Design Practices: “Nothing about Us without Us”

Published on: Feb 27, 2020

Figure 2.1 Cover illustration for "Nothing About Us Without Us: Developing Innovative Technologies For, By and With Disabled Persons" by David Werner, 1998, http://www.dinf.ne.jp/doc/english/global/david/dwe001/dwe00101.html

> Today the tech industry does not look like America, and that has a significant influence on the types of products and services that get created … When the lived experience of underrepresented communities is omitted from the product development cycle, the usefulness of the technology becomes biased towards one group.
>
> —Kapor Capital Founders' Commitment, 2015

> If you have come here to help me, you are wasting your time. But if you have come because your liberation is bound up with mine, then let us work together.
>
> —Lilla Watson, Australian Aboriginal activist and artist

In August 2017, a software engineer at Google ignited a firestorm of controversy with a memo titled "Google's Ideological Echo Chamber," which was widely circulated inside the company before it spread worldwide via social media and, later, mainstream news outlets. The author argued that underlying biological differences between men and women, rather than sexism, may explain the underrepresentation of women in software development and in high-level positions inside technology

companies, as well as gendered salary differences, and that programs at Google that are designed to increase diversity and support women actually discriminate against men.

Response was swift. Within days, Google Chief Executive Sundar Pichai issued a public statement condemning the memo, and the employee who wrote the memo was fired.[1] The memo's author then sued the company for discrimination against whites, Asians, and men. The memo and lawsuit were hotly debated on social media, in blogs, and by scientists; dozens, if not hundreds, of news stories, op-eds, and think pieces were written about the case. Many provided detailed refutation of the memo's arguments; others noted that there is some support for some of the memo's scientific claims, but not for the author's conclusions about diversity policies; still others attempted to summarize arguments both for and against the memo's claims.[2] Some writers excoriated the culture of technology companies that allows misogyny and racism to flourish,[3] or suggested strategies for Silicon Valley firms to create more diverse and inclusive working environments.[4] Still others drew attention to women's many contributions to the field of software development,[5] from Ada Lovelace, the first software developer, to Grace Hopper, creator of one of the first compilers, to Katherine Johnson, the Black woman whose calculation of space flight trajectories contributed to NASA's first moon landing (a story adapted for the big screen in the Hollywood film *Hidden Figures*).[6]

The infamous Google memo was only one moment in a series of increasingly high-profile controversies about sexism, racism, sexual harassment, and rape culture in the tech sector. These have had growing impact, in no small part due to the explosion of the #MeToo movement. Yet despite publicly repudiating the ideas in the Echo Chamber memo, tech companies continue to be sites for the systematic reproduction of the matrix of domination. Tech companies reproduce intersectional oppression through their hiring, retention, and promotion practices; through internal corporate culture that tolerates misogyny, racism, and sexual harassment; and through the products they design. For example, even as PR teams clambered over one another to publicly repudiate the misogyny inherent in the Echo Chamber memo's arguments, companies like IBM were meeting with the Trump administration to discuss bids on a government contract to build a "good immigrant/bad immigrant" prediction system.[7] Courts across the country were signing contracts to implement recidivism risk prediction software that has been shown to be racially biased.[8] Data about millions of low-income women was being ingested and analyzed by black box algorithms to determine whether these women would receive or be cut off from public benefits.[9]

The story of the Google memo, and of the pushback against it, illustrates three key points. First, racism and sexism (or, to describe oppression in structural terms that are more difficult to individualize, white supremacy and heteropatriarchy) remain pervasive within the culture of the most powerful technology companies in the world. The Google memo was not only notable because it was written by a

software engineer at Google, but also because of its widespread circulation within the company and its sympathetic reception from many of the author's colleagues.

Second, although these ideas remain pervasive and they continue to structure practices in many spheres of life, they are no longer considered socially acceptable. Those who consciously hold these ideas understand this and exploit it to their advantage. The Echo Chamber memo is only the latest work in a long-standing genre that attempts to position misogynist ideas as reasonable arguments that are unfairly suppressed and marginalized due to "political correctness." This narrative of white (cis)male marginalization and oppression, on the defense against irrational attacks by feminists and/or people of color, is deeply embedded within the larger political climate. White male "marginalization" has long been a core narrative strategy of the right wing in the United States.[10] Indeed, the victorious Trump campaign tapped this wellspring of fears about the erosion of white masculinity, along with deeply rooted narratives of white womanhood under threat from Black and Latino men, to secure the world's most powerful elected position, with 62 percent of white men's and 53 percent of white women's votes, in the 2016 general election.[11]

Third (and most salient here), prominent critiques of the Google memo, like most stories about sexism and racism in Silicon Valley, are typically framed in terms of the untapped capacity of women, Black people, Indigenous people, and/or people of color (B/I/PoC), to perform well in jobs currently dominated by white and Asian cisgender men. Many laud the benefits of "diverse teams" for capitalist profitability. Sexist and racist discourse and practice within the technology industry are nearly always delinked from broader and deeper critiques of the ways that tech reproduces white supremacy, heteropatriarchy, capitalism, and settler colonialism—not only through employment practices, but through all aspects of technology design. Although the matrix of domination shapes a range of tech sector activities, including (but not limited to) employment, choice of intended users, scoping, affordances, access to capital, platform ownership and governance, and more, the conversation about challenges (and solutions) usually remains within an "employment diversity" frame.

Employment diversity is important. However, ultimately, design justice challenges us to push beyond the demand for more equitable allocation of professional design jobs. Employment diversity is a necessary first move, but it is not the far horizon of collective liberation and ecological sustainability. The goal of this book is to spur our imaginations about how to move beyond a system of technology design largely organized around the reproduction of the matrix of domination. In its place, we need to imagine how all aspects of design can be reorganized around human capabilities, collective liberation, and ecological sustainability.

Designers: Who Gets (Paid) to Do Design?

To begin with, design justice as a framework recognizes the universality of design as a human activity. As noted in the introduction, *design* means to make a mark, make a plan, or problem-solve; all human beings thus participate in design.[12] However, though all humans design, not everyone gets paid to do so. Intersectional inequality systematically structures paid professional design work. Professional design jobs in nearly all fields are disproportionately allocated to people who occupy highly privileged locations within the matrix of domination. At the same time, the numerous expert designers and technologists who are not wealthy and/or educationally privileged white cis men have often been ignored, their labor appropriated, and their stories erased from the history of technology.[13] Also, professional designers constantly draw both from one another and from the unsung design work of everyday people. Although the discussion that follows could easily apply to any professionalized design field, I will focus on the software and technology industries. Designers in this sector are highly rewarded, both economically and culturally, and have achieved status as iconic figures who stand in for the promise of innovation and entrepreneurialism under informational capitalism.

In recent years, there has been a growing public conversation about the fact that the most advanced sector of the economy might well be the most unequal. In 2016, several technology firms, under pressure from mobilized publics, released diversity data about their employment practices. Unsurprisingly, this data does not paint a flattering picture of progress toward gender and racial equality in the tech sector. White and Asian cis men dominate technology jobs. For example, in the United States, women overall hold 26 percent of tech jobs, Black women hold just 3 percent of computer programming jobs, and Latinas hold 2 percent.[14] As feminist media anthropologist Christina Dunbar-Hester notes, gender disparity in the software industry is far worse within the supposedly "open" arena of free/libre and open-source software (F/LOSS): just 2 percent of F/LOSS developers are women, compared to 30 percent of developers who work on proprietary software.[15] A 2016 report by Intel found that nearly two-thirds of tech workers are white.[16] Sector-wide employment trends are not steadily advancing toward increasing diversity; instead, women and/or B/I/PoC sometimes gain ground, sometimes lose ground.[17]

Even when women and/or B/I/PoC are employed in technology design, development, and product management, only a handful have positions at the top of these extremely hierarchical organizations. Gender diversity on the boards of top tech companies tends to range from just 10 percent to 25 percent (almost exclusively white) women. For example, Apple's board currently has six men and two women, Google (Alphabet) has nine and two, Facebook seven and two, and so on. Yahoo, with a board composed of six men and three women, is the top-tier tech firm that comes closest to gender parity at the highest decision-making level.[18]

Extreme gender disparity in computing was not always the norm. Indeed, *computers* originally were human beings, often women, who performed extensive calculations in fields including astronomy, ballistics, economic analysis, and more.[19] The world's first professional computer programmers were arguably the six women (Fran Bilas, Betty Jean Jennings, Ruth Lichterman, Kay McNulty, Betty Snyder, and Marlyn Wescoff) tasked with programming ENIAC to calculate ballistics trajectories during World War II.[20] In the early days of modern computer science, women made up a much higher proportion of computer scientists. One study from Google estimated that in the 1980s, 37 percent of computer science majors were women; by 2012, the proportion had dropped to 18 percent.[21] Dunbar-Hester discusses some of the reasons for this shift. As a skillset and occupational path, computer programming was initially marginal, unprestigious, poorly understood, and (crucially) not particularly well-paid. As programming took center stage in the new information economy, men pushed women to the side.[22] White male geek culture, replete with heteropatriarchal cultural structures, forms of humor, and mechanisms for normalizing white cis male standpoints, came to rule the roost.[23]

Dismal equity statistics reflect broader raced and gendered patterns that persist across nearly all sectors of the economy. Racial and gender inequality in who gets paid to do design work is also shaped by educational access inequalities,[24] and I will return to questions about diversity in technology education, as well as the purpose of such education, in chapter 5, which focuses on the pedagogy of design justice. For now, it is enough to say that the many "diversity in tech" initiatives are important. If they are matched by systematic shifts in hiring, mentorship, and retention practices across the technology industry, such as those indicated by recent research into best practices in corporate gender parity efforts,[25] there may well be a long-term shift in trends toward more equitable employment in this industry. However, full parity remains unlikely without macro policy shifts to support systems-wide equalizers such as universal family policies, job protection, generous paid parental leave, child care services, and other key factors that are known to support gender-diverse employment, retention, and career advancement.[26]

Diversity Is Good for Capitalist Profitability

Although employee diversity is certainly a laudable goal, it remains comfortably within the discourse of (neo)liberal multiculturalism and entrepreneurial citizenship.[27] Indeed, there is a growing managerial literature on the competitive business advantages of employee diversity. Diverse firms and product teams have repeatedly been shown to make better decisions, come up with more competitive products, and better understand potential customers. Racial and gender diversity are linked to increased sales revenue, more customers, and greater relative profits,[28] although some research complicates this narrative.[29] This is now fairly well understood in mainstream business literature. As the 2017 *Breaking the Mold* report notes: "McKinsey & Company has reported that companies in the top

quartile in terms of racial diversity are 35 percent more likely to have financial returns higher than the national median in their industry. This research complements multiple studies which conclude that gender diversity clearly improves corporate financial performance."[30] The cited McKinsey report analyzed private data sets on employment diversity from 366 firms and found that "in the United States, there is a linear relationship between racial and ethnic diversity and better financial performance: for every 10 percent increase in racial and ethnic diversity on the senior-executive team, earnings before interest and taxes (EBIT) rise 0.8 percent."[31] Despite a growing body of studies that demonstrate at least correlation (if not causation) between employee diversity and capitalist profitability, as well as shifting mainstream cultural norms that favor increased gender and racial/ethnic diversity, corporate leadership remains dominated by white cis men across all sectors of the economy. Women make up just 16 percent of executive teams in US companies, 12 percent in the United Kingdom, and 6 percent in Brazil. In terms of race, 97 percent of US companies have senior leadership teams composed primarily of white people.[32]

In other words, under the informational stage of racial capitalism, employee diversity is seen by most of the managerial class as an input to increased efficiency, innovation, market domination, and capital accumulation. However, despite steadily increasing interest in establishing a diverse pool of designers, developers, product managers, and other tech workers, the industry persistently fails to meaningfully diversify. What's more, structural inequality is rarely mentioned, let alone challenged. Because design justice as a framework includes a call to dismantle the matrix of domination and challenge intersectional, structural inequality, it requires more than a recognition that employment diversity increases capitalist profitability. Employment in paid design fields is important, but is not the whole picture. Design justice also involves rethinking other aspects of design practice, including the intended design beneficiaries: the "users."

Imagined Users: Whose Tech?

For whom do we, as a society, design technology? Journalist and feminist activist Laurie Penny puts it this way:

> There is nothing wrong with making things that people want. The problem is that personhood and desire are constrained by capital; money affects whose wants appear to matter. The kids in Startup House may want a pizza delivery drone, but not in the same way low-income families want health care, or the elderly men lying in their own faeces on Howard Street want a safe place to sleep. There is nothing wrong with making things people want. It's just that too little attention is being paid to the things people need. The wants and needs of young, healthy, middle-class people with connections and a reasonable amount of spare cash are overrepresented among Start-up City's priorities. For one thing, those are the problems with solutions that sell. For

> another, given a few million dollars and a team of semi-geniuses, those problems are easy to solve. Structural social injustice and systemic racism are harder to tackle.[33]

Penny's critique of classed user prioritization within capitalist start-up scenes can be extended: default imagined users are raced, classed, and gendered within a worldview produced by the matrix of domination, internalized and reproduced within technology design teams. Designers most frequently assume that the unmarked user has access to several very powerful privileges, such as US citizenship, English language proficiency, access to broadband internet, a smartphone, a normatively abled body, and so on.

User-Centered Design, the "Unmarked" User, and the Spiral of Exclusion

User-centered design (UCD) refers to a design process that is "based upon an explicit understanding of users, tasks, and environments; is driven and refined by user-centered evaluation; and addresses the whole user experience. The process involves users throughout the design and development process and it is iterative."[34] Over time, UCD has become the recommended design approach within many firms, government bodies, and other institutions. However, UCD faces a paradox: it prioritizes "real-world users." Yet if, for broader reasons of structural inequality, the universe of real-world users falls within a limited range compared to the full breadth of *potential* users, then UCD reproduces exclusion by centering their needs. Put another way, design always involves centering the desires and needs of some users over others. The choice of *which users* are at the center of any given UCD process is political, and it produces outcomes (designed interfaces, products, processes) that are better for some people than others (sometimes very much better, sometimes only marginally so). This is not in and of itself a problem. The problem is that, too often, this choice is not made explicit.

In addition, designers tend to unconsciously default to imagined users whose experiences are similar to their own.[35] This means that users are most often assumed to be members of the dominant, and hence "unmarked" group: in the United States, this means (cis)male, white, heterosexual, "able-bodied," literate, college educated, not a young child and not elderly, with broadband internet access, with a smartphone, and so on. Most technology product design ends up focused on this relatively small, but potentially highly profitable, subset of humanity. Unfortunately, this produces a spiral of exclusion as design industries center the most socially and economically powerful users, while other users are systematically excluded on multiple levels: their user stories, preferred platforms, aesthetics, language, and so on are not taken into consideration. This in turn makes them less likely to use the designed product or service. Because they are not among the users, or are only marginally present, their needs, desires, and potential contributions will continue to be ignored, sidelined, or deprioritized.

It is tempting to hope that employment diversity initiatives in the tech sector, if successful over time, will solve this problem. Diversifying the technology workforce, as noted above, is a good move, but unfortunately, it will not automatically produce a more diverse default imagined user. Research shows that unless the gender identity, sexual orientation, race/ethnicity, age, nationality, language, immigration status, and other aspects of user identity are explicitly specified, even diverse design teams tend to default to imagined users who belong to the dominant social group.[36]

There is growing awareness of this problem, and several initiatives attempt to address it through intentional focus on designing together with communities that are usually invisibilized. For example, the Trans*H4CK series of hackathons focuses on trans* and gender-non-conforming communities. Contratados.org[37] is a site built by the Center for Migrant Rights that operates like Yelp, but for migrant workers, to let them review potential employers and recruitment agents, educate them about their rights, and protect them from transnational recruitment scams.[38] Such efforts to design together with users from communities that are mostly overlooked by design industries are important. However, they remain small-scale. What's more, individual inclusive design projects cannot, on their own, transform the deeply entrenched systemic factors that militate toward design that constantly centers an extremely limited set of imagined users.

Design Justice and Lead User Innovation

Another way to think about the relationship among users, design processes, and the matrix of domination is through MIT management professor Eric Von Hippel's concepts of *lead user innovation*, *information asymmetry between manufacturers and users*, and *variance in user product needs*. Design justice focuses on the ways that race, class, gender, and disability structure both information asymmetries and variance in user product needs.

In Von Hippel's widely influential text *Democratizing Innovation*, he demonstrates that a great deal of technological innovation—perhaps the majority—is actually conducted by what he terms *lead users*. Von Hippel uses a powerful mix of case studies, economic theory, and industry data to demonstrate how this process works across a range of sectors, from extreme sports to software development. He identifies several underlying shared principles that help explain why users innovate and modify commercially available products, why users often freely share these innovations with one another, and why firms frequently fail to develop products that meet user needs. For example, Von Hippel demonstrates that information asymmetry between manufacturers and users is one of the underlying forces that supports lead user innovation. In a nutshell, when the cost (in time and energy) of communicating a specific kind of user need to the manufacturer is high, it often makes more sense for users to modify products on their own than to attempt to convince manufacturers to do so.[39] In addition, Von Hippel shows that it is highly likely that certain groups of users—in particular, those

who are too few to ensure that the manufacturer will benefit from economies of scale—will be more likely than others to have unmet needs. Because the group of users who push the limits of any particular technology tends to overlap closely with those who are the most skilled in the activity the technology is meant to support (the lead users), there is a permanent tension between economies of scale for manufacturers and the most likely location of innovation. To mitigate this problem, Von Hippel suggests strategies for firms that hope to learn from and more effectively incorporate lead user innovation into their product development cycles.

However, Von Hippel's otherwise compelling theory of lead user innovation does not engage with race, gender, class, or other axes of structural inequality. For example, he never considers the implications of information asymmetry between manufacturing firms and users in a context in which a firm is controlled by, say, white men, but its users are more diverse. As we have seen, design, engineering, and decision making in firms are led by people from the dominant social groups, and so product specifications are likely to center the needs of people who belong to those groups. If white cis male designers, engineers, and decision-makers run most product design processes, white cis men will be more likely to have their needs met than members of other groups. The costs of communicating specific user needs will generally be higher for users from disadvantaged locations within the matrix of domination. Building on Von Hippel's theory, there is less information asymmetry between designers and users who occupy similar positions in the matrix of domination than between designers and users in very different locations.

However, even if design teams perfectly mirrored users in terms of standpoint within the matrix of domination, and even if the unequal costs of communicating specific user needs to decision-makers were addressed, firms would still face pressures from economies of scale to produce solutions optimized for the specifications of the most profitable group of users. As Von Hippel describes, because of economies of scale, firms have very strong incentives to foist existing solutions on all users, even where some users have different specifications. User product specifications for groups of users who are numerically a minority and/or whose purchasing power is relatively small are less likely to be met. Because purchasing power under white supremacist capitalist heteropatriarchy is unequally structured by race, class, and gender, product design ends up disproportionally prioritizing the user specifications of relatively wealthy white men.

Finally, Von Hippel never specifically explores how what he refers to as *variance in user product specifications* might be structured by race, class, gender identity, sexual orientation, and/or disability. For example, consider the gender identity and sexual orientation options on the popular dating site Tinder. In response to pressure from users with gender identities other than "man" or "woman," in 2016 the site began to allow selection of additional gender identities for display, such as trans*, nonbinary, and so on.[40] However, these new options only affect the displayed label in the gender field;

they are not useful for the actual searching and matching function of the site. In the settings that determine who will see the user's profile, the options remain constrained to Man and Woman. Similarly, in the setting that determines which subset of profiles the user will see, there is no option to specifically see the profiles of users who have selected trans*, nonbinary, or other gender identity labels. In other words, the change is primarily cosmetic; it does not meet the variance in user product specification of interest to many trans*, GNC, or nonbinary users.[41]

"Stand-in Strategies" to Represent Communities That Are Not Really Included in the Design Process

Well-meaning designers and technologists often agree that including "diverse" end users in the design process is the ideal. However, many feel that this is usually, sometimes, or mostly impossible to realize in practice. To mitigate the potential problems that come from having no one with lived experience of the design problem actually participate in the design team, researchers and designers have suggested several strategies. Unfortunately, most of these strategies involve creating abstractions about communities that are not really at the table in the design process. Such strategies include design ethnography, focus groups, and a great deal of what passes for participatory design. Here I explore the most widely used "stand-in" strategy: user personas.

User personas are short, fictional characterizations of product users, often with a name, an image, and a brief description. They are widely used to guide a range of design processes, including UX and UI, graphic design, product development, architecture, service design, and more.[42] User personas are so widespread that there is even a small sector of firms in the business of providing tools for design teams to generate, manage, and share them. For example, the Userforge website (figure 2.2) allows rapid random generation of user personas and promises to help design teams "build empathy and develop focus quickly. Create realistic representations of your user groups in far less clicks than it would take using design software or word processors, which means you can start prioritizing design decisions and get to the wins sooner."[43]

User Personas

User personas can be useful tools for communicating project goals, both within teams and firms and to other actors, including funders, investors, the press, and potential users. There is some evidence that user personas help designers stay focused on the intended use case.[44] In addition, some case-control studies have sought to demonstrate the utility of user personas for better design outcomes.[45] If they are developed in ways that are truly grounded in the lived experience of the community of end users, through careful research or by community members themselves, they may be especially worthwhile. However, there is no systematic study that I was able to locate that examines whether the use of diverse user personas produces less discriminatory design outcomes.

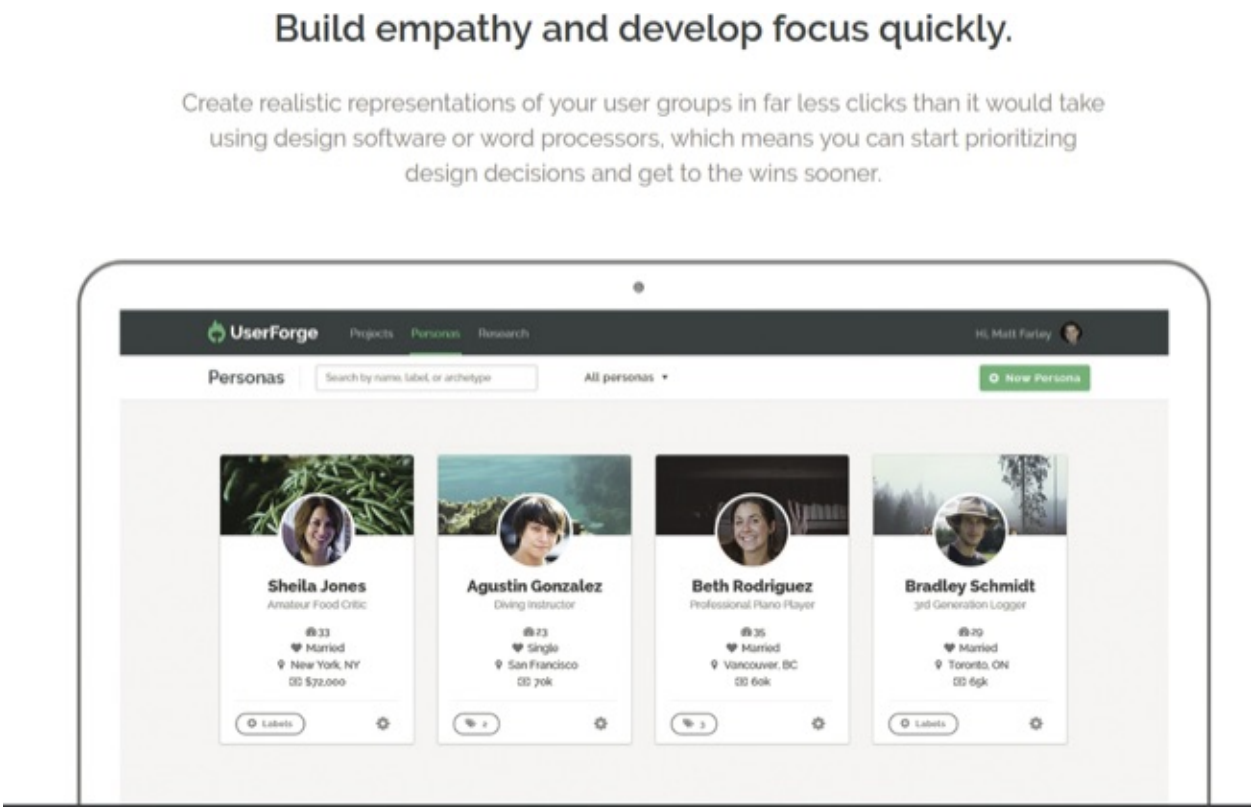

Figure 2.2 Userforge user persona generator. Screenshot from Userforge.com.

Too often, design teams only include "diverse" user personas at the beginning of their process, to inform ideation. Occasionally, diverse user stories or personas are incorporated into other stages of the design process, including user acceptance testing. However, even if the design team imagines diverse users, creates user personas based on real-world people, and incorporates them throughout the design process, the team's mental model of the system they are building will inevitably be quite different from the user's model. Don Norman, one of the most important figures in User Centered Design (UCD), notes that in UCD "the designer expects the user's model to be identical to the design model. But the designer does not talk directly with the user—all communication takes place through the system image."[46]

To make matters worse, far too often user personas are created out of thin air by members of the design team (if not autogenerated by a service like Userforge), based on their own assumptions or stereotypes about groups of people who might occupy a very different location in the matrix of domination. When this happens, user personas are literally objectified assumptions about end users. In the worst case, these objectified assumptions then guide product development to fit stereotyped but unvalidated user needs. Sometimes, they may also help designers *believe* they are engaged in an

inclusive design process, when in reality the personas are representations of designers' unvalidated beliefs about marginalized or oppressed communities. Unsurprisingly, there are no studies that compare this approach to actually including diverse users on the design team.

Disability Simulation Is Discredited; Lived Experience Is Nontransferable

There are several reasons that designers who attempt to preempt discriminatory design by imagining themselves as various kinds of users often fail. Ultimately, pretending to be another kind of person is not a good solution for design teams that want to minimize discriminatory design outcomes. Design theorist D. E. Wittkower argues against informal attempts to imagine diverse user experiences and in favor of *systematic phenomenological variation*.[47] Other design techniques to imagine diverse users include designation of a team member as a "user diversity advocate," diverse user personas, real-world user testing, formal audits, and iterative feedback and redesign cycles with real-world users after product launch, among others. None of these techniques are as good as the inclusion of diverse users on the design team throughout the process. For example, the supposedly beneficial design practice of "disability simulation" has been discredited by a recent meta-analysis.[48] In disability simulation, "a nondisabled person is asked to navigate an environment in a wheelchair in order, supposedly, to gain a better understanding of the experiences of disabled persons. These 'simulations' produce an unrealistic understanding of the life experience of disability for a number of reasons: the nondisabled person does not have the alternate skill sets developed by [Disabled people], and thus overestimates the loss of function which disability presents, and is furthermore likely to think of able-normative solutions rather than solutions more attuned to a [Disabled person's] life experience."[49] For example, abled designers typically focus on an ableist approach to technologically modifying or augmenting the individual bodies of Disabled people to approximate normative mobility styles, compared to Disabled people, who may be more interested in architectural and infrastructural changes that fit their own mobility needs. As Wittkower says, ultimately, attempting to imagine other people's experience is "no substitute for robust engagement with marginalized users and user communities. … [systematic variation techniques], although worth pursuing, are strongly limited by the difficulty of anticipating and understanding the lived experiences of others."[50] A design justice approach goes further still: beyond "robust engagement," design teams should be led by and/or in other ways be formally accountable to marginalized users.

If You're Not at the Table, You're on the Menu

Design justice does not focus on developing systems to abstract the knowledge, wisdom, and lived experience of community members who are supposed to be the end users of a product. Instead, design justice practitioners focus on trying to ensure that community members are actually included in meaningful ways throughout the design process. Another way to put this is "If you're not at the table, you're on the menu."[51] Design justice practitioners flip the "problem" of how to ensure community

participation in a design process on its head to ask instead how design can best be used as a tool to amplify, support, and extend existing community-based processes. This means a willingness to bring design skills to community-defined projects, rather than seeking community participation or buy-in to externally defined projects. Ideally, design justice practitioners don't focus on how to provide incentives that we can dangle to entice community members to participate in a design process that we have already determined and that we control. Instead, design justice compels us to begin by listening to community organizers, learning what they are working on, and asking what the most useful focus of design efforts would be. In this way, design processes can be community-led, rather than designer- or funder-led. Another way to put this might be: "Don't start by building a new table; start by coming to the table."

Design Process: From Participation to Accountability to Ownership

This chapter began with a critique of the raced, classed, and gendered nature of employment in the technology sector, as well as the ways that the matrix of domination structures imagined users and focuses designer's imaginations about who we are designing for. Besides diversity in professional design jobs, design justice requires full inclusion in the design process of people with direct lived experience of the conditions the design team wants to change. What's more, in addition to equity (we need more diverse designers, and more diverse imagined users), design justice also emphasizes accountability (those most affected by the outcomes should lead design processes) and ownership (communities should materially own design processes and their outputs).

Participatory Design

The proposal to include end-users in the design process has a long history. The "participatory turn" in technology design, or at least the idea that design teams cannot operate in isolation from end users, has become increasingly popular over time in many subfields of design theory and practice. These include participatory design (PD), user-led innovation, user-centered design (UCD), human-centered design (HCD), inclusive design, and codesign, among a growing list of terms and acronyms.[52] Some of these approaches have been adopted by multinational technology companies. Top firms have recently created toolkits and methods to address inclusion in design. For example, in 2017, in a story for *Fast Company* about Airbnb's new inclusive design toolkit,[53] technology journalist Meg Miller writes: "Microsoft has an inclusive design kit and a general design strategy centered around the philosophy that designing for the most vulnerable among us will result in better products and experiences for all. Google focuses on accessibility practices for their developers for the same reasons. Industry leaders like John Maeda and Kat Holmes have built their careers on speaking on the importance of diversity in the field, and how human-centered design should encompass potential users of all different races, genders, and abilities."[54] Only some of these approaches and practitioners, however, ask key

questions about how to do design work in ways that truly respond to, are led by, and ultimately benefit the communities most targeted by intersectional structural inequality.

The question of community accountability and control in supposedly inclusive design processes has recently come to the fore in public conversations about civic tech. Daniel X. O'Neil, one of the key early actors in the field, has written a blistering critique of civic tech's lack of community accountability or connection to existing social movements.[55] Artist, educator, and community technologist Laurenellen McCann calls for technologists to "build with, not for."[56] Both find fault with civic tech's frequent solutionism, disconnection from real-world community needs, and tech-centric ideas about how to address difficult social problems, as well as for ongoing reproduction of white cis male "tech bro" culture that alienates women, trans* folks, B/I/PoC, Disabled people, and other marginalized communities.[57] This debate is the latest incarnation of a long-standing conversation about the relationship between communities and technology development that has animated shifts in theory, practice, and pedagogy across fields including design, software development, science and technology studies, international development, and many others over the years.

For example, as early as the 1960s, in parallel with the rise of the Non-Aligned Movement (formerly colonized countries across the Global South that hoped to chart a path away from dependency on either the United States or the USSR),[58] the *appropriate technology movement* argued that technology should be cheap, simple to maintain and repair, small-scale, compatible with human creativity, and environmentally sustainable.[59] Writings by economist E. F. Schumacher[60] and popular manuals such as Stewart Brand's *Whole Earth Catalog*[61] focused attention on small, local economies powered by appropriate technology, and countercultural movements throughout the 1960s spawned thousands of organizations dedicated to locally governed, environmentally sustainable technologies that could be adapted to the contexts within which they were embedded, in opposition to one-size-fits-all megaprojects championed by both Cold War powers as keys to "international development."[62]

In Scandinavia, the field of participatory design (PD) was created by trade unionists working with software developers such as Kristen Nygaard. They hoped to redesign industrial processes, software interfaces, and workplace decision-making structures.[63] In PD, end users are included throughout. Philosopher of science, technology, and media Peter Asaro describes PD as "an approach to engineering technological systems that seeks to improve them by including future users in the design process. It is motivated primarily by an interest in empowering users, but also by a concern to build systems better suited to user needs."[64] Like many scholars, Asaro traces the roots of PD to the Norwegian Industrial Democracy Project (NIDP). In the 1960s, Scandinavian designers and researchers were concerned with the ways that the introduction of new technology in a workplace is often used to eliminate jobs, deskill workers, and otherwise benefit the interests of owners and managers over the interests of workers.

The collective resources program of NIDP centered on bringing choices about technology into the collective bargaining process. According to Asaro, British researchers at the Tavistock Institute focused on a parallel strand of research about individual worker empowerment through technology design, known as *sociotechnical systems design*. Asaro also points to the UTOPIA project as the canonical first successful instance of PD. UTOPIA was a collaboration among the Nordic Graphic Workers Union, researchers, and technologists, who worked with newspaper typographers to develop a new layout application. UTOPIA was developed after earlier PD experiments had failed, in part because of the creative limitations of existing technologies.

For decades, software developers employing PD have met at the biannual Participatory Design Conference.[65] PD has been widely influential and has spread to fields such as architecture and urban planning,[66] computer software,[67] public services, communications infrastructure, and geographic information systems,[68] among others. The Nordic approach to PD is also characterized by an emphasis on the normative value of democratic decision making in the larger technological transformation of work, not only the microlevel pragmatic benefits of improved user interface design. However, in the US context, this broader concern is often lost in translation. Here, PD has sometimes (at worst) been reduced to an extractive process to gather new product ideas.[69]

From the 1980s through the early 2000s, a parallel set of concepts was developed by scholars such as Eric Von Hippel, whose studies of lead user innovation demonstrated that the vast majority of innovation in any given technological field is performed not by governments or formal research and development branches of corporations, but by technology end users themselves.[70] This insight led to changes in product design approaches across a wide range of fields. Technology appropriation researchers such as Ron Eglash[71] and Bar, Weber, and Pisani[72] have shown that user practices of hacking, modifying, remixing, and otherwise making technologies work for their own ends are enacted quite commonly across diverse contexts. Whereas lead user innovation focuses on the hacks that people implement to make technologies serve their needs, and technology appropriation theory centers activities outside of formal product or service design processes, human-centered design emphasizes better understanding of everyday user needs and experiences in professional technology design and development.[73] By the 1990s, design consultancies such as IDEO emerged to champion (and capitalize on) this approach by selling HCD and design thinking as a service to multinational firms, governments, educators, and NGOs.[74] An extensive community of practitioners and scholars also clusters around the term *codesign*, often used as an umbrella that includes various approaches to PD and HCD. This approach is reflected in the journal *CoDesign*, in annual codesign conferences, and in the appearance of the concept across multiple fields.[75]

In the tech sector, *lean product development*, an approach that emphasizes early and frequent tests of product assumptions with real-world users, has largely replaced top-down "waterfall" design approaches as established best practice.[76] This shift has been increasingly influential in civic tech and government tech circles as well. Lean and HCD approaches to civic tech led to innovations such as 18F, a unit within the federal government's General Services Administration (GSA) that is focused on bringing software development best practices to government, as well as the Chicago User Testing group (CUTgroup), based on the experience of the Smart Chicago Collaborative and meant to promote the inclusion of end users in product design.[77] These approaches certainly increase end user input into key design decisions, but most of them have little to say about community accountability, ownership, profit sharing, or credit for innovation.

Power Dynamics and the Ladder of Participation

Power shapes participation in all design processes, including in PD, and the politics of participation are always intersectionally classed, gendered, and raced. Asaro outlines several challenges in PD projects: for one, it's not enough to have end users simply join design meetings. In a workplace context (or in any context), some users will feel they have more power than others. For example, workers participating in a PD meeting with managers at the table may not feel comfortable saying what they mean or sharing their full experience. The same may be the case in any PD process in which socially dominant group members are in the same room as marginalized folks, but without skilled facilitation. In addition, engineers and professional designers may control the "PD" process relatively easily, based on their "expert" knowledge. What's more, according to Asaro, gender inequality shapes participation in design processes: "In many work contexts, the positions traditionally occupied by women are often viewed as being of lower value by management and unions. This undervaluing of women's work easily overflows into inequalities of participation in design activities, especially when combined with social prejudices that view technological design as a masculine pursuit. Unless gender issues in the design process are recognized and dealt with, there exists a strong possibility of gender inequalities being built into the technology itself."[78] In the worst case, PD processes may actually normalize cultural violence through seemingly participatory processes. As design scholar and practitioner Ramesh Srinivasan says, "Foucault points out that cultural violence is perpetuated through seemingly inclusive systems, what one today might describe as liberal or neoliberal. These systems appear democratic, yet in practice they subordinate beliefs and practices not in line with those who manufacture discourse and manipulate media and technology systems to maintain their power and privilege."[79]

Participatory Design, Community Knowledge Extraction, and Non-extractive Design

Many design approaches that are supposedly more inclusive, participatory, and democratic actually serve an extractive function. Sometimes this is intentional, as in design workshops run by

multinational corporations with potential end users, in which the goal is explicitly to generate ideas that will then be turned into products and sold back to consumers.[80] More frequently, the intentions of the designers are good. Well-meaning designers employ PD techniques for a wide range of reasons. For one thing, the process of working with community members is enjoyable. It feels good to elicit design ideas and possibilities from "nondesigners," it can be quite fun and engaging for everyone involved, and it can feel empowering for both design professionals and community members. Unfortunately, this does not change the fact that in most design processes, the bulk of the benefits end up going to the professional designers and their institutions. Products, patents, processes, credit, visibility, fame: the lion's share goes to the professional design firms and designers. Community members who participate in design processes too often end up providing the raw materials that are processed for value further up the chain. Design justice practitioners are working to rethink extractive design processes and to replace them with approaches that produce community ownership, profit, credit, and visibility.

Legal scholar Barbara L. Bezdek, theorizing what she terms *development justice*, notes: "Sherry Arnstein, writing in 1969 about citizen involvement in planning processes in the United States, at the height of American racial and economic tensions, described a typology of citizen participation arranged as a ladder with increasing degrees of decision-making clout ranging from low to high. The Arnstein rungs ascend from forms of 'window-dressing participation,' through cursory information exchange, to the highest levels of partnership in or control of decision-making."[81] Bezdek revisits the Arnstein rungs and rethinks the rules that govern public participation in urban economic redevelopment projects. She proposes a revised set of principles for civic engagement, and a series of actions toward development justice. Arnstein's ladder might also be useful to further articulate community participation in any design process.

Consider figure 2.3, in which the X axis represents the design phase (in this case, based on the widely used five-phase model from the Stanford d.school), and the Y axis represents the degree of participation by people from the communities most affected by the design project (following Arnstein's ladder). Each horizontal wavy line represents a (hypothetical) visual shorthand for how community participation unfolds across the life cycle of an individual design project. Put aside for the moment the fact that design does not really proceed along a linear path from phase to phase and that there are many, many different design process models.[82] In reality, phases have porous boundaries and are revisited multiple times during the project life cycle. The point is to encourage a more complex understanding of participation and to emphasize that very few design processes are characterized by community control throughout. A version of this diagram may be a useful heuristic for thinking through questions of community participation, accountability, and control. A simple image that represents the participation waveform of a design project might be used in design criticism to analyze

case studies, or it might be used by design justice practitioners to think through concrete community accountability and control mechanisms in projects that we work on.

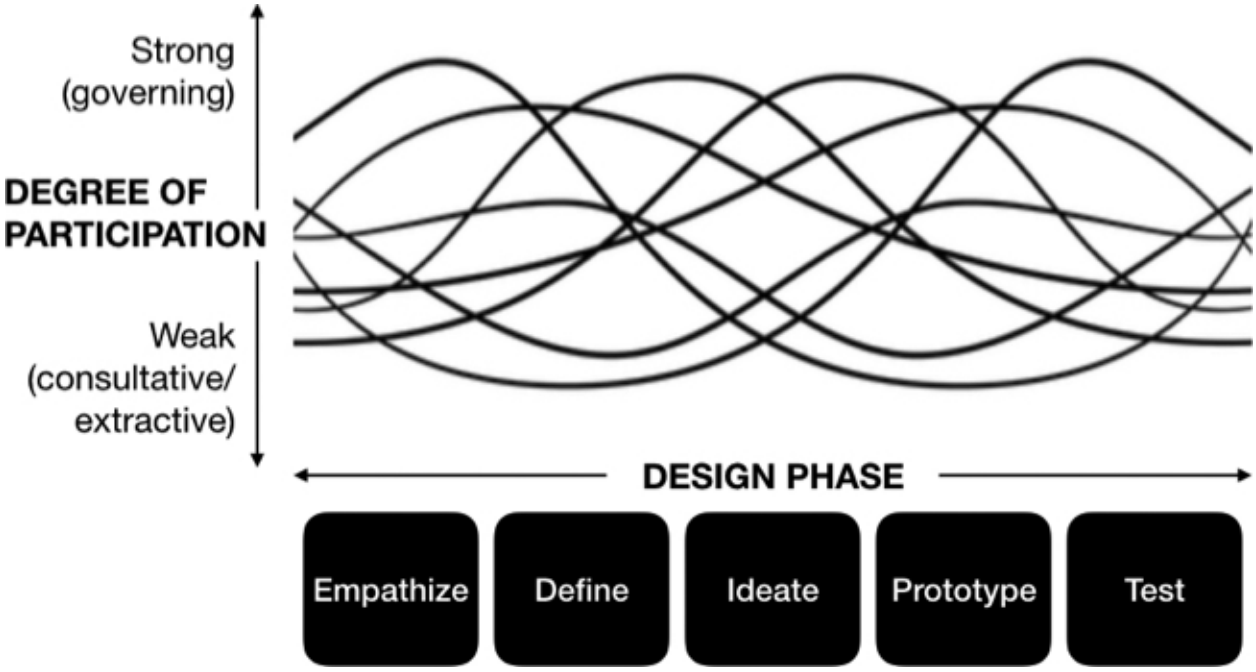

Figure 2.3 Analysis of community participation throughout the design process. *Source:* Author.

Design Justice as Community Organizing

Design justice practitioners must also engage with fundamental questions about the definition of *community*. It is possible to criticize simplistic conceptions of community and representation without throwing up our hands and accepting the Thatcherite position that "there is no such thing as society."[83] The question of what a community is and how we can know what it wants is the domain of democratic theory and political philosophy. It is also a key question for fields including urban planning, participatory action research (PAR), development studies, and PD, among others.[84]

Design justice practitioners choose to work in solidarity with and amplify the power of community-based organizations. This is unlike many other approaches to PD, in which designers partner with a community but tend to retain power in the process: power to convene and structure the work, to make choices about who participates, and, usually, to make key decisions at each point. Analysis of political power in the design process—who sits at the table, who holds power over the project, what decision-making process is used—will be fundamental to the successful future articulation of design justice in theory and practice.

Ultimately, at its best, a design justice process is a form of community organizing. Design justice practitioners, like community organizers, approach the question of who gets to speak for the community from a community asset perspective.[85] This is rooted in the principle that wherever people face challenges, they are always already working to deal with those challenges; wherever a community is oppressed, they are always already developing strategies to resist oppression. This principle underpins what Black feminist author adrienne maree brown calls *emergent strategy*.[86] Emergent strategy grounds design justice practitioners' commitment to work with community-based organizations that are led by, and have strong accountability mechanisms to, people from marginalized communities. This contrasts with most other design approaches; even those that aim to involve users, citizens, or community members typically do so in a consultative process that ultimately is led by the professional designers. There are also many design approaches, including value sensitive design but also especially in urban planning, that seek "multi-stakeholder" participation. A typical design project focused on, say, gentrification and displacement might convene people representing as many of the different interests (stakeholders) as possible, such as long-time residents facing displacement; new, wealthier residents seeking housing; landlords; developers; planners; city officials; and so on. In contrast, a design justice project might engage with all these kinds of actors in the research phase, but then work closely with, and under the leadership of, organizations that represent those most directly harmed by gentrification and displacement.

Disability Justice and Queer Crip Design

So far, this chapter has explored PD as one pathway toward community accountability and control. It turns now to additional lessons from the disability justice movement. As discussed in chapter 1, Disability rights and Disability justice activists popularized the phrase "nothing about us without us" in the 1980s and 1990s.[87] These linked movements have had an extensive impact on the design of everything from the built environment to human-computer interfaces, from international architectural standards to the technical requirements of broadcast media and the internet, and much more. For example, Gerard Goggin and Christopher Newell explore the ways that disability is constructed in new media spaces, as well as how Disabled people have organized to shape those spaces over time.[88] Elizabeth Ellcessor's recent scholarship considers the importance of these movements to the development of media technologies, from closed captioning to the Web Content Accessibility Guidelines, and from the implications of copyright for accessible content transformation to the possibility of collaborative futures designed through coalitional politics.[89]

Over time, disability rights and justice scholars and activists pushed for a shift from the medical model of disability, which locates disability within individual "dysfunctional" bodies, toward the social-relational model: that is, an analysis of how disability is constructed by culture, institutions, and the built environment, which are all organized in ways that privilege some bodies and minds over others.

For example, the medical model might seek "solutions" for wheelchair users that would help them stop using wheelchairs, whereas the social-relational model might seek to ensure that buildings, streets, and bathrooms are all constructed to allow mobility for both wheelchair users and non-wheelchair-users.[90] Disability justice work, developed by queer and trans* people of color (QTPOC), has also developed an analysis of the interlocking nature of able-bodied supremacy, racial capitalism, settler colonialism, and other systems of oppression. According to Patty Berne, cofounder and executive director of QTPOC performance collective Sins Invalid, disability justice is built on the principles of intersectionality, leadership of those most impacted, anti-capitalist politic, cross-movement solidarity, recognizing wholeness, sustainability, commitment to cross-disability solidarity, interdependence, collective access, and collective liberation; a disability justice analysis recognizes that "the very understanding of disability experience itself is being shaped by race, gender, class, gender expression, historical moment, relationship to colonization, and more. … We don't believe human worth is dependent on what and how much a person can produce. We critique a concept of 'labor' as defined by able-bodied supremacy, white supremacy, and gender normativity. … We value our people as they are, for who they are."[91] Disability justice is to the disability rights movement as environmental justice is to mainstream environmentalism. Scholars, activists, and cultural workers like Patty Berne, the Sins Invalid collective, Alison Kafer, Leah Lakshmi Piepzna-Samarasinha, Aimi Hamraie, and many others have extensively documented this history and have developed tools for intersectional feminist, queer, and Crip analysis and practice.[92]

Another lesson from disability activism is that involving members of the community that is most directly affected by a design process is crucial, both because justice demands it and also because the tacit and experiential knowledge of community members is sure to produce ideas, approaches, and innovations that a nonmember of the community would be extremely unlikely to come up with.

A third key lesson is that it is entirely possible to create formal community accountability and control mechanisms in design processes, and that these can in part be institutionalized. Institutionalization of disability activists' victories proceeded through a combination of grassroots action, lawsuits,[93] policymaking (the Americans with Disabilities Act), and lobbying standards-setting bodies to create and enforce accessibility standards. For these activists, it was important to pressure multiple actors, including lawmakers, government agencies, universities, and private sector firms, to change research and design practices, adopt new approaches, and implement new standards of care.[94] Although these victories are only partial and there is an enormous amount of work to do to deepen the gains that have been secured, disability justice must be a key component of design justice theory and practice.

#MoreThanCode: Findings from the Technology for Social Justice Project

The final section of this chapter explores key findings about community-led technology design practices from #MoreThanCode. *#MoreThanCode* is a PAR report that amplifies the voices of diverse technology practitioners in the United States who speak about their career paths, visions of how technology can be used to support social justice, and experiences of key barriers and supports along the way. The project was coordinated by Research Action Design (RAD.cat) and the Open Technology Institute at New America (newamerica.org/oti), with research partners Upturn, Media Mobilizing Project, Coworker.org, Hack the Hood, May First/People Link, Palante Technology Cooperative, Vulpine Blue, and the Engine Room.[95] I was part of the coordination team for the project from 2016 to 2018, and I was the lead co-author of the report that we produced, together with Maya Wagoner, Berhan Taye, Caroline Rivas, Chris Schweidler, Georgia Bullen, and the Tech for Social Justice Project (T4SJ). As a PAR project, all research partner organizations worked together to develop the research questions, study design, data collection and analysis, conclusions, and recommendations. Over a period of two years, we interviewed 109 practitioners and conducted eleven focus groups, with seventy-nine participants. Interviewees and focus group participants were quite diverse in terms of sexual orientation, gender identity, race/ethnicity, education, geography, and other factors.[96] The first of the report's five key recommendations is "'Nothing About Us Without Us': Adopt Co-Design Methods and Concrete Community Accountability Mechanisms."[97]

Across the ecosystem of social justice and public interest technologists, we found that practitioners know the importance of real engagement with community-based organizations at all stages of the design process. For example, Charley (not their real name), executive director at a technology nonprofit, put it this way: "I think what happens is that people are so quick to say, 'Oh, I got a tool for that.' That's not what we do. We should be listening to the needs of the community. We should be centering the needs of the community over everything else, as our vision. That's sort of like, basic."[98] Study participants from every sector (government, for-profit, nonprofit, and social movement) said that people need to be involved in technology design that is supposed to benefit them. Community-driven design means that communities get to make critical decisions throughout the process; along the way, this approach helps community members develop technical knowledge and skills. For example, Heiner (executive director of a legal service organization) emphasized the importance of having people who are poor, undocumented, seeking housing, and/or have dealt with the criminal justice system at the table when creating civic tech apps that are supposed to be for them. Hibiki, a digital security trainer, put it this way: "[Community-led design is] all about developing tools and technology along with the people that it's meant to serve. Just, in general, I think adopting any type of participatory approach from the beginning is usually super helpful, and also enables people to actually

want to use this technology."[99] One concrete accountability mechanism that practitioners suggest is community advisory boards or governing councils that can guide and own design processes.

In contrast, civic tech projects that lack community leadership tend to fail. Several interviewees used civic gamification platforms as examples. Hardy, a technology capacity builder and crisis response specialist, said: "[These] platforms tried to get people engaged with civic planning without understanding that they had to be able to implement what people were talking about. You can't just ask people for their opinion. You also have to act on their opinion."[100] Even when there is a clear need for a new tech solution, community-specific user research should precede design and development. According to Lulu, a funder at a national foundation: "We funded an earned income tax credit tool [because] … unfortunately billions of dollars each year go unclaimed by the working poor because they don't know they're entitled to it. So, we built a system like that, and it got a lot of usage in English, but when we built it in Spanish and Vietnamese almost nobody used it. … So either we don't understand how to deliver technology to these special language groups, or we're not doing the right outreach, or it's not culturally appropriate, I don't know."[101]

Projects with good intentions are not immune from failure, and can even cause inadvertent harm. Alda, a program manager at a national organization, helped build an SMS voter registration system, but the project team then built a voting component into the tool that had the potential to expose community members' voting history: "It was kind of just built because it could be built. … There was no analysis on the political context of what could happen if they started using that and different groups got hold of telecoms and could ask telecoms to turn over that data. SMS is clear text. It's very easy to see then who you voted for, depending on what your mobile number was. There's just so many things wrong with that. I feel like that was something built with good intentions, but they did not do any of the risk modeling that they should have done."[102] Thinking that tools provide silver bullets without taking the time to really understand community contexts is also a recipe for failure. #MoreThanCode study participants shared many stories of failed projects; frequently, those projects jumped too quickly to "solutions" and were tool-centric. At best, this approach tends to waste scarce resources and time. Tivoli describes one failed project that stood out for her as a user researcher—an iPad-based self-assessment tool for elderly people: "It completely failed, because it was a technology solution. I don't remember if it was the same group that redid it or if it was a parallel project, but someone did a brochure, and it was much more successful. … We don't have to always make an app for it."[103]

Before deploying new tools, it's essential to verify whether they meet organizational needs. Although organizations may be eager to adopt new technologies, pushing the wrong tool can result in backlash, mistrust, and, over the long run, even greater inefficiency. For example, one practitioner described an example in which a consultant foisted an unnecessarily complicated new database on an organization,

and staff became so frustrated that they abandoned databases altogether and went back to time-consuming paper processes. What ultimately matters is not tool adoption: it is people's struggles and their lived experiences. Gertruda, a digital security researcher, put it this way: "The struggle is not access to encryption tools. It is organizing day labor communities in order to protect against ICE raids and things like that. We're confusing means and ends."[104]

We also heard from many practitioners that funders tend to support "techie parachuters" for a quick fix, instead of investing to build capacity within a community. These quick fixes are not sustainable, as Charley notes: "We have funders that will fund large organizations who have large amounts of money to fly in to communities of color and basically tell them, this is how things should be done. We disagree. I disagree with that methodology and that strategy. One is that there are people within the communities already with knowledge, or lots of knowledge, who are not being lifted up. Two, we believe that if we're really going to build power, we need to build power in the communities, which means we need to let go of our ego and we need to sort of build, mentor, build that power in the community, build the skills there."[105] Several practitioners said that funders need to listen to community organizers, not only to techies. However, too frequently designers and technologists who occupy privileged positions within the matrix of domination influence funder decisions about who should receive resources. They also get to decide what tools are considered "cool," without much consideration for community context or the broader implications of their preferred approach.[106]

After talking with designers, developers, researchers, community organizers, funders, and other practitioners around the country, the T4SJ Project synthesized hundreds of concrete suggestions for community accountability into the following recommendations:

> **Adopt codesign methods.** This means spending time with a community partner, in their space, learning about needs, and working together through all stages of design. Usually, no new tech development is necessary to address the most pressing issues. Codesign methods have a growing practitioner base, but they could be better documented.
>
> **Develop specific, concrete mechanisms for community accountability.** Nearly all interviewees said that the people most affected by an issue have to be involved throughout all stages of any tech project meant to address that issue. All actors in this field need to move past stating this as a goal and toward implementing specific, concrete accountability mechanisms. For example: funders should require concrete community accountability mechanisms from their grantees, and educators should center community accountability in education programs.
>
> **Center community needs over tools.** Community needs and priorities must drive technology design and development, and technology is most useful when priorities are set by those who are

not technologists. Be humble and respect community knowledge. Process and solution should be driven by the community; do not make community members token participants.

Invest in education (both formal and informal) that teaches codesign methods to more practitioners. Support existing efforts in this space, create new ones, and push existing educational programs and institutions to adopt codesign perspectives and practices.

Create tech clinics, modeled on legal clinics. Public interest law and legal services work are client-oriented, and lawyers doing this work are constantly interacting with people who need to navigate larger unequal systems. This is considered part of their legal education. Tech can learn from this model.

Avoid "parachuting" technologists into communities. In general, parachuting is a failed model. Don't do it. Stop parachuting technologists into organizations or focusing on isolated "social good" technology projects, devoid of context, when the real need is capacity building. We are not saying "never bring someone in from outside a community." … We do think that it is worthwhile to develop better models for sharing local knowledge with national groups and for national groups to share their perspectives with local groups in such a way that all parties can benefit.

Stop reinventing the wheel! Well-meaning technologists often reinvent the wheel, without researching existing solutions. Designers, developers, and project leads, no matter what sector they are in, should begin projects by researching existing projects and organizations. This also stems from competitive, rather than collaborative, mindsets ("ours will be better, so we'll just compete"). It is important to work together to develop shared tools and platforms, instead of only competing for scarce technology resources.

Support maintenance, not just "innovation." Significant resources are necessary to maintain and improve existing movement tech, but most focus is on the creation of new projects. We need more resources to update, improve, and maintain already proven tools.[107]

Conclusions

Ultimately, although all people design, only some people are employed as design professionals. Unfortunately, access to paid design work is deeply unequal and is shaped by the matrix of domination. Although the larger problem is structural, individual design firms can help if they develop inclusive hiring and retention plans, publicize specific targets and dates for staff, leadership, and board diversity, adopt best practices in accountable community partnerships, and share profits and credit with community partners.

Beyond employment equity, design justice requires full inclusion of, accountability to, and ultimately control by people with direct lived experience of the conditions the design team is trying to change. Not only is community leadership ethical, but also, the tacit and experiential knowledge of community members is sure to produce ideas, approaches and innovations that no one else would be able to create. People's lived experiences of race, class, gender identity, sexual orientation, disability, immigration status, language, age, and so on structure variance in user product needs, as well as access to the resources that are needed to address those needs. There are several approaches to design practice that recognize these dynamics and attempt to address them, at least in part. These include human-centered design, participatory design, and codesign, among others.

Human-centered design (HCD) includes end-users in the design process through various strategies; it focuses on better-matched affordances and improved user experience. This is good—but it has little to say about values, community accountability or control, or the ultimate distribution of benefits such as profits or attention. It may be used by any institutional actor, and it may be used for extractive design processes that gather ideas from marginalized communities, create products, and sell them back to that community (or elsewhere). Participatory design (PD) and codesign, in contrast, attempt to include end users throughout the design process. Most PD processes also aim to develop feelings of investment and ownership in the outcome by all participants, and many PD practitioners are also deeply concerned with questions of community accountability. However, the discourse of PD has in some cases been co-opted, on the one hand by university-based researchers, and on the other by multinational firms, governments, and other powerful institutions. PD, like HCD, is sometimes used for extractive processes that gather community input but primarily produce benefits for the careers of professional design researchers and practitioners. PD processes sometimes, but not always, have formal community accountability mechanisms, and do not always center community power and control.

Design justice is aligned with and draws from the history of PD, and may employ specific techniques from PD, codesign, and HCD. However, it also focuses on concrete mechanisms for community control, is linked to a disability justice analysis, and explicitly attends to the distribution of design's benefits and burdens according to the matrix of domination. Design justice proposes a shift in the unaccountable and deeply inequitable state of affairs in design practice at several levels, including toward a more inclusive professional design workforce, as well as recognition of and resources for community-led, Indigenous, and diasporic design practices. This requires work at many levels, from micro to macro, from individual design projects all the way up to transnational standards bodies.

At the micro level, individual professional designers from various design fields can learn how to participate in community-led processes by bringing our skills and resources to the table, rather than seeking community members to participate in processes that we initiate and control. Design teams can

adopt strategies for community accountability and control, such as inclusion of community members with direct lived experience of the design problem, intersectional user story validation and testing, and formal memoranda of understanding (MOUs) or working agreements that set clear expectations about project roles, decision making, and ownership of design products. Formal agreements are especially important when working with historically marginalized communities but also apply to any design process. A design justice framework also requires gathering resources to enable meaningful community participation and shared ownership.

Design justice can help guide us in the long-term struggle to transform institutions such as professional associations, universities, and standards bodies so that they are more accountable to communities that are marginalized within the matrix of domination. In universities, a design justice approach can shift the way design is taught (chapter 5) and help develop a generation of designers who practice community leadership, accountability, and control. Standards bodies can adopt and promote standards that include community accountability, as well as an intersectional approach to benchmarks, testing, and audits. At the level of the nation-state (as long as nation-states exist), we need policy changes to shift priorities toward research and design that center the needs of historically marginalized communities, incentivize formal community accountability and control mechanisms, discourage extractive approaches to design work, and provide far greater resources for already-existing networks of community-based design practitioners.

Footnotes

1. Wakabayashi 2017. ↩
2. For refutations of the memo's arguments, see Sadedin 2017; Fuentes 2017; Johnson 2017; and Barnett and Rivers 2017. Eagly (2017) argued that there is some support for the memo's claims about biological differences between men and women, but not for the author's conclusions about diversity policies. Some scholars supported the memo; for an attempt to summarize scientific arguments on both sides, see Stevens and Haidt 2017. For an overview, see Molteni and Rogers 2017. ↩
3. Wiener 2017; Bogost 2017. ↩
4. Zaleski 2017. ↩
5. Waxman 2017. ↩
6. Shetterly 2017. ↩
7. Volz 2017. ↩
8. Angwin et al. 2016. ↩

9. Eubanks 2018. ↩
10. Lyons, It's Going Down, and Bromma 2017; see https://www.politicalresearch.org/2017/01/20/ctrl-alt-delete-report-on-the-alternative-right. ↩
11. Tyson and Maniam 2016; CNN 2016. ↩
12. Papanek 1974. ↩
13. Wajcman 1991; and see Chanda Prescod-Weinstein's "Decolonising Science Reading List" at https://medium.com/@chanda/decolonising-science-reading-list-339fb773d51f; see also Beatrice Martini's "Decolonizing Technology: A Reading List" at https://beatricemartini.it/blog/decolonizing-technology-reading-list.

↩
14. National Center for Women & Information Technology 2018. ↩
15. Nafus, Leach, and Krieger 2006, cited in Dunbar-Hester 2014. ↩
16. See the report *Breaking the Mold: Investing in Racial Diversity in Tech,* http://breakingthemold.openmic.org. ↩
17. See the *Mother Jones* exposé "Silicon Valley Firms Are Even Whiter and More Male Than You Thought," by Josh Harkinson (2014), based on data gathered through FOIA requests. Later, Google released its own data at http://googleblog.blogspot.com/2014/05/getting-to-work-on-diversity-at-google.html. See also Swift 2010. ↩
18. See Thurm 2018. ↩
19. Skinner 2006. ↩
20. Kleiman, n.d. ↩
21. Google 2014. ↩
22. Silbey 2018; Hicks 2017. ↩
23. Dunbar-Hester 2017. ↩
24. Weeden, Cha, and Bucca 2016; Wilson 2016; and Arce and Segura 2015. ↩

25. For an excellent review of this literature, see Gardner, n.d. ↩
26. Kushi and McManus 2016. ↩
27. Irani 2015. ↩
28. Herring, 2009. ↩
29. For example, see Kochan et al. 2003. ↩
30. OpenMIC 2017. ↩
31. Hunt, Layton, and Prince 2015. ↩
32. Hunt, Layton, and Prince 2015. ↩
33. Penny 2014. ↩
34. See https://www.usability.gov/what-and-why/user-centered-design.html. ↩
35. For example, see the analysis of the design process for two virtual cities in the Netherlands, by Oudshoorn, Rommes, and Stienstra (2004). ↩
36. Hamraie 2013. ↩
37. See http://contratados.org/. ↩
38. Melendez 2014. ↩
39. Von Hippel 2005. ↩
40. Schmider 2016. ↩
41. It is beyond the scope of this section to more fully explore the arguments about why, under these conditions (unmet user product specifications for specific groups of users), markets often fail to produce new firms that in theory should emerge to cater specifically to unmet user needs. Suffice it to say that as of the time of writing, gender non-conforming people's specific user needs have not been met by dating app markets. ↩
42. Nielsen 2012. ↩
43. See Userforge.com ↩
44. Guo, Shamdasani, and Randall 2011. ↩

45. Long 2009. ↩
46. Norman 1990, 16. ↩
47. For more on phenomenological variation, see Ihde 1990. ↩
48. Flower et al. 2007. ↩
49. Wittkower 2016, 7. ↩
50. Wittkower 2016, 7. ↩
51. Chris Schweidler from Research Action Design, cofounder of the Research Jus- tice track at AMC, remixed this saying and turned it into a hilarious operating table meme that illustrates it best. ↩
52. Von Hippel 2005; Schuler and Namioka 1993; and Bardzell 2010. ↩
53. See https://airbnb.design/anotherlens. ↩
54. Miller 2017. ↩
55. O'Neil 2016. ↩
56. McCann 2015; and see http://www.buildwith.org. ↩
57. See the web magazine *Model View Culture* at modelviewculture.org for excellent summaries of these critiques. ↩
58. Prashad 2013. ↩
59. Pursell 1993. ↩
60. Schumacher 1999. ↩
61. Turner 2010. ↩
62. Willoughby 1990. ↩
63. Gregory 2003. ↩
64. Asaro 2000. ↩
65. Bannon, Bardzell, and Bødker 2019. ↩
66. Sanoff 2008. ↩

67. Muller 2003. ↩
68. Dunn 2007. ↩
69. Byrne and Alexander 2006. ↩
70. Von Hippel 2005. ↩
71. Eglash 2004. ↩
72. Bar, Weber, and Pisani 2016. ↩
73. Steen 2011. ↩
74. See IDEO's design toolkit at https://www.ideo.com/post/design-kit. ↩
75. Sanders and Stappers 2008. ↩
76. Ries 2011. ↩
77. O'Neil 2013. ↩
78. Asaro 2014, 346. ↩
79. Srinivasan 2017, 117. ↩
80. For example, see the work of Jan Chipchase at Nokia: http://janchipchase.com/content/essays/nokia-open-studios. ↩
81. Bezdek 2013. ↩
82. For a humorously framed sampling of design process diagrams, see https://designfuckingthinking.tumblr.com. ↩
83. Thatcher 1987. ↩
84. Fals-Borda 1987; White 1996. ↩
85. Mathie and Cunningham 2003. ↩
86. Brown 2017. ↩
87. Charlton 1998. ↩
88. Goggin and Newell 2003. ↩

89. Ellcessor 2016. ↩
90. Kafer 2013. ↩
91. From "10 Principles of Disability Justice," by Patty Berne on behalf of Sins Invalid, quoted in Piepzna-Samarasinha 2019, 26–28. ↩
92. Kafer 2013; Piepzna-Samarasinha 2018; and see https://www.sinsinvalid.org ↩
93. For example, see https://www.d.umn.edu/~lcarlson/atteam/lawsuits.html. ↩
94. Another example of a social movement shifting research and design is the AIDS Coalition to Unleash Power (ACT UP!), which transformed both the state of bio- medical research on HIV and the accessibility of treatment through a potent mix of direct action, media savvy, and policy lobbying. See Shepard and Hayduk 2002. ↩
95. The project was funded and advised by Code for America and NetGain. ↩
96. Detailed information about the project methodology is available at https://more thancode.cc; we also analyzed secondary data, such as IRS form 990 data, for over thirteen thousand relevant nonprofits. ↩
97. The report was coauthored by Sasha Costanza-Chock, Maya Wagoner, Berhan Taye, Caroline Rivas, Chris Schweidler, Georgia Bullen, and the T4SJ Project and is available at https://morethancode.cc. See Costanza-Chock et al. 2018. ↩
98. "Charley" (all interviewee names were changed for anonymity), interviewed in Costanza-Chock et al. 2018. ↩
99. "Heiner" and "Hbiki" in Costanza-Chock et al. 2018. ↩
100. "Hardy" in Costanza-Chock et al. 2018. ↩
101. "Lulu" in Costanza-Chock et al. 2018. ↩
102. "Alda" in Costanza-Chock et al. 2018. ↩
103. "Tivoli" in Costanza-Chock et al. 2018. ↩
104. "Gertruda" in Costanza-Chock et al. 2018. ↩
105. "Charley" in Costanza-Chock et al. 2018. ↩
106. "Matija" in Costanza-Chock et al. 2018. ↩

107. Costanza-Chock et al. 2018. ↩