Designing for Proactive Accountability: Lessons on Governing Technology from Detroit's Food Sovereignty Movement

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Figure 1: Illustration from Workbooks Used in Speculative Workshops on "Anticipating Technology's Impact on Food Sovereignty."

Abstract

Governance structures for new technologies are frequently top-down, reactive, and informally enforced, leaving marginalized communities with little power to address harms until after they occur. To address these limitations, we introduce Proactive Accountability, a conceptual framework theorizing that effective governance must be community-led, formally enforced, and continually maintained. We explore these principles through a speculative design study with Detroit's food sovereignty community, in which participants identified community-owned cooperatives—described as "ancestral technologies"—as a model for redistributing power within a capitalist economy. Synthesizing these theoretical and empirical insights, we introduce the Designing for Proactive Accountability (D4PA) framework, providing implications for how designers can operationalize the goals of proactive accountability into HCI research and design projects. Finally, we contribute a future research agenda that positions cooperatives not merely as beneficiaries of design, but as sites of inquiry for understanding how to institutionalize justice-oriented democratic governance of sociotechnical systems.

CCS Concepts

• **Human-centered computing** → **Empirical studies in collaborative and social computing**.

Keywords

technology governance, proactive accountability, community cooperatives, solidarity economy, food sovereignty

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1 Introduction

While technologies promise to address societal challenges, adopting new technologies often exacerbates social injustices, with marginalized communities disproportionately bearing the brunt of negative consequences [6, 33]. To better align technology development with societal values, HCI scholars have increasingly called for incorporating governance mechanisms into the design process [4, 60, 116]. These governance interventions typically focus on individual systems, such as creating community-based audit processes for algorithmic systems [69]. Other efforts include encouraging developers to incorporate ethical values and requiring companies to consider potential risks before deploying new systems [39, 78].

Despite these efforts, conventional governance is limited in three important ways. First, many mechanisms are informal, relying on voluntary commitments from developers that easily break down when mitigation conflicts with an organization's profit-maximizing goals [6, 33]. Second, formal governance models are typically reactive and top-down, often failing to protect marginalized communities who lack the power and capital to seek redress through state or corporate channels [60, 90, 113, 116]. Third, technical governance is often implemented as a one-off exercise, which overlooks the continually contested nature of what is considered just. Instead, governance needs to be an ongoing process of continual maintenance and adaptation [1, 28, 35, 59].

In this paper, we address these governance gaps by introducing a framework for **designing for proactive accountability**: an approach that motivates technical actors to design governance mechanisms that take accountability for the harms of innovation *before* they occur, rather than relying on post-hoc remedies. While prior research has demonstrated that communities desire proactive, formal, and ongoing accountability mechanisms, it is unclear how to design and institutionalize these mechanisms [25]. Drawing on our community workshops, we offer design principles for elevating governance from a secondary ethical check to a primary design material—operationalizing accountability not as a post-hoc remedy, but as a fundamental prerequisite for design.

We situated our inquiry within Detroit's food sovereignty community, a group actively building an alternative food economy to overcome economic marginalization and the ongoing dispossession of wealth in a majority-Black city [21]. Our research began with a grant to explore whether and how technology could support food access in Detroit. However, preliminary fieldwork revealed the community's fraught relationship with extractive technology pilots. Consequently, we shifted our research focus from *designing technology* to *designing governance mechanisms*, asking how we might redistribute power within Detroit's innovation economy. We hosted design workshops with 25 participants from Detroit's food sovereignty community to explore the following research questions:

(1) **RQ1**: How does Detroit's food sovereignty community foresee new technologies impacting their communities?
(2) **RQ2**: What governance models do they propose for mitigating the negative outcomes they foresee new technologies creating?

Through our workshops, participants consistently foresaw that new technologies would harm their communities because developers would prioritize profit over social and environmental justice. In response, they advocated for formal accountability mechanisms that mitigate these harms—proactively. When asked to propose governance models, participants cited community-owned cooperatives as a proven model. The International Cooperative Alliance (ICA) defines a cooperative as an "autonomous, jointly-owned and democratically-controlled enterprise" [55]. In our workshops, participants described cooperatives as an "ancestral technology" that their community has used to counter capitalist extraction [84]. Participants then described how the structural features of cooperatives, such as democratic decision-making, binding agreements, and collective identity formation, offer the specific mechanisms needed to achieve proactive accountability.

Our work makes four main contributions to HCI. First, we introduce *Proactive Accountability (PA)* as a conceptual lens to synthesize the limitations of previous governance approaches. We identify that current frameworks, whether reactive and community-centered [13, 28] or proactive but top-down [83, 106], do not fully capture the structural models of governance that marginalized communities propose for achieving accountability. We thus theorize the need for a governance model that is community-led, formally enforced, and continually maintained. Second, we present an empirical case study grounding these principles in the work of Detroit's food sovereignty movement. By centering the voices of a community actively building a solidarity economy, we demonstrate how marginalized groups envision governing innovation not merely through participation, but through collaborative models that reorganize structural power. Third, we introduce the *Designing for Proactive Accountability (D4PA)* framework to operationalize these principles, detailing both specific design implications and the structural challenges HCI researchers will face when pursuing proactive accountability in technical ecosystems. Fourth, we propose a research agenda that positions cooperatives as sites for investigating how to design proactive accountability for the innovation economy.

2 Motivation & Related Work

Accounting for the possible social impacts of emerging technologies has produced a broad engagement with questions of technology governance in HCI. In this section, we review related work to motivate our conceptual model of "proactive accountability," which shaped our design inquiry.

2.1 Governance and Policy in Social Justice-Oriented HCI

Governing technology in ways that address societal inequities has long been a core interest of the HCI community. The field's engagement with social issues has focused on rebalancing power and agency throughout the innovation process [5, 13]. This began with Scandinavian Participatory Design (PD) in the 1980s, which sought to democratize decision-making within workplaces [7, 8]. Building on this, Batya Friedman introduced Value Sensitive Design in 1996 to explicitly embed values in the design process to mitigate human biases [39]. However, as HCI scholars expanded their scope to complex challenges like food insecurity, they began to critique approaches that promoted individualistic narratives of behavior change [82, 86], arguing that without explicitly addressing power and privilege, design risked perpetuating harm [18, 28].

To prevent such harm, HCI scholars have embraced social justice as a core orientation. Dombrowski et al. [28] defined "social justice oriented HCI" as an approach that attends to "the ways that individuals experience oppression, including how benefits, burdens, obligations, power, opportunity, and privilege have been (in)equitably distributed within society" (p. 657). This perspective examines how technology development intersects with systems of oppression (e.g., racism, sexism, ableism) to produce social harm [13] and raises technology governance as a critical question for HCI. In this paper, we define governance as "the established structures for decision-making" that determine who has power regarding certain responsibilities [62, p. 311]. In the context of technology, governance can refer to both the decision-making structures of those designing a single technical system and the structures and relationships within the broader innovation ecosystem (e.g., influences on how funders, researchers, developers, and users act in response to their social responsibilities) [14, 40].

While discussion of social justice has a longer history in HCI, questions around how to design governance mechanisms are a relatively recent focus. Historically, HCI treated governance mechanisms, like policy, as an afterthought or the responsibility of other experts including regulators, legal teams, and policymakers [60]. Moreover, technology policy is typically created retroactively: a new technology is designed, users adopt it, and only then do impacted groups of people turn to public agencies or the courts to seek intervention and remediation. For instance, even Dombrowski et al. [28]'s "designing for accountability" framework theorizes a responsive approach to accountability, where design interventions enable a community to pursue justice for harms that have already occurred. This post-hoc view of accountability limits HCI practice because it does not highlight important questions of how oversight, governance, and control precede and influence interaction design [44, 60]. In response, Jackson et al. [60] call on HCI to explore methods for proactively designing for the "policy knot," which involves attending to the interactions among people, policies, and technologies, to mitigate negative societal outcomes of sociotechnical systems.

2.2 The Need for Proactive Accountability

To understand why accountability remains elusive, we synthesize four critical dimensions where current HCI governance approaches often fall short (summarized in Table 1). These four dimensions—orientation, locus of power, enforcement mechanism, and temporal engagement—frame our design inquiry into resilient social infrastructure that enables actors in the innovation economy to take accountability for foreseeable harms. While prior work has often addressed these dimensions in isolation—such as combining community engagement with informal ethics (e.g., PD) or formal enforcement with reactive regulation (e.g., laws and policies)—we argue that effective justice requires synthesizing all four. Combining these four features into a singular framework, which we call Proactive Accountability (PA), enables us to define a capacity that existing governance models lack: the ability to condition innovation on binding, community-defined terms. While frameworks such as PD grant communities a voice and Responsible Innovation encourages anticipation, they often lack mechanisms to enforce community will against powerful institutional interests. Proactive Accountability fills this gap by moving beyond consultation to enabling communities to design the formal, continual infrastructures necessary to hold actors accountable for harms that have yet to materialize.

Table 1: Dimensions of the Governance Gaps. We synthesize existing HCI literature to identify four critical dimensions where prevailing approaches to governance often fall short of the requirements for Proactive Accountability.

Dimension	Prevailing Approaches	Proactive Accountability (PA)
Orientation *When do we act?*	**Reactive** Mechanisms that address harms and seek redress after they have occurred	**Proactive** Mechanisms that motivate responsibility and mitigate harms before they occur
Locus of Power *Who holds authority?*	**Expert-led** Policymakers, developers, or researchers "prioritize" stakeholders	**Community-led** Provide communities with agency over the governance process
Enforcement Mechanism *How is it upheld?*	**Informal** Voluntary ethical commitments, guidelines, or checklists	**Formal** Binding mechanisms that provide consequences for not fulfilling responsibility
Temporal Engagement *How does it happen?*	**Episodic** One-off audits, workshops, or post-hoc interventions	**Continually Maintained** Resilient infrastructure that adapts to changes in social context

First, we distinguish between the **orientation of the intervention (reactive vs. proactive)**. Reactive accountability addresses harm after it occurs, whereas proactive accountability establishes mechanisms that motivate actors to act before harm occurs (e.g., before a system is designed). For under-resourced communities, pursuing sanctions for social injustices after the fact is difficult, if not impossible. Given that governance approaches are often reactive, this places an unfair epistemic burden on those impacted, even when a harm is easily foreseeable given the history of social injustices [91]. Yet, we find that proactive accountability has been undertheorized in the HCI literature.

Second, governance interventions differ according to the **locus of power (expert-led vs. community-led).** Previous work has explored how to integrate policy design directly into technology research and development, from engaging in state policy-making to designing organizational policies [20, 71, 106, 116]. While these contributions are valuable, they often originate from perspectives

beyond the communities they can impact. Many "elite" forms of governance, such as state regulation and corporate policies, fail to work for the marginalized communities they are intended to protect. Seeking justice often requires capital, time, expertise, and political power that these under-resourced communities rarely have access to. In response, there has been a critical imperative for HCI to engage with a politics from below [113]. We define "community" here not merely as a geographic location, but as a group with a shared political struggle [26]. Proactive accountability requires shifting agency to these groups, moving beyond consultation to structures where those most impacted by harm hold genuine structural power [18]. For example, researchers have developed methods for engaging stakeholders and impacted communities in the policy design process [66, 67]. Other scholars have proposed "middle-out" design as a way to incorporate bottom-up community needs into design projects with powerful institutions like city governments [29, 38]. We argue that for communities with a history of extraction, the locus of power must explicitly shift to the community to prevent the co-optation of their interests. This is essential because communities often pursue forms of governance, such as political mobilization or refusal, that extend beyond state- or corporate-centric policy design [42, 113].

Third, we distinguish between the **enforcement mechanism (informal vs. formal)**. Governance interventions frequently tend to be informal, relying on a voluntary commitment from developers [18, 24, 56]. This poses a significant risk, as accountability can be quickly dropped if developer priorities change or if mitigating harms demands time and money that conflict with the economic incentives of research and development. HCI scholars have responded to these risks by prioritizing the design of governance that establishes formal accountability mechanisms. Such efforts might include building tools to help communities seek accountability by producing evidence or supporting developers in redesigning existing systems [50, 57, 68].

Fourth, proactive governance is defined by its **temporal engagement (episodic vs. continually maintained)**. Common governance interventions, such as algorithmic impact assessments or one-off consultation workshops, often function as episodic checkpoints rather than ongoing processes [78, 79]. However, episodic engagements are insufficient since proactively mitigating all possible harm is impossible for complex systems. Systems will eventually degrade, what constitutes harm will evolve, and a technology will likely be used in ways beyond its initial imagined intent [1, 31, 59, 78, 85]. Many approaches, like early participatory design efforts, have been critiqued for failing to provide long-term governance, as they are highly dependent on researcher engagement and facilitation [58, 104]. This highlights the need for resilient, independent community infrastructure that can adapt to emerging, unpredictable harms.

2.3 From Supporting Values to Enforcing Structure: The Cooperative Turn in HCI

The imperative for community-led governance extends to investigating accountability not just in how technology is designed, but in how it is assimilated into complex economic contexts within the broader innovation ecosystem [14, 40]. In response to the extractive nature of capitalism-driven innovation, HCI scholars have increasingly looked toward alternative economic models, such as "solidarity economies," to re-imagine the power dynamics of innovation [25, 110, 111]. This shift is particularly visible in sustainable HCI research on food systems, where communities are actively restructuring economic relationships. Researchers have emphasized that technology in these spaces must support values such as participation, equity, and local empowerment [47, 48, 76, 89, 93]. However, while this body of work successfully identifies the values necessary for responsible innovation, it has focused less on the specific structural mechanisms required to enforce those values in the face of market pressures [25, 70].

Within these solidarity economies, the cooperative model is a distinct structure for operationalizing accountability. Unlike values like inclusivity and reflexivity [106], which can be granted or revoked by power holders, cooperatives are defined by structural ownership. The International Cooperative Alliance (ICA) defines a cooperative as an *"autonomous association … united voluntarily to meet their common economic, social and cultural needs … through a jointly-owned and democratically-controlled enterprise"* [55]. Building on Black economic thought, scholars like Nembhard [84] argue that this structure—defined by member ownership and democratic control—provides a mechanism for formal enforcement that traditional participatory design research lacks [22]. Recent work examining data practices in housing and platform cooperatives suggests that this organizational form offers a unique governance advantage: accountability is not an afterthought, but it is encoded in the ownership structure itself [63, 110]. Yet, these models are not panaceas; they face significant challenges in practice, especially in the technology sector, where market forces pressure democratic organizations to prioritize profit over their mission [17, 63, 100, 108, 110].

While the field has studied how to design tools for alternative economies [70, 100, 110], the field lacks sociotechnical imaginaries for designing innovation ecosystems rooted in these economic realities rather than traditional capitalist growth [27, 32, 72, 101]. Our paper addresses this gap by providing an empirical case study of the design of proactive accountability mechanisms with marginalized communities within the innovation ecosystem. By focusing on how Detroit's food sovereignty movement envisions and designs for governance, our work shifts the emphasis from merely designing for alternative economies to empowering communities to shape how technology is governed within their existing economic models and values.

3 Context: Detroit's Urban Farming & Food Sovereignty Movement

As a majority-Black city, Detroit presents a compelling context for exploring proactive governance. The city's history of food apartheid, racialized disinvestment, and systemic inequities has shaped a food system where many residents lack access to affordable and culturally relevant food [21, 49, 97, 112]. To address this, Detroit's urban farming and food sovereignty movement has emerged as a national leader, built on a legacy of urban agriculture and Black political organizing around food, land, and economic justice [21, 92]. However, because of these complex social and political histories, the

community has developed a deep-seated skepticism that traditional accountability frameworks will protect them. Our preliminary fieldwork confirmed this wariness; participants described a history of telling institutions what they needed, only to be ignored. For decades, the community has been economically marginalized and, at times, in political antagonism with other economic actors and the state [21, 49, 97, 112]. Individuals in the community defined themselves not only by geography, profession, and race but by a shared political practice of resistance and collective care—a "community of practice" actively negotiating its own survival against systemic neglect [26, p. 184]. This history positions the community as a critical case for exploring how to design governance mechanisms when existing state and corporate frameworks are deemed insufficient.

Moreover, the Detroit food sovereignty movement is not merely reacting to a broken system; it is actively creating a "solidarity economy" based on values of cooperation, sovereignty, and social and environmental justice [74]. This vision moves beyond short-term food access efforts (e.g., scaling food pantries by rerouting unsold food away from landfills) toward a long-term framework of food sovereignty, that reimagines the entire food system itself [87]. Food sovereignty calls for the decommodification of food systems, shifting toward a democratic economy based on social solidarity—where communities, not corporations, develop and govern how food is produced, distributed, and consumed in ways that are culturally, socially, nutritionally, and politically appropriate. Within food sovereignty, access to food is recognized as a human right, and people should not be left hungry while food goes to waste. This context makes the community a powerful site for imagining technology governance outside of traditional, profit-maximizing logics. The existence of this alternative economic imaginary provides a rich foundation for co-designing governance mechanisms rooted in a community's values and goals, rather than simply accepting or reacting to the norms of neoliberal capitalism.

Finally, Detroit is a compelling context because this local food economy has become a complex innovation ecosystem, creating tension regarding the ethical deployment of capital. Given its growth, Detroit's urban agriculture movement has become a symbol of Detroit's potential for economic revitalization [51, 102]. For instance, Detroit Future City's 2021 report on implementing Detroit's Strategic Plan suggested that the city become a leader in food production by "taking advantage of Detroit's resident urban farming movement" to become a leader in the "design and production of urban farming tools" [23, p.73, p.80]. Reflecting this vision, Detroit's growing start-up scene has introduced technical innovations across Detroit's urban food lifecycle, such as vertical farming for food production [64], the use of drones and electrical vehicles for food distribution [2, 37], and the use of automated robots to collect food waste to turn into compost [41]. These initiatives align with a broader digital revolution in agriculture, where developers promote data-driven farming as a solution to global food crises [34, 105]. However, these corporate visions often diverge from those of local growers, who remain largely excluded from shaping the future of farming technology [48].

This raises a critical governance question: who decides what constitutes development? While developers prioritize novel technical innovations, farmers would rather redirect that capital toward building foundational infrastructure [19]. This creates foreseeable tensions and highlights the need for a governance process that can manage accountability across the entire ecosystem of new technologies. This is why we focused our research on how communities would govern this broader ecosystem, rather than just how they would design a single technical artifact.

4 Our Approach

Our study design was driven by a commitment to addressing the complex interplay of technology, power, and community autonomy. As summarized in Figure 2, our research comprised three phases: (1) exploratory field research, (2) speculative design workshops, and (3) iterative thematic analysis. Throughout the fieldwork, we identified themes bottom-up, which guided the structure of our design workshops. We then used these themes as the basis for coding the collected data, while allowing for new codes to emerge. This study received exempt status from our university's Institutional Review Board (IRB).

As academic outsiders to Detroit's urban farming community, we acknowledge the limitations and subjectivities inherent to qualitative design work. We started this project as part of a grant that examined the role technology can play in supporting food access among low-income communities. However, our directive to explore "what kind of technology" could support food access was met with skepticism during our initial fieldwork. After learning about the community's negative experiences with extractive technology pilots, we pivoted our inquiry. We shifted from asking how technology could support food security to asking how we could redesign the innovation economy for greater power redistribution. To investigate these questions of power, we utilized speculative design probes, which enable critical reflection on technology and the creation of new imaginaries [10]. We chose this approach not to predict the future of food-tech in Detroit, but for its epistemic value in surfacing hidden assumptions and revealing tensions within existing social and economic structures [10, 94]. In addition, this approach enabled the workshops to function as a space for creating a politicized arena in which the community could articulate collective arguments about how they want to shape their sociotechnical futures [26].

However, we acknowledge significant limitations of this method, particularly when working with marginalized communities. Prior work warns that speculative design can be experienced as disempowering or abstract if not grounded in the everyday realities of participants [30, 46, 77]. Furthermore, without explicit attention to social context, participants may reproduce dominant narratives rather than imagining alternatives [12]. We addressed these limitations by anchoring our speculations in scenarios grounded in the community's reality and by conducting constant member checking. By using speculation to identify where current governance models likely break down, we moved beyond creating artifacts to identify the structural gaps that future proactive accountability mechanisms could fill.

4.1 Phase 1: Exploratory Field Research

Building on prior work that identified Detroiters' desire to support local food sources, the first author conducted exploratory fieldwork

	Phase 1: Field Research	Phase 2: Speculative Design Workshops		Phase 3: Thematic Analysis & Iterative Coding
	Step 1: Field Research	**Step 2: Speculative Workbooks**	**Step 3: Group Discussions**	**Step 4: Data Analysis**

Method	Volunteered at urban farms and gardens (1-4 hours each, some multiple times)
	
	Open discussion:
	• Needs/assets for supporting food security efforts across the city
	
	Spoke with university experts with experience with food sovereignty
	
	Informal interviews with developers who proposed or implemented technology pilots
		Pre-workshop workbook (~1 hour) with $50 compensation
		
		Included 3 text-based activities:
		• Defining food sovereignty values
		
		• Discussing 2 speculative technical scenarios (Figure 3)
		
		• Open questions:
		  • Collective action
		  • Accountability mechanisms
			2-hour Zoom workshops ($100 provided)
			
			Workshop broken into 3 activities:
			• Review food sovereignty values
			• Review harms
			  • 1-3 breakout groups
			  • Discuss technical scenarios (Figure 4)
			• Open discussion: Models/collective actions for holding technology developers accountable
			
			Iterated on workshop activities from facilitator discussion post-workshop
			
			Collected Online Feedback Form:
			• Demographic data
			• Workshop experience
			• Suggestions for future workshops
				Iterative qualitative coding exercise (4 weeks):
				• Initial codebook: Synthesized from field research and workbooks
				• Vivo codes created during analysis
				
				• Workshops divided into 3 separate activities + 5 breakout groups
				
				• Coded each of the 19 workbooks (6 sections each) as a single unit
				
				Randomly assigned workshop activities and workbooks across 5 coders:
				• 1 PhD student (author)
				• 1 faculty (author)
				• 1 post-doc
				• 1 master's student
				• 1 undergrad

Data Collected	Field notes: • 12 urban farms and gardens in Detroit • Informal interviews with 24 stakeholders Memos from community events	19 /25 participant provided pre-workshop workbooks	• 3 workshops, 25 participants total (6, 8, 11 respectively) • 8.25 hours of video transcriptions • Zoom chat logs • Facilitator notes • 24 Feedback Form responses	Synthesize 250 codes into 3 high-level themes: • Food sovereignty values • Implications of technology designs (e.g. desires, concerns, tensions, risks, and recommendations) • Proposed accountability mechanisms

Data Analysis	• Grounded theory to produce a codebook
	
	• Developed design probes for speculative workbook
		Before workshops:
		• Thematic analysis to summarize findings
		
		After workshop:
		• Revised codebook
		• Triangulate emerging themes
			• Member check during workshops
			
			• Used codebook to synthesize workshop feedback and iterate on themes
			
			• Disseminated a Community Report to:
			  • participants
			  • community leaders
			  • public officials
				• Merged similar codes into broader themes
				
				• Grouped harms by intersection with food sovereignty values
				
				• Analyzed how accountability mechanisms addressed specific harms

Figure 2: Overview of Study Design. A high-level overview of our three-phase study design: (1) Field Research, (2) Speculative Design Workshops, and (3) Thematic Analysis & Iterative Coding. The diagram details the specific activities, methods, data collected, and data analysis approach for each phase, demonstrating how insights from one phase informed the design and execution of the next. The methodology was intentionally structured to move from broad contextual understanding to the co-design of specific governance mechanisms, addressing the complex interplay of technology, power, and community autonomy.

with food providers. Over three months, the first author visited 12 urban farms and gardens and talked with 24 stakeholders, including farm owners, paid staff, and community volunteers. To avoid pushing technology as an inherent solution to their challenges, we used a broad definition of "technology" and let participants guide the conversation toward issues that mattered most to them. Then, given our background and interests in digital technology development, we followed up with further discussions on physical farming infrastructures, interactions with digital systems, and sociotechnical practices.

From these initial conversations, which lasted from one to four hours, we learned that Detroit's food sovereignty community needed

funding to support ongoing social programs that they saw as working, rather than new technologies. This, however, presented a challenge as our grant funder prioritized techno-solutionist projects to spur economic growth. While we could have engaged in refusal [42, 117], we reasoned that our positionality as academics gave us a unique opportunity to investigate how to intervene in the political economy of technology development and suggest ways to redirect capital more beneficially.

During our fieldwork, we learned about multiple technology pilots aimed at integrating emerging technologies into Detroit's food system. Many of these pilots were controversial, with participants expressing their frustration with the developers who ran technology pilots on their farms. We shifted our focus and hosted workshops to explore how the food sovereignty community could design governance mechanisms to hold developers formally accountable. While we recognize that the governance of innovation requires more stakeholders (e.g., funders, policymakers), we framed the design workshops around the accountability relationship between the community and the technology developer to enable participants to discuss their personal experiences. We leave for future work explorations of the relationship between the community and other stakeholders.

4.2 Phase 2: Speculative Design Workshops

Building on insights from our fieldwork, we hosted three separate two-hour speculative design workshops to identify implications for designing governance systems for Detroit's food-innovation economy. Building on previous work in community-based speculative design, we provided participants with a take-home workbook. Given the complexity of governance design, we used these workbooks to scaffold individual reflection before the group session, which enabled the workshops to focus on synthesizing collective strategies rather than initial ideation [25, 46]. We designed both the workbooks and the workshops around a three-part structure: (1) defining food sovereignty values, (2) evaluating fictional and real technologies to address food sovereignty, and (3) discussing collective actions and models for accountability.

4.2.1 Participant Recruitment. We recruited 25 participants from Detroit's food sovereignty movement who identified as farmers, growers, and/or food producers. Recruitment occurred via word of mouth, community networks, and farmer email lists. We offered a monetary incentive based on farmers' recommendations ($100 for attending the workshop, and an additional $50 for filling the take-home packet), acknowledging the demanding harvest season. Overall, 68% (N=17) of participants identified as Black or African American, with other participants identifying as Native American (N=2), Middle Eastern (N=1), Hispanic (N=2), and White (N=3). Half of our participants identified as women (N = 12), 5 participants identified as men, and more than a quarter (N=7) identified as non-binary, agender, genderqueer, or two-spirit. Their farming experience ranged from personal plots to managing large, non-profit farms, providing a rich diversity of perspectives for our study, with about 12% (N=3) having 20+ years of experience farming, about 25% (N=6) having 10-20 years, about 40% (N=10) having 5-10 years, and about 20% (N=5) having less than 5 years of experience. Nearly half of the participants farmed on less than one acre, while the largest farm—Detroit's largest—spanned approximately 7 acres. About 80% of our participants grew vegetables (N=20), about half grew fruit (N=13), and others also grew flowers (N=9), herbs (N=8), native plants (N=3), nuts (N=2), and medicinal plants (N=1). In the findings, we refer to participants according to an assigned pseudonym (see Appendix A.1).

4.2.2 Speculative Workshop Packets & Technical Scenarios. Participants completed a text-based workbook containing two speculative sociotechnical scenarios, designed to explore different developer-community relationships. Of the 25 participants, 19 completed a pre-workshop workbook. The first scenario involved a technology developer internal to the community (a hypothetical farmer collective, Motor City Grows), while the second involved an external developer (the City of Detroit). As summarized in Figure 3, these scenarios asked participants to evaluate a hypothetical technical system and then anticipate the social challenges it could produce. The goal was to elicit not only design imaginaries but also initial insights on governance mechanisms for holding actors accountable for unintended impacts. More details, including the full workbook, are available in the Appendix A.2.

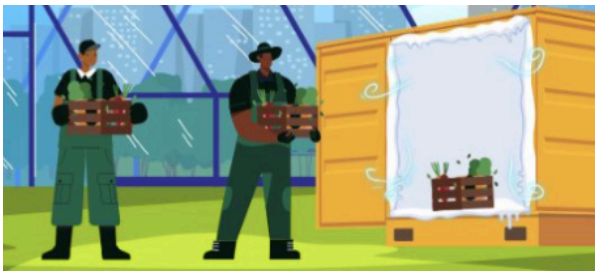
4.2.3 Group Discussions. We then hosted two-hour facilitated group discussions to dive deeper into how participants would design governance mechanisms that provide accountability within the innovation ecosystem. Each workshop began with an ancestor and land acknowledgment modeled on examples from community events. This highlighted the historical injustices faced by the human (including the Odawa, Ojibwe, and Potawatomi tribes) and non-human ancestors in Detroit, while inviting the spirit of the land as an active participant in our discussions (see Appendix A.3). For each activity, we synthesized themes from the collected workbooks to have participants confirm or refine them to better reflect their views. In addition, we introduced three real-world technology pilots to further ground discussions of technology governance in reality for participants. As summarized in Figure 4, this included: (1) an electric vehicle pilot for a mobile food market, (2) an autonomous vehicle pilot providing free rides for elderly and disabled residents to food markets, and (3) an autonomous robot system for composting food waste. Participants analyzed how these pilots aligned with the food sovereignty movement's values, and we facilitated a discussion on harm prevention strategies and accountability mechanisms for developers. Following each session, the facilitation team debriefed, refining research questions and the workshop design to enhance data collection.

4.2.4 Feedback Surveys & Community Report. Following the workshops, we administered an online survey to gather demographic data and qualitative feedback on what participants "loved, learned, and longed for." Participants deeply valued the opportunity to connect with other farmers, hear diverse viewpoints, and recognize their shared needs and desires. This feedback suggests that the workshops functioned as a site for strengthening the community of practice, allowing members to learn about current technology pilots and the potential challenges they posed to their community. However, participants also offered valid critiques of the virtual format, with many expressing a longing for in-person gatherings with

Scenario 1: Motor City Grows - Detroit Growing Cooperative Platform

Q1-Q3: Design Scenario

- An urban farm "Bountiful Harvest" estimates they have extra capacity to grow food for those in need
- They join a Detroit farming cooperative, Motor City Grows (MCG), to share infrastructure (cold storage, delivery trucks)
- MCG asks farmers to communicate (website or text): what and how much the farm is growing, their asking prices, expected harvest times, and how to coordinate pick-up.



Design Inquiry:
How can a farmer's process for planning, communicating, and distributing produce be improved?

Q3-Q6: Anticipated Conflict

- At the end of the season, MCG has data on all their farm partners operations.
- They can calculate customer demands and identify which farms are not reliable at fulfilling their produce orders.
- MCG starts influencing farmers to change their growing practices to improve the efficiency of the cooperative.

Design Inquiry:
How can the cooperative be structured to provide accountability and prevent conflicts like this from happening?

Scenario 2: City-Wide Food Information Platform

Q1-Q3: Design Scenario

- The City of Detroit wants to collect data on how urban farming improves food access and sustainability to inform city planning
- Provides farmers with iPads to track what farmers are growing, what resources they use, how much food is wasted
- Detroit wants to make city data public so other services can build applications (e.g., food banks could connect folks to available produce)

Design Inquiry:
How could collected data support equitable food access initiatives across urban farms in the city?

Q3-Q6: Anticipated Conflict

- Once the city makes the dashboard public, other organizations can use the data in their applications
- A real-estate company uses the public data to speculate on real-estate prices for properties near urban farms
- Property owners see the increase in estimated prices online and start raising their buying prices

Design Inquiry:
How could you hold technology developers accountable for impacts on community?

Figure 3: Speculative Technical Scenarios in Workbooks. (1) Illustrates the Motor City Grows Cooperative Platform, detailing its operational setup and data collection for growing practices. (2) Describes the City-Wide Food Information Platform, demonstrating data input and public data visualization to measure the impacts of urban farming initiatives. Speculative scenarios were used to gather initial insights on design imaginaries (Q1-Q3) and introduce possible tensions (Q3-Q6) to prime conversations for how participants thought about holding actors accountable for unintended impacts.

food, noting that the Zoom environment was often less accessible than physical community spaces.

To capture the community's forward-looking aspirations, we asked participants to identify future topics and stakeholders for continued engagement. Participants expressed a desire to expand the conversation to include practical farming issues (e.g., land use laws, compost), specific technical applications (e.g., solar energy), and broader community health and cooperative models. They also recommended widening the circle of participation to include city employees, tech developers, and local youth. To ensure our research remained reciprocal and accountable to these insights, we synthesized the workshop feedback and themes into a Community Report. We shared this document with participants, thereby inviting ongoing dialogue and ensuring the knowledge generated remained accessible to the movement. We also made the report public and shared it with community leaders and public officials, framing the findings as concrete action items they could take.

4.3 Phase 3: Thematic Analysis & Iterative Coding

We analyzed our data using an iterative approach to thematic analysis [9]. We allowed patterns to emerge inductively during the fieldwork, and the first author developed a preliminary codebook based on themes identified in field notes. Our goal became to accurately represent and elevate the community's insights into the elite spaces of the academy.

Then, through a four-week iterative coding process [96], a five-person research team refined the codebook by recoding workshop transcripts and workbook responses. The team included the three workshop facilitators, an undergraduate research assistant, and a post-doctoral researcher. Over four weeks, we refined our codebook through iterative team coding exercises with five members of our larger research lab, analyzing both workshop transcripts and workbook responses. We segmented the 18 workshop transcripts (8.25 hours) according to the three activities of the workshop, and attached corresponding Zoom chat logs and facilitator notes. Within the same activity, break-out groups were coded separately from group-wide discussions. We then coded each of the 19 workbooks (containing six sections) as a single unit. We randomly assigned workshop activities and workbooks to five coders on the research team. If a coder facilitated a breakout room, we ensured that it was coded by someone else to enhance the reliability of the analysis. This process generated new in vivo codes that largely aligned with our existing themes. In addition, we corroborated that similar themes were present across both the workbook responses and workshop transcripts.

The analysis synthesized codes into three high-level themes: (1) food sovereignty values, (2) implications of technology designs, such as desires, concerns, tensions, risks, and recommendations, and (3) proposed accountability mechanisms. Our final round of coding synthesized codes into groups that described how and why participants foresaw negative impacts of the technical scenarios and why the proposed accountability mechanism addresses them.

5 Findings: Design Governance Using A Community's Accountability Mechanisms

In this section, we review findings from the speculative workbooks and design workshops. We found that participants were open to new technologies that could genuinely support their food sovereignty efforts, citing examples such as robots to help with weeding. However, they expressed palpable frustration at having to restate what felt obvious to them: that innovations rarely benefit economically marginalized communities. When asked why these harms occurred, they consistently pointed to a lack of accountability from technology developers within the capitalist system. In response, participants proposed governance models rooted in their own historical and ongoing practices of accountability, particularly the cooperative model, to mitigate the harms they foresaw.

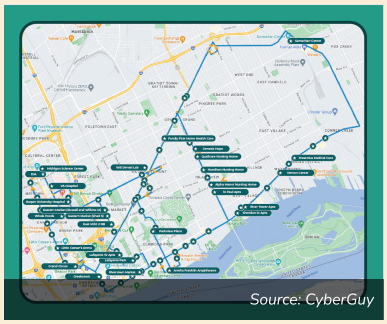
5.1 RQ1: Without Proactive Accountability, New Technologies Foreseeably Harm Economically Marginalized Communities

When asked why innovations would harm their communities, participants framed the potential negative impacts of technology not as technical flaws, but as a direct consequence of fundamental power imbalances between developers and their communities. In their workbook, one participant, Rochelle, succinctly expressed their deep skepticism grounded in a history of broken promises: no one is ever *"held accountable to the black community, especially the city and large corporations"*. This wariness was further grounded in projects that failed to provide formal accountability, such as the example of a car factory closing and leaving the community with an abandoned facility and no agency over its future. They consistently emphasized that if technology developers were part of their community or shared their values of social solidarity, economic cooperation, and environmental justice, they would proactively prevent possible harms because a community would not intentionally hurt itself. This historical pattern confirmed for participants that without formal, binding accountability processes that redistribute power, technology development would rarely benefit marginalized communities.

This power imbalance, participants argued, results in innovations that are fundamentally misaligned with community values. Developers often pursue projects for profit rather than for community benefit. Participants cited technologies that support extractive social and environmental practices, such as the use of underpaid labor for data annotation and harmful mining practices to produce digital electronics. In addition, they highlighted how automating labor removes a *"well-paying job that someone could support their family with"* (Samir, Workshop 3). It also produces technologies that are inaccessible to under-resourced communities due to high costs or a need for advanced technical literacy. This exacerbates existing economic inequalities, as small-scale urban farmers already struggle to compete with corporate farms that use cheaper, unsustainable methods [19]. As Andre anticipated, the inability to integrate new technologies *"risks further 'cultural and economic displacement' of their community's practices"* (Workshop 2).

We then probed participants on the inherent complexity of emerging technologies, suggesting that some harms might arise regardless of who's in power (e.g., data breaches or environmental

	Example 1: Veggie Express	**Example 2:** Accessible-D	**Example 3:** Orange Sparkle Ball
Developers	Collaboration: • Pluck.eco (start up) • Newlab @ Michigan Central (tech incubator / investors)	Collaboration: • City of Detroit • May Mobility	Atlanta based startup piloting robots with local urban farms
Purpose	An electric vehicle (EV) mobile market that visits apartment complexes, community centers to then provide affordable produce subsidized by these organizations.	Unlimited free rides from autonomous vehicles for those with disabilities and age 62+ along pre-programmed routes to help with accessing grocery stores.	Finding "sustainable and cheap" alternatives to waste management.
Pilot Details	Buys from: • Detroit farms • Eastern Market wholesale	Pilot with locations such as: • Eastern Market • Whole Foods	Pick up food waste for composting in Corktown



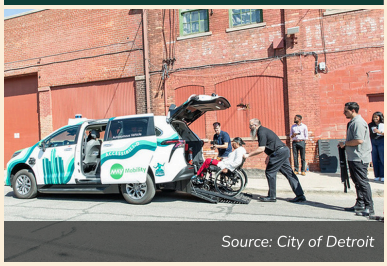


Figure 4: Technical Scenarios Discussed in Workshops. This figure presents the three real-world technology pilots that were introduced during our facilitated workshops. These pilots—(1) a mobile food market service, (2) an autonomous vehicle pilot providing free rides for elderly and disabled residents, and (3) a robotic composting platform—served as probes to ground discussions of technology governance in a reality that was relevant to the Detroit food sovereignty community. They were used to explore how these existing innovations did or did not align with community values and what forms of accountability were needed.

impacts). Participants agreed, but then strongly argued that the point of power redistribution is not to eliminate all harm but to provide mechanisms for accountability when such harms inevitably occur. As Desiree noted, *"when that unethical behavior occurs, there will already be processes in place... to rectify the behavior"* (Workshop 3). For this community, proactively establishing these accountability mechanisms is more important than having developers foresee and mitigate negative impacts during the initial design process.

5.2 RQ2: Community Cooperatives As Models for Proactive Accountability

Participants argued that researchers do not need to reinvent the wheel when it comes to community-based governance models. As James put it, while the challenges of technology may be new, *"the negative impacts to a community not having input agency or sovereignty into interventions being placed... is not a new challenge"* (Workshop 2). Across all workshops, participants proposed cooperatives as a model for community-led governance, citing multiple examples of cooperative projects in Detroit that have successfully managed community empowerment and benefits. As Erica described it in the first workshop: *"Cooperatives ... are ancestral technologies of how we dealt with each other ... whether we are talking about relating with each other, relating with the land, this is one of the major technologies that helped us move forward"* under the pressures of capitalism.

In the following sections, we highlight three ways that participants described community cooperatives as providing the proactive accountability mechanisms they cited as missing in current technology development: (1) community ownership and control over decision making, (2) transparency and formal, binding agreements, (3) a collective identity rooted in solidarity.

5.2.1 Community Ownership and Control Over Resources and Decision-Making. Cooperatives provide community ownership and control over resources and decision-making, which participants identified as a prerequisite for proactive accountability. Participants consistently highlighted that when technology development originates from outside the community, power and resources are centralized with external developers. As Bria advised in the workshop, *"if your community is not leading, someone else will lead you, and then you get things in your community that you don't want."* Participants suggested that this leads to the creation of systems that are often unusable and solve the "wrong problems" because developers lack a deep community understanding or shared values. Participants emphasized that these technical systems, which one participant referred to as a *"monster"* of inefficiency (Chante, Workshop 1), were unwieldy, burdensome, and made the challenging work of farming even harder. For example, Chante complained about all of the extra labor that the food-composing robots required from her:

> While I'm in the middle of doing transplants, now I have to go over to the robot, push buttons wait on the door to open. Now she's yelling at me to close the door...I got to dump the buckets. I got to go get clean buckets. Oh, it rains...now something that's supposed to help me has taken 40 minutes of my time in the farm, and now it's lunch, and I didn't finish my transplants. (Chante, Workshop 1)

Thus, for participants, reclaiming power over decision-making and resources is essential to ensure technology is deployed in the service of, rather than in opposition to, a community's goals.

Furthermore, collective ownership of resources—including knowledge, labor, and data—fosters independence, which mitigates the risk of external exploitation and abandonment. For example, to proactively safeguard against actors exploiting their data (e.g., the government using a map of farms to target surveillance efforts), Maya proposed a cooperative model where the community would have explicit agency to decide on who is *"vetted [to] use it."* She proposed that *"the reason for using it or wanting to use it needs to come first before [the data is] turned over"* (Workshop 2). This collective control over resources also provides accountability for future decisions over the maintenance of a technical system. This mitigates risks that external technology developers pose to a farm's long-term economic viability when they cease supporting systems that farmers have become reliant on. As one participant argued, if a community controlled the infrastructure, they would *"have access to everything"* and could decide when a system is useful to them or not (Bria, Workshop 3).

For a community to achieve this level of economic self-determination, participants stressed the need to cultivate local knowledge and skills to build and direct their own systems. When discussing the use of autonomous vehicles for food delivery (Example 2, Figure 4), James stated they are open to the new technology, but *"if the community cannot offer direction as to how the program is implemented, then they do not have any agency. And that means they are pretty far from sovereignty"* (Workshop 2). Without agency, participants speculated that developers would prioritize their own needs over those of their community. Thus, participants saw community ownership of the direction of development as necessary to ensure that technology development was aligned with community values and needs from its inception.

5.2.2 Transparency & Formal, Binding Agreements. Participants also emphasized the crucial role of transparency and formal, binding agreements in ensuring accountability in technology development. These mechanisms establish clear expectations and pathways for recourse before conflicts escalate or harms materialize. As Avery articulated, *"Transparency is how you would protect against a lot of these things. If they always have to be very clear about, why this project was chosen, why this community was chosen to put it in, and why you know the specifics reflect what the community wanted"* (Workshop 3). This level of transparency proactively allows communities to scrutinize intentions, identify potential misalignments, and assess whether partnerships truly serve their values and goals, enabling early intervention.

Participants frequently foresaw that new technologies could lead to the breakdown of solidarity within their community if the technology did not explicitly incentivize economic cooperation. In our speculative scenarios, a growers' collective like Motor City Grows (MCG) could start with community-minded values, but participants highlighted that, depending on how power is distributed, a decision-maker could later prioritize profit at the expense of farmer autonomy and well-being. To proactively mitigate the potential for value drift and exploitation, participants advocated for the establishment of pre-defined, binding agreements with explicit codes of ethics – otherwise the arrangement is *"unreasonably structured"* (Samir, Workbook). For a cooperative, agreements are typically needed to form the organization, which functions as a proactive governance framework that guides behavior and preempts unethical actions. As Desiree explained in the third workshop,

> If you build out a community or worker-owned cooperative, then there are already agreements and a code of ethics in place that people have to follow. When

> those things are not followed, there are agreed-upon rules and regulations of how to move forward. That way, if something does happen where an individual is moving in an unethical manner, everybody is in agreeance [sic] already in how to handle the situation.

The mere existence of such clear, collectively agreed-upon, proactively established rules, can deter harmful behaviors before they occur, fostering an environment of shared understanding and accountability.

Furthermore, participants emphasized that for agreements with technology developers to be truly effective, they must possess "legal teeth," granting the community tangible power to enforce them. They envisioned structures in which agreements could be legally binding, allowing communities to pursue recourse when entities breach their commitments, whether regarding privacy, data misuse, or unfulfilled promises. As Parker emphasized, this requires *"laws and regulations or some kind of binding that they have with the community that the community can take to small claims court or whatever localized court"* (Workshop 2). This contrasts sharply with existing mechanisms like a community benefit agreement, which participants noted often *"theoretically sounds good"* but lacks the legal enforceability to provide real proactive protection. Given these limitations, participants have little *"faith in [the promise of benefits] being realized"* (Avery, Workshop 3).

5.2.3 A Collective Identity Around Solidarity. Participants highlighted that formal rules and binding agreements are necessary but insufficient for long-term accountability. They argued that proactive accountability requires the continual maintenance of a collective commitment to shared values of solidarity, which cooperatives are designed to provide. For example, Charmaine in the first workshop reflected on the importance of a collective identity when starting to organize people into a group:

> "How can we make sure that we really have the best interests? What are our objectives? What are our goals? Are we all on the same page...when it's time to really talk about it and to really fight for the cause?"

Participants foresaw that, without ongoing maintenance work, internal human factors—such as the emergence of selfish behavior or profit-seeking—would eventually erode the cooperative's solidarity.

To proactively mitigate this internal decay, participants proposed specific social mechanisms for maintenance. First, they advocated for *"decolonial education"* as a tool to actively foster a collective identity rooted in *"collaboration over competition, truth, honesty, inclusiveness, and vulnerability"* (Quincy, Workshop 1). Participants emphasized that accountability must extend beyond legal structures to include cultural processes that repair relationships before they break. For instance, drawing parallels to Indigenous cultures where *"selfishness was seen as a mental illness,"* one participant highlighted the role of restorative processes as a technology of maintenance: *"coming together and having conversations, especially when a harm has been done—how do we restore that and heal that and move forward in a restorative but also revolutionary way?"* (Quincy, Workshop 1).

Second, participants extended this concept of maintenance to the external relationship between developers and the broader community. Bria emphasized that any development process must *"grow out from the community"* rather than being imposed from the outside. Critically, she framed accountability not as a one-off process of gaining consent, but as a long-term relational practice. As she argued, *"Even if I am here for 20 plus years, I still need their approval. Even if I don't get their approval, I need to be in contact and engagement with the community that I'm in and the community that I feel like I serve"* (Workshop 3). This suggests that proactive accountability requires deeply embedded, continuous dialogue to ensure that initiatives remain community-driven even as they scale or age.

Finally, participants offered a realistic assessment of the limits of internal maintenance. Throughout the workshop, they noted that even a strong collective identity cannot fully protect against external systemic forces, such as government surveillance or real estate speculators leveraging open data to raise property values. Participants understood that addressing deep-seated systemic exploitation is a continuous political project. Thus, they argued that cooperatives cannot be seen as a silver bullet; developers must design these systems in tandem with broader social reform so that the collective well-being of people and the planet can be sustained against external market pressures.

6 Discussion

While prior work has established that marginalized communities desire governance models that align technology with their values [25], a critical challenge remains: the field lacks concrete visions for designing innovation ecosystems rooted in environmental and economic justice rather than traditional capitalist growth [27, 72]. This distinction is crucial because existing technology governance models often fail to account for the specific value systems of communities fighting for economic liberation [83]. Our work contributes an empirical case study on designing for the systemic governance of technology with communities active in the solidarity economy. Our findings motivate a governance framework designed for proactive accountability, that is community-led, formally enforced, and continually maintained.

In this section, we introduce the Designing for Proactive Accountability (D4PA) framework to operationalize participants' insights into actionable design strategies (Table 2). We analyze how the structural mechanisms of cooperatives—specifically democratic ownership, binding agreements, and a collective identity rooted in solidarity—provide a blueprint for achieving the three dimensions of proactive accountability. By examining the friction between these cooperative ideals and the realities of implementation, we derive specific design implications and structural challenges for HCI researchers. We conclude with a future research agenda that positions cooperatives as sites of inquiry for expanding on the open questions generated by the D4PA framework.

6.1 Designing for Proactive Accountability (D4PA): A Conceptual Framework for Community-Led Governance

To theorize the design implications of our findings, we introduce the framework of **Designing for Proactive Accountability** (D4PA).

Table 2: The Designing for Proactive Accountability (D4PA) Framework. We synthesize our findings across the three principles of Proactive Accountability. First, we map how participants proposed that cooperative mechanisms operationalize the principle. Then, we present the resulting design implications for D4PA and the structural challenges, synthesizing current work on technology cooperatives.

Proactive Accountability Dimension	Community Perspectives and Goals (Findings 5.2)	D4PA Design Principle (Discussion 6.1)	Structural Challenges (Discussion 6.2)
Community-Led (Locus of Power)	**Democratic Ownership & Decision-Making.** Participants argued that accountability requires direct ownership of technical resources, not just inclusion, to prevent tokenism.	**Design for Community Ownership Capacity.** Ownership requires more than legal status, but also capacity building (e.g., grant writing, technical training) to ensure genuine sovereignty is possible.	**Social Preconditions.** Community ownership requires high social capital (e.g., trust), otherwise stakeholder misalignment paralyzes collective identity formation and decision-making.
Formally Enforced (Enforcement Mechanism)	**Binding Agreements.** Participants demanded "legal teeth" (e.g., bylaws) rather than voluntary commitments to ensure the community has power to seek redress.	**Develop Existing Protocols.** Instead of inventing new ethical frameworks, researchers should anchor governance in a community's existing accountability mechanisms (e.g., cooperatives, grassroots organizing).	**The Knowledge Gap.** Formal rules exist, but members may not know how to enact them. Without education, members abdicate power to experts/managers.
Continually Maintained (Temporal Engagement)	**Collective Identity Around Solidarity.** Participants emphasized that formal rules are insufficient. Accountability relies on the continual renewal of a collective identity around shared values of cooperation (e.g., through decolonial education).	**Maintain Cultural Infrastructure.** Researchers must incorporate political consciousness-raising into design to prevent value drift and ensure solidarity remains central.	**The Degeneration Thesis.** Market pressures force democratic organizations to prioritize profit over solidarity, eroding accountability over time.

We distinguish between *proactive accountability* (PA)—the abstract goal of motivating actors to take responsibility for harms before they occur—and D4PA, which refers to the concrete design practices required to operationalize that goal. While prior scholarship has identified the importance of principles like anticipation and inclusion in governance [18, 44, 106], our findings extend this work by demonstrating that these values are insufficient without structural mechanisms to enforce them. As participants highlighted, community-led governance requires formal structures of ownership, which, in turn, fail without the continual maintenance of solidarity. Therefore, D4PA operationalizes the abstract goals of PA through three interrelated principles: (1) shifting from participation to designing for ownership capacity, (2) moving from voluntary ethics to translating a community's existing accountability protocols, and (3) evolving from episodic engagement to infrastructuring solidarity. By grounding these principles in a bottom-up epistemology, we reveal how accountability must be instantiated not only as a policy, but also as a sociotechnical practice.

6.1.1 Principle 1: Design for Community Ownership Capacity, Not Just Participation. To operationalize the community-led dimension of proactive accountability, we argue that researchers must move beyond designing for participation to designing for community ownership. While the goal of community-led design is to center community agency [13, 18, 22], our participants argued that without explicit democratic control over resources and decision-making, participation becomes a tokenistic exercise that allows developers to extract community wisdom while retaining the power to prioritize profit. However, participants highlighted that ownership means more than just legally owning a technical system; it requires the resources and capacity to maintain it. For instance, while participants were open to autonomous vehicles, they argued that if a community relies entirely on external experts to fix their "owned" infrastructure, it possesses only nominal ownership, not genuine sovereignty. Without the technical sovereignty to operate and maintain the systems they own, the community remains dependent on experts, recreating the power imbalances proactive accountability seeks to solve.

We argue that designers can operationalize community ownership within D4PA by developing a community's capacity to enforce structural power. This approach extends recent discussions in HCI governance design by demonstrating that the field's current emphasis on anticipating downstream impacts is insufficient without the structural power to act on those insights. Prior work in Participatory Design and Policy-HCI has emphasized involving stakeholders to foresee downstream impacts [3, 79, 116]. However, even if harms are foreseen, communities need structural mechanisms—such as cooperative bylaws—that cede ultimate control to the community, ensuring that the power to enforce values remains with those most impacted. Yet, as our findings argue, ownership cannot just be given; it is a capacity that must be built [45].

Thus, HCI researchers engaging in D4PA should turn to community empowered methodologies, such as Participatory Action

Research (PAR) and asset-based design, for how to support community capacity during design engagements [15, 115, 115]. This is especially critical when addressing systemic issues like innovation governance, which often lacks a clear institutional home. During our fieldwork, we struggled to identify a community partner capable of serving as an owner for technology governance work. While participants viewed the discussions as necessary, they frequently noted that they were already overworked and underpaid, leaving little capacity to advance these insights without additional resources. This suggests that the D4PA process is not just about designing mechanisms, but also about developing a community's ability to take full ownership of its sociotechnical infrastructure before it is designed—such as through collaborative organizing, joint grant writing, and technical education [52, 65, 98].

6.1.2 Principle 2: Design for Formal Enforceability by Using the Community's Existing Accountability Protocols. Within D4PA, to operationalize the formally enforceable dimension, we argue that researchers should not invent new ethical frameworks; instead, we should anchor governance in the accountability protocols a community already uses. While the goal of proactive accountability is to create binding agreements, our findings demonstrate that governance mechanisms are more accepted when they are derived from a community's existing practices rather than imposed from the outside. For instance, participants in our workshops dismissed standard external mechanisms, such as Community Benefit Agreements (CBAs), as tools that "sound good" in theory but lack the power to provide real redress. Instead, participants highlighted that fighting for accountability was not new for their community, and they explicitly pointed to cooperative organizing as how they achieve empowerment. Thus, D4PA should involve identifying existing "governance assets" of communities—such as conflict management practices and high-trust relational networks—and how to develop them into the context of a sociotechnical design.

This approach extends current discussions within speculative design and Policy HCI by shifting the focus of inquiry from designing new governance to supporting governance infrastructure. Prior work has emphasized the need to ground speculative probes in a community's social context to ensure technical realism [46, 48]. Scholars such as Jackson et al. [60], Wong et al. [114], Yang et al. [116] have argued that this should include paying attention to the laws and regulations surrounding a sociotechnical infrastructure. Our work extends this further by demonstrating that governance practices extend beyond laws and regulations. How a community's social and economic organization also shapes its governance assets. Rather than asking "How should we govern this new technology?," researchers should investigate existing accountability infrastructure; for example, they might ask, "How might this technology be governed in ways that build on existing accountability infrastructures while advancing the community's own goals and values?"

We found that participants more easily engaged with similarly grounded questions, such as "How do you currently hold individuals in your community accountable for harms?" or "How would you ensure accountability if your community built this system instead?" By asking these questions, researchers can identify the "ancestral technologies" of governance—like the cooperative model—that provide a sturdier foundation for accountability than any new ethical framework could provide.

6.1.3 Principle 3: Design for Ongoing Maintenance of Cultural Infrastructure. To operationalize the continual maintenance dimension, we argue that D4PA should focus on the continual maintenance of cultural infrastructure, as accountability relies on the continuous work of reminding members why they are cooperating in the first place. While artifacts (like a policy or set of bylaws) could provide the infrastructure for accountability over a long-time frame [116], participants highlighted the risk selfishness poses to the ongoing maintenance of a system. Participant argued that if a platform is not structured to maintain solidarity [111], individuals may start to take advantage of each other in search of individual profit. When this selfishness takes root, even if a policy is in place, communities may no longer have the cultural infrastructure to ensure democratic enforcement. Thus, extending the policy-knot framework [60], D4PA must incorporate tools to maintain a collective identity around solidarity as a way of managing the co-constructive nature between the policy and the users.

We propose that D4PA can maintain this cultural infrastructure by designing systems that continually renew a collective identity through political consciousness raising. For instance, participants highlighted how the continual practice of decolonial education and restorative justice circles can infrastructure solidarity, and our research found that the speculative design process can also be a mechanism for strengthening a community's solidarity. In our post-workshop feedback, participants noted that they valued the workshops not just for the technical information, but for the opportunity to connect with other farmers and discuss shared political struggles. This confirms previous work that theorizes how design engagements can become a site for negotiating shared political realities by "contaminating" dominant sociotechnical imaginaries [75]. By prioritizing methods that also function as sites for ongoing political education [26], D4PA must treat users as active political agents, rather than passive recipients of protection, to provide the resilience necessary to resist external extraction.

6.2 The Messy Realities of Cooperative Development: Practical Challenges for D4PA

Our study contributes empirical insights into community-led models of technology governance, moving beyond expert-focused approaches within HCI. While traditional governance frameworks often prioritize external oversight (e.g., algorithmic audits or corporate regulation) [36, 68, 78, 83], participants in our workshop prioritized community cooperatives as the primary vehicle for accountability—describing them as ancestral technologies that communities, particularly Black farming communities, have long used to organize themselves in the face of capitalist extraction. These findings further demonstrate that designing governance from below produces distinct political tactics compared to expert-led approaches [113].

However, identifying a collection vision for a community to work towards is only the first step, and participants noted that cooperatives face many challenges and limitations. While cooperatives have a long history of successful community empowerment

in sectors such as agriculture and energy, it remains an open question whether the cooperative movement in the United States (US) can overcome the specific complexities of technical innovation (i.e., find financial backing to compete in high-growth industries [80]). While there are some technology-forward cooperative incubators in the US [95], starting new cooperative businesses face an especially hostile legal and social landscape that rarely supports scalable cooperative development [80, 88, 108]. To anticipate the structural barriers researchers will face when attempting to scale proactive accountability, we examine the friction between the cooperative imaginary and the practical difficulties of implementation. By extrapolating from documented challenges in cooperative development, we analyze these tensions across the three dimensions of our D4PA framework.

6.2.1 The Challenge to Community Ownership: Social Preconditions and Stakeholder Complexity. The community-led dimension of D4PA is directly addressed by the cooperative model, which structurally counters the misaligned economic incentives that allow traditional firms to evade accountability. By definition, cooperatives are owned and operated by their members, prioritizing collective well-being over pure profit maximization [70]. As our participants highlighted, this alignment of ownership and benefit is crucial; even when unintended consequences arise, the democratic structure of a cooperative provides the social and procedural mechanisms to incentivize reconciliation.

However, this democratic structure is not self-sustaining; its success is contingent on pre-existing social conditions. Research on cooperative development has shown that social-geographical factors—such as a favorable legal landscape, the presence of existing cooperative ecosystems, and high levels of civic participation—are critical determinants of success [43, 99]. The most vital of these factors is social capital. For instance, a study of the world's 300 largest cooperatives concluded that trust is a key determinant of a cooperative sector's scale Jones and Kalmi [61]. Conversely, a lack of trust, weak interpersonal relationships, and misaligned goals make it incredibly difficult for cooperatives to achieve their intended outcomes [99].

This challenge is particularly acute in the technology space, which often requires coordinating multi-stakeholder groups with starkly different economic and cultural backgrounds [73]. For example, research on a multi-stakeholder, ride-sharing platform cooperative cited the immense challenge of coordinating between its "white-collar tech teams and working-class immigrant drivers" [63]. Other research on platform cooperatives highlights a similar tension between the role of the entrepreneur and the role of the worker, which forces trade-offs between market pressures and the cooperative's social values [11].

These documented challenges imply that the community-led principle within D4PA cannot simply assume a community is ready or able to adopt a cooperative structure. The first step for any D4PA project must be a rigorous stakeholder analysis and power mapping exercise. Designers must ask: What are the distinct stakeholder groups? What are their relationships and power dynamics? Is there sufficient social capital to bridge these differences, or is foundational organizing work required before any technology design can begin? Can the incentives of all stakeholders—such as technology developers and diverse community members—be aligned within a single, formal democratic structure? If not, then another governance structure may be needed.

6.2.2 The Challenge to Formal Enforceability: Knowledge Gaps in Governance. Cooperatives, by design, are built for formal enforceability through their clear, predefined rules and explicit governance structures [54]. As participants highlighted, this formal framework, jointly established by members, enables the early identification of misaligned partnerships. It provides a clear, democratic pathway for timely intervention before significant harm materializes—for instance, a member can formally bring a case to the board that technology developers are no longer serving the community's interests.

However, the vast literature on cooperative management shows that formal enforceability fails if members do not know how to enact their power in practice. Many cooperatives struggle because members, who are often unfamiliar with democratic governance, fail to engage the board or, more commonly, abdicate their power to professional managers [17]. This knowledge gap creates an agency problem where the co-op's formal democratic power becomes hollow, allowing the organization to drift from its mission.

To counter this risk to their democratic foundations, cooperatives invest in education [109]. They recognize that without education, members and their elected boards lack the knowledge and confidence to govern effectively. Extrapolating from these challenges, we argue that a core component of D4PA is not just designing the formal rules, but also designing mechanisms that increase members' capacity to engage in those accountability processes (e.g., through ongoing education, accessible toolkits, and clear participation pathways).

6.2.3 The Challenge to Continual Maintenance: The Degeneration Thesis. Through its emphasis on solidarity, the cooperative model is designed for the continual maintenance of accountability. Participants highlighted how cooperatives teach individuals to unlearn colonial logics of individuality by practicing solidarity. This, they argued, raises a community's critical consciousness to view accountability as an ongoing engagement with the politics of collective liberation, resisting the desire for a simple check-box fix for social injustice [28, 70].

However, the greatest challenge to this continual maintenance is that cooperatives must balance their social missions with economic sustainability. Scholars have highlighted that under the intense pressures of a capitalist market, cooperatives face a constant risk of "degeneration"—making systematic choices that prioritize profit, thereby behaving more like traditional capitalist firms [16]. This degeneration can manifest as cutting democratic corners to become more efficient. Reducing membership control directly erodes the formal mechanisms of accountability. Cooperatives combat this risk by building networks and federations to share resources [103]. For example, if a cooperative business is not performing well due to market conditions, another cooperative can share its surpluses to prevent negative outcomes, such as job layoffs. This ecosystem-level approach builds collective economic resilience, which in turn gives individual co-ops the capacity and stability to protect their social missions.

For D4PA, this means that continual maintenance cannot be designed at the level of a single sociotechnical system (e.g., one

cooperatively-owned tech platform), because that system will be under constant degenerative pressure from its wider environment. Therefore, a D4PA approach must expand to the ecosystem level, finding ways to build solidarity across diverse stakeholders [53]. For instance, in an innovation economy, establishing accountability only with technology developers is insufficient. To be durable, accountability must also engage the funders, investors, and policymakers who create the very market pressures that force democratic organizations to degenerate in the first place.

6.3 Future Work: Cooperatives as Sites for Proactive Governance Inquiry

As our study in Detroit's food sovereignty community revealed, HCI researchers should view communities not only as users of technology but also as stakeholders who govern its development. Our speculative design workshops contributed insights for how cooperatives and the D4PA framework can help HCI researchers develop this alternative vision with communities. However, to understand the actual practice of instituting proactive governance, future research must move from speculative imaginaries to the empirical study of existing sites where these struggles are already playing out, such as in technology cooperatives.

Cooperatives have spent decades wrestling with the practicalities of democratic ownership, good governance, and maintaining collective solidarity. Yet, investigating the governance practices within cooperatives, specifically technology cooperatives, remains largely underexplored within HCI [70]. Instead of treating cooperatives merely as contexts to design *for*, our work provides a framework to scaffold a future research agenda for how cooperatives can provide a fruitful site for investigating many questions that HCI researchers are exploring around technology governance [70, 107, 110, 111]. We organize future questions by the three dimensions of the D4PA framework.

First, future work can explore how cooperatives navigate **community-led governance** by studying non-technical governance assets. Communities often possess robust, non-technical infrastructures for decision-making—such as mutual aid networks, cultural consensus protocols, and a network of trusted relationships. A future research agenda should involve developing methods to map these existing governance assets and designing sociotechnical architectures that amplify them. For instance, how can a community's existing offline consensus protocol be translated into a digital voting mechanism for a shared platform?

Second, researchers can investigate **formally enforceable governance** by studying bylaws as design artifacts. Cooperatives have established methodologies for drafting bylaws, defining member classes, and establishing voting thresholds [109]. Future work could further explore how these governance design processes can be adapted into participatory policy design for sociotechnical systems [81]. For example, how can the process of drafting cooperative bylaws serve as a method for defining how a platform can provide recourse for an identified algorithmic harm? How could these tools be used within the HCI research process itself to establish formal ownership agreements between academic outputs and community partners?

Third, the field could examine how cooperative networks **continually maintain governance** and solidarity within a broader innovation economy. Socially aligned organizations face immense market pressure to prioritize profit over mission, and cooperatives combat this through cooperation–combining autonomous units into federations that share resources and mutually invest in cooperative education. By studying how established cooperative networks manage technology innovation, future research could ask: How do federated networks design interoperable accountability protocols? How do they maintain the social alignment of actors across a decentralized ecosystem, ensuring that solidarity is not just a sentiment, but a structural property of the network?

6.4 Limitations

Our study has three primary limitations. First, our findings are deeply situated within the specific historical and cultural context of the United States, defined by the legacy of racial capitalism and industrial decline [21]. In Detroit, the cooperative movement functions as a survival mechanism against an extractive state and market. Consequently, the specific operationalization of proactive accountability we focus on here—such as the intense focus on "ownership" as a defensive measure—may differ in international contexts where alternative economies operate with different goals and organizational arrangements. We caution against generalizing these findings without adapting them to local cultural histories of cooperation.

Second, the formal enforcement mechanisms proposed by participants are constrained by the current regulatory environment of the United States. While participants demanded binding agreements to ensure accountability, the US legal system often prioritizes shareholder primacy, creating a hostile environment for the types of community-governed enforcement mechanisms our participants envisioned [88]. We acknowledge that our analysis is derived from design research, not legal scholarship; we did not evaluate whether the specific bylaws proposed by participants would hold up against external legal challenges. Realizing D4PA in practice will require interdisciplinary collaboration with cooperative development experts and legal scholars to navigate the friction between community-led governance and existing regulatory frameworks.

Third, the D4PA framework is derived from speculative design workshops, not a longitudinal deployment. While speculative methods are effective for surfacing values and anticipating harms, they cannot capture the friction of daily operations over years. Future work is needed to test these principles in practice, investigating how D4PA mechanisms withstand the degeneration pressures of the market in a live sociotechnical system.

Third, the D4PA framework is derived from speculative design workshops with a specific community subset, rather than a longitudinal deployment involving the broader ecosystem of funders, policymakers, and intermediaries. While speculative methods are effective for surfacing values, the workshop setting may have privileged consensus-building, potentially smoothing over internal community tensions that often surface during the material allocation of resources. Additionally, implementing D4PA in practice would necessitate navigating the vertical power dynamics of external stakeholders, whose incentives may conflict with community goals.

Future work is needed to test these principles in practice, investigating how D4PA mechanisms withstand the degeneration pressures of the market in a live sociotechnical system.

7 Conclusion

New technical innovations frequently impose foreseeable harms on marginalized communities, yet current accountability mechanisms are often reactive, motivating intervention only after harm has occurred. Through a speculative design study with Detroit's food sovereignty movement, we explored how a community actively building a solidarity economy envisions governing new technologies. Our work makes four contributions to HCI. First, we synthesize the limitations of existing reactive and top-down governance models to introduce Proactive Accountability (PA). We argue that existing approaches fail to fully capture the structural mechanisms marginalized groups envision for accountability, and thus theorize the need for governance that is community-led (shifting from participation to ownership), formally enforced (ensuring voluntary ethics come with binding agreements), and continually maintained (through cultural infrastructures that support solidarity). Second, we provide an empirical case study demonstrating how the food sovereignty community in Detroit envisions governing innovation through these structural mechanisms. Third, we introduce the Designing for Proactive Accountability (D4PA) framework to operationalize these principles, providing specific design implications and highlighting the structural challenges that researchers will face in practice. Fourth, we motivate a future research agenda that positions cooperatives not just as beneficiaries of design, but as sites of inquiry for investigating how to design proactive accountability for the innovation economy. Our research echoes calls for a paradigm shift to proactive accountability, where communities collectively own and define the processes of technological engagement, ensuring innovation serves collective well-being from its very inception.

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References

[1] Mark S. Ackerman. 2000. The Intellectual Challenge of CSCW: The Gap Between Social Requirements and Technical Feasibility. *Human–Computer Interaction* 15, 2-3 (Sept. 2000), 179–203. https://doi.org/10.1207/S15327051HCI1523_5

[2] Alyssa Strickland. 2023. Michigan Central, MDOT Launch Advanced Aerial Innovation Region in Detroit to Accelerate Commercial Drone Development. https://www.michigan.gov/mdot/news-outreach/pressreleases/2023/10/25/mi-central-mdot-launch-advanced-aerial-innovation-region-in-det-to-accelerate-commercial-drone-dev.

[3] Julia Barnett and Nicholas Diakopoulos. 2022. Crowdsourcing Impacts: Exploring the Utility of Crowds for Anticipating Societal Impacts of Algorithmic Decision Making. In *Proceedings of the 2022 AAAI/ACM Conference on AI, Ethics, and Society*. ACM, Oxford United Kingdom, 56–67. https://doi.org/10.1145/3514094.3534145

[4] Oliver Bates, Kathy New, Samantha Mitchell-Finnigan, Matthew Louis Mauriello, Christian Remy, Roy Bendor, Samuel Mann, Simran Chopra, Adrian K. Clear, and Chris Preist. 2019. Towards a Responsible Innovation Agenda for HCI. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*. ACM, Glasgow Scotland Uk, 1–8. https://doi.org/10.1145/3290607.3299017

[5] Rosanna Bellini, Debora de Castro Leal, Hazel Anneke Dixon, Sarah E Fox, and Angelika Strohmayer. 2022. "There Is No Justice, Just Us": Making Mosaics of Justice in Social Justice Human-Computer Interaction. In *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems (CHI EA '22)*. Association for Computing Machinery, New York, NY, USA, 1–6. https://doi.org/10.1145/3491101.3503698

[6] Ruha Benjamin. 2019. *Race after Technology: Abolitionist Tools for the New Jim Code*. Polity, Oxford, England.

[7] Susanne Bødker, Pelle Ehn, Dan Sjögren, and Yngve Sundblad. 2000. Co-Operative Design — Perspectives on 20 Years with 'the Scandinavian IT Design Model'.

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

[9] Virginia Braun and Victoria Clarke. 2021. *Thematic Analysis: A Practical Guide*. SAGE Publications, London.

[10] Kirsten E Bray, Christina Harrington, Andrea G Parker, N'Deye Diakhate, and Jennifer Roberts. 2022. Radical Futures: Supporting Community-Led Design Engagements through an Afrofuturist Speculative Design Toolkit. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3491102.3501945

[11] Damion J. Bunders and Tine De Moor. 2024. Paradoxical Tensions as a Double-Edged Sword: Analysing the Development of Platform Cooperatives in the European Gig Economy. *Journal of Management Inquiry* 33, 4 (Oct. 2024), 366–382. https://doi.org/10.1177/10564926231202422

[12] Simran Chopra, Rachel E Clarke, Adrian K Clear, Sara Heitlinger, Ozge Dilaver, and Christina Vasiliou. 2022. Negotiating Sustainable Futures in Communities through Participatory Speculative Design and Experiments in Living. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–17. https://doi.org/10.1145/3491102.3501929

[13] Ishita Chordia, Leya Breanna Baltaxe-Admony, Ashley Boone, Alyssa Sheehan, Lynn Dombrowski, Christopher A Le Dantec, Kathryn E. Ringland, and Angela D. R. Smith. 2024. Social Justice in HCI: A Systematic Literature Review. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–33. https://doi.org/10.1145/3613904.3642704

[14] Roberto Cibin, Sarah Robinson, Maurizio Teli, Conor Linehan, Laura Maye, and Christopher Csíkszentmihályi. 2020. Shaping Social Innovation in Local Communities: The Contribution of Intermediaries. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society*. ACM, Tallinn Estonia, 1–12. https://doi.org/10.1145/3419249.3420178

[15] Robert Cole, Sandeep Purao, Matti Rossi, and Maung Sein. 2005. Being Proactive: Where Action Research Meets Design Research. *International Conference on Information Systems* 26 (Dec. 2005).

[16] Chris Cornforth. 1995. Patterns of Cooperative Management: Beyond the Degeneration Thesis. *Economic and Industrial Democracy* 16, 4 (Nov. 1995), 487–523. https://doi.org/10.1177/0143831X95164002

[17] Chris Cornforth. 2004. The Governance of Cooperatives and Mutual Associations: A Paradox Perspective. *Annals of Public and Cooperative Economics* 75, 1 (March 2004), 11–32. https://doi.org/10.1111/j.1467-8292.2004.00241.x

[18] Sasha Costanza-Chock. 2020. *Design Justice: Community-led Practices to Build the Worlds We Need*. The MIT Press, Cambridge, MA.

[19] Sarita Daftary-Steel, Hank Herrera, and Christine Porter. 2015. The Unattainable Trifecta of Urban Agriculture. *Journal of Agriculture, Food Systems, and Community Development* 6 (Dec. 2015), 19–32. https://doi.org/10.5304/jafscd.2015.061.014

[20] Janet Davis, Harry Hochheiser, Juan Pablo Hourcade, Jeff Johnson, Lisa Nathan, and Janice Tsai. 2012. Occupy CHI!: Engaging U.S. Policymakers. In *CHI '12 Extended Abstracts on Human Factors in Computing Systems*. ACM, Austin Texas USA, 1139–1142. https://doi.org/10.1145/2212776.2212406

[21] Alexander de Rege. 2024. *Shrinking City, Growing City: Food Sovereignty in Shrinking Cities*. M.S. Pratt Institute, United States – New York.

[22] Fernando Delgado, Stephen Yang, Michael Madaio, and Qian Yang. 2023. The Participatory Turn in AI Design: Theoretical Foundations and the Current State of Practice. In *Proceedings of the 3rd ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO '23)*. Association for Computing Machinery, New York, NY, USA, 1–23. https://doi.org/10.1145/3617694.3623261

[23] Detroit Future City. 2021. *Detroit Future City: Detroit Strategic Framework Plan*. Technical Report. Detroit Future City.

[24] Catherine D'ignazio and Lauren F. Klein. 2023. *Data Feminism*. MIT press.

[25] Tawanna R Dillahunt, Alex Jiahong Lu, and Joanna Velazquez. 2023. Eliciting Alternative Economic Futures with Working-Class Detroiters: Centering Afrofuturism in Speculative Design. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23)*. Association for Computing Machinery, New York, NY, USA, 957–977. https://doi.org/10.1145/3563657.3596011

[26] Carl DiSalvo, Andrew Clement, and Volkmar Pipek. 2012. Communities: Participatory Design for, with and by Communities. In *Routledge International Handbook of Participatory Design* (0 ed.). Routledge, 202–230. https://doi.org/10.4324/9780203108543-15

[27] Olivia Doggett, Kelly Bronson, and Robert Soden. 2023. HCI Research on Agriculture: Competing Sociotechnical Imaginaries, Definitions, and Opportunities. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. ACM, Hamburg Germany, 1–24. https://doi.org/10.1145/3544548.3581081

[28] 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)*. Association for Computing Machinery, New York, NY, USA, 656–671. https://doi.org/10.1145/2901790.2901861

[29] Andy Dow, Rob Comber, and John Vines. 2018. Between Grassroots and the Hierarchy: Lessons Learned from the Design of a Public Services Directory. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3173574.3174016

[30] Chris Elsden, David Chatting, Abigail C. Durrant, Andrew Garbett, Bettina Nissen, John Vines, and David S. Kirk. 2017. On Speculative Enactments. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM, Denver Colorado USA, 5386–5399. https://doi.org/10.1145/3025453.3025503

[31] Clifton A. Ericson. 2011. *Concise Encyclopedia of System Safety: Definition of Terms and Concepts*. Wiley, Hoboken, NJ.

[32] Arturo Escobar. 2018. *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*. Duke University Press.

[33] Virginia Eubanks. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. St. Martin's Press.

[34] EY Global. 2021. Digital Agriculture: Enough to Feed a Rapidly Growing World? https://www.ey.com/en_gl/insights/digital/digital-agriculture-data-solutions.

[35] K. J. Kevin Feng, Rock Yuren Pang, Tzu-Sheng Kuo, Amy Winecoff, Emily Tseng, David Gray Widder, Harini Suresh, Katharina Reinecke, and Amy X. Zhang. 2025. Sociotechnical AI Governance: Challenges and Opportunities for HCI. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–6. https://doi.org/10.1145/3706599.3706747

[36] K. J. Kevin Feng, Rock Yuren Pang, Tzu-Sheng Kuo, Amy Winecoff, Emily Tseng, David Gray Widder, Harini Suresh, Katharina Reinecke, and Amy X. Zhang. 2025. Sociotechnical AI Governance: Challenges and Opportunities for HCI. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '25)*. Association for Computing Machinery, New York, NY, USA, 1–6. https://doi.org/10.1145/3706599.3706747

[37] Anna Fifelski. 2023. Detroit Startup Brings Fresh Produce to Low-Income Housing Complex. https://www.detroitnews.com/story/business/2023/08/07/detroit-startup-brings-fresh-produce-to-low-income-housing-complex/70541881007/.

[38] Joel Fredericks, Glenda Amayo Caldwell, and Martin Tomitsch. 2016. Middle-out Design: Collaborative Community Engagement in Urban HCI. In *Proceedings of the 28th Australian Conference on Computer-Human Interaction (OzCHI '16)*. Association for Computing Machinery, New York, NY, USA, 200–204. https://doi.org/10.1145/3010915.3010997

[39] Batya Friedman. 1996. Value-Sensitive Design. *interactions* 3, 6 (Dec. 1996), 16–23. https://doi.org/10.1145/242485.242493

[40] David M. Frohlich and Risto Sarvas. 2011. HCI and Innovation. In *CHI '11 Extended Abstracts on Human Factors in Computing Systems*. ACM, Vancouver BC Canada, 713–728. https://doi.org/10.1145/1979742.1979670

[41] MJ Galbraith. 2024. Pilot Program to Test Autonomous Robots' Potential for Picking up Food Waste for Compost in Corktown. https://www.modeldmedia.com/devnews/Food-waste-pilot.aspx.

[42] Patricia Garcia, Tonia Sutherland, Niloufar Salehi, Marika Cifor, and Anubha Singh. 2022. No! Re-imagining Data Practices Through the Lens of Critical Refusal. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (Nov. 2022), 1–20. https://doi.org/10.1145/3557997

[43] Elena Garnevska, Guozhong Liu, and Nicola Mary Shadbolt. 2011. Factors for Successful Development of Farmer Cooperatives in Northwest China. *International Food and Agribusiness Management Review* 14, 4 (2011).

[44] Barbara Grimpe, Mark Hartswood, and Marina Jirotka. 2014. Towards a Closer Dialogue between Policy and Practice: Responsible Design in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, Toronto Ontario Canada, 2965–2974. https://doi.org/10.1145/2556288.2557364

[45] David H. Guston. 2013. "Daddy, Can I Have a Puddle Gator?": Creativity, Anticipation, and Responsible Innovation. In *Responsible Innovation*, Richard Owen, John Bessant, and Maggy Heintz (Eds.). John Wiley & Sons, Ltd, Chichester, UK, 109–118. https://doi.org/10.1002/9781118551424.ch6

[46] 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 (Nov. 2019), 1–25. https://doi.org/10.1145/3359318

[47] Sara Heitlinger, Nick Bryan-Kinns, and Janis Jefferies. 2013. Sustainable HCI for Grassroots Urban Food-Growing Communities. In *Proceedings of the 25th Australian Computer-Human Interaction Conference: Augmentation, Application, Innovation, Collaboration*. ACM, Adelaide Australia, 255–264. https://doi.org/10.1145/2541016.2541023

[48] Sara Heitlinger, Rachel Clarke, Adrian K. Clear, Simran Chopra, and Özge Dilaver. 2019. Co-Creating "Smart" Sustainable Food Futures with Urban Food Growers. In *Proceedings of the 9th International Conference on Communities & Technologies - Transforming Communities*. ACM, Vienna Austria, 114–120. https://doi.org/10.1145/3328320.3328399

[49] Alex B. Hill. 2017. Critical Inquiry into Detroit's "Food Desert" Metaphor. *Food and Foodways* 25, 3 (July 2017), 228–246. https://doi.org/10.1080/07409710.2017.1348112

[50] Yen-Chia Hsu, Paul Dille, Jennifer Cross, Beatrice Dias, Randy Sargent, and Illah Nourbakhsh. 2018. Community-Empowered Air Quality Monitoring System. https://doi.org/10.48550/arXiv.1804.03293 arXiv:1804.03293 [cs]

[51] P. J. Huffstutter. 2009. Investors See Farms as Way to Grow Detroit. https://www.latimes.com/archives/la-xpm-2009-dec-27-la-na-detroit-farms27-2009dec27-story.html.

[52] Julie Hui, Kristin Seefeldt, Lutalo Sanifu, Christie Baer, Jeanette Szomstein, and Tawanna R Dillahunt. 2024. "I Was Able to Give Her the Confidence": Reciprocal Capacity Building in a Community-based Program for Digital Engagement. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3613904.3642209

[53] Sohyeon Hwang, Sophie Rollins, Thatiany Andrade Nunes, Yuhan Liu, Richmond Wong, Aaron Shaw, and Andrés Monroy-Hernández. 2025. Governing Together: Toward Infrastructure for Community-Run Social Media. https://doi.org/10.48550/arXiv.2509.19653 arXiv:2509.19653 [cs]

[54] International Cooperative Alliance. 2017. *Guidance Notes to the Co-operative Principles*. Technical Report. International Cooperative Alliance.

[55] International Cooperative Alliance. 2025. Cooperative Identity, Values & Principles. https://ica.coop/en/cooperatives/cooperative-identity.

[56] Lilly Irani, Janet Vertesi, Paul Dourish, Kavita Philip, and Rebecca E. Grinter. 2010. Postcolonial Computing: A Lens on Design and Development. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)*. Association for Computing Machinery, New York, NY, USA, 1311–1320. https://doi.org/10.1145/1753326.1753522

[57] 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*. ACM, Paris France, 611–620. https://doi.org/10.1145/2470654.2470742

[58] Ole Sejer Iversen and Christian Dindler. 2014. Sustaining Participatory Design Initiatives. *CoDesign* 10, 3-4 (July 2014), 153–170. https://doi.org/10.1080/15710882.2014.963124

[59] Steve Jackson. 2014. Rethinking Repair. In *Media Technologies: Essays on Communication, Materiality, and Society*. The MIT Press. https://doi.org/10.7551/mitpress/9780262525374.001.0001

[60] Steven J. Jackson, Tarleton Gillespie, and Sandy Payette. 2014. The Policy Knot: Re-Integrating Policy, Practice and Design in Cscw Studies of Social Computing. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 588–602. https://doi.org/10.1145/2531602.2531674

[61] Derek C. Jones and Panu Kalmi. 2009. Trust, Inequality and the Size of the Co-Operative Sector: Cross-Country Evidence. *Annals of Public and Cooperative Economics* 80, 2 (2009), 165–195. https://doi.org/10.1111/j.1467-8292.2009.00383.x

[62] John Kaler. 2002. Responsibility, Accountability and Governance. *Business Ethics: A European Review* 11, 4 (2002), 327–334. https://doi.org/10.1111/1467-8608.00292

[63] Amir Khafagy. 2024. The Rise and Fall of NYC's Driver-Owned Ride-Share.

[64] R. J. King. 2023. Bedrock Explores Development of Vertical Farming Operation in Detroit.

[65] Yasmine Kotturi, Julie Hui, Tj Johnson, Lutalo Sanifu, and Tawanna R. Dillahunt. 2024. Sustaining Community-Based Research in Computing: Lessons from Two Tech Capacity Building Initiatives for Local Businesses. *Proceedings of the ACM on Human-Computer Interaction* 8, CSCW1 (April 2024), 1–31. https://doi.org/10.1145/3641017

[66] Pranav Kulkarni, Reuben Kirkham, Ling Wu, and Roisin McNaney. 2024. Designing for Participatory Data Governance: Insights from People with Parkinson's. In *Designing Interactive Systems Conference*. ACM, IT University of Copenhagen Denmark, 541–555. https://doi.org/10.1145/3643834.3661529

[67] Tzu-Sheng Kuo, Quan Ze Chen, Amy X. Zhang, Jane Hsieh, Haiyi Zhu, and Kenneth Holstein. 2025. PolicyCraft: Supporting Collaborative and Participatory Policy Design through Case-Grounded Deliberation. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, 1–24. https://doi.org/10.1145/3706598.3713865

[68] M.S. Lam, M.L. Gordon, D. Metaxa, J.T. Hancock, J.A. Landay, and M.S. Bernstein. 2022. End-User Audits: A System Empowering Communities to Lead Large-Scale Investigations of Harmful Algorithmic Behavior. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022). https://doi.org/10.1145/3555625

[69] Michelle S. Lam, Mitchell L. Gordon, Danaë Metaxa, Jeffrey T. Hancock, James A. Landay, and Michael S. Bernstein. 2022. End-User Audits: A System Empowering Communities to Lead Large-Scale Investigations of Harmful Algorithmic Behavior. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW2 (Nov. 2022), 512:1–512:34. https://doi.org/10.1145/3555625

[70] Airi Lampinen, Moira McGregor, Rob Comber, and Barry Brown. 2018. Member-Owned Alternatives: Exploring Participatory Forms of Organising with Cooperatives. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (Nov. 2018), 1–19. https://doi.org/10.1145/3274369

[71] Jonathan Lazar, Julio Abascal, Janet Davis, Vanessa Evers, Jan Gulliksen, Joaquim Jorge, Tom McEwan, Fabio Paternò, Hans Persson, Raquel Prates, Hans Von Axelson, Marco Winckler, and Volker Wulf. 2012. HCI Public Policy Activities in 2012: A 10-Country Discussion. *Interactions* 19, 3 (May 2012), 78–81. https://doi.org/10.1145/2168931.2168947

[72] Silvia Lindtner and Seyram Avle. 2017. Tinkering with Governance: Technopolitics and the Economization of Citizenship. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (Dec. 2017), 1–18. https://doi.org/10.1145/3134705

[73] Yuhan Liu, Varun Nagaraj Rao, Sohyeon Hwang, Janet Vertesi, and Andrés Monroy-Hernández. 2025. OpenCourier: An Open Protocol for Building a Decentralized Ecosystem of Community-owned Delivery Platforms. https://doi.org/10.48550/arXiv.2511.02455 arXiv:2511.02455 [cs]

[74] Penn Loh and Julian Agyeman. 2019. Urban Food Sharing and the Emerging Boston Food Solidarity Economy. *Geoforum* 99 (Feb. 2019), 213–222. https://doi.org/10.1016/j.geoforum.2018.08.017

[75] Alex Jiahong Lu, Eleanor Villafranca Wikstrom, and Tawanna R Dillahunt. 2024. Contamination, Otherness, and Negotiating Bottom-Up Sociotechnical Imaginaries in Participatory Speculative Design. In *Participatory Design Conference 2024*. ACM, Sibu Malaysia, 173–186. https://doi.org/10.1145/3666094.3666110

[76] Peter Lyle, Jaz Hee-jeong Choi, and Marcus Foth. 2014. Designing for Grassroots Food Production: An Event-Based Urban Agriculture Community. In *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: The Future of Design*. ACM, Sydney New South Wales Australia, 362–365. https://doi.org/10.1145/2686612.2686666

[77] Mianna Meskus and Emilia Tikka. 2024. Speculative Approaches in Social Science and Design Research: Methodological Implications of Working in 'the Gap' of Uncertainty. *Qualitative Research* 24, 2 (April 2024), 209–228. https://doi.org/10.1177/14687941221129808

[78] Jacob Metcalf, Emanuel Moss, Elizabeth Anne Watkins, Ranjit Singh, and Madeleine Clare Elish. 2021. Algorithmic Impact Assessments and Accountability: The Co-construction of Impacts. In *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (FAccT '21)*. Association for Computing Machinery, New York, NY, USA, 735–746. https://doi.org/10.1145/3442188.3445935

[79] Jimin Mun, Liwei Jiang, Jenny Liang, Inyoung Cheong, Nicole DeCario, Yejin Choi, Tadayoshi Kohno, and Maarten Sap. 2024. Particip-AI: A Democratic Surveying Framework for Anticipating Future AI Use Cases, Harms and Benefits. https://doi.org/10.48550/arXiv.2403.14791 arXiv:2403.14791 [cs]

[80] Michael Murdoch. 2025. Adaptation Over Replication: Mondragon and the U.S. Cooperative Ecosystem. *International Journal of Co-operative Accounting and Management* 8, 2 (2025).

[81] Varun Nagaraj Rao, Samantha Dalal, Eesha Agarwal, Dana Calacci, and Andrés Monroy-Hernández. 2025. Rideshare Transparency: Translating Gig Worker Insights on AI Platform Design to Policy. *Proc. ACM Hum.-Comput. Interact.* 9, 2 (May 2025), CSCW161:1–CSCW161:49. https://doi.org/10.1145/3711059

[82] Bonnie Nardi. 2019. Design in the Age of Climate Change. *She Ji: The Journal of Design, Economics, and Innovation* 5, 1 (March 2019), 5–14. https://doi.org/10.1016/j.sheji.2019.01.001

[83] Lukasz Nazarko. 2020. Responsible Research and Innovation in Enterprises: Benefits, Barriers and the Problem of Assessment. *Journal of Open Innovation: Technology, Market, and Complexity* 6, 1 (March 2020), 12. https://doi.org/10.3390/joitmc6010012

[84] Jessica Gordon Nembhard. 2024. *Collective Courage: A History of African American Cooperative Economic Thought and Practice*. Penn State Press.

[85] Donald A. Norman. 1999. Affordance, Conventions, and Design. *interactions* 6, 3 (1999), 38–43.

[86] Juliet Norton, Ankita Raturi, Bonnie Nardi, Sebastian Prost, Samantha McDonald, Daniel Pargman, Oliver Bates, Maria Normark, Bill Tomlinson, Nico Herbig, and Lynn Dombrowski. 2017. A Grand Challenge for HCI: Food + Sustainability. *Interactions* 24, 6 (Oct. 2017), 50–55. https://doi.org/10.1145/3137095

[87] Nyéléni. 27 Februrary 2007. *Declaration of Nyéléni*. Technical Report.

[88] Doug O'Brien. 2020. Testimony of Doug O'Brien: Hearing on "Challenges and Benefits of Employee-Owned Small Businesses".

[89] Feifei Pang, Rob Grace, and Jess Kropczynski. 2024. From Seed to Compost: A Systematic Review of the Impact of Digital Technologies Across the Community Food System Lifecycle. In *Proceedings of the 13th Nordic Conference on Human-Computer Interaction (NordiCHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–17. https://doi.org/10.1145/3679318.3685396

[90] Pauli, Benjamin J. 2019. *Flint Fights Back: Environmental Justice and Democracy in the Flint Water Crisis*. MIT Press.

[91] Jennifer Pierre, Roderic Crooks, Morgan Currie, Britt Paris, and Irene Pasquetto. 2021. Getting Ourselves Together: Data-centered Participatory Design Research & Epistemic Burden. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)*. Association for Computing Machinery, New York, NY, USA, 1–11. https://doi.org/10.1145/3411764.3445103

[92] Kameshwari Pothukuchi. 2015. Five Decades of Community Food Planning in Detroit: City and Grassroots, Growth and Equity. *Journal of Planning Education and Research* 35, 4 (Dec. 2015), 419–434. https://doi.org/10.1177/0739456X15586630

[93] Sebastian Prost, Vasilis Vlachokyriakos, Jane Midgley, Graeme Heron, Kahina Meziant, and Clara Crivellaro. 2019. Infrastructuring Food Democracy: The Formation of a Local Food Hub in the Context of Socio-Economic Deprivation. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (Nov. 2019), 1–27. https://doi.org/10.1145/3359159

[94] Ronda Ringfort Felner, Judith Dörrenbächer, and Marc Hassenzahl. 2025. The Quality of Speculation – A Scoping Review. In *Proceedings of the 2025 ACM Designing Interactive Systems Conference*. ACM, Madeira Portugal, 2373–2394. https://doi.org/10.1145/3715336.3735794

[95] Andy Rosen. 2019. Meet the New Startup: It's a Co-Op, Keen to Spread That Model. *The Boston Globe* (June 2019).

[96] Johnny Saldaña. 2013. *The Coding Manual for Qualitative Researchers* (2nd ed ed.). SAGE, Los Angeles.

[97] Sammy Schuck. 2022. Detroit's Status as 'Food Desert' Challenged as More Produce Options Emerge. https://news.jrn.msu.edu/2022/01/detroits-status-as-food-desert-challenged-as-more-produce-options-emerge/.

[98] Devansh Saxena, Erhardt Graeff, Shion Guha, EunJeong Cheon, Pedro Reynolds-Cuéllar, Dawn Walker, Christoph Becker, and Kenneth R. Fleischmann. 2020. Collective Organizing and Social Responsibility at CSCW. In *Companion Publication of the 2020 Conference on Computer Supported Cooperative Work and Social Computing*. ACM, Virtual Event USA, 503–509. https://doi.org/10.1145/3406865.3418593

[99] Isabel Saz-Gil, Ignacio Bretos, and Millán Díaz-Foncea. 2021. Cooperatives and Social Capital: A Narrative Literature Review and Directions for Future Research. *Sustainability* 13, 2 (Jan. 2021), 534. https://doi.org/10.3390/su13020534

[100] Trebor Scholz and Nathan Schneider (Eds.). 2016. *Ours to Hack and to Own: The Rise of Platform Cooperativism, a New Vision for the Future of Work and a Fairer Internet*. OR Books, New York London.

[101] Vishal Sharma, Neha Kumar, and Bonnie Nardi. 2024. Post-Growth Human–Computer Interaction. *ACM Transactions on Computer-Human Interaction* 31, 1 (Feb. 2024), 1–37. https://doi.org/10.1145/3624981

[102] Simon Wilson. 2010. Can Farming Save Detroit? https://moneyweek.com/18286/can-farming-save-detroit-47302.

[103] Juan Manuel Sinde Oyarzabal. 2021. Keys for the success of the Mondragon Cooperative Experience: Lessons for An Inclusive-Participatory Business Model. *DYNA* 96, 1 (March 2021), 119–122. https://doi.org/10.6036/9819

[104] Rachel Charlotte Smith and Ole Sejer Iversen. 2018. Participatory Design for Sustainable Social Change. *Design Studies* 59 (Nov. 2018), 9–36. https://doi.org/10.1016/j.destud.2018.05.005

[105] Rosemary Steup, Lynn Dombrowski, and Norman Makoto Su. 2019. Feeding the World with Data: Visions of Data-Driven Farming. In *Proceedings of the 2019 on Designing Interactive Systems Conference (DIS '19)*. Association for Computing Machinery, New York, NY, USA, 1503–1515. https://doi.org/10.1145/3322276.3322382

[106] Jack Stilgoe, Richard Owen, and Phil Macnaghten. 2013. Developing a Framework for Responsible Innovation. *Research Policy* 42, 9 (Nov. 2013), 1568–1580. https://doi.org/10.1016/j.respol.2013.05.008

[107] Özge Subasi, Anton Fedosov, Oliver Bates, Airi Lampinen, and Ann Light. 2020. Sharing & Cooperativism: Designing For Economies. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (NordiCHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–3. https://doi.org/10.1145/3419249.3420094

[108] Udayan Tandon, Vera Khovanskaya, Enrique Arcilla, Mikaiil Haji Hussein, Peter Zschiesche, and Lilly Irani. 2022. Hostile Ecologies: Navigating the Barriers to Community-Led Innovation. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW2 (Nov. 2022), 443:1–443:26. https://doi.org/10.1145/3555544

[109] Guy Tchami. 2007. *Handbook on Cooperatives for Use by Workers' Organizations*. ILO, Geneva.

[110] Priyanka Verma, Mohammad Rashidujjaman Rifat, and Samar Sabie. 2025. Management, Cooperation, and Sustainability: Unpacking the Data Practices of Housing Cooperatives. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, 1–16. https://doi.org/10.1145/3706598.3713121

[111] Vasillis Vlachokyriakos, Clara Crivellaro, Pete Wright, Evika Karamagioli, Eleni-Revekka Staiou, Dimitris Gouscos, Rowan Thorpe, Antonio Krüger, Johannes Schöning, Matt Jones, Shaun Lawson, and Patrick Olivier. 2017. HCI, Solidarity Movements and the Solidarity Economy. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. Association for Computing Machinery, New York, NY, USA, 3126–3137. https://doi.org/10.1145/3025453.3025490

[112] Calley Wang. 2022. Is Detroit a Food Desert?

[113] Cedric Deslandes Whitney, Teresa Naval, Elizabeth Quepons, Simrandeep Singh, Steven R Rick, and Lilly Irani. 2021. HCI Tactics for Politics from Below: Meeting the Challenges of Smart Cities. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–15. https://doi.org/10.1145/3411764.3445314

[114] Richmond Y. Wong, Vera Khovanskaya, Sarah E. Fox, Nick Merrill, and Phoebe Sengers. 2020. Infrastructural Speculations: Tactics for Designing and Interrogating Lifeworlds. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–15. https://doi.org/10.1145/3313831.3376515

[115] Marisol Wong-Villacres, Carl DiSalvo, Neha Kumar, and Betsy DiSalvo. 2020. Culture in Action: Unpacking Capacities to Inform Assets-Based Design. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. ACM, Honolulu HI USA, 1–14. https://doi.org/10.1145/3313831.3376329

[116] Qian Yang, Richmond Y. Wong, Steven Jackson, Sabine Junginger, Margaret D. Hagan, Thomas Gilbert, and John Zimmerman. 2024. The Future of HCI-Policy Collaboration. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*. ACM, Honolulu HI USA, 1–15. https://doi.org/10.1145/3613904.3642771

[117] Jonathan Zong and J. Nathan Matias. 2024. Data Refusal from Below: A Framework for Understanding, Evaluating, and Envisioning Refusal as Design. *ACM J. Responsib. Comput.* 1, 1 (March 2024), 10:1–10:23. https://doi.org/10.1145/3630107

A Methodological Details

A.1 Participant Demographics

We hosted three workshops on Zoom with a total of 25 participants (1 participant did not provide demographic data, as summarized in Table 3).

A.2 Speculative Workbook Scenarios

Scenario 1: Motor City Grows (MCG). We created the first scenario as an example where the technology developers are internal to the community. From our field research, we learned how small farmers would love to provide more of their surplus produce to equitable food programs, but lack the infrastructure and additional labor to support logistics and operations. Thus, digital platforms could provide an opportunity to support the coordination of infrastructure, crop production, and distribution. For example, by lowering the cost of coordination, digital platforms could help small farmers better compete with larger food suppliers, who can pursue and acquire partnerships more easily on their own.

In the first part, we asked questions such as: what would an ideal farm collective look for you, how could the digital platform improve how a farmer plans their seasonal production, and how the platform could improve their distribution and collaboration with other farmers. We sought to understand whether and how the digital platform could support participants in efforts to strengthen food security within the city. Extrapolating from previous work on platform capitalism, we speculated that the platform could identify trends in how well a farmer performs at producing certain crops, and use algorithms to suggest and incentive different behaviors from the platform's users. We introduced the possibility that the platform developers could start using data collected on farms to provide recommendations for how members could improve their growing operations to support the needs of the overall collective. We used this scenario to ask participants to foresee conflicts that could arise from the affordances of the platform, and asked "How should the farmers hold MCG accountable for their possible retaliation? How could the cooperative be structured to prevent possible scenarios like this from happening?" We used this scenario to elicit possible mechanisms a community could use to hold the developers of the technology more accountable.

Scenario 2: Urban Farming Dashboard. We created this second scenario as an example of an technology developer external to the community, (the City of Detroit). From our fieldwork, we identified an opportunity around how access to city level data on urban farming would help the Detroit better support food sovereignty initiatives. Building on previous urban data initiatives, we speculated that data could help the city prioritize where to roll out new urban infrastructure according to need. In addition, by making the data public, Detroit could then also support a more open software ecosystem where developers can create new applications to support food security initiatives. Because many of the impacts of technology come from downstream uses of a system, we designed this scenarios to understand whether and how accountability could be designed to constrain developers outside the original partnership.

In the first part of this scenario, we asked participants about how to best design the platform and what what data they would want to use to support food security initiatives across the city. Then, in the second part of the scenario, we introduced the possible challenges that open data could pose to the food sovereignty community. While urban farming provides a great way to revitalize neighborhoods, there's a risk that it produces what scholars call "eco-gentrification." Real estate speculators will begin to raise property values, because urban farms make neighborhoods more attractive to those with more capital, either by reducing crime, increasing health outcomes, or improving aesthetics. In certain neighborhoods in Detroit, farmers have cited that his process is already well underway. Thus, we introduced the possibility that a real estate company could use open data from the city to inform their financial models. We asked participants, "what positive and negative impacts could you foresee this creating, and for whom?" We then elicited additional ways participants foresaw people using public data to positively or negatively impact their communities, and how they could hold actors accountable for said impacts.

A.3 Land and Ancestor Acknowledgment

Before each workshop, we started the session with a Land and Ancestor Acknowledgment. We asked if any participants would want to lead the acknowledgment, but no one volunteered in any workshop. We then spoke the following:

> I'd like everyone to get comfortable in their seats, if they can place their feet on the ground. And I want to call in the land to join us for this discussion. And I invite each one of us to connect with the land, the water, and the air through what works for you.
> The Waawiyaataanong (waa-wiy-at-en-on), which we now refer to as Detroit, has been and continues to be violently abused and exploited by white settler colonialism, of which the University of Michigan has played a significant part. I call in the ancestors of those who have have enabled us to be here today, who's spirits still live on around us. To the first peoples of the Three Fires Confederacy, the Odawa, Ojibwe, and Potawatomi, who used this land as a central meeting place. To the enslaved Africans brought by the French and the British, who exploited their deep agricultural wisdom. To those who risked their lives making this land a pivotal location in the underground railroad and the leaders who cultivated a culture of resistance and movement for civil rights. To the fallen and current leaders who still fight to free the people on this land from poverty, racism, and sustained forms of colonialism and enslavement. And to the many lost in fights over resources and land in Palestine and Congo.
> As I explore how to repair and live in right relationship with the land, I ask the land for forgiveness for the harm I have caused and continue to cause you. It is my hope that through this work and today's discussion, that we will find ways to promote a better future for the earth and all relationships on the planet.
> If anyone would like to add additional acknowledgments, or speak names of spirits and ancestors they would like to invite into the space. I will leave a moment for that now. *Pause.*

Table 3: Participant Information

ID	Pseudonym	Age	Gender	Race	Experience	Farm Size	What They Grow
P1	Aaliyah	39	Woman	Black	<5 years	<1 acre	Vegetables, herbs, flowers
P2	Andre	28	Man	Black	5-10 years	1-2 acres	Vegetables, fruit
P3	Avery	49	Agender	Black	20+ years	<1 acre	Vegetables and fruits
P4	Bria	50	Woman	Black	20+ years	<1 acre	Vegetables, nuts, berries, herbs
P5	Chante	41	Woman	Black	10-20 years	1-2 acres	Vegetables
P6	Charmaine	42	Woman	Black	<5 years	<1 acre	Herbs
P7	Cameron	31	Non-binary	Black	<5 years	<1 acre	Flowers, textiles, herbs, veggies
P8	Desiree	35	Woman	Black	5-10 years	1-2 acres	Vegetables, herbs, fruit, nuts
P9	Erica	42	Woman	Black	5-10 years	<1 acre	Native plants, flowers, veggies
P10	James	34	Man	White	10-20 years	<1 acre	Vegetables
P11	Julian	32	Man, Non-binary, Transgender	White	<5 years	<1 acre	Vegetables, fruit, flowers
P12	Kaden	25	Gender non-conforming	Black	5-10 years	2-4 acres	Vegetables, herbs, fruit
P13	Kaya	31	Non-binary, Two-Spirit	Native American	10-20 years	<1 acre	Native food, medicinal crops
P14	Khalil	28	Man	Black	5-10 years	5+ acres	Vegetables, fruit
P15	Latrice	33	Woman	Black	5-10 years	<1 acre	Vegetables, herbs
P16	Maya	56	Woman	Black, Native American	20+ years	<1 acre	Vegetables, fruit
P17	Nia	52	Woman	Black	5-10 years	<1 acre	Vegetables
P18	Paloma	43	Genderqueer	Latinx	10-20 years	1-2 acres	Vegetables, herbs, cut flowers
P19	Parker	34	Non-binary, Transgender	White	5-10 years	<1 acre	Fruits, veggies, herbs, flowers
P20	Pilar	44	Woman	White, Latinx	5-10 years	1-2 acres	Vegetables and some fruit
P21	Quincy	–	-	-	–	5+ acres	Vegetables, fruits
P22	Rochelle	50	Woman	Black	<5 years	<1 acre	Vegetables, herbs, flowers
P23	Samir	30	Man	Middle Eastern	10-20 years	2-4 acres	Flowers
P24	Tiana	62	Woman	Black	10-20 years	<1 acre	Fruit, Flowers
P25	Tariq	38	Man	Black	5-10 years	<1 acre	Vegetables, fruit