mandate, it is difficult to ensure its democratic potential is met in workplace design projects today. Instead, design projects in industry today hail themselves as "user-" or "human-" centered – representing a shift away from a technology-centric, software engineering perspective. But these approaches fail to consider that the user or human is a *worker* in a *capitalist* context. This paper aims to remedy this omission.

A focus within social computing in recent years has been a related, though distinct, work context – that of gigwork. Notably is the pioneering work of Irani and Silberman [35] in building Turkopticon, an activist app that lets gigworkers on the platform Amazon Mechanical Turk communicate with each other about their working conditions. Gigwork has scaled to remarkable heights, changing many industries and raising important questions on the underpaid, hidden, and sometimes dangerous work that runs many of the world's biggest tech systems [30]. A comprehensive review of this work is outside the scope of this paper; indeed, gigwork differs from our focus in its corollary to what was historically called piecework, where payment is for the output rather than the time [1, 10]. Our focus is on wage theft as it happens in the context of low-wage work in the conventional employer/employee relationship, where payment is for time worked, rather than output.

3 METHODS

We conducted a qualitative interview study to understand a wide range of phenomena related to technology and the experiences of pro-labor advocates, including legal, policy, nonprofit, union, research, and technology experts, and wage theft interventions and related concerns. We conducted data collection from February to October 2018. One researcher on the project interviewed 25 pro-labor advocates in a variety of occupations/areas, including worker advocates, *i.e.,* union organizers (8), legal experts and lawyers (7), policy experts (4), and technologists (9) working on wage theft-centric computing technologies. Some individuals may have been in multiple categories, for example, one informant might have been a lawyer who was working on a wage theft computing project. We identified and recruited informants by using our own professional networks and by directly emailing pro-labor advocacy individuals and organizations. All informants were in the United States (with the exception two technologists who were from New Zealand) and included eight women and 17 men. To the best of our knowledge, we spoke with at least one person (but more when possible) from every publicly available wage theft-centric computing technology existing at the time.

Our interviews focused on the daily practices of worker advocates, how they used information and technology as part of their work advocacy, their challenges, and how they addressed those challenges. We specifically discussed advocates' experiences related to how they advocated for or worked on behalf of low-wage workers who experienced wage-theft violations and how technology and information were a part of their process and any developed interventions, including computing, policy, and practice changes. After we conducted several interviews with pro-labor advocates (*i.e.*, lawyers, policy experts, union advocates), we realized there were organizations working on developing wage theft-centric computing technologies and that understanding what has worked about these computing technologies, their challenges, and unanswered questions would likely benefit the design and development of the next generation of similar pro-labor computing technologies. For the individuals who were building computing systems to address wage theft, our interview protocol focused on much of the same content, with special attention focused on how they started in work-related advocacy, their design and development process, adoption, challenges, opportunities, and lessons learned. Initially, we were surprised to learn that such technologies were struggling. Thus, the initial protocol focused on understanding process, open questions, and concerns, and likely moves forward, however, we expanded these aims to unpack why these technologies did not meet their stakeholders' initial goals.

All interviews were conducted in a location and medium (*e.g.*, in-person, over video call or phone) of the informant's choosing and lasted between 30 and 90 minutes and were on average 65 minutes long. Interviews were audio recorded and transcribed. Extensive notes were taken during the interview and thorough memos created post-interview, usually within 24 hours of the initial interview. Four of the interviews had two informants present during the interviews.

Table 1: List of Informant Details

Informant ID – Pseudonym (Industry)	Informant ID – Pseudonym (Industry)
P1 & P2* – Abe and Ben (Worker Advocacy)	P14 – Nick (Designer/Technologist)
P3 – Christine (Policy)	P15 – Olivia (Designer/Technologist)
P4 – Dylan (Legal)	P16 – Philomena (Worker Advocacy, Designer/Technologist)
P5 – Ethan (Legal)	P17 – Quentin (Designer/Technologist)
P6 & P7* – Frank and Gabe (Worker Advocacy)	P18 & P19* – Rosemary & Sofia (Worker Advocacy)
P8 – Hunter (Legal)	P20 – Thomas (Designer/Technologist)
P9 – Ian (Policy)	P21 – Ursula (Policy)
P10 – Jackie (Legal)	P22 & P23* – Vance & Wallace (Legal)
P11 – Kevin (Policy)	P24 – Xander (Designer/Technologist)
P12 – Larry (Legal)	P25 – Yolanda (Worker Advocacy)
P13 – Mia (Designer/Technologist)	* denotes informants interviewed together

We include a table of informant details in Table 1. All proper nouns are pseudonyms.

The research team met regularly to discuss trends in the interview data. Dominant early themes included: how they advocated for workers and the different stakeholders they enrolled into their advocacy; how advocates used technology and information as part of their worker advocacy; how different work challenges manifested; and the role of technology in these challenges. We conducted inductive analysis of our notes and interview transcripts using memoing, coding, and affinity diagramming. Our initial codes typically focused on understanding worker advocates' practices and challenges and the role of technology, information, and communication in that advocacy. Subsequent iterations focused on situating how designers and technologist of wage theft-centric computing technologies, understood wage violations, worker advocacy possibilities, their design process, challenges in the design, development, and deployment of their tools, and if and how they addressed those challenges. In another round of analysis, we returned to entire set of interviews, to see how the other (non-technologist) worker advocate interviews could inform insights about the practices and challenges of the designer and technologist interviews. Specifically, we looked at how challenges related to the design, development, and deployment of these wage theft-centric technologies and how the experiences of the non-technologists might inform those concerns, including issues of adoption, inter-group politics, funding, and so on. Lastly, we wanted to understand how and why these presented concerns and challenges were interrelated. Through this process, we realized that many of these challenges were related to what our informants identified as facets of capitalism. We conducted further readings on criticisms of capitalism from a labor perspective, which we used as a final basis to tease out distinctions of how activists' notions of capitalism may be present in our data. Specifically, we wrote memos about how capitalism impacts individuals, relationships, and institutions in relation to workers.

During this research process, one informant reached back out to the researchers and "unconsented" to the interview and requested that their interview not be used for research purposes. We contacted our Internal Review Board (IRB) to discuss the issue. While the IRB determined that an individual cannot revoke their consent post-interview, we removed the interview from further analysis to respect the informant's wishes.

Lastly, we are explicit in noting a limitation of our paper is that it does not incorporate empirical perspectives of workers themselves. While this work identifies key issues in how low-wage labor-focused computing technologies were designed, shaped, and deployed, our empirical data is from the perspective of the designers and other key project stakeholders working on these projects but not from the perspective of low-wage workers, the intended users of these applications. Ideally, we would have included workers in our sample and we made efforts to talk to former users, but we were not granted access. The project stewards either no longer had access to their former users or would not grant us access to their users due to privacy and safety concerns. Furthermore, we note the challenges of studying technology non-use [49] which presents a constraint given the overwhelming failures across the projects. To help mitigate such analytic concerns and strengthen our analysis, we discussed these applications (in terms of general design directions, specific features, and their issues) with legal, policy, and worker experts to further enrich non-project stakeholder perspectives on how these technologies might align with low-wage worker's perspectives and challenges.

4 SOCIAL COMPUTING WAGE-THEFT INTERVENTIONS

In this section, we report on the various wage-theft applications (apps) described by our informants. While these apps ranged in features, functions, and connectedness, they were all geared towards low-wage workers to help them address wage theft and other labor issues.

4.1 What features did these apps support?

Typically, these computing interventions served one or more major functions: track and document work hours; educate on workers' rights; and/or submit wage claims. In terms of technical infrastructure, these social computing programs ranged from native mobile iOS or Android applications to web-based forms. We will discuss

how these applications were intended to work in practice and further examine how these computing technologies did not meet their developers and designers' expectations.

In the US, employers are federally mandated by the Fair Labor Standards Act (FLSA) to keep payment-related employee record-keeping, including daily and weekly hours worked, pay rate, overtime, and more.[1] The wage-theft apps described by our informants tracked and documented work hours in several ways to help users develop alternative work documentation that could be used to compare (and contest, if needed) the employer's documentation. Most of the apps enabled users to manually enter their hours worked into a digital timetable. One outlier app pulled automatically collected location-based data from Android mobile phones. Then, the location-based data was transformed into a human-readable record of the hours worked based on location. For both manual and automatic data collection, the collected data were useful for comparing to the employer's records on the worker's activity. Creating alternative work records enables several possible key practices. First, the alternative work documentation aided workers in identifying wage theft. Second, the workers could use the documentation to start discussing the potential wage theft with their co-workers, employers/managers, or lawyers. Lastly, such documentation could be used as evidence in a wage theft case.

To educate workers on their rights, the apps would often present information about their rights and responsibilities as employees. The topics ranged from helping people identify wage theft in their own workplace to more general information about workplace rights and responsibilities. Technologists often partnered with domain experts for this complicated information because rules and worker protections vary based on local, state, and federal laws. Typically, more localized laws tend to have stronger protections than federal labor law. Federal laws usually set the "minimum" obligations and protection, which individual states and municipalities can then heighten, based on local politics. To submit wage claims, these apps helped workers connect with other workers, lawyers, or union representatives via forums or by listing contact information.

4.2 How were these apps designed?

These were designed using mixed and multiple methods. Informants raised three, often piecemeal and interwoven design styles: user-centered design; community-focused design; and expert-led design.

User-centered design: Many of the informants we talked to engaged in design practices very closely related to user-experience (UX) or human-centered design, like gathering user requirements (*e.g.*, interviews; user focus groups) and evaluating design processes, (*e.g.*, usability evaluations with think-aloud protocols). When possible, the user-centered design practices were conducted with the intended user group (low-wage workers), however, sometimes such folks were not available and other workers were used as a proxy.

Community-focused design: Some informants described design practices where close consultation with workers and pro-labor organizations (*e.g.*, unions; worker experts; nonprofits) drove intervention development. Often this included community meetings, one-on-one meetings with key stakeholders or experts (*e.g.*, pro-labor lawyers; union experts), and feedback sessions from community partners. Given the power dynamics inherent in this problem space, politics often shaped certain design decisions, including who to partner with and which design features to prioritize or implement.

Expert-led design: Lastly, several groups engaged in expert-led design, where subject-matter experts with domain expertise (*e.g.*, lawyers; union experts; academics) drove design practices. In these situations, the lead designers were also domain experts. Frequently, such folks did not have technical expertise and would partner with more technical experts to build and deploy the envisioned systems.

These different orienting philosophies shaped how design decisions were made, which features were implemented or prioritized based on competing needs of the various stakeholders.

5 WHY DO THESE PRO-LABOR INNOVATIONS FAIL WITHIN CAPITALISM?

When we use the language of "failure", we adopt our informants' language and use their evaluation concepts – failure is an *emic* label. Our informants were dissatisfied with their project's outcomes and would use language directly indicating failure or more obliquely indicating the projects did not meet initial expectations. In our empirical findings section, we highlight three ways the socioeconomic context of capitalism adversely impacted the trajectories of these wage-theft interventions:
1) *adoption*: how these projects experienced adoption issues;
2) *relationships:* how economic ideological incompatibilities and political events impacted key social relationships for design collaborations; and
3) *institutions*: how pervading large-scale institutions shaped the possibilities of such apps.
Analytically, using capitalism (as it is understood by labor experts) helps us make sense of why and how these project stakeholders collectively experienced barriers to success and instead were "failing to thrive." Not all applications faced the same issues nor in the same way; however, collectively, each faced critical issues that hindered their product's launch, adoption, and/or use. A focus on labor-informed notions of capitalism helps us understand and foreground workers' conditions and goals, the relationships between employers and workers, and how work institutions support employers' interests over workers'.

In what follows, we discuss each of these three themes in depth.

5.1 Adoption Issues: Designing to Overextend Capacity

For most informants, a key concern was adoption by their intended population at a sustainable rate. Achieving critical user mass was a key metric across projects. Whether needed to make money and show return on investment (ROI) or to advocate for policy changes, healthy adoption rates were consequential objectives and key results (OKRs) that surfaced across our informants' accounts.

Many informants articulated that the root cause of low adoption was practice misalignment. These apps often did not align with potential users' existing practices, creating extra burden for workers and a high barrier to adoption. Utilizing capitalism as a lens helps

[1] See FLSA, 29 CFR 516, available at: https://www.ecfr.gov/current/title-29/part-516

us uncover and understand the weight and magnitude of these mismatches. When we talk about capitalism, we are talking about workers' daily, lived experiences, and working conditions, which make self-advocacy difficult. In a capitalistic context, workers need time, energy, capacity, and training to protect their own interests *vis-à-vis* their employers [17]. Many of the apps tried to create individually-enforced worker protections by having each worker track and document their own work hours. However, this is not realistic in the working conditions of many low-wage workers today; low-wage workers often hold multiple part-time jobs, work many shifts/hours, and experience occupational precarity [17]. Such conditions make it difficult for workers to attend and commit to a sociotechnical strategy of long-term documentation practices, especially when doing so has no guarantee of ensuring workplace protections.

When judges and lawyers (or even employers) evaluate the merits of a wage violation case, they will assess workers' documentation for trustworthiness and reliability, as our informants noted. Factors considered here include whether the records were *contemporaneous* (*i.e.*, meaning the data was regularly created at the time of the event), *complete* (*i.e.,* no inexplicable record gaps), and *legible* (*i.e.,* another person can immediately discern the discrepancies between the workers and the employer's records). This means that manual documentation requires significant, persistent effort over time from workers to be useful. Specifically, workers have to continually document their relevant work information every single day to create contemporaneous accounts. With these evidentiary standards in mind, many of these apps required workers to both know about wage theft and have the time, ability, and capacity to manually track their work hours. However, as one lawyer explained, with or without technology, workers do not often manually track their hours: "*It's pretty uncommon for people to go home every night and write down the hour that they started and the hour that they finished,*" Vance (P22) shared, continuing:

"...The problem with all the apps that I saw is the same problem that my clients had with the [manual-entry] calendar which is that [these wage-theft apps] require people to proactively fill out information, to proactively download an app, to daily record their hours. It was just an unreasonable expectation of anybody, let alone people who had many other issues going on in their lives. The last thing they were going to do after a really long day of work is sit down with their phone and type their hours in every single day really, really consistently." - Vance (P22, Lawyer)

Most of the wage theft apps were built on an assumption that the threat of wage theft would be enough of an incentive for workers to take on the yoke of manually tracking work hours. Several other informants stated that they rarely saw high quality, consistent manually documentation, regardless if the documentation was physically written or from a mobile app.

Informants raised this sentiment when debriefing with us and trying to make sense themselves why their applications were unsuccessful. For example, we can see this in Philomena (P16)'s reflection:

"Me and my team had this insight that we were treating poor working people - their uses of technology - different from our uses of technology...no they don't want to download something on their phone, nobody wants to do that. They want something to be ubiquitous, right? Like, 'I'm going to go here [to the app] every day to learn something, to share something [...]'" –Philomena (P16, Worker-Centric Non-Profit Executive)

Beyond the issues we have articulated, there are also other reasons why workers may not manually track their work hours via mobile technologies, including access issues – *e.g.,* low-income populations tend to share phones more readily than their wealthier counterparts [34] or awareness issues – *e.g.*, workers may not be aware of existing apps to help them with wage-theft claims [17]. Some informants did mention technological literacy/access concerns to explain adoption issues. To address such concerns, many informants talked of working closely with intended user groups and allies to address potential onboarding and adoption issues related to capacity, including hosting technology skills training workshops or conducting usability assessments. These apps create an additional responsibility and burden on the workers themselves, though, which ultimately hindered their use and uptake. For some of the apps, a lack of a consistent user base meant our informants either shut down or stop supporting the apps.

These apps' user imaginaries (*i.e.*, personas) were not consistent with the lived experiences of real low-wage workers' lives. Pro-labor design praxis, then, must move past assumptions or stereotypes if it aims to produce technologies that are not only usable but also useful and accessible, capable of meeting workers where they are at, in their everyday lives.

5.2 Relationship Issues: Designing Within an Anti-Labor Political and Economic Climate

In this section, we discuss how capitalism manifested through anti-labor political climates and how these climates impacted key design stakeholder relationships, processes, and outcomes. By anti-labor climate, we refer to phenomena that systematically impacts workers adversely, ranging from localized unfair workplace policies and practices to local, state, and federal labor-related events that detrimentally impact workers and by anti-labor policies or practices, we refer to those that prioritize managerial interests over workers' needs and concerns [24, 61].

Our data reflect how the labor-relevant political climate concerns within the US impacted both the intra and inter-group dynamics, key to effective pro-labor outcomes and processes. By "labor-relevant" political climate, we reference to two key trends. First, how specific types of economic relationships embedded within projects impact design processes in anti-labor ways. Second, how larger U.S. anti-labor policies and events adversely impact common relationship building and organizing practices. We elaborate on each of these below.

5.2.1 Economic relationships impact design decisions. By economic relationships, we refer to the role funding plays in how project decisions are made. Economic relationships can be explicit and direct – for example, where a funder has the authority or influence to make direct and explicit decisions about a project. Economic pressures can also be more implicit and anticipatory, a form of "soft power" [45] where design decisions are made to appease funders' assumed preferences [58]. For our informants, funding happened in several ways, including 1) self-funding (*e.g.*, someone was personally investing their own funds and resources into the project); 2) external organizational funding (*e.g.*, startup incubator; academic project);

and 3) business or venture capitalist (VC) funding. Project funding impacted how project-level decisions were made and by whom. Business, organizational, and community stakeholders sometimes held irreconcilable differences regarding the projects' business models, such as how the team envisioned the app's general functionality, how the project would make money, and its long-term economic sustainability. Such economic incompatibility led to the failure of some applications as money ran out or projects were never externally funded. Some project leaders took care in selecting funders, because they anticipated how these economic relationships might adversely impact their project:

"*Yes, [the application] has a revenue model component, but that's not squeezing every dime [from our clients] and max[imizing] profitability. The [prospective] investors I had talked to earlier all wanted different things. They were saying, 'oh, it should be a subscription model for law firms and all you should do is go to law firms [and] put the app as a front end and just charge them the subscription fee.' And that shows a massive misunderstanding of what and how the space works.*" –Thomas (P20, Software Developer)

Some project leaders were concerned with how certain investors might sway the project in ways that were incompatible with community partners' existing practices and values; others were explicitly concerned about how economic relationships might impact existing community partnerships. Here, a project lead refused to enter a business relationship with another stakeholder based on the direct request of their community collaborators: "*We chose not to do that because that made [our community partners] nervous - they were concerned about us serving two masters*" – Mia (P13, Project Lead; Technology Project Manager).

Mia shared how they had decided not to pursue a project direction that involved selling worker's data to employers and affiliated companies. Doing so could potentially have adverse consequences for workers, as such design features may "out" workers, opening them up to retribution, stifling their willingness to use such an app, and damaging the relationship between community partners (who would be advocating for using the app) and the workers, etc. Mia's project was self-funded and the project had strong partnerships within the pro-labor community. These factors enabled the team to identify, discuss, and ultimately reject potentially anti-labor design decisions.

While self-funding provides autonomy, many informants questioned the long-term sustainability of this route. We can see this sentiment reflected frankly in Nick (P14)'s account: "*I think that the likelihood that a bootstrapped project is going to build an app that is as widely adopted as it needs to be is not too likely. So, I do think that without some significant institutional funding, it's going to be a problem.*" -Nick (P14, Labor expert; Project Stakeholder)

Pro-labor projects need resources and funding to be effective, stable, and sustainable, but partnering with business stakeholders comes with making certain compromises or accepting certain responsibilities or risks. Concerns about project integrity occur when the project and business stakeholders are on unequal standing and the project's stakeholders feel they cannot refuse business stakeholders' demands. These economic interests do not become explicitly anti-labor until funders (or other influential business stakeholders) categorically impose anti-labor restrictions. For example, a funder may prohibit the project from partnering with labor-oriented stakeholders; or, another example, is when a funder promotes anti-labor agendas that impede workers' interests. In the following excerpt, Quentin (P17) discusses their challenges with economic-leaning business stakeholders who were not interested in building a pro-labor computing app:

"*So, this for-profit organization said, 'look, we have to be responsible to our stockholders, which is our board directors. And [the board of directors has] said no. And they don't feel like this is value-generating. And so, we said no.' And that was essentially it. It really didn't matter how good of a product I had built, how good of an idea it was, how technically competent it was, how really cool it is developed, how many people were on board - and essentially, in the long run - how good it actually was for the company to have that collaboration. Because they're making tracking software. If you have labor on your side, and you're making tracking software, that's where I wanna be. They didn't wanna be on that. They wanted labor on the other side of the table and to stay on that side of the table and they absolutely were not going to collaborate [with labor].*" - Quentin (P17, Domain expert and community liaison)

Quentin's project centered on workers and unions' needs to use mobile computing devices to track union member construction workers' physical location to develop documentation to ensure employers were appropriately paying benefits to the workers and unions. Later, in the interview, Quentin described the board of directors' approved project direction. Their plan used the same underlying mobile tracking infrastructure, but instead of centering workers, the new, stockholder-approved direction, centered employers' goals:

"*Things started to go badly when [company name omitted] went to the lowest common denominator and they decided to make this a babysitting app and it's now going to check: did the worker go off to the store to go get lunch and say that they were at work, were they in the bathroom, did they clock in three minutes late - just a whole slew of really, really bad ideas. But, from their standpoint as MBAs [Masters of Business Administration] from a business background, these were really great ideas.*" Quentin (P17, Domain expert and community liaison)

Pro-labor projects aim to create social change; they require a re-imagining of the socioeconomic relationships between businesses and low-wage workers. Business executives and VC funders, though, see their primary objective as increasing profit for shareholders. While much of the tech world is predicated on the idea of "disruption," a closer look reveals a deep investment in the *status quo* of capitalism: business interests are centered – exalted even – over workers' interests.

5.2.2 Anti-labor U.S. political events impact labor communities' design relationships. Beyond funding and economic relationships, many of these projects typically worked with pro-labor community stakeholders. Community partnerships are foundational to the design, development, and long-term efficacy of pro-labor projects. Conceptually, healthy community partnerships ensure a project addresses the right problem in the right way [8, 12]. More pragmatically, community partners frequently assist with product adoption and roll out [13]. For our informants, partnerships were helpful

on different levels: from user interface feedback to assistance navigating local worker communities to identifying how labor laws impacted computing projects, and so forth.

While community partners are vital to pro-labor projects, partnering requires significant effort, commitment, and resources to maintain relationships. This includes negotiating expectations, building consensus, and gathering material resources [31, 57]. For our informants, community stakeholders often worked directly with the low-wage workers, who were sometimes documented and undocumented immigrants. Two key U.S. political events impacting low-wage workers hindered the community stakeholders' ability to invest in new, potentially risky, projects. In what follows, we will briefly describe these two political events and how such events, and their concurrent political climate, impacted the community partners' ability to participate with novel wage-theft computing technology projects.

The two key political events were the U.S. immigration enforcement raids and a landmark anti-labor U.S. Supreme Court decision. First, the U.S. Trump administration's domestic policies increased immigration enforcement with a focus on deporting undocumented immigrants [29]. In the U.S., there is an estimated nearly eight million unauthorized immigrant workers, many of whom work in low-wage occupations [46]. U.S. Immigration and Customs Enforcement (ICE) workplace raids were one immigration enforcement strategy, where ICE agents detained and eventually deported undocumented workers. These immigration raids are anti-low-wage worker because these raids focused on targeting undocumented individuals, whereas ICE charged few companies employing undocumented residents [44]. Overall, in the U.S., union reactions to these events were mixed [23].

In our study, many community partners had undocumented worker members in their ranks; rallying against ICE raids was a way to show support for their undocumented worker membership. Supporting undocumented workers required several kinds of resource-intensive work, including preparing their members for raids, collecting donations, and fighting the raids and their associated domestic policies in the legal system [*e.g.*, [62] and [9] and [60]. Broadly, these political events are part of the larger anti-worker sentiment and policy trends within the U.S., such as "Right to Work" laws which take rights away from working people and undermine protections afforded by unions [63]. From our data, these political events impacted low-wage workers and their supporting organization's ability to advocate and organize on workers' behalf, including experimental technology projects. Community stakeholders became risk-adverse and unwilling to allocate resources on unproven projects. Specifically, community partners focused their attention and resources on the most urgent issues facing their constituents (*e.g.,* training for and fighting against deportation).

For our informants, there was a concern that their community partners were unable to fulfill previously committed obligations (*e.g.,* resources, attention) to the computing projects due to the anti-labor political events. Further, labor-focused community partners are notoriously under resourced. Thus, when adverse political events unfold (like ICE raids) community partners must make decisions about where to focus their efforts. Here, Mia (P13) describes frustrations over trying to collaborate with labor-focused community partners during this time:

"For the worker advocates, part of the problem is [that] these folks are always understaffed, they're always trying to do too much - too many different things. So, particularly with the [pro-farm worker community organization], I would have to keep telling them, 'you need to focus, you need to pick a few things you want to be good at - including mine and just push on that!' Part of their problem is they're so passionate and the need is so urgent, that it's hard for them to not do things. For the [pro-farm worker community organization], we are now in the era of Trump with all the immigration stuff. That, appropriately, became their very urgent focus dealing with all the ICE raids and stuff like that. That became a huge distraction for them [when trying to work on the computing project]." – Mia (P13, Technology Project Manager)

Here, distraction refers to the organization's inability to continue to invest time and human resources into Mia's project. Specifically, Mia wanted community partners to advocate for and provide direct support for workers to use the developed computing tool. Often such direct support is vital to a project's success but can be in tension between long-term development goals and the urgent, critical needs of the organizations and its membership. Paradoxically, dealing with critical political events is both pro-labor organizations' real, tangible mission, while also simultaneously distracting from their longer-term, social change goals.

The second political event impacting community partners was *Janus v. AFSCME* [59], a landmark U.S. Supreme Court decision. The *Janus* decision is widely regarded as anti-labor because it makes it more difficult for public sector unions to collect dues, thus impairing their ability to operate [50]. Specifically, it undermines unions ability to collect "fair share" dues, "which required people represented by unions who did not choose to be members of these unions to pay fees to cover the cost of the unions' collective bargaining activities" [51]. Fair-share rules exist because even if people do not join their workplace union, nonmembers often still benefit from union efforts. In our research context, public sector unions typically have larger memberships and more resources and therefore have the funds and resources to take on more risky projects (like developing computing apps for labor issues).

Nick connects the more recent anti-labor political events to a longer-standing anti-labor trend. Specifically, Nick talks about how the *Janus* court decision connects to public unions' ability to invest in new projects and the challenges of partnering with pro-labor organizations during this time period:

"Most of the unions that are more willing to adopt technology tend to be public sector unions [which were the ones most affected by the Janus court decision]. I don't think that's a casual relationship, I think that's a causal relationship. But, [two pro-labor organizations] asked me - they are the people who have historically invested in things that are a little outside the norm. They - to a very large degree – said, 'we needed time to figure out how we're going to deal with the fact that our budgets are all about to be slashed as thousands of union members decide to stop paying dues. We're not investing in stuff that's untested anymore.' And so, I do think that one of the things that's happened in the last five years is [...] there's been an entrenched effect in the formal labor movement when it comes to investing in new stuff in a way that there wasn't, say, [in] the early Obama era. If we had been trying to do this in 2009 it might have been a different story in terms

of getting more labor investment." – Nick (P14, Labor expert; Project Stakeholder)

Beyond material and human resources and support, informants raised concerns about the long-term capacity of these organizations to invest in new pro-labor projects. As Nick (P14) continued:

"There is a general acknowledgement that the parts of the labor movement - not just funding technology, but other kinds of progressive organizing - have been pretty clear with their partners, like, 'this is not the year to come and ask us for 100 million dollars for some big effort.' [. . .] there's not a ton of funding for apps for worker organizing, but some of the people who were interested in it I think just were like, 'oh yea. We heard this story and it didn't work, so we're not interested in exploring this anymore." – Nick (P14, Labor Expert; Project stakeholder)

Across our data, we see how such anti-worker political events (like workplace ICE raids or the *Janus* decision) directly impact low-wage workers and advocacy organizations who support them. Specifically, here we can see how different anti-worker methods, policies, and practices impede key relationship practices and eventually hinder long-term investments like designing, building, and deploying experimental pro-labor social computing technologies.

5.3 Institutional Issues: Failure at Macro Scales

Across our data, we also identify institutional structures as a challenge among pro-labor social computing projects. By institutional structures, we refer to the various bureaucratic political, legal, economic, and regulatory systems that reinforce key aspects of capitalism. These include taxation, regulation, and legislation. For our informants, these institutional structures shape the (im)possibility for effective computing interventions around wage theft.

Prior work has shown that, for low-resourced and marginalized populations, dealing with bureaucratic political, legal, economic, and regulatory institutions poses many challenges as such populations often lack the training, resources, or support to effectively navigate such institutions. Within our interviews, several informants spoke to the challenges of working to address issues within these larger institutional scales, and the impact that had on their work. Xander (P24) acknowledged the constrained impact of digital tools:

"But, we find it could be that much more convenient and enhance access to justice. Although, it is all quite limited. I think the informational model or giving people information about their rights is only one piece of the puzzle. . . . for various reasons, although [low-wage workers facing wage theft] have most of the information they need, have not had the power to act on it apart from an anonymous way. Information is only a little bit of the job. But, I think it's a useful bit of the job. [. . .] So, I might have the information of the process that I should follow, but I still - because of the structural setup of the system - I may still not get what's right." – Xander (P24, Legal Expert; Project stakeholder)

Here, Xander refers to "information" related to wage theft that can be facilitated by existing tech interventions, (like time-trackers or tools that educate about workers' rights). Xander acknowledged that information is critically helpful, but its impact is limited by the pervasive structures (e.g., working conditions; legal enforcement, etc).

Similarly, Ursula (P21), a director of a pro-labor economic and policy research organization, articulated frustrations with working with technology as their impact largely relies on "*business models that are applied that result in one form of the application of technology that may replace people versus another form of another application of technology that may augment what people do.*" Ursula explicitly pointed to capitalism as a structural challenge to workers where "shareholder value" drives decisions to further extract from workers rather than reinvest in companies or directly in the workers. Philomena (P16) also spoke to the anti-worker biases of regulatory structures, specifically:

"*The regulatory regime is intentionally broken in ways that disfavor working people. [. . .] Although there are a set of laws, the enforcement of those laws or the funding for the enforcement of those laws is paltry at best and nonexistent in most places, placing the burden almost entirely on working people to go through a protracted process of enforcing the law and placing the burden on them to make sure that the laws that are meant to protect them are actually working.*" – Philomena (P16, Worker-centric Non-Profit Executive)

Philomena was one of many informants who pointed to a constellation of structures collectively reinforcing conditions that "*disfavor working people*," including the legal/criminal justice system, policy/regulatory structures, and economic/capitalist structures. In the above quote, Philomena (P16) points to a key disconnect that occurs across different scales where the individuals with the least amount of power to affect change are made responsible for with additional work necessary to ensure their basic needs are being met as is promised by law.

Ursula (P21) also discussed institutions biased against workers, referring specifically to taxation:

"*Rather than throwing up your arms and saying "this is technology and there's some natural force that's coming down and beating us," it's better to look behind it and say "part of it is shareholder value, but what's driving shareholders?" A lot of it's taxation laws. [. . .] The people who were making the decisions about buybacks, for instance, are the same executives who were being paid with stocks. They are—in effect—through their own trading policies improving their own compensation. So, it was like insider trading, except it's legal.*" Ursula (P21, Worker-centric Non-Profit Executive)

Here, Ursula (P21) echoes some of the organizational and management practices described in earlier sections which exploit workers, but situates them within infrastructures that enable those practices. Other informants referred to instances of taxation laws working against the interests of workers, such as the difference in tax obligations between sub-contractors and employees, effectively incentivizing companies to hire workers as the former so they do not have to provide the benefits necessitated by the latter.

US labor history points to moments where such institutions did exist to support workers, such as unions or worker centers. Without these countervailing structures, it is difficult to make meaningful, pro-labor social change. Philomena (P16) describes this as a "system issue":

"*I felt like we as an organization were lending some credibility to that narrative by saying, 'well, if only they had a tool. If only they had an app' when it's not an app or a tool issue. It's a system issue and it's about how we perceive poor, working people as having a set of pathological failings as opposed to pointing a finger at the people*

in the systems that keep them poor. Both on the government side and on the corporate side." – Philomena (P16, Worker-centric Non-Profit Executive)

Here, Philomena (P16) reasserts how tech interventions alone are not sufficient to make up for structural deficits, and additionally highlights how workers (who historically are the people with the least amount of power and resources) end up incurring the costs for structural failings. Yolanda (P25) describes unions as one institution that historically helped workers effectively advocate for workers' interests:

"*When you get rid of the only institution that's about gainsharing - because if you think about what unions are about, they're about gain sharing. They're about making sure that employers share the gains that they make off of labor that they have in their workforce. As unions disappeared, gainsharing disappeared with it. ... When you have such a small percentage of the workforce with collective bargaining, no one's figured out how to replicate that structure in a different way. You've got these worker centers and you've got these co-op initiatives that often get stood up by philanthropy, but in the end, a lot of these things are just too small and really don't operate at the scale you need to be able to make a difference.*" – Yolanda (P25, Union Advisor)

While acknowledging the existence of some labor-centric groups, Yolanda emphasized the sense of scale needed to be able to effect meaningful change. When we consider this context as the socioeconomic environment in which pro-labor design interventions are deployed, it becomes clear that it's not "just an app or tool issue." Instead, it is a complex systems issue where the absence of large scale, pro-labor structures significantly weaken workers' capacity to negotiate for their interests. As a result, workers are asked to individually take on risks and responsibilities disproportionate to their potential gains if they choose to file a wage theft claim. Given these scalar inequities, pro-labor design projects inevitably become, as our informants put it, "failures."

6 DISCUSSION

In this paper, we have explained the challenges pro-labor projects face, particularly those aimed to stopping the wage theft of low-wage workers in the US. Why did our informants' efforts to build technologies to stop wage theft fail?

In this paper, we have made both empirical and conceptual contributions to address this question. Empirically, the paper laid out our findings, which map out tangible, messy problems emergent in real-world, social justice, and pro-labor computing projects. These provide us with tangible insights and lessons learned, avenues for future research and design efforts to pursue or avoid, which we unpack in further depth below.

Conceptually, we have framed our paper borrowing a lens from critical theorists that helps us unpack the grand, totalizing notion of "capitalism." Conceptualizing capitalism as not one, but rather *many* capitalisms has helped us understand the complex facets of why some pro-labor sociotechnical interventions fail. Our analysis pointed to several levels or scales that these projects must contend – at the individual scale of worker adoption (micro-level), at larger corporate scales that shape the worker-employer dynamics organizationally (meso-level), and at the scale of economic, institutional systems (macro-level). Therefore, designing within capitalism means accounting for and seeking out ways of intervening within these multiple faces of capitalism and the multiple cracks and fissures that form in between these monstrous, interlocking systems. There is no *one* totalizing capitalism [28, 39]. There are many capitalisms, many different interfaces and experiences within situated incarnations of capitalism as an economic system; thus, any efforts towards labor justice must also be wars battled on multiple fronts and scales.

Even though the pro-labor technologies that we analyzed failed because of multiple capitalism-related reasons, this does not mean hope is lost; capitalism's varied multiplicities means that failures at one juncture do not preclude successes at others. This possibility stresses the importance of documentation, communication, dissemination, dialogue, education, and collaboration – to collectively understand what fails and why, particularly given the risk that projects might increase worker burden (as we saw in our empirical data). Understanding the particulars of where, when, and how a particular facet of capitalism shapes and distorts everyday life is crucial if we hope to make change meaningful to our project stakeholders' everyday lives. What is the *status quo* our stakeholders confront? How does the economic system they face today work, and how might we intervene to make it fairer, more equitable? Has an intervention in this situation been tried before and if so, what happened? What have we – or should we have – learned?

Our discussion is organized as follows. First, we talk about the implications of this paper on the individual scale, discussing ways technology might help workers bring more successful wage-theft claims during legal proceedings. Then we talk about the implications of this paper for the organizational scale, discussing ways that design practices configure certain relationships. Lastly, we talk about the implications of this paper for the institutional scale, discussing the importance of designing within capitalism and designing for alternative institutions.

6.1 Designing for Workers

Other scholars have pointed out the difficulties of designing for marginalized individuals within oppressive systems [52] and our empirical section on Adoption Issues points out how designing for individual workers can be burdensome for lone users. With these considerations in mind, we outline several key sociotechnical speculations on how technology may help automate certain kinds of data collection and how connecting workers to existing support structures can be helpful moves forward.

As we have examined in this paper, workers bringing wage theft claims need help navigating the complex legal system that is not designed to well support them. Having hours documented, especially having contemporaneous records (*i.e.,* meaning the data was created at the time of the event) that contradict their employers' records (with hours removed and wages stolen) is an essential piece of evidence if a legal case is to yield a positive outcome for a worker.

This problem space sparks design thinking into ways we might design technology to help workers in these situations. Challenging wage theft through design is to work within more traditional modes of user-centered design, as the interventions would aim to

produce more practical design elements that reduce user/worker burden and scaffold more friction-less use of digital tools in wage-theft legal claims. A more techno-centric approach, for example, might propose automating tedious tasks or providing scaffolding to make information and education "sticky" and meaningful to users inside these digital tools individual workers use for wage claims. These approaches are not mutually exclusive – worker education or worker-centric data collection might be bolstered within the app through automation, and vice versa – though we wish to emphasize here that these interventions are limited in scale and impact and bring with them other concerns or risks to the worker.

One example of a design intervention around automation would be to leverage features and interactions that facilitate data collection. Referring back to Philomena (P16)'s comments about "technology [missing] the mark," there is an opportunity to reduce the burden placed on individual workers by relying on existing data that has already been collected by a smartphone as proxies for user-entered data. Geolocation data, in particular, could be leveraged to corroborate a worker's location with their recorded work hours, functioning as a way to automate 'clocking in,' thus documenting the hours a person has worked. These automated recordkeeping features could be used in tandem, for example, pairing the 'clocked' hours of a worker with set hourly wages for a user's state, thus calculating the wages owed to an individual, which may differ from the wages provided by bosses, management, or companies. Here, automated data collection would make use of existing data and capacities 'always on' within a smartphone. Beyond reducing user burden, an automated approach encourages contemporaneous data collection, which is consequential from a legal perspective. In addition to being contemporaneous, presiding officials also want to see data that appears trustworthy, is complete, and methodologically sound (e.g., can explain how the data was collected, produced, and analyzed) – that is, the worker can speak to the data's provenance. If a worker cannot show these things, judging officials are reticent to weigh in favor of a worker's accounting of hours against the employer's account in wage theft cases.

With an automated, data-collecting approach, though, we want to also highlight the potential added risks that a worker may face, despite the seeming benefits of this type of design intervention. Specifically, collecting these existing geolocation data may open the door for more invasive breaches of privacy for an individual. There is the risk of creating a database that may be used for purposes other than tracking wages, such as potentially sharing the real-time location of people with certain immigration statuses or other sensitive identities (*e.g.*, stalking scenarios or intimate partner violence, etc). The risk here is offering minimal benefits or minor conveniences to an individual at the expense of creating new or contributing to existing digital infrastructures that could contribute to larger scale biases and systems of exploitation, or what Ruha Benjamin calls the "New Jim Code" [5]. This tradeoff is one that designers, researchers, and practitioners should consider through their interventions and professional practices: given our expertise of digital systems and understanding of their impacts and reach, it is our responsibility to minimize the potential harms we are opening our users to through our design interventions.

While we have analytically organized this section to focus on the individual, we take care to note the individual is situated within relational networks both in and out of the workplace. Indeed, designing within capitalism means accounting for the various scales that our efforts circulate through and are netted within. Workers are not alone in their fight against wage theft – and any social computing effort should help to support workers' social scaffolding throughout the wage theft claim process. We should not be asking workers to do this work by themselves. When possible, projects should help workers connect to people who can help them, such as legal or pro-labor organizations. We advocate for taking a pro-labor approach here that works to countervail the dominant neoliberal pressure on workers to take on all the yoke of self-advocacy, even potentially arbitrating for themselves. Taking a pro-labor approach, applications that focus on connecting workers to resources such as lawyers or the Department of Labor (DOL) work well from a design perspective, because they are tapping into existing support-knowledge infrastructures – lawyers often have the expertise to help workers understand their data and use that data to produce evidence necessary to talk to employers or bring wage claims. The success story here comes into focus as we start to see a collective coming together – worker, app community, legal help community – to ensure that workers have what they need to fight for compensation they are owed. This type of success is where we start to see the networks of care and interdependence emerge, networks that may feel peculiar or idealistic to those of us who have never known a world without neoliberalism. Though these types of interventions may feel small vis-à-vis capitalism's mega inequalities, it is through these relational networks that we can continue to seed diverse work experiences under capitalism. Workers are no longer alone, but instead able to connect to broader networks of labor concerns and care, necessary precursors towards workplace emancipation.
More fully understanding the individual worker experience is crucial for success of wage-theft projects and future work is needed on this front. We were unable to obtain workers' perspective in our dataset, due to methodological limitations. Longer term, ethnographic methods (*e.g.*, embedding on a design project; observing at a legal aid organization) may be more fruitful at engaging with workers, which future work can explore.

6.2 Reflections on Relationships, Practices, and Power Dynamics When Designing Within Capitalism

In the empiric section on Relationship Issues, we used capitalism as an analytic lens to see how various socioeconomic and sociopolitical relationships influenced project outcomes. Here, we continue that discussion on the themes of relationships, power dynamics, and designer responsibility. In our data, we saw how funding – whether self-funded or backed by a VC – impacted how project decisions get made, by whom, and to what effect. It is not just that different project stakeholders hold various roles, but that these roles are hierarchal within capitalist employment structures. Designing within capitalism means raising awareness of and accounting for these power dynamics throughout our projects.

As social computing researchers and designers, we can critically interrogate our own praxis for ways that it may be unduly extractive of our stakeholders. We uplift the work of Meng *et al.* as an

example of leveraging design research to challenge extractive practices without creating entirely new institutions [43]. Through PD, Meng *et al.* engaged with these dynamics by ceding their authority to community partners and sharing their agencies to lead and shape the research. In addition to the design interventions orienting around the community partners and their needs, these smaller-scale interventions were mechanisms for the authors to build and care for their partners such that the relationship did not exist solely to extract data and insights for research publications, but instead focused on mutually beneficial efforts. Meng *et al.* identify this kind of care as a form of solidarity, and we echo that framing here: by replicating these more collective, caring practices, Meng *et al.* advocate for what they call "democratic caring experiments in the small." Reflecting on Meng *et al.*, we acknowledge the weight of asking individual researchers to reflect on their position in larger oppressive structures and, beyond that, the stakes of asking researchers to respond to them. Individual actions are necessary, though not sufficient to affect systemic change, particularly if those actions come from actors with little to no power to influence larger structural mechanisms [52]. Despite this, however, we continue to consider the role of designers and researchers to reflect on our work's sphere of influence and the opportunities to challenge the *status quo*. We do not practice alone – and it is consequential that we remember our place within a broader, engaged profession. Indeed, our professional responsibilities requires us to grapple with and attend to these ethical issues as they arise in our everyday work practices and adhere to Professional Codes of Conduct (see, for example the ACM Code of Ethics[2].

In our next section, we will highlight ways to build and sustain different relationships while working under capitalist contexts.

6.3 Building Alternative Institutions

Thus far, we have discussed how to design to build pro-labor and reflected on our relationships within design practices when designing within capitalism. Now, we want to discuss how we, as researchers and designers, might work toward building new and more just futures by building alternative institutions. We see alternative institutions, or counter-institutions, as structures that intentionally try to model more just interactions and practices on a smaller scale with the intention to scale up and replace oppressive systems. In this paper, we have examined how institutions are a central figure throughout our empirical data, where their hegemonic inertia constantly favors the *status quo* and works against social change. But what is the way forward? How might social computing research and design efforts intervene in shaping alternative institutions?

For insight here, we turn to organizational studies scholars and in particular institutions and institutionalization [47]. Recent work in this field has highlighted the need to more fully understand institutional work, which are the everyday practices of individual people and teams whose actions comprise the micro-foundations of social institutions [38, 47]. We are our institutions. This recognition brings with it a great sense of accountability – for the harm that institutions perpetuate – and a great possibility – for the alternative futures we might have a hand in bringing about. Institutional work "focuses on situated practices of actors reflexively engaged with the institutions that surround (penetrate) them. Thus, it suggests neither determinism nor heroism and is potentially sensitive to both the oppressiveness of social, cultural, and material structures, and the potential for emancipation from some of those structures some of the time" [38] (p.5). An institutional work lens is helpful in both making the grand, largescale institution-building work mundane, at the same time it recognizes that individual agencies and actions are situated and shaped by the very same structures they are trying to transform. Looking at the everyday, micro-foundations of social institutions is a source of tempered hope – macro social change rests not entirely on individual shoulders, and indeed cannot be achieved through individual action alone. But our institutions are made in and through our everyday actions – thus, everyday actions are the site and source of transformation for these bigger institutions that we live under, endure, and strive to (re)make.

We again reiterate our refrain – capitalism is no monolith. The idea follows that there is no one institution but rather many. This multiplicity may feel overwhelming – instead, we advocate for a framing of this multiplicity as inciting many possible openings for change. These openings are invitations to fight for social justice on many fronts, confronting capitalism where it manifests most brutally: in the everyday experience of workers. But while these grassroots efforts may feel micro, they hold potential for wider spread, emancipatory transformation at larger scales. It is our job to help make those connections and aid in opening design spaces where alternative institutions can be imagined, iterated, and enacted. How might we design a new economic system that isn't so harshly extractive? How might we imagine a new type of worker/employer relationship? Design can trigger these conversations, opening space for alternative institutions to be speculated about, worked out, and worked on.

We highlight "within" in our paper's title – designing within capitalism means a recognition that one's space within an economic system can be turned into a site of social change (change from within), in addition to more traditional tactics inciting change from outside. There is no positionality outside totalizing systems of oppression; we must resist from within. We may not be able to abolish capitalism wholesale in our lifetime, but strategies can be leveraged to address how we might achieve pro-labor gains along the way, improving working conditions in piecemeal, though progressive ways.

Capitalism has so maliciously and pervasiveness snuffed out our collective imagination, it has created what critical theorist Mark Fisher has called "capitalist realism," a social reality where capitalism is so taken-for-granted that it feels impossible to even imagine an alternative [26]. Our invocation of "within" capitalism is by no means an acquiescence to such fatalism; in fact, we see possibilities for ways forward. We can, through our projects and design praxis, wrestle with and struggle against the institutions that we ourselves live and work under, at the same time we try to create alternatives that are more equitable and make possible anti-capitalist futures. We can – and must – work to make the broken, harmful systems we are subjected to today livable, at the same time we strive to build emancipation for tomorrow.

Designing within capitalism evokes an ethos that echoes the "dig where you stand" movement, a pro-labor Swedish movement that advocates for workers to learn, write, and ultimately shape

[2]https://www.acm.org/code-of-ethics)

their own histories [41] that influenced early PD work in Silicon Valley [54]. To dig where you stand is to advocate for social justice if and when you see its relevance in your day-to-day work life. Workplace emancipation becomes not a special project or initiative, but an undertaking possible during everyday work practices – we are digging right where we are standing, trying to make change. This view democratizes social change as something everyday and accessible, a social project we can all effect. This view also acknowledges the messiness and precariousness of trying for social change: the ground shifts and the landscape does too, transforming as we dig down towards progress.

This practice also opens up questions about design commitments and allegiances to positionalities, politics, and ethics, as each new project accounts for their own ensembles of concerns. What forms of epistemic justice and allyship should we strive for in social computing? How might we design different kinds of resistance in relation to oppressive systems like capitalism? These remain questions in need of further investigation.

There is a gap between the needs that stem from social issues and the resulting social computing interventions. A dual tactical/strategic approach can address this gap: at once supporting urgent, tactical needs and also fostering strategic conditions for social change. Workers have urgent needs – in our case here, they have had wages stolen from them. However, we must also focus our design attention on intervening in the overarching social conditions and relations that perpetuate social inequalities. Otherwise, those needs will persist. A dual tactical/strategic approach can foster the conditions for social change by presenting new opportunities to shift the social relations around the oppressed and marginalized.

This raises the broader question of the role of design in addressing systemic or structural social change: we resist providing an easy binary that positions design as either beneficial or harmful for change. Instead, we wish to build on this question and ask what our roles are as social computing researchers and designers with agency within these largescale, precarious systems of wealth and oppression. Given that many of the potential risks and harms we may introduce users to are outside the scope of design activities (*e.g.*, surveillance culture, biases in the criminal justice system, etc.) how might that impact our design and/or research work? How might we anticipate and countervail these harms?

7 CONCLUSION

In this paper, we have grappled with the problem of capitalism and its relationships to social computing research and design. We set out a number of considerations that a conceptual focus on capitalism offers us – specifically the unduly extractive nature of capitalism and the wide, cold reach of neoliberalism. Taking guidance from critical theories of capitalism, we conceptualized capitalism not as one, totalizing system but instead as many, overlapping systems of oppression that are experienced differently by different actors. With these in mind, we analyzed our empirical materials: interviews with stakeholders working on pro-labor projects working to help stop wage theft among low-wage workers in the US. Our conceptual framework – of capitalism as multiple – provided us with a way to understand the situated dimensions in our informants' accounts, at the same time we are able to appreciate the larger organizational and institutional facets which shape and constrain participation at varying social scales. These analyses serve as inspiration and incitement – for further engagement and future work. In laying bare the cold, heartless machinations of the many capitalisms we confront – and how capital comes to shape and constrain the possibilities of action within design praxis – we aim to open up spaces where plots can be hatched and maneuvers formed that break open, pick apart, dismantle, and ultimately, replace our inhumane, inequitable *status quo*.

ACKNOWLEDGMENTS

This material is based upon work supported by the National Science Foundation under Grant No. 1718121 and Grant No. 1909500. Thanks to our informants, whose time, energy, and insights have been instrumental in this work. Thanks to reviewers whose engaged & thorough feedback pushed us to clarify and refine the paper. In solidarity with workers everywhere who persist.

REFERENCES

[1] Ali Alkhatib, Michael S. Bernstein, and Margaret Levi. 2017. Examining Crowd Work and Gig Work Through The Historical Lens of Piecework. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI '17), 4599–4616. https://doi.org/10.1145/3025453.3025974.

[2] Cinzia Arruzza, Tithi Bhattacharya, and Nancy Fraser. 2019. *Feminism for the 99%: A Manifesto*. Verso, London; Brooklyn, NY.

[3] Mariam Asad. 2019. Sculpting reality from our dreams: Prefigurative design for civic engagement. Retrieved February 16, 2022 from https://smartech.gatech.edu/handle/1853/61773.

[4] Christoph Becker, Ann Light, Chris Frauenberger, Dawn Walker, Victoria Palacin, Syed Ishtiaque Ahmed, Rachel Charlotte Smith, Pedro Reynolds Cuéllar, and David Nemer. 2020. Computing Professionals for Social Responsibility: The Past, Present and Future Values of Participatory Design. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 2*, 181–184. https://doi.org/10.1145/3384772.3385163.

[5] Ruha Benjamin. 2019. *Race After Technology: Abolitionist Tools for the New Jim Code*. Polity, Medford, MA.

[6] Lauren Berlant. 2011. *Cruel Optimism*. Duke University Press Books, Durham.

[7] Kim Bobo. 2014. Wage Theft in America: Why Millions of Americans Are Not Getting Paid—And What We Can Do About It. The New Press.

[8] Susanne Bødker and Morten Kyng. 2018. Participatory Design that Matters—Facing the Big Issues. *ACM Transactions on Computer-Human Interaction* 25, 1: 4:1-4:31. https://doi.org/10.1145/3152421.

[9] Rose Bookbinder. 2019. Poultry Workers and Allies Organize in the Wake of Anti-Immigrant Raids. *Labor Notes*. Retrieved February 18, 2022 from https://labornotes.org/2019/09/poultry-workers-and-allies-organize-wake-anti-immigrant-raids.

[10] Alice M. Brawley. 2017. The Big, Gig Picture: We Can't Assume the Same Constructs Matter. *Industrial and Organizational Psychology* 10, 4: 687–696. https://doi.org/10.1017/iop.2017.77.

[11] Peter Burnham. 2009. Capitalism. In *The Concise Oxford Dictionary of Politics*. Oxford University Press. Retrieved December 11, 2021 from http://www.oxfordreference.com/view/10.1093/acref/9780199207800.001.0001/acref-9780199207800-e-161.

[12] Bill Buxton. 2010. *Sketching User Experiences: Getting the Design Right and the Right Design*. Morgan Kaufmann.

[13] John M. Carroll and Mary Beth Rosson. 2007. Participatory design in community informatics. *Design Studies* 28, 3: 243–261. https://doi.org/10.1016/j.destud.2007.02.007.

[14] C. A. L. Dantec and C. DiSalvo. 2013. Infrastructuring and the formation of publics in participatory design. *Social Studies of Science* 43, 2: 241–264. https://doi.org/10.1177/0306312712471581.

[15] Tawanna R. Dillahunt, Matthew Garvin, Marcy Held, and Julie Hui. 2021. Implications for Supporting Marginalized Job Seekers: Lessons from Employment Centers. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2: 324:1-324:24. https://doi.org/10.1145/3476065.

[16] Carl DiSalvo, Jonathan Lukens, Thomas Lodato, Tom Jenkins, and Tanyoung Kim. 2014. Making Public Things: How HCI Design Can Express Matters of Concern. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '14), 2397–2406. https://doi.org/10.1145/2556288.2557359.

[17] Lynn Dombrowski, Adriana Alvarado Garcia, and Jessica Despard. 2017. Low-Wage Precarious Workers' Sociotechnical Practices Working Towards Addressing

Wage Theft. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI '17), 4585–4598. https://doi.org/10.1145/3025453.3025633.
[18] Lynn Dombrowski, Ellie Harmon, and Sarah Fox. 2016. Social Justice-Oriented Interaction Design: Outlining Key Design Strategies and Commitments. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems* (DIS '16), 656–671. https://doi.org/10.1145/2901790.2901861.
[19] Pelle Ehn. 1993. Scandinavian Design: On Participation and Skill. In *Participatory Design*. CRC Press.
[20] Pelle Ehn. 2008. Participation in Design Things. 92–101. Retrieved February 18, 2022 from http://urn.kb.se/resolve?urn=urn:nbn:se:mau:diva-11060.
[21] Hamid Ekbia and Bonnie Nardi. 2015. The political economy of computing: the elephant in the HCI room. *Interactions* 22, 6: 46–49. https://doi.org/10.1145/2832117.
[22] Hamid Ekbia and Bonnie Nardi. 2016. Social Inequality and HCI: The View from Political Economy. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16), 4997–5002. https://doi.org/10.1145/2858036.2858343.
[23] Mike Elk. 2018. Undocumented workers find new ally as unions act to halt deportations. *The Guardian*. Retrieved February 18, 2022 from https://www.theguardian.com/us-news/2018/mar/22/unions-undocumented-workers-immigration-deportation-painters.
[24] David T. Ellwood and Glenn Fine. 1987. The Impact of Right-to-Work Laws on Union Organizing. *Journal of Political Economy* 95, 2: 250–273. https://doi.org/10.1086/261454.
[25] Virginia Eubanks. 2019. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. Picador, New York.
[26] Mark Fisher. 2009. *Capitalist Realism: Is There No Alternative?* Zero Books, Winchester, UK.
[27] Sarah E. Fox, Kiley Sobel, and Daniela K. Rosner. 2019. Managerial Visions: Stories of Upgrading and Maintaining the Public Restroom with IoT. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–15. https://doi.org/10.1145/3290605.3300723.
[28] J. K. Gibson-Graham. 2006. "The" End of Capitalism (as We Knew It): A Feminist Critique of Political Economy; with a New Introduction. U of Minnesota Press.
[29] John Gramlich. How border apprehensions, ICE arrests and deportations have changed under Trump. *Pew Research Center*. Retrieved February 18, 2022 from https://www.pewresearch.org/fact-tank/2020/03/02/how-border-apprehensions-ice-arrests-and-deportations-have-changed-under-trump/.
[30] Mary L. Gray and Siddharth Suri. 2019. *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass*. Houghton Mifflin Harcourt, Boston New York NY.
[31] Christina Harrington, Sheena Erete, and Anne Marie Piper. 2019. Deconstructing Community-Based Collaborative Design: Towards More Equitable Participatory Design Engagements. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 1–25. https://doi.org/10.1145/3359318
[32] David Harvey. 2007. *A Brief History of Neoliberalism*. Oxford University Press, Incorporated, Oxford, UNITED KINGDOM. Retrieved December 11, 2021 from http://ebookcentral.proquest.com/lib/iupui-ebooks/detail.action?docID=422896.
[33] Nigar Hashimzade, Gareth Myles, and John Black. 2017. Capitalism. In *A Dictionary of Economics*. Oxford University Press. Retrieved December 11, 2021 from http://www.oxfordreference.com/view/10.1093/acref/9780198759430.001.0001/acref-9780198759430-e-337.
[34] Heather Horst and Daniel Miller. 2020. *The Cell Phone: An Anthropology of Communication*. Routledge.
[35] Lilly C. Irani and M. Six Silberman. 2013. Turkopticon: interrupting worker invisibility in amazon mechanical turk. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13), 611–620. https://doi.org/10.1145/2470654.2470742.
[36] Finn Kensing and Jeanette Blomberg. 1998. Participatory Design: Issues and Concerns. *Computer Supported Cooperative Work (CSCW)* 7, 3–4: 167–185. https://doi.org/10.1023/A:1008689307411.
[37] Robert Kling. 1991. Cooperation, Coordination, and Control in Computer-supported Work. *Commun. ACM* 34, 12: 83–88. https://doi.org/10.1145/125319.125396.
[38] Thomas Lawrence, Roy Suddaby, and Bernard Leca. 2011. Institutional Work: Refocusing Institutional Studies of Organization. *Journal of Management Inquiry* 20, 1: 52–58. https://doi.org/10.1177/1056492610387222.
[39] Débora De Castro Leal, Max Krüger, Vanessa Teles E. Teles, Carlos Antônio Teles E. Teles, Denise Machado Cardoso, Dave Randall, and Volker Wulf. 2021. Digital Technology at the Edge of Capitalism: Experiences from the Brazilian Amazon Rainforest. *ACM Transactions on Computer-Human Interaction* 28, 3: 18:1-18:39. https://doi.org/10.1145/3448072.
[40] Ann Light. 2019. Design and Social Innovation at the Margins: Finding and Making Cultures of Plurality. *Design and Culture* 11, 1: 13–35. https://doi.org/10.1080/17547075.2019.1567985.
[41] Sven Lindqvist. 1979. Dig Where You Stand. *Oral History* 7, 2: 24–30.
[42] Silvia Lindtner, Shaowen Bardzell, and Jeffrey Bardzell. 2016. Reconstituting the Utopian Vision of Making: HCI After Technosolutionism. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16), 1390–1402. https://doi.org/10.1145/2858036.2858506.
[43] Amanda Meng, Carl DiSalvo, and Ellen Zegura. 2019. Collaborative Data Work Towards a Caring Democracy. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW: 42:1-42:23. https://doi.org/10.1145/3359144.
[44] Nomaan Merchant. 2019. ICE raids raise question: What about the employers? *AP NEWS*. Retrieved February 18, 2022 from https://apnews.com/article/immigration-donald-trump-us-news-ap-top-news-arrests-e7113c50a6fd4d2688fc2f2b8a9a91cd
[45] Joseph S. Nye. 1990. Soft Power. *Foreign Policy*, 80: 153–171. https://doi.org/10.2307/1148580.
[46] Jeffrey S. Passel and D'Vera Cohn. 2018. Unauthorized immigrant workforce is smaller. *Pew Research Center's Hispanic Trends Project*. Retrieved February 18, 2022 from https://www.pewresearch.org/hispanic/2018/11/27/unauthorized-immigrant-workforce-is-smaller-but-with-more-women/.
[47] Trish Reay, Tammar B. Zilber, Ann Langley, and Haridimos Tsoukas. 2019. *Institutions and Organizations: A Process View*. Oxford University Press.
[48] Toni Robertson and Jesper Simonsen. 2012. Challenges and Opportunities in Contemporary Participatory Design. *Design Issues* 28, 3: 3–9. https://doi.org/10.1162/DESI_a_00157.
[49] Christine Satchell and Paul Dourish. 2009. Beyond the user: use and non-use in HCI. In Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7 (OZCHI '09), 9–16. https://doi.org/10.1145/1738826.1738829.
[50] Lee Saunders. Why Janus v. AFSCME is a Threat to All Working People. *AFSCME*. Retrieved February 18, 2022 from https://www.afscme.org/blog/why-janus-v-afscme-is-a-threat-to-all-working-people.
[51] Alana Semuels. 2018. Is This the End of Public-Sector Unions in America? *The Atlantic*. Retrieved February 18, 2022 from https://www.theatlantic.com/politics/archive/2018/06/janus-afscme-public-sector-unions/563879/.
[52] Sharifa Sultana, François Guimbretière, Phoebe Sengers, and Nicola Dell. 2018. Design Within a Patriarchal Society: Opportunities and Challenges in Designing for Rural Women in Bangladesh. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–13. Retrieved February 18, 2022 from https://doi.org/10.1145/3173574.3174110.
[53] Christine T. Wolf and Jeanette L. Blomberg. 2020. Ambitions and Ambivalences in Participatory Design: Lessons from a Smart Workplace Project. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1* (PDC '20), 193–202. https://doi.org/10.1145/3385010.3385029.
[54] Emily Theissen. 2018. An Anthropologist in Silicon Valley. *Anthropology News*. Retrieved February 18, 2022 from https://www.anthropology-news.org/articles/an-anthropologist-in-silicon-valley/.
[55] Kentaro Toyama. 2015. *Geek Heresy: Rescuing Social Change from the Cult of Technology*. PublicAffairs, New York.
[56] John Vines, Rachel Clarke, Peter Wright, John McCarthy, and Patrick Olivier. 2013. Configuring participation: on how we involve people in design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13), 429–438. https://doi.org/10.1145/2470654.2470716.
[57] Christine T. Wolf and Jeanette L. Blomberg. 2020. Ambitions and Ambivalences in Participatory Design: Lessons from a Smart Workplace Project. In *Proceedings of ACM Conference on Participatory Design*. https://doi.org/10.1145/3385010.3385029.
[58] Richmond Y. Wong. 2021. Tactics of Soft Resistance in User Experience Professionals' Values Work. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2: 355:1-355:28. https://doi.org/10.1145/3479499.
[59] 2018. *Janus v. AFSCME*. Retrieved from https://www.supremecourt.gov/opinions/17pdf/16-1466_2b3j.pdf.
[60] 2019. CWA Statement on Mass Raids in Mississippi. *Communications Workers of America*. Retrieved February 18, 2022 from https://cwa-union.org/news/releases/cwa-statement-on-mass-raids-in-mississippi.
[61] *Union Members Summary - 2021*. US Bureau of Labor Statistics (BLS). Retrieved February 18, 2022 from https://www.bls.gov/news.release/union2.nr0.htm.
[62] UFCW Statement on ICE Raids in Ohio. *The United Food & Commercial Workers International Union*. Retrieved February 18, 2022 from http://www.ufcw.org/press-releases/ufcw-statement-on-ice-raids-in-ohio/.
[63] Right to Work | AFL-CIO. Retrieved February 18, 2022 from https://aflcio.org/issues/right-work.