Technology Against Technocracy: Toward Design Strategies for Critical Community Technology

by

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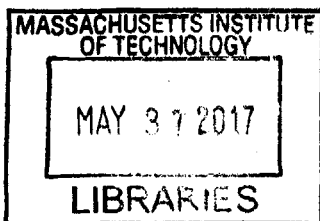
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Abstract

This thesis develops an intersectional, critical analysis of the field of practice known as Civic Tech and highlights other relevant community-organizing and activist practices that utilize technology as a central component. First, I develop critiques of Civic Tech as a dominant technocratic, neoliberal approach to democracy and bureaucracy and trace the history and intellectual genealogy of this specific movement. I then highlight civic technologies outside of the field of Civic Tech that have resulted in more redistributive and democratic outcomes, especially for Black people and other people of color. Finally, I define a research and design practice called Critical Community Technology Pedagogy that is demystificatory, multi-directional, transferable, and constructive, and draws upon examples from the Civic Lab for Environmental Action Research (CLEAR) in Newfoundland, Data DiscoTechs in Detroit, and the Center for Urban Pedagogy in New York City.

Thesis supervisor
Sasha Costanza-Chock
Associate Professor of Civic Media

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Introduction

Over the past few years, hundreds of millions of dollars have gone to support

innovation in government.[1] Around 2011, a bureaucratic reform movement called Civic Tech

emerged out of Silicon Valley, partially from earlier e-government and civic innovation projects,

but with a much stronger emphasis on open source software, transparency, and citizen

engagement in the software development process. The establishment of Code for America by

Jennifer Pahlka, with major backing by technical manual publisher and Silicon Valley idea-man,

Tim O'Reilly, generated an explosion of interest in bringing the philosophies of Agile Software

Development and Web 2.0 into government service delivery. Unfortunately, along with those

philosophies, and the benevolent image they are associated with, also came phantasms that

imported discrimination, societal structural inequalities, skewed power dynamics, and

capitalistic priorities.[2] What lessons from Silicon Valley have been imported into government

and "social good" industries, even inadvertently, and whose interests have they served? Why

are U.S. citizens willing to believe that success in business will improve government, civic

engagement, and community more broadly? What people do people who build technology for

the public interest, myself included, imagine government's problems to be?

My own introduction to the field of Civic Tech provides an instructive example. Initially, I

too was wooed by the promises of civic innovation. I knew people were engaging with

information technology in *some way*, for many hours a day, online, but were not necessarily

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[1] Mayur Patel et al., "The Emergence of Civic Tech: Investments in a Growing Field," *Knight Foundation*, 2013.

[2] D. Fox Harrell, *Phantasmal Media: An Approach to Imagination, Computation, and Expression* (Cambridge, Massachusetts: The MIT Press, 2013).

directing their engagement toward what I considered to be substantive issues. I believed that by incorporating lessons from the most popular web platforms, like Facebook, into community organizing and governance, decision-making power could be distributed and people who were previously marginalized by the official channels of public participation would gain deeper control over their own cities. In 2013, when I joined one of Code for America's volunteer Meetup groups, Code for San Francisco, I had recently graduated from college, was relying on supplementary nutrition assistance (commonly known as Food Stamps in the United States, and CalFresh in California), and had just finished studying to become a user experience designer at a small technology bootcamp called General Assembly. The group seemed like a perfect fit for my interests and needs. At General Assembly and in the user experience design community more broadly, the language of improving lives and solving problems was ubiquitous. The process for doing so seemed sound, but many of the "innovations" coming out of the startup scene, and even the Civic Tech scene, seemed like a misallocation of empathy, skill, and resources under the banner of improving lives. Whose lives were being improved? I did not understand why those concerned with ease of use and accessibility would choose to focus on the people with access to the most conveniences already. It seemed unjust that people without vast amounts of disposable income should be left out of the usability revolution. What was the point of technology if people (or ordinary people) could not use it? Previously, in my undergraduate studies, I had focused on the structural ways in which the actual users of public transit in Santa Cruz, who were overwhelmingly Latinx, were excluded from the transit planning process and urban planning more broadly, while those in predominantly white organizations, such as those that focused solely on sustainability and environmentalism, were fully supported to participate in the decision-making process.[3] My involvement in Code for San

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[3] Wagoner, Maya. "(Il)legible Sustainabilities: Public Participation in the Santa Cruz County Transportation Planning Process." Undergraduate Thesis, University of California, Santa Cruz, 2013.

Francisco was an extension of this line of questioning, as I sought to build a web platform for networked community organizing.

In addition to my interest in interface design and participation, many of my personal everyday tribulations had to do with the difficulty in getting, using, keeping, and understanding food stamps. These were annoyances added on top of my school work, attempts to find marginally affordable housing in San Francisco, and attempts to find stable employment. In the converted hotel in which I was living with around one hundred other tenants, government interfaces and trips to government offices were high stakes features of everyday life that took up an inordinate amount of time and caused a great deal of frustration. Code for San Francisco seemed like it should be a productive space to begin chipping away at all the small, but cumulative government interface headaches that myself and my co-tenants experienced every day. It seemed as though through collaboration and coding, we could solve a large portion of our interactions with government services and agencies.

However, it remained to be seen how the Civic Tech community would handle more politically charged issues in which structural inequalities and group identity were ignited. During this time, the Black Lives Matter movement was explosively unfolding, with cell phone videos of police brutality receiving more media attention than they ever had, and protests in what seemed like every city against the impunity with which police officers appeared to be operating. The Civic Tech community was focused on citizen-government interfaces, and while police were one way of interfacing with the government, this community did not think of the police as a technical or bureaucratic part of the system. Through conversations and a series of events within the brigade, I came to understand that the field of practice known as Civic Tech rested on two assumptions: first, that the government should be seen as ultimately the good and proper channel for solving problems, and secondly, that technology can only help and not

hurt. If these two statements could not be assumed to be true in a given project, it was not Civic Tech, but something else entirely.

At this point, it is useful to make a distinction between civic technologies more broadly, and Civic Tech. Civic technologies are any technologies that make a difference in the way decisions in the public sphere are made, or in the ways in which people relate to their own and other communities. I tend to agree with Langdon Winner's distinction between "inherently political technologies," such as the atomic bomb, which have properties that require a particular political arrangement (in the case of the atomic bomb, authoritarianism), in order to work, and the much more common category of technologies that are not inherently political, but through their design or implementation, become a way of "settling an issue in a particular community."[4] In the realm of technologies that serve a civic purpose, this may be the distinction between an application developed to make campaign finance information available to the public (inherently civic), and cell phone cameras and video-sharing platforms that allow regular people to record and publish videos of police misconduct (technology with a civic implication). "Civic Tech" refers to a very specific, and I would argue, technocratic movement founded in 2011 by Code for America that is dedicated to developing inherently civic technologies to make government and governance more efficient, innovative, and transparent. While the movement is helmed by Code for America, it has resulted in dozens of organizations, government offices, and startups that operate with flavors of this ideology. However, this is not the only ideology with which to build, use, and deploy civic technologies. Many users of technology are more worried about surveillance than transparency and may privilege privacy. Additionally, a number of the "innovations" and improvements to efficiency in the criminal

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[4] Langdon Winner, "Do Artifacts Have Politics?," Daedalus 109, no. 1 (1980): 121–36, 123.

justice system have led to what some might call a "disruption of due process,"[5] in that people are implicitly not given a fair trial when biased policing and sentencing algorithms factor into their trial. Rather than privileging the development of apps, or a focus on government, there are a wide variety of ways to use technology for civic and democratic outcomes, some of which I discuss in Chapters 3 and 4. Oftentimes, and especially within Civic Tech publications, conferences, and presentations, the distinction between Civic Tech as a specific framework with a specific ideology and civic technologies more broadly is lost. This leads to broad definitions of Civic Tech such as "the use of technology for public good,"[6] which subsume other specific ways of engaging with technology within this dominant framework.

In the first part of this thesis (Chapters 1 and 2), I discuss the history and intellectual genealogy of Civic Tech, as well as the problematic ways in which this movement sometimes prioritizes paradoxically *anti*-democratic arrangements and platforms. In the second part (Chapters 3 and 4), I discuss examples of civic technologies that fall outside of Civic Tech but result in more redistributive and democratic outcomes, especially for Black[7] people and other people of color.

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[5] Virginia Eubanks, "Digital & Data Privacy: Civil Rights Solutions for Good" (Panel Discussion, Library of Congress, June 21, 2016), http://nulwb.iamempowered.com/content/digital-data-privacy-civil-rights-solutions-good.

[6] Matt Stempeck, "Towards a Taxonomy of Civic Technology," *Microsoft on the Issues*, April 27, 2016, http://blogs.microsoft.com/on-the-issues/2016/04/27/towards-taxonomy-civic-technology/.

[7] Throughout this paper I have chosen to capitalize Black, and not white, when referring to racial and ethnic classifications. Due to the historical disruption of slavery, most people of African descent in the United States do not have the same belonging, knowledge of, or familial connections to ethnic groups before coming to America. Because of this, Black Americans have formed a unique ethnic group ("Black") that should be capitalized in the same way Italian-American or Mexican is. People who are white (e.g. French Canadian, Polish American, or German) do not have this same type of shared ethnic cohesion, but rather have another ethnic reference point. This is, however, disputed by white supremacist publications, which typically capitalize "white." When referencing surveys by others, I use whatever classification system and language the original survey used.

The Technology for Social Justice Field Scan

This thesis draws significantly from the Technology for Social Justice Field Scan, a research project led by Research Action Design and the Open Technology Institute. This ongoing project seeks to develop understandings of who is building, using, or critiquing technology for social justice, and how people enter into this work. I joined the project as an intern in the Summer of 2016, and over the past nine months, have worked with other members of the research team to interview twenty-three practitioners, develop an annotated bibliography and literature review, put together and categorize a list of over 600 organizations that are doing some type of public interest technology work, and run a workshop with around thirty Civic Tech practitioners at the Code for America Summit. We have recently begun to work in close collaboration with nine social justice-oriented technology organizations that do critical work in the space. A few of the interviews and a significant portion of the literature and other learning from this project has contributed to the following chapters.

Thesis Overview

This thesis is structured as follows:

In Chapter 1, "Incompatibilities," I show the ways in which many corporate software development practices commonly used in Civic Tech are incompatible with a redistributive, egalitarian community technology practice that works against historical systemic inequalities. I analyze how many of these failures are rooted in a both a focus on individual expertise rather than community, and in an attempt to transfer unjust practices into the civic sphere when alternate practices are necessary.

In Chapter Two, "Intellectual Genealogy of Recent Technocratic Movements for Social Good," I trace the intellectual genealogy of the Civic Tech movement as a case study of what

can happen when a user- and technology-centered process is used to drive a movement for social good. I locate Civic Tech within its own history of corporate software development discourse combined with the discourses of civic engagement, as well as within the larger history of people appropriating technology for their own purposes. Additionally, I draw loosely on the comparative method from the field of historical linguistics to help analyze the values and principles explicitly stated by organizations in this space to show the driving value systems behind different movements and moments in the technology for good ecosystem.

Chapter three is titled "Build with One Hand, Fight with the Other." In this chapter, I move away from Civic Tech and analyze design practices that critically consider the role of labor, sustainability, and culture when developing new tools and technologically mediated practices. I specifically focus on a group of community mesh wireless networks that address the roles of labor, ownership, and education in technological systems. I also look at projects that attempt to answer the question: how can design, as a practice for creating, dismantle and destroy oppressive systems? Additionally, I look at technologically-assisted practices ranging from mitigation or navigation within existing oppressive systems, to projects that enable questioning and imagining, to projects that actually dismantle as they build. I try to understand the role of "dark sousveillance," defined by Simone Browne as "an imaginative place from which to mobilize a critique of racializing surveillance, a critique that takes form in antisurveillance, countersurveillance, and other freedom practices,"[8] in our online publics, and how algorithmic filtering of contemporary social media platforms affects organizing spaces.

Chapter Four, "Critical Community Technology Pedagogy," is an argument for the role of a form of critical pedagogy as an integral part of a liberatory design practice. Rather than

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[8] Simone Browne, Dark Matters: On the Surveillance of Blackness (Duke University Press Books, 2015), 21.

centering design or rooting design research in client objectives, how can popular education and digital literacy be both motivators and outcomes of a decolonizing and redistributive design practice? I plot my concept of Critical Community Technology Pedagogy as a practice that demystifies systemic power inequalities, involves a multi-directional learning process, results in transferable skills, and constructs a new world as it constructs knowledge. I bring in examples of critical community pedagogical approaches to building and engaging with technology from the fields of marine biology research (Civic Lab for Environmental Action Research), community organizing (Detroit Digital Justice Coalition Data Discotechs), and information design (Center for Urban Pedagogy's Urban Investigations).

Chapter 1

Incompatibilities

How do corporate software development practices, with all their attendant value systems and priorities, influence civic, community, and activist work? Many such practices work well for an organization that is structured towards generating profits. However, when applied to projects that ostensibly have motives such as health, education, safety, or civic empowerment, they are often counterproductive. In this chapter, I look at five of the the ways in which the corporate software development practices that have been adopted by Civic Tech have resulted in anti-democratic or disempowering outcomes. First, I examine the ways in which the systemic exclusion of Black, Latinx, and many other people of color from positions of power is not meaningfully challenged, and is even reproduced, within Civic Tech spaces. Second, I reveal the ways in which Civic Tech is an expression of neoliberal shifts towards a shrinking of the state and the application of economic metaphors to previously civic goals. Third, I critique the techno-solutionist tendencies that result in a process that starts with technology and then looks to how people can be served, and thereby often places technology ahead of people. Fourth, I engage in a discussion of the ways in which design for government and for politics can often be stifling to political agonism, as defined by political theorists Carl Schmitt and Chantal Mouffe and design theorist Carl DiSalvo. Finally, I use examples to show the ways in which a focus on individual issues, as emphasized in the field of user- and human-centered design, rather than collective issues, can be helpful in many cases but unfortunately often continue to underserve people already marginalized by technology and affected by systemic and structural inequalities. Through this critical approach, I hope to begin

a conversation about the ways in which these traps can be avoided in order to create truly civic

and democratic technologies.

Exclusion of POC

When technological systems fail people of color, such as the recent HP camera that

failed to recognize dark skinned faces as faces,[9] the Google automatic image tagging that

tagged a pair of African-American friends as gorillas,[10] and the increased rates at which African

Americans are incorrectly assigned as high risk of recommitting a crime by criminal risk scoring

algorithms,[11] there is often a call for more diversity in the development teams of that software

that could provide adequate cultural sensitivity. This exclusion and disempowerment of Black

and Latinx people in technology production, and by technology production, is typically framed

as a "lack of diversity." I want to highlight, however, that the concept of "diversity," while often

contextually useful, comes out of the management literature and is often not an appropriate

framing to use in social movements. For example, Scott Page argues that businesses can be

more productive with greater intellectual diversity, which can come from many sources,

including but not limited to identity diversity.[12] The ultimate goal of this strategy is not

empowerment or redistribution, but an increase in innovation through a diversity of viewpoints.

As businesses, entities are primarily focused on increased profits, and this innovation via the

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[9] Adam Frucci, "HP Face-Tracking Webcams Don't Recognize Black People," *Gizmodo*, accessed April 29, 2017, http://gizmodo.com/5431190/hp-face-tracking-webcams-dont-recognize-black-people.

[10] Jacky Alciné, "Google Photos, Y'all Fucked Up. My Friend's Not a Gorilla.," Twitter Thread., (June 28, 2015), https://twitter.com/jackyalcine/status/615329515909156865?lang=en.

[11] Julia Angwin et al., "Machine Bias: There's Software Used Across the Country to Predict Future Criminals. And It's Biased Against Blacks.," *ProPublica*, May 23, 2016, https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing.

[12] Scott E. Page, *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies* (Princeton: Princeton University Press, 2008).

inclusion of people of color is one way to achieve those goals.[13] However, the adoption of this language by people and organizations not focused on increased productivity and profits obscures and softens the real issues of racism and dispossession. If people of color do not have access to decision-making power and resources, that is not just a problem for corporations that are not as productive and profitable as they could be, but also for the generations of people pushed out of these spaces of privilege and opportunity while being harmed by their outcomes.[14]

The recent trend of bringing people from the tech industry into government and civil society for "tours of duty" has had the unfortunate effect of importing the woefully disproportionate demographics of the tech industry into government and civil society. By relying on this pool of people, we do not significantly empower or transfer power to Black and Latinx people, but simply shuffle it around from one privileged sector to another. In a 2015 comparison of diversity reports from eight of the largest tech companies, only 13-22% were held by women, despite 46.8% of the United States workforce being women, and anywhere from 1-7% of technical positions were held by people identified as Black, and 2-8% by people identified as Hispanic, despite a general United States population of 12.85% and 15.1%, respectively.[15] At every step of the way, Black and Brown people, and women of all races and

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[13] Mark Zuckerberg, founder of Facebook, when asked about his inclusion of Peter Thiel, a Trump supported and advisor, on Facebook's board of directors stated that "you need to be committed to all kinds of diversity, including ideological diversity." Since Facebook's board is made up of exclusively wealthy white people, this commitment to all kinds of diversity is questionable. http://www.inc.com/business-insider/mark-zuckerberg-says-calls-remove-peter-thiel-facebook-crazy.ht ml

[14] For a more in-depth discussion of the ways in which the diversity frame may be counterproductive or actually harmful for many people of color, see Ellen Berrey, *The Enigma of Diversity: The Language of Race and the Limits of Racial Justice* (Chicago: The University of Chicago Press, 2015).

[15] Nick Heer, "Diversity of Tech Companies by the Numbers: 2015 Edition," *Pixel Envy*, August 28, 2015, http://pxlnv.com/blog/diversity-of-tech-companies-by-the-numbers-2015-edition/.

ethnicities, are pushed out of technical roles.

Civic Tech is no different. In an informal survey of 293 Code for America Brigade

participants in 2014, 24.57% were female, 74.40% were male, and 0.34% were transgender.

74.06% were white, 8.53% were Asian, 7.17% were Hispanic or Latino, 3.41% were "Multi,"

1.71% were Black or African American, and 0.34% were Native Hawaiian or Other Pacific

Islander. These preliminary results paint a picture of a national brigade that is proportionally

more white and more male than both software engineers overall, and the general United States

population. In spaces like Code for America's brigades, dominated by a seemingly innocuous

framing of the work as service to the community and volunteer time to use skills to make

something for others, members both see the work as charitable and emphasize the HCI mantra

"you are not your user,"[16] but also problematically are given a pass to not include that

community meaningfully in the design and development process. Because the leadership of

brigades often fail to realize that one of the main positive outcomes for people are the job

opportunities members gain access to and the skills they develop while in the group, the lack

of representation in the membership may be seen as less of a problem.

Neoliberal Metaphors

Additionally, by focusing on the development of products, or services that act like

products, Civic Tech limits the democratic imaginary of what democracy can and should be to

scalable, replicable, and discrete solutions that could conceivably be packaged and sold. The

field ultimately enacts a neoliberal project in which "the distinctly *political* character, meaning,

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[16] Whitney Hess, "The User Is Not Like Me," *Pleasure & Pain by Whitney Hess*, May 4, 2012, https://whitneyhess.com/blog/2012/05/04/the-user-is-not-like-me/.

and operation of democracy's constituent elements [are turned] into *economic* ones."[17] As Wendy Brown demonstrates in *Undoing the Demos*, even in the absence of actual marketization or monetization, projects that previously might be rooted in democratic political principles of justice are increasingly being economized and transformed via the idioms of marketable products. She uses the example of Barack Obama's 2013 State of the Union speech in which "democratic state commitments to equality, liberty, inclusion, and constitutionalism," as practiced through social justice, government investment, and environmental protection, "are now subordinate to the project of economic growth, competitive positioning, and capital enhancement."[18] With the 2016 election of Donald Trump, the neoliberal shift toward prioritizing business experience, over any of the other measures of civic or community experience, is now even more clear than when Brown was writing.

Technosolutionism

Approaches celebrated within the network tend to be those that streamline a process, and not ones that seek systemic change or critical questioning. Expunge.io, one of the more celebrated civic tech projects within and outside the community, is one example of this phenomenon. This project is frequently touted as a civic tech success story because of its collaboration with community organizations and clear material effect on its users' lives. In Chicago, the civic tech organization Smart Chicago Collaborative introduced a designer and developer to the Juvenile Justice Council to address the issue of juvenile arrest records. Over 25,000 youth in Cook County are arrested every year, and, although not all of them are

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[17] Brown, Wendy. "Undoing Democracy: Neoliberalism's Remaking of State and Subject." In *Undoing the Demos: Neoliberalism's Stealth Revolution*. The MIT Press, 2015. http://www.myilibrary.com?id=751357, 17.

[18] Ibid., 26.

convicted of a crime, all have the arrest added to their record. This arrest record is accessible

to anyone seeking a background check, such as a potential employer, school, or landlord. In

many cases, these records can be expunged, but not without significant work on the part of

the youth who has been arrested. After a collaborative process led by the youth of the Juvenile

Justice Council, a developer created the website, which guides young people through the

process of finding and expunging their record. This process opens up countless opportunities

for housing, education, and jobs that would have been more difficult to secure with an arrest

record, even if the youth had not been convicted of any crime.

While this project features more community involvement and concrete benefits than

most civic tech projects, much of the work still falls on the predominantly Black and Latinx

youth with arrest records in Cook County and the Juvenile Justice Council's Help Desk, and

much of the credit goes to Smart Chicago and the developer who created the site.

Expunge.io also happens to be a clear example of technological solutionism, a term

originally coined by Evgeny Morozov in *To Save Everything, Click Here,*[19] and a critique

frequently launched against civic tech programs. In this book, Morozov denounces solutionism

as the practice of framing a problem in just the right way to elevate a solution that has been

pre-crafted. "It's not that solutions proposed are unlikely to work but that, in solving the

'problem,' solutionists twist it in such an ugly and unfamiliar way that, by the time it is 'solved,'

the problem becomes something else entirely."[20] This combination of technological solutionism

and neoliberal stifling of the democratic imaginary is exemplified even or especially in the most

compelling civic tech projects. By making the interface for expunging a record more usable,

the problem of juvenile criminal records is used as a platform to showcase the state's

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[19] Morozov, Evgeny. *To Save Everything, Click Here: The Folly of Technological Solutionism*. First edition (New York: PublicAffairs, 2013), 18.

[20] Ibid., 32.

resources for expungement, and free legal help, no matter how inaccessible, and for celebrating what seems to be the technologically-solved problem of juvenile justice. Meanwhile, in the name of simplicity, usability, and a coherent narrative, imaginaries for further action are left unprovoked.

What would it mean if the state automatically expunged juvenile records without leaving the onus on youth to find this website and to understand the complicated process for removing a criminal record? How would things be different if criminal records did not impact a person's ability to receive housing, employment, and education? How can we think about alternatives to incarceration and permanent and semi-permanent criminal records? What if actual resources were allocated differently? What are the systemic biases and historical configurations that have led to African-American youth being arrested at nearly twice the rate of other youth?[21] There is no room for questions like these to be speculated upon in the Expunge.io web interface, and in this way the democratic imaginary for what is possible is limited to what can be done with just a website and a temporarily available developer. The narrative of discrete, technical solutions cuts out the critical community-based and social movement work being done on an issue outside of the confines of the software.

One of the persistent critiques of the field of Civic Tech is that projects tend to not address actual problems, or significant problems at all. This is not entirely fair. Depending on the definition of "real" or "significant," civic tech has indeed changed many people's lives for the better. For example, in San Francisco, Code for America collaborated with the Human Services Agency (HSA) to create an SMS-based alert system called Promptly that would alert food stamp recipients when their food stamps were about to expire and would need to be

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[21] "African American Youth and the Juvenile Court System," Position Paper (Coalition for Juvenile Justice), http://www.juvjustice.org/sites/default/files/resource-files/African%20American%20Youth%20Fact%20Sheet.pdf.

renewed. This quarterly "churn," as it is officially called when someone is needlessly terminated from government benefits even though they are still eligible, affected nearly 30% of the agency's 52,000 clients in the city of San Francisco alone. At the time the SMS-application was created, around 1,000 people per month were losing benefits because they could not, or did not know they had to, renew in time. The app, created in collaboration with Code for America, the Mayor's Office of Civic Innovation, and the Human Service Agency in San Francisco, allowed thousands of people to renew their benefits before finding out in the checkout line of a grocery store that they would need to make a lengthy trip to the HSA to try to reinstate the benefits they were still eligible for.[22]

Projects like Promptly and Expunge.io have had direct and measurable human impacts, and have been spoken about and celebrated extensively in the Civic Tech community. However, when looking at the bulk of projects coming out of the Brigade network, they are the exceptions that allow the field to expand. Most applications emerging from the Brigade network still have a tendency to (1) target potholes in city streets and related quality-of-life phenomena and (2) target other civic technologists with tools, APIs, and resources meant to support the growth of Civic Tech as a field. Out of the 50 most "starred" repositories for all of the organizations in the Brigade network, 30 are tools for other civic technologists to use.[23]

Anti-Political

While government and politics, in the realm of civic tech, are only seen as good things that can only be improved by increasing efficiency, what Carl Schmitt and Chantal Mouffe refer

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[22] As of April 2015, Promptly is no longer maintained.

[23] This information was gathered by using the Github API to pull information about all the projects by all the organizations that have identified themselves as part of the Brigade network: https://docs.google.com/spreadsheets/d/1FdIUboVW0RAcIDBBUim-jgQoHIaotNT5g92R-g3a5PY/edit?usp=sharing.

to as "the political" is not welcome. Carl DiSalvo, a researcher of the potential space for (ant)agonism in design who draws heavily from Chantal Mouffe and Carl Schmitt, defines "the political [as] a condition of society. It is a condition of ongoing opposition and contest. This condition is experienced and expressed in a multiplicity of ways, from debate to acts of provocation, protest and resistance."[24] In fact, "politics," which are the means, structures, mechanisms, and infrastructure by which these opposing forces and power relations are held together, can often be stifling to the political. The ability to propagate the myth that something is apolitical is a privilege only afforded to those who do not need to fight political battles to ensure their basic rights. Every project, especially those involving allocation of resources, is imbued with politics and competing interests, even if not all interests are given the forum to compete within the same space. In many ways, civic tech has been able to grow by focusing on building tools and crafting compelling narratives that support the growth of the field, often over direct benefits to marginalized communities. Unfortunately, issues affecting marginalized people are always political. In R.L.'s essay on afro-pessimism, they argue that violence against Black people is an ontological feature of Black existence, and an essential antagonism that has irreversibly structured both whiteness and American politics. "Contrary to contingent applications of violence in accordance with legitimate cause (transgression of law, as repressive strategy, as reaction, etc.), violence against blacks is gratuitous, without any prior reason or justification. It is the direct relation of force as the basis of the slave relation, which essentially structures the disposession of black existence, an ontological disposession of being."[25] A failure to account for this antagonism, and a failure to respond to it, leads only to

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[24] Carl Disalvo, "Design, Democracy and Agonistic Pluralism," *ResearchGate*, accessed June 1, 2016, https://www.researchgate.net/publication/266249811_Design_Democracy_and_Agonistic_Pluralism, 3.

[25] R.L, "Wanderings of the Slave: Black Life and Social Death," Text, *Mute*, (June 5, 2013), http://www.metamute.org/editorial/articles/wanderings-slave-black-life-and-social-death.

further erasure of Black power and livelihood.

Individual-Focused

Urban planner Cara Michell responds to the afro-pessimist ontological condition with

her urban design thesis, "Performing Spatial Justice." Her project is an extended exercise in

highlighting the absurdity of attempting to design individual solutions within a system that is

violent and unjust.[26] She uses a human-centered design process to do "user research" on how

Black people move through space, and through interviews, discovers that one strategy the

people she spoke to use to survive is to keep their hands visible and out of their pockets when

they enter stores, so that the shopkeeper does not suspect them of stealing. Through the

user-centered design process of designing individual solutions for consumers, Michell

designed clothing with transparent pockets, so that innocent Black people can travel safely

through space without suspicion, because their pockets are transparent. This is an obviously

absurd solution that addresses only a narrow symptom, at the level of the individual, rather

than a root, or systemic cause. The piece calls attention to the ways in which Black people are

tasked with the responsibility of "becoming transparent" to stay alive in public space. While

this type of project is not one that proponents of human-centered design typically have in

mind, it does do the work of raising serious questions about systemic violence and the role of

design in addressing it. By solving individual users' everyday problems with technological

artifacts, we often skim over deeper political problems that cannot be solved with a form of

design that is only able to focus on individual users. This does not mean that user-centered

design, or design at the level of interface, should be abandoned, but rather, that it should be

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[26] Michell, Cara. "Performing Spatial Justice." Master in Urban Planning Thesis, Harvard
Graduate School of Design Department of Urban Planning & Design, 2016.
https://caramichell.files.wordpress.com/2016/07/performing-spatial-justice-pdf-for-upd.pdf.

part of a more holistic design methodology, perhaps one that incorporates the type of critical

questioning that Michell so thoughtfully deploys in "Performing Spatial Justice." What is the

role of the political in technologies for social justice? Can these technologies both serve an

infrastructural need for social and political movements, *and* provoke the political imaginary?

The focus on bringing in experts to create discrete, seemingly apolitical products for

democracy makes it nearly impossible to have democratic community involvement and control,

to address the problems of people who do not have the privilege to call their problems

"apolitical," or to imagine more expansive change than that which lives at the level of interface.

How can structural inequality along lines of race, class, gender identity, sexual orientation,

national origin, and disability be addressed in a space that limits discussion of systemic issues

in order to ship?

Don Norman, often thought of as the grandfather of user experience design because of

his landmark book *The Design of Everyday Things*, written in 1988, wrote more recently in 2010

that "many problems involve complex social and political issues. As a result, designers have

become applied behavioral scientists, but they are woefully undereducated for the task.

Designers often fail to understand the complexity of the issues and the depth of knowledge

already known. They claim that fresh eyes can produce novel solutions, but then they wonder

why these solutions are seldom implemented, or if implemented, why they fail."[27] As the

definition of design and Design Thinking expands to include all manner of human activities,

designers and older design methodologies are being asked to address nearly every complex

social and political issue. Ideo's *Field Guide to Human-Centered Design* states that "embracing

human-centered design means believing that all problems, even the seemingly intractable ones

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[27] Norman, Donald. "Why Design Education Must Change." *Core77*, November 26, 2010.
http://core77.com/blog/columns/why_design_education_must_change_17993.asp.

like poverty, gender equality, and clean water, are solvable."[28] This is one of the problems

Michell is responding to. While design and technology can of course be helpful tools, this shift

has had the unintended effect of centralizing decision-making power, prestige, funding, and

attention on designers and technologists who live outside of a particular problem area.

Through the methodology of human-centered design, designers have seemingly become

specialists in solving Other People's Problems. Indeed, one of the most popular mantras of the

user experience design profession is, "the user is not like me."[29] While this principle is

extremely important when the designer is a professional, creating solutions for people who are

not professional designers, it begins to break down as a design process becomes increasingly

democratic and distributed, as it may in a community-centered technology project. How must

methods change when the designer *is* the user?

Design research methods such as ethnography, user interviews, and usability testing

are important methods to ensure that the product being developed serves a real need and is

easy for the target user to use. However, an overemphasis on these methods in

community-based technology projects has diminished the role of coalition building and

community organizing as ways to understand what a community needs. Rather than seeking to

understand the methods community organizers use to solve both short-term, long-term, and

systemic issues, civic technologists often rely on only the processes developed by designers

for including the community. Many designers and technologists are trying to do the work of

community organizers. This often alienates community organizations from wanting to

collaborate with professional designers and technologists, who often promote

techno-determinist solutions that improve their own portfolio and TED talk opportunities, while

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[28] IDEO.org, *The Field Guide to Human-Centered Design: Design Kit*, 1st. ed (San Francisco, Calif: IDEO, 2015), 9.

[29] Hess, "The User Is Not Like Me."

not necessarily aligning with an organization's strategy of addressing immediate needs while also seeking systemic change.

While human-centered design and user experience design are focused on ease and comfort of use for *individuals*, the processes used to achieve user-friendliness are often poorly suited for solving problems with systemic causes that impact classes of people. The critique that projects fail to adequately include community members or community organizations in any meaningful way is related to this focus on the atomized individual. While "community" can be an extraordinarily fuzzy concept, the critique itself manifests in a few different, slightly more specific, ways. In some contexts, "community" is simply meant as a vague stand-in term for the racial diversity that is perceived to be missing in the space, which, though well-intentioned, can be a tokenizing way to think about people imagined to be outside the fold of a particular organization. That being said, the racial diversity of Civic Tech organizations and groups often reflects the technology industry more closely than it reflects the cities it is ostensibly meant to serve. Another category of "community" refers to all "experts" outside of computer science or the tech industry. This can include subject matter experts such as lawyers, public policy experts, politicians, or anyone who has a particular professional expertise in the topic addressed by a Civic Tech product. A third meaning of "community" refers to community organizations or other movement spaces that have already been working on issues that are just beginning to be tackled by Civic Tech. These community organizations and groups of people often come with their own agendas, which are typically prioritized differently than those of civic tech organizations. The final meaning of "community involvement" is perhaps the most shallow, though it should be considered a bare minimum for any human-facing technology project: user-centered design. This is the practice of conducting user research and usability testing in order to ensure that the final product is something that the target audience will need

and will be able to use without frustration. Out of all of these meanings, the response of the civic tech community has been to focus primarily on the latter meaning of "community," which is perhaps indicative of the framework's roots in agile software development, customer development, and usability over participation or collaborative design methodologies.

In this thesis, I interrogate the ways in which human-centered design has been inadequate to serve civic, community, and political technology projects because of its emphasis on the individual over a possible emphasis on collective action and the community. I hope this critique can help inform strategies for addressing systemic issues, such as those often used by community organizers, together with those for crafting thoughtful and immediate solutions.

Chapter 2

Intellectual Genealogy of Recent Technocratic Movements for Social Good

In the first chapter, I outlined many of the critiques of the Civic Tech movement, and in general, the application of dominant software development methodologies to projects that seek social change. In this chapter, I explore the history, or histories, of that impetus to govern, organize, and resist with technology.

Since 2012, a group of around thirty government and technology enthusiasts has met every Tuesday to try to solve Boston's problems with software. The volunteer organization Code for Boston (a derivative of Code for America, a national Civic Technology nonprofit, itself a reference to Teach for America), describes itself as "part mission-driven nonprofit, part advocacy group, part tech team, and part social club."[30] They meet on the 5th floor of the Cambridge Innovation Center (CIC), a coworking space adjacent to MIT that is home to "More Startups Than Anywhere Else On The Planet,"[31] and they collaborate with governments and nonprofits in Boston, Cambridge, and Somerville. They are literally productive, by virtue of their main activity, which is producing civic products and interfaces.

Less obviously, however, the social space of this brigade is produced by competing value systems and intellectual histories of of civic engagement, governmentality, and

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[30] Harlan Weber, from a presentation at the Code for Boston New Members Meeting, April 12, 2016.

[31] "Homepage," *CIC Cambridge*, accessed April 13, 2016, http://cic.us/.

techno-culture. Although brigades are similar to churches or YMCAs in that they are all community gathering spaces co-constituted by members and conducive to connecting people to opportunities, the brigade's language, structure, and outputs are influenced less by these old-style community spaces, and more by the discourse and culture of contemporary software startups.

History

Civic Tech's intellectual history, as I hope to show, emerges more from the history of post-dot-com collapse corporate software development practices and the form of neoliberalism that began in the era of Margaret Thatcher and Ronald Reagan, than from any history of community organizing, activism, or counterpublic discourse. Additionally, the methods for incorporating community participation draw somewhat from the civic engagement literature, but more directly from the field of user research. This has consequences.

Since around the time Code for America was founded in 2011, at least forty-eight civic innovation offices have been created to facilitate civic engagement, to spur technological innovation, and to "disrupt" city governments (and often more specifically, their IT infrastructure) from the inside out.[32] Around one hundred and fifty semi-independent local volunteer chapters of Code for America (like Code for San Francisco and Code for Boston) have formed around the world, with the shared goal of empowering citizens to build open source solutions to civic problems.[33] In addition, three United States federal government agencies were introduced: first, the Presidential Innovation Fellowship, modeled directly on the

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[32] From an unpublished research project by Bin Li and Rebecca Michelson at the Engagement Lab at Emerson College that involved identifying all of the innovation and engagement offices of the 110 most populous American cities.

[33] "Full Brigade List." Website. *Code for America Brigade*. Accessed December 15, 2016. http://brigade.codeforamerica.org/brigade/list.

one year, "tour of duty," government agency placement model of Code for America; second,

18F, an agency meant to both administratively house Presidential Innovation Fellows as well as

to create a more permanent digital agency for consulting within the federal government; and

finally, the United States Digital Service, created after 18F not just to consult with other

agencies, as 18F does, but to fully take on large public-facing federal government digital

projects like Healthcare.gov (but still with a one year, "tour of duty" model meant to temporarily

attract skilled technologists from the private sector). While these all differ in terms of their

structure and directives, each is rooted in the same ethos of focusing on apolitical projects

meant to improve government service delivery and citizen engagement by using agile software

development methodology.

Values

One way to analyze the values held by a community, a discourse, or an organization is

to look at their explicitly stated values and principles. In trying to determine the origins of Civic

Tech's intellectual threads, I compared the principles of Code for America with the Agile

Software Development Manifesto, the United States Digital Service Playbook, the Detroit

Digital Justice Coalition Principles, and the principles of the Appropriate Technology

movement. Of course, these types of manifestos and lists do not account for the great diversity

of opinions held by members of these groups, nor do they necessarily reflect the actual

practices of that group, but they do provide one meaningful axis of comparison and a useful

way to directly trace values and intellectual genealogy. Many organizations, when creating

principles for themselves, draw from other sets of principles and add, subtract, or modify them

to suit their needs. By following these branching threads, we can get a good sense of what set

of discourses influence how people approach their work, and what is valued.

For example, Code for America has seven principles: "Build iteratively," "Start with people's needs," "Use real-time data to inform decisions," "Default to open," "Build the right team," "Build or buy the right technology," and "Ensure everyone can participate."[34] Looking at the U.S. Digital Service Playbook plays, "Build the service using agile and iterative practices," "Understand what people need," "Use data to drive decisions," "Default to open," "Bring in experienced teams," and "Choose a modern technology stack,"[35] it is easy to see that Code for America's principles were directly inspired by this Playbook and that they work under a philosophy that is closely aligned with the federal agency.

Table 1. Code for America Principles and U.S. Digital Service Playbook "Plays" (order rearranged to show parallels)

Code for America Principles	U.S. Digital Service Playbook
Build iteratively	Build the service using agile and iterative practices
Start with people's needs	Understand what people need
Use real-time data to inform decisions	Use data to drive decisions
Default to open	Default to open
Build the right team	Bring in experienced teams
Build or buy the right technology	Choose a modern technology stack
Ensure everyone can participate	

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[34] "Products and Primers." Code for America, November 12, 2014. https://www.codeforamerica.org/resources/.

[35] "The Digital Services Playbook" (The U.S. Digital Service, August 12, 2014), https://playbook.cio.gov/.

These principles, which are framed as predominantly technical and focused on organizational structures, effectiveness, and efficiency, are closely akin to the principles of the extremely influential Agile Manifesto. The Agile Manifesto was created by seventeen white, cisgender men at Utah's Snowbird Ski Resort in February of 2001 as a response to the dot-com crash and what were perceived to be failures in the dominant ways of building software. The principles, which include "Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage" and "Working software is the primary measure of progress," are focused on iterative software development and frequent releases.[36]

Additionally, the language draws from the Open Data, Open Source, and Web 2.0 communities, all of which have been heavily promoted by Tim O'Reilly, speaker and CEO of O'Reilly Media, which is a publisher of many popular technical manuals. Tim O'Reilly was instrumental in the founding of Code for America, and indeed, his language of "Gov 2.0" and "Government as a Platform" appears in many early blog posts and conference talks by Code for America affiliates.[37] In 2007, in anticipation of the upcoming 2008 presidential election, O'Reilly invited 30 open data advocates (29 men and 1 woman) to Sebastopol, California to develop a set of principles for Open Government Data. This meeting eventually resulted in the Memorandum on Transparency and Open Government, released by President Barack Obama on his first day in office, mandating that executive agencies must create plans to increase

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[36]"Principles Behind the Agile Manifesto," February 13, 2001, http://agilemanifesto.org/principles.html.

[37] Also, in 2015, he and Jennifer Pahlka, founder and Executive Director of Code for America, married.

transparency, collaboration, and participation through strategic releases of information.[38] The

ramifications of this memo eventually included the creation of 18F, the Presidential Innovation

Fellowship, the United States Digital Service, and the open source website Code.gov, as well

as changes across many agencies to release more data through open data portals. The

principles that emerged from this meeting strongly influenced the ways in which Code for

America chose to organize around releases of government data and around creating the

structures needed to use those data releases. We can see the ways in which Civic Tech's

intellectual threads stem from the open source, open data, and Web 2.0 movements, and the

ways in which certain goals, such as iterative development and parsable, structured, and

abundant datasets, are prioritized over other, more justice or power-related goals.

One helpful way to understand this difference in values is to compare the ways in which

these manifestos and lists reference who builds these platforms and products, who uses them,

and how these two groups are intended to be brought together. One of the eight principles for

Open Government Data is that "data is available to the widest range of users for the widest

range of purposes."[39] This is meant in a technical sense, as in, it should be available to users

with assistive devices, and should not be in an unparsable PDF or buried behind a web form.

The questions of who is collecting the data, who it is being collected from, who is using the

data, and how it is being used, are left unarticulated. The Code for America principle "Build the

right team," subtitled "Wouldn't it be great if you had seasoned product managers, engineers,

and designers on your team? In order to build modern digital services, we need people working

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[38] Obama, Barack. "Memorandum on Transparency and Open Government." The Federal Register, January 21, 2009.
https://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment.

[39] "Open Government Data Principles," December 8, 2007.
https://public.resource.org/8_principles.html.

in government who have experience doing just that,"[40] the U.S. Digital Service Playbook play

"Bring in experienced teams," and the Agile Manifesto's "Build projects around motivated

individuals" go a step further and specify that the people steering and building these projects

should be technical experts, preferably brought from the tech industry. Equitable hiring

practices, or the politics and decision-making power given to these technical experts, is less of

a consideration. In terms of how to consider the voices and needs of end-users, the Digital

Services Playbook emphasizes that developers should try to "understand what users need."

This is further explained as "The needs of people — not constraints of government structures

or silos — should inform technical and design decisions. We need to continually test the

products we build with real people to keep us honest about what is important."[41] This

sentiment is repeated in the Code for America principles, and highlighted in the Agile manifesto

as "Our highest priority is to satisfy the customer through early and continuous delivery of

valuable software." In a private context, it makes sense for there to be a mediator between the

user and the technical system. In a for-profit corporation, the user and the producer have

different motivations. While the user may wish to do any number of things, the producer

ultimately needs to maximize profit. The role of a human-centered design process, in this

context, is to design the system to meet user needs and motivations, but in a way that creates

surplus for a corporation.

Neither the human-centered design process, nor other design approaches such as

Value-Sensitive Design,[42] consider the role of labor, governance, and process in the creation of

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[40] Code for America, "Products and Primers."

[41] The U.S. Digital Service, "The Digital Services Playbook."

[42] Batya Friedman, Peter H. Kahn Jr., and Alan Borning, "Value Sensitive Design and Information Systems," in *The Handbook of Information and Computer Ethics*, ed. Kenneth Einar Himms and Herman T. Tavani (John Wiley & Sons, Inc., 2008), 69–101.

these technologies. There is always assumed to be a clear divide between the expert who is designing the technology (even with user input) and the ultimate end-user of that technology.

Compare these to the Appropriate Technology principle "Easily repaired, by local people with locally available equipment"[43] or the Detroit Digital Justice Coalition Principles that state, "Digital justice ensures that all members of our community have equal access to media and technology, as producers as well as consumers," "Digital justice prioritizes the participation of people who have been traditionally excluded from and attacked by media and technology," "Digital justice provides spaces through which people can investigate community problems, generate solutions, create media and organize together," and "Digital justice demystifies technology to the point where we can not only use it, but create our own technologies and participate in the decisions that will shape communications infrastructure."[44] In this set of principles, we see the collapse of the sharp divide between consumer and producer found in principles drawn from the software industry. Rather than describe a set of products designed by one community of experts to be used by another community of consumers, these principles not only acknowledge the inequalities that have led to the sharp division between producers and consumers, but place the power to make decisions, ask questions, and to build in the hands of users, who are the people affected most by the technological implementation.

How can we use the distinctions between these values as a jumping-off point for considering the role of power in the use and development of politically and ethically-oriented technology? Within the realm of Civic Tech, the user is often tokenized and celebrated, while

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[43] Carroll Pursell, "The Rise and Fall of the Appropriate Technology Movement in the United States, 1965-1985," *Technology and Culture* 34, no. 3 (1993): 629–37, doi:10.2307/3106707.

[44] Detroit Digital Justice Coalition, *Communication Is a Fundamental Human Right: Issue #2* (Detroit, MI: Detroit Digital Justice Coalition, 2010), 3-4.

the ultimate power to make decisions and shape the ways in which people are able to interact with their government is centralized with a few technical experts.

As we have seen, many technologies have been developed under the Civic Tech framework for monitoring governments, and through improvements to government service interfaces, many people's everyday interactions with governments are less frustrating. However, I do hope to convey the imperative that all our technological, democratic, and liberatory imaginaries do not get compressed into a neoliberal discourse of efficiency, simplicity, and individual, rather than collective, action. The particular qualities of this discourse have both allowed the field to grow relatively unscarred by persistent criticism of its focus on technological solutionism, but also to absorb and dilute projects from other movements that are better suited to address political issues of equity, fairness, and justice. We must recognize both the general and particular ways in which a dominant discourse causes the rarefaction of the space of possibility, and decide which intellectual lineage, and associated sets of problems, we want to draw from.

Rather than looking towards more efficient systems of broken windows policing that predominantly work to incarcerate and prosecute youth of color, why don't funders and organizations look towards the anti-surveillance activism of groups like the Electronic Frontier Foundation, Third World Majority, and the Stop LAPD Spying Coalition? Rather than asking people to become "a nation of hands"[45] in service of the state, what can we learn from groups like the Black Panther Party, that attempted to provide services to their community despite overt and covert repression by the state? How can technology be used as a tool for redistribution? A better understanding of our history and the role of power in

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[45]Jennifer Pahlka, "Coding a Better Government" (TED Talk, TED2012, Long Beach, California, February 2012), https://www.ted.com/talks/jennifer_pahlka_coding_a_better_government/transcript?language=en.

technologically-based movements will help stem the bleeding out of our imaginations for the

role of technology in fostering a truly just and democratic society.

Chapter 3

Build with One Hand, Fight With the Other: Technology Design Practices

So far we have looked at the ways in which corporate software development practices have

clashed with goals of social change and empowerment, and the histories of those practices,

but the question I want to turn to now is whether and how technological systems can be

designed to resist or fundamentally alter the social and political systems in which they are

embedded. As we have seen, technologies tend to reproduce social inequalities and historical

and systemic biases, usually not through malice, but through ignorance, neglect, and a

preference for ease. It is easier to solve a relatively minor inconsistency than to challenge a

complex system. In Langdon Winner's aforementioned essay "Do Artifacts Have Politics?", he

gives the example of the disability rights movement, that began to draw attention to the

countless ways in which architecture, urban design, and machines work to systematically

exclude people with disabilities from moving freely and participating in public life.[46] Without

laws in place to ensure accessibility, disabled architects who understand the needs of people

with similar disabilities, and/or a participatory design process that includes those from

communities marginalized within and by the profession, it is simply easier for an architect to

not incorporate diverse needs. This holds true across the design professions. The projects I

write about in this chapter challenge inequitable and historically biased systems and seek to

actively replace them.

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[46] Langdon Winner, "Do Artifacts Have Politics?," *Daedalus* 109, no. 1 (1980): 121–36.

"If our moral and political language for evaluating technology includes only categories having to do with tools and uses, if it does not include attention to the meaning of the designs and arrangements of our artifacts, then we will be blinded to much that is intellectually and practically crucial."[47] Indeed, a limited emphasis on usability neglects crucial questions of who is building, who (really) are the users, and how the artifact and the conditions of that artifact's production affect social and power relations. Often the simplest and most efficient design, such as a predictive policing system that uses existing police data, is one that most neatly reproduces or amplifies an existing power relation. Technology for civics, justice, or "good" is not always empowering, just, or good . Often these technologies reproduce historically rooted patterns of labor and power, rely on a mythical notion of a Habermasian open public sphere, and center Euro-American, European, and Silicon Valley cultural practices. In this chapter I want to introduce a few projects that challenge those inequalities in interesting ways, and that ultimately result in economically, politically, or culturally redistributive effects.

Build with One Hand: Community Mesh Wireless Networks

One series of projects that have sought systemic change in the ways marginalized people relate to technology is the Digital Stewards project and the many wireless mesh networks that have been inspired by or directly connected to this program. The Digital Stewards were initially launched in 2012 by Allied Media Projects, a Detroit organization that puts on the media-based organizing Allied Media Conference each year, and the Open Technology Institute. This program sought not only to bring broadband wireless internet access to people in Detroit who otherwise would not have access to it, but more importantly, to provide training and to create ownership and local control of network infrastructure. Classes

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[47] Ibid., 25.

of "stewards," who ranged in age from 20 to 73, learned digital literacy skills, including how to build and maintain a wireless network and intranet and then, in the twenty weeks that followed, set up wireless networks in five Detroit neighborhoods through collaborations with building tenants and community organizations.

After the success of Digital Stewards in Detroit, the model spread to Red Hook, Brooklyn (hosted by the Red Hook Initiative), followed by seven other sites around New York City through the RISE : NYC program and to eleven sites around the world as part of the Community Technology Project SEED Grant program. Each new mesh wireless network was formed in different circumstances and often for different reasons, but united by a commitment to "building autonomous, community controlled communication infrastructure through a collective process of learning, teaching, and building."[48] The point, at least in this paper, is not to critique or understand the technology of mesh networking itself, which may not be appropriate in every circumstance, but rather to understand the community-controlled process for designing, building, and operating the technology. The decentralized, locally-controlled iterations of this process makes community wireless mesh networks a great example for understanding what intersectional community technology can look like, with the aim of applying a similar process to other community technology projects.

Although the project initially received funding by focusing on a specific technology, many of those involved have noted that any emphasis on the technology over the original goals (equitable access to the network, education and increased job opportunities, or whatever the local goal is) is detrimental to the project as a whole and misguided. In the (Re)building Technology v.2 zine, which documented the Community Technology Project's work in 2015,

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[48] Ryan Gerety, Diana Nucera, and Andy Gunn, "Community Technology Retrospective: 2015 SEED Grants" (New America Foundation, January 2016).

there are several cautions against techno-solutionism for people wishing to build their own community technology. In their "10 Community Network Lessons," four are related to this issue: "focus on the community process at least as much as the end result," "are you providing a service (as an Internet Service Provider), or organizing people to build infrastructure?," "choose the simplest technology or even non-tech solution to get the job done," and finally, "be sure the project is not technology in search of a problem."[49] In some cases, the solution ended up not being a community wireless mesh network at all.

Flipping the Diversity Frame

Rather than focusing on the concept of diversity, these projects emphasize first and foremost that the people using, benefitting, and facing potential harms from the network should be those initiating, leading, and building the project. This notion of expertise is almost oppositional to that within tech industry, much of the professional world in general, as well as many technology for social good projects. By relying solely on a form of professional and educational expertise that, while certainly valuable in certain contexts, is based in systems that historically have underrepresented people of color, social good projects that privilege professional expertise over community rootedness reproduce the inequities found in traditional academic and professional environments. While many important programs seek to repair the "leaky pipeline" of traditional educational and professional career paths through diversity and inclusion programs within companies, and advocacy and training outside of them, programs like these community wireless networks look outside of the pipeline and use a different notion of expertise. If people do not have the requisite skills to maintain the technology in their communities, they are trained to do so (oftentimes by outsiders with technical knowledge), and

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[49] Ryan Gerety, Diana Nucera, and Andy Gunn, eds., *(Re)building Technology v.2*, vol. 2 (Detroit Community Technology Project and the Open Technology Institute, 2016).

then given full control over that technology. Once they leave the program, they are then equipped with technical skills and experience. This fusion of education, design, maintenance, and local ownership redistributes decision-making power and resources to those most affected and who most stand to benefit from the technology. This structure does not need to apply just to community wireless, but can be useful to any technology or infrastructure project that seeks to have positive material impact on marginalized communities.

This brings us to the third facet of these projects that complicates technology development and implementation processes. User-centered design processes typically only consider the role of the end-user, not necessarily everyone who comes into contact with a technology. For a community wireless network, this would include the people who access the internet (or intranet) through the network. For the projects we are discussing, these people are certainly important, and without them, the project would not exist. However, they are not the only people who have a role in the technology. These projects also seek the best possible outcomes for the people who build and initiate these projects. For Red Hook Wifi and the Digital Stewards programs, each successive class of Stewards has incorporated more of an emphasis on digital literacy training and job placement for the stewards, as this has been a significant positive externality. The Work Department, a Detroit-based design firm, helped to design training materials for people building these networks. A typical user-centered design process that only incorporates representative end-users would have overlooked the producers of the technology and the potential external benefits (and harms) of producing technology, and, while hiding behind the phrase "you are not your user" would exclude opportunities for meaningfully incorporating users as designers.

Fight with the Other: Building and Protecting Counterpublic Spaces

To overcome a "culture of silence,"[50] as described by Paulo Freire, and to allow political

discourse to flourish among marginalized, unfairly stigmatized, and politicized groups, these

very groups must have control over their own discursive spaces. This sometimes means

practicing forms of exclusion through shutting out violent behavior, practicing counter and

anti-surveillance, and selectively hiding information. Each of these practices is made especially

possible and relevant within networked, online publics, such as Twitter or Reddit.

However, in Civic Tech projects designed specifically for civic action, this structural

feature of discursive space has not often been a primary concern, or has been refused

altogether. Rather than ensuring a variety of community-controlled spaces, projects such

NextDoor or Open Town Hall rely on municipal notions of community that disregard racial,

political, and agonistic tension, and seem to trust the Habermasian model of a universal public

sphere. Scholars such as Nancy Fraser[51] and Catherine Squires[52] dissect the ways in which a

singular public space for rational debate has failed women, Black people, and other

marginalized and stigmatized groups. This may explain civic technologist Dan O'Neil's

disheartening observation that "The dominant social movements of the last five years have

next to nothing to do with civic tech. Black Lives Matter, the rise of racist Trumpian political

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[50] Paolo Freire, *Pedagogy of the Oppressed*, 20th Anniversary edition (New York: Continuum Publishing Company, 1993), 30.

[51] Fraser, Nancy. "Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy." *Social Text*, no. 25/26 (1990): 56–80.

[52] Squires, Catherine R. "Rethinking the Black Public Sphere: An Alternative Vocabulary for Multiple Public Spheres." *Communication Theory* 12, no. 4 (November 1, 2002): 446–68.

ideas, marriage equity—they owe nothing to civic tech."[53] While many civic tech platforms do provide space for discourse, by centralizing control to a group such as a planning department, or by opening the community to a non-specific group of civically-engaged residents, historical political struggles cannot find a home, and agonism cannot be effectively harnessed. The people who feel most empowered to "speak" in these spaces are likely to be the same privileged people who feel empowered to speak in traditional town halls (except, often individualized and removed from supporting structures such as community organizations).

How can we build power among marginalized communities with the help of technology? What design principles for social networks can support the needs and continued existence of these subaltern counterpublic spaces? The area that I will be focusing most closely on are socio-technical features that pose the most threat to subaltern communities, but are not well-addressed in existing civic technologies.

Losing Control of Discursive Practices: Algorithmic Bias

One growing threat to historically marginalized communities is algorithmic discrimination, or more accurately, algorithmic amplification of existing discriminatory practices. This is not a new phenomenon: the effects of race-based redlining practices, although outlawed in the 1960s, continue to affect lending practices, urban geography, and economic inequality in the United States.[54] However,as the minutiae of our lives are increasingly documented and subsumed within large, searchable datasets, there are more possibilities for these patterns to occur. What happens when data from many years of human

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[53] O'Neil, Daniel X. "An Education in Community Technology: An Exit Interview with Daniel O'Neil upon Leaving Smart Chicago." Civicist, June 1, 2016. http://civichall.org/civicist/an-education-in-community-technology/.

[54] Gregory D. Squires and Charis Elizabeth Kubrin, *Privileged Places: Race, Residence, and the Structure of Opportunity* (Boulder, Colo: Lynne Rienner Publishers, 2006).

bias is used to train a theoretically unbiased system? This concern is particularly prevalent in predictive policing and algorithmic hiring practices, though it also extends to the composition of social groups. Ted Striphas argues that "What is at stake in algorithmic culture is the privatization of process: that is, the forms of decision-making and contestation that comprise the ongoing struggle to determine the values, practices and artifacts—the culture, as it were—of specific social groups."[55] I would challenge this notion that humans are becoming a smaller part of the process, and agree with Tarleton Gillespie's assertion that algorithms are best thought of as part of "socio-technical assemblages."[56] I would argue that algorithms are characterized less by a stabilization of culture, and more by a proliferation of algorithmically-tinged subcultures and counterpublics. While sorting algorithms based on a user's performed preferences may ultimately homogenize visible public space for them, they create more overlapping public spaces as a whole.

Networked publics are not empowering by default, and in fact they often reify and amplify existing power structures formed by historical patterns rooted in racism and anti-Blackness. In order to more fully utilize the affordances for openness and accessibility that the web allows, we need to more deeply understand what kinds of filters and sorting mechanisms exist, and how to use them without amplifying the structural disadvantages built into offline life. How can we design and understand algorithmic publics to reverse the negative effects of segregation and to extend legitimate power to people who aren't part of the same circles that are already in power? How can exclusionary affordances and practices be used to

[55] Ted Striphas, "Algorithmic Culture," *European Journal of Cultural Studies* 18, no. 4–5 (August 1, 2015): 395–412, 395.

[56] Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot, *Media Technologies: Essays on Communication, Materiality, and Society* (MIT Press, 2014).

protect counterpublic spheres? How do people currently use algorithmically-curated public spaces to resist and/or reverse systems of domination?

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Public and Counterpublic Spheres Online

In 1962, Jürgen Habermas characterized the ideal public sphere as "a theater in modern societies in which political participation is enacted through the medium of talk."[57] This utopian ideal of communicative action was modeled on coffeehouses and public squares and meant to describe the ideal process of forming public opinion: through rational debate about public matters. In the years since its initial formulation, many scholars, especially feminist scholars such as Nancy Fraser and Catherine Squires, have critiqued this ideal as rooted in masculinist and bourgeois conceptions of propriety, and as ignorant of the conversational dynamics that take place in real spaces like the one Habermas describes. For example, feminist research has shown that "men tend to interrupt women more than women interrupt men; men also tend to speak more than women, taking more turns and longer turns; and women's interventions are more often ignored or not responded to than men's."[58] In online spaces, this can manifest through algorithmic obfuscation of content, status affordances that make certain types of discourse more visible, and disruptive conversational practices that force people to take a defensive, rather than proactive stance.[59] Without technical affordances for accountability and selective exclusion of harmful people, content, and behaviors, the safety and discursive authenticity of marginalized groups are compromised.

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[57] Fraser, "Rethinking the Public Sphere," 57.

[58] Ibid., 64.

[59] See Alice Emily Marwick. *Status Update: Celebrity, Publicity, and Branding in the Social Media Age*, 2013, for a discussion of "status affordances."

In her landmark 1990 essay "Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy," political theorist Nancy Fraser highlights the phenomenon in which dominant groups set the tone and norms for discourse and informally (or formally through rules) enforce marginalization of other groups. She spells out how this is exacerbated when there is only a single, comprehensive public sphere. Fraser concludes that an egalitarian, multi-cultural public sphere cannot function in this way, as "that would be tantamount to filtering diverse rhetorical and stylistic norms through a single, overarching lens. Moreover, since there can be no such lens that is genuinely culturally neutral, it would effectively privilege the expressive norms of one cultural group over others, thereby making discursive assimilation a condition for participation in public debate."[60] Spaces that claim to be for everyone and that protect free speech over all other values, such as Reddit or city council meetings, also operate under these dynamics. On Reddit, this is particularly apparent due to the "upvoting" and "downvoting" system of ranking content. Although it is egalitarian in the sense that each user can vote on the kinds of posts they want to see, it creates a situation in which users with minority viewpoints find it difficult to be seen, even by members of their own groups.

Fraser introduces the concept of "subaltern counterpublics" to describe a different kind of ideal in which subordinated social groups operate to form counterdiscourses that express their own interests and needs, using their own expressive practices. One example Fraser gives that is contemporaneous with Habermas's conception of the public sphere is that of the French salon. This was a space for community discourse that was much friendlier to women, but which was stigmatized as "effeminate," "artificial," and "aristocratic," (and indeed, while more representative of some women, was predominantly composed of upper-class white

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[60] Fraser, "Rethinking the Public Sphere," 69.

women). Fraser argues for the acceptance of a diversity of public spheres, rather than a

singular public sphere, in order to expand the discursive space and to create the possibility of

resistance to domination.

Social media, which can be thought of as a form of mediated public space, creates a

range of supported public behaviors through its very architecture. As Thérèse F. Tierney writes

in her 2013 book *The Public Space of Social Media*:

> These platforms give individuals agency to use social media as if it is, in fact, a public
> space. This is only possible because there are technological properties specific to the
> Internet and social media that earlier forms of media do not share. These
> affordances—such as speed, ease of transmitting text, images, and video, mainstream
> as well as subaltern access; and distribution of news and information—make
> crackdown difficult in the long term since certain industries are dependent on internet
> transactions and exchange. Thus, social media platforms, despite their compromise
> and contamination, are still more accessible, and arguably more democratic, and more
> difficult to censure than what was previously available to these populations.

In the same way Dan O'Neil notes that deliberately civic platforms have not fostered as

much civic participation as accidentally civic platforms such as Twitter, Tierney notes the

inherently positive and democratic affordances of these sites. At the same time, she highlights

the paradox that "increased accessibility to networked publics has proceeded in lockstep with

an equivalent loss of privacy."[61] This is the contradiction inherent to networked publics. Access

to platforms is not enough to ensure an equitable public sphere; we must further examine the

infrastructures and affordances that exclude certain users, and why. Scholars of public space

and privately owned public space, such as Benjamin Shepard and Greg Smithsimon, have long

interrogated the specific architectural techniques as well as the legal and social structures that

undergird how people use and misuse constructed spaces.[62] While online spaces do not have

retractable spikes on benches or specially timed sprinklers to architecturally police who can

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[61] Ibid., 17.

[62] Benjamin Shepard and Greg Smithsimon. *The Beach Beneath the Streets*. Albany: State University of New York Press, 2011.

use a space (i.e. not homeless people are not allowed), algorithms function to change who is visible in a space, as well as who a user is visible to. Additionally, inappropriateness worthy of exclusion is determined less often by law enforcement or some other centralized authority, and more frequently by individual users who curate their own space through following, unfollowing, liking, or blocking their fellow social media inhabitants. Features for reporting, blocking, unfollowing, and unfriending are standard on many of the most common social sites today.

With the advent of networked publics, defined by social media scholar danah boyd as publics restructured by networked technologies,[63] the boundaries of these counterpublic spaces have become more blurred as billions of different utterances are filtered through the same mediating site. Before the organizing infrastructure of social media, people with shared interests would need to categorize themselves and actively join a group of like-minded individuals to form a public or a counterpublic. While this still happens in the form of organizations, social clubs, schools, and other institutions, a significant part of the association process has been made invisible. By simply liking a piece of content, and then affirming that affect through "liking" on Facebook, or "following" on Twitter, a user finds herself privy to conversations, information, and discourses that previously might only happen within the context of clearly categorized social groups. Instead, categorization often happens through a bottom-up process based on behavior rather than conscious self-selection. This has the effect of creating "a 'cacophonic media' that allows multiple partial glances at collective 'truth..'"[64] In these kinds of environments, many discursive norms can coexist, unlike in the Habermasian singular public sphere where social differences must be bracketed and subsumed under a

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[63] danah boyd. "Taken Out of Context: American Teen Sociality in Networked Publics." University of California, Berkeley, 2008.

[64] Nick Couldry, Mary L. Gray, and Tarleton Gillespie. "Culture Digitally: Digital In/Justice." *Journal of Broadcasting & Electronic Media* 57, no. 4 (December 2013): 614.

singular style of public speech. Instead, by including features that allow users to have control over their visibility and the visibility of others, users are able to artificially construct the type of space that Catherine Squires describes as necessary in her work on Black counterpublic spheres, in which a community is able to "enclave itself, hiding counterhegemonic ideas and strategies in order to survive or avoid sanctions, while internally producing lively debate and planning."[65]

Surveillance and the Exclusion of Centralized Power

Despite the opportunities afforded by networked publics for a diverse array of discursive topics and styles, opportunities for surveillance in these online spaces are heightened due to the persistent and searchable nature of networked interaction. Because of this danger, more work is still needed to mitigate against dangerous and controlling surveillance practices when designing spaces for people likely to face political repression. For an earlier phase of this project, I interviewed two Boston-based Black social justice activists, Chrislene DeJean and Eric Martin,, about using the internet as a piece of traditional organizing. In our interviews, surveillance emerged as a primary area of concern when using social media for social and political work. Their social media practices reflected both a cognizance of surveillance and knowledge of specific techniques used to evade it. They shared a general concern about sites collecting and aggregating personal and community data to sell to advertisers, but also each had specific concerns about themselves or their communities being tracked and targeted by law enforcement agencies. Surveillance scholar Simone Browne contends that "rather than seeing surveillance as something inaugurated by new technologies, such as automated facial recognition or unmanned autonomous vehicles (or drones), to see it

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[65] Squires, "Rethinking the Black Public Sphere," 448.

as ongoing is to insist that we factor in how racism and anti-Blackness undergird and sustain the intersecting surveillances of our present order."[66] Browne's proposal that Blackness is inseparable from a condition of surveillance is aligned with much of the scholarship on the Black counterpublic sphere, as well as dense histories of surveillance carried out by state projects like COINTELPRO[67] and the Mississippi State Sovereignty Commission.[68] DeJean described her concerns to me as follows: "The thing about Facebook is, who owns my posts? Who owns what I'm saying? Is that really the voice that I want? I don't feel that much agency over my stuff and state surveillance makes me feel very uncomfortable, so I'm just trying to find a way to navigate with these platforms that are safe and I that I feel ownership over." Encrypted messaging applications like Signal, and more recently, WhatsApp, have provided a space of security, but for the most expansive forms of public discourse to emerge, and to fully empower members of marginalized groups, issues of surveillance and data collection must be built in when developing social platforms that are resistant to surveillant practices.

Nevertheless, the combination of networked publics and cheaply available cameras on mobile devices has made "sousveillance," or citizen undersight, a much more prevalent practice by people seeking justice from abuses in the criminal justice system. Simone Browne defines the term "dark sousveillance" to refer to "an imaginative place from which to mobilize a critique of racializing surveillance, a critique that takes form in antisurveillance, countersurveillance, and other freedom practices."[69] How can dark sousveillance be

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[66] Simone Browne, *Dark Matters: On the Surveillance of Blackness* (Duke University Press Books, 2015), 8.

[67] Joshua Bloom and Waldo E. Martin, *Black against Empire: The History and Politics of the Black Panther Party* (Berkeley: University of California Press, 2013).

[68] Jenny Irons, *Reconstituting Whiteness: The Mississippi State Sovereignty Commission*, 1st ed (Nashville, Tenn: Vanderbilt University Press, 2010).

[69] Browne, *Dark Matters*, 21.

incorporated into social systems of accountability? How do countersurveillance,

anti-surveillance, and other freedom practices function in a networked public made possible by

massive data collection?

Currently, 80% of federal, state, and local law enforcement agencies use social media

as an intelligence gathering tool,[70] yet there are few laws governing how social media can or

cannot be used for surveillance by law enforcement agencies. What would it mean to create a

reflective apparatus that makes these often invisible audiences visible, and to apply democratic

methods to networked public space?[71]

Both dark sousveillance and the community mesh wireless network projects I described

here reject the notion that a centralized, falsely universalist ruleset can be used to empower

people in marginalized communities and subaltern counterpublics. The role of distributed

ownership and decision-making power, as well as protection from the harmful and chilling

effects of algorithmic discrimination and surveillance, are necessary to ensure

self-determination for marginalized people. While these practices are fairly specific to context,

in the next chapter, we will explore the role of critical pedagogy as a flexible methodology for

research, community input, education, and design for communities.

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[70] 2014 LexisNexis online survey.

[71] Fenwick McKelvey. "Algorithmic Media Need Democratic Methods." *Canadian Journal of Communication* 39 (2014): 597–613.

Chapter 4

Critical Community Technology Pedagogy

In earlier chapters, I discussed the role of human participation in the creation of technologies for social justice and social change. Now, I discuss the role that pedagogy, as a specific form of participation, plays in community organizing and the broader tech ecosystem, and how it can be used not only in traditional schooling environments or as a form of "outreach," but as a transformative core for design and development of technology more broadly.

As previously mentioned, in almost every interview we conducted for the Technology for Social Justice Field scan, we heard that participation, especially participation in the design process by people in the communities most affected by a particular project, is critical to ensuring the success of that project. Interviewees saw this participation as necessary in order to have a more diverse set of people in the room, and to create accountability to a community that directly struggles with the problem being addressed. Including those most affected, or at least organizations representing those most affected, was seen as the most effective way to create a technological solution that would actually solve a real-world problem. Additionally, we heard that without funding, capacity, or an institution willing to continue maintaining a project, it is all too common for a technology to be built and then for it to unnecessarily fall into disrepair or neglect. This lack of community engagement or input, lack of racial, ethnic, class, or gender diversity in technical roles, lack of concrete benefits to existing communities, and lack of long-term maintenance of projects is seen as an all-too-common failure of '"technology

for good" (or even just technology) projects. I would argue that each of these potentially core problems can be addressed through a form of critical pedagogy as research, participation, and design process.

The approach owes a great deal to the work of Diana Nucera and projects she has been instrumental in, such as the Detroit Digital Justice Coalition, Detroit Community Technology Projects, the Allied Media Conference, and Detroit Future Media. Through these projects, curricula, and writings have been published in the Rebuilding Tech v.1 and v.2 zine, the DiscoTech zine, the Detroit Future Media Guide to Digital Literacy, and the Teaching Community Technology Handbook, among others. In turn, these projects owe a great deal to Paulo Freire, the Mississippi Freedom Schools, Grace Lee Boggs, and the Detroit Summer.

Critical pedagogy, as introduced by educator and philosopher Paulo Freire, is an educational philosophy that aims to empower marginalized people through an egalitarian learning process that values learners' self-determination. As Freire puts it, this can be contrasted with the traditional banking model of education, which has also been described as the factory,[72] or instructionist model,[73] in which a clearly identified teacher "deposits" information about the dominant society into students' brains, to be withdrawn later. The banking model focuses on memorization and regurgitation, and cannot be used to successfully create critical consciousness. As Grace Lee Boggs observed, "We all know kids who are as smart as a whip but who do poorly in school and drop out as soon as they can because they refuse to accept this violence to their humanity."[74] Students who do not thrive in this context

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[72] Grace Lee Boggs and Scott Kurashige, "Chapter 5: The Next American Revolution," in *The Next American Revolution: Sustainable Activism for the Twenty-First Century* (Berkeley, CA: U. of California, 2011).

[73] Seymour Papert and Idit Harel, "Situating Constructionism" (Ablex Publishing Corporation, 1991).

[74] Boggs and Kurashige, "Chapter 5: The Next American Revolution."

are seen as deviant, disobedient, or simply failures.

In a critical pedagogy framework, however, students are empowered to shape the course of their own education towards addressing themes that affect them most saliently. The focus is on the dialectic, and on problem-posing. Students, rather than being conceived of as vessels to be filled, are seen as students-teachers, and as co-investigators. The language and practice of co-investigation has been used extensively in The Center for Urban Pedagogy, which in their Urban Investigations program works with a group of high school students to understand a city problem, and to explain it to others through designed materials.[75] Within critical pedagogy, praxis, which is "reflection and action upon the world in order to transform it"[76] is a central piece of the pedagogy itself. Education is not practiced for abstract reasons, but in order to change the world in a positive way.

While Freire was developing this philosophy in Brazil, Ella Baker and civil rights activists were setting up Freedom Schools in Mississippi, which although officially unrelated, also focused on culturally relevant and liberatory education for students, and an educational experience that consciously transformed both students and teachers. Unlike in traditional (underfunded, segregated) schools, students were given authority and trained to become leaders.

These projects were developed to serve the community need for enfranchisement. Reading and writing skills were necessary to vote, and so the core of the curriculum was reading and writing skills (albeit taught using culturally, socially, and politically relevant material). How can this philosophy be incorporated into the ways we teach digital literacy?

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[75] Yeung, Bernice. "Students Investigate Local Issues Through Service Learning." *Edutopia*, August 3, 2009. https://www.edutopia.org/service-learning-center-urban-pedagogy.

[76] Freire, *Pedagogy of the Oppressed*, 51.

Defining Critical Community Technology Pedagogy

In this chapter, I propose a model of Critical Community Technology Pedagogy, which is the application of a popular education framework for addressing complex social and political issues with technology. I see this not just as a replacement for traditional schooling, but as a way to conduct user research (when the user is the producer) and to ensure dynamic, long-term, transformative ownership and maintenance of technology by the community in which it is embedded. This process is one for building tools and media, multi-directional education, reconfiguration of power dynamics, and the development of transferable skills. The educational approach is demystificatory, multi-directional, transferable, and constructionist. I will describe each of these facets of the process in turn.

Cornel West locates the value of demystification in its efforts "to keep track of the complex dynamics of institutional and other related power structures in order to disclose options and alternatives for transformative praxis; it also attempts to grasp the way in which representational strategies are creative responses to novel circumstances and conditions."[77] In this way, people from oppressed groups who work within and receive benefits from mainstream institutions that ultimately suppress their humanity may still engage in a process for transformative and revelatory (or as West describes it, "prophetic") analysis and practice. Just as Fanon's version of a decolonizing education both unearths and uproots eurocentrism, West's demistificatory criticism requires that oppressed people continuously "keep track" of the power dynamics and cultural value systems that have devalued them psychologically (even if materially, they must still engage within those systems).

This process of "keeping track" in order to transform is necessary for a critical

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[77] Cornel West, "A New Cultural Politics of Difference," *October* 53, no. The Humanities as Social Technology (Summer 1990): 93–109, 105.

community technology pedagogy to impact the lives of students (and teachers) who have internalized anti-Blackness and other oppressive ideologies. An hypothetically neutral educational process that does not seek to demystify still privileges students who have been told by eurocentric, masculinist, bourgeois ideology that they are intelligent and capable of succeeding. One facet of this phenomenon, called "stereotype threat," has been studied and measured dozens of times since Steele & Aronson's landmark 1995 paper, "Stereotype Threat and the Intellectual Test Performance of African-Americans."[78] This paper showed that priming African-American students with the reminder that they are African-American, tends to have a significant negative effect on test performance. The risk of confirming a negative stereotype about one's group has been shown to have significant cognitive effects, such as anxiety, psychological arousal, and reduced cognitive capacity, all of which affect how students engage and perform. The effect has been shown to be general and to have effects on girls taking math tests, the elderly on tests of memory, white men in sports, and women in negotiation. Strategies that reduce stereotype threat typically de-emphasize students' threatened identity, and are important short-term methods for designing equitable assessments. While these strategies may mitigate the effect, they cannot, and should not, permanently erase a student's social identity. Additionally, the mitigation tactics may create tests that have more equal outcomes between groups, but I would argue, due to their minimization of group membership, identity, and pride, are not ultimately empowering beyond the test.

D. Fox Harrell argues that in order to create truly empowering computational systems, these oppressive stereotypes must not only be addressed, questioned, and demystified

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[78] Claude M. Steele and Joshua Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," *Journal of Personality and Social Psychology* 69, no. 5 (1995): 797–811.

through the system, but also be replaced by "empowering phantasms."[79] This holds true for a

pedagogical process.

The second key quality of critical community technology pedagogy is that it is

multi-directional and involves a reconfiguration of power dynamics both on the small scale of

the learning environment, but also with an attempt at reconfiguration of power in the larger

community and world. We saw this project in the literacy schools described by Paulo Freire, in

which students were given authority to generate themes, and teachers were put in the role of

listeners, as well as in the Citizenship Schools originally founded by Septima Clark in the Deep

South in order to build power in Black communities not only through formal legal rights, or only

through reading and writing, but also through culturally-relevant, civically-driven education

meant to create leaders for people's movements. Unlike in traditional schooling, priority for

teaching was given to people who had learned to read as adults, often also through Citizenship

Schools. Power is reconfigured in this space because while students are conceptually thought

of as teachers, they also often literally become teachers, much like in the Digital Stewards

projects (see Chapter 3). Critical community technology pedagogy empowers students from

marginalized communities because rather than operating with a deficit model of seeking the

most underprivileged, it works with an asset model for finding teachers who are most

interested in becoming leaders in their own communities.

The third principle of critical community technology pedagogy is transferability.

Learners in this process should be able to come away with skills that can be used in a different

context than the one in which they were taught. Rather than training students in concepts that

can be applied only to the narrow application of the organization or the project, projects should

[79] D. Fox Harrell, Phantasmal Media: An Approach to Imagination, Computation, and Expression (Cambridge, Massachusetts: The MIT Press, 2013), ix.

be structured so that people can leave if they want to. This is an important benefit of both the community mesh wireless networks discussed above, and the Code for America brigade network. In both cases, emphasis is placed on projects that are extensible, well documented, and that are built using skills that can be reused in the industry or anywhere else, even if this does not fit within the political analysis of the teacher and organization sharing skills. The goal of the Digital Stewards program is not for the stewards to spend their entire lives maintaining the wireless network, but to learn digital skills through the development of a wireless network, and then to have the option of taking a more lucrative career in technology or starting new projects if they so choose. The goal is expanding opportunity, not a limited emphasis on the present obstacle.

The digital literacy and entrepreneurship training organization Hack the Hood is an excellent example of this. This organization accepts youth of color from Oakland and teaches the tech skills necessary to either start a web development company or to join a company like the ones found in Silicon Valley. While many, if not most, of the students in the program came in with social and political reasons for pursuing technical work, and seek to use it to empower others in their communities, they also have the freedom to choose, and are not limited to a particular political analysis or space to work within.

Finally, the fourth integral piece of a critical community technology pedagogy is that it involves the construction of an object, piece of media, or technology. The idea that students learn through building was most central to Seymour Papert's theories on learning, but also could be found in Freire's discussion of praxis, and in the Detroit Digital Justice Coalition's emphasis on education and organizing through the processes of media production. The three theories I draw on for this concept are Walidah Imarisha and adrienne maree brown's notion of "visionary fiction," Seymour Papert and Idit Harel's learning theory of "constructionism," and

Paulo Freire's discussion of "praxis."

In their anthology of speculative fiction stories by social justice activists and writers, editors Walidah Imarisha and adrienne maree brown highlight the critical elements of "visionary fiction" as the ways in which it "explores current social issues through the lens of sci-fi; is conscious of identity and intersecting identities; centers those who have been marginalized; is aware of power inequalities; is realistic and hard but hopeful; shows change from the bottom up rather than the top down; highlights that change is collective; and is not neutral—its purpose is social change and societal transformation."[80] Brown and Imarisha are part of a long line of Afrofuturists who seek to use the tools of fiction to imagine new worlds and new technologies of resistance. Scholars and writers such as Mark Dery, Alondra Nelson, Walidah Imarisha, adrienne maree brown, Reynaldo Anderson, Ytasha Womack, and John Jennings have, in recent years, highlighted the role of Afrofuturism as a liberatory practice for "[reintegrating] people of color into the discussion of cyberculture, modern science, technology, and sci-fi pop culture,"[81] and as an aesthetic movement and source of critical theory with a rich history across fiction, music, film, and other media. The aspects I focus on now are the ways in which "being imaginative and creative, and even projecting black culture into the future, [is] part of a lineage of resistance to daunting power structures."[82] How can speculative and visionary fiction be used to not only critique contemporary and historical race-based power imbalances, but also to imagine new worlds and new technologies? Walidah Imarisha writes that "If we want to bring new worlds into existence, then we need to challenge

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[80] Octavia's Brood: Science Fiction Stories from Social Justice Movements (p. 279). AK Press. Kindle Edition.

[81] Reynaldo Anderson and Charles E. Jones, eds., *Afrofuturism 2.0: The Rise of Astro-Blackness* (Lanham, Maryland: Lexington Books, 2016) Kindle Locations 231-234.

[82] Ibid., 248-249.

the narratives that uphold current power dynamics and patterns."[83]

These four pieces of a critical community technology pedagogy—demystification, multi-directionality, transferability, and construction—add up to create a design process and an organizational process that privileges the development of new technologies that critically engage with structural issues, both in the ways they affect learners and doers of computing, and in the ways they reveal themselves in society. By structuring a design research, public participation, and design process around equitable and critical pedagogy, projects can address issues that organically arise from a community and tend towards redistributive outcomes, and technology that reflects the values and needs of a community.

CCTP as Research: Civic Laboratory for Environmental Action Research

In Newfoundland, Canada, marine biologist Max Liboiron runs a feminist marine biology lab called Civic Laboratory for Environmental Action Research (CLEAR) in which she and her team (along with members of the community, including fishers, and children) conduct community-based participatory action research and tool development for conducting marine science research. In this lab, environmental monitoring is done in a way that privileges equity, above all else, and engages in activist practices both in the way the lab itself is run (for example, by determining author-order through consensus and according to a set of principles),[84] and through the outcomes and implications of the lab's research.[85] Research on fish and marine pollution is conducted with the help and research design input of local fishermen and

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[83] Walidah Imarisha et al., *Octavia's Brood: Science Fiction Stories from Social Justice Movements*, 2015, 279.

[84] Max Liboiron, "Equity in Author Order," *Civic Laboratory*, May 23, 2016, https://civiclaboratory.nl/2016/05/23/equity-in-author-order/.

[85] Max Liboiron et al., "Low Plastic Ingestion Rate in Atlantic Cod (Gadus Morhua) from Newfoundland Destined for Human Consumption Collected through Citizen Science Methods," bioRxiv, October 14, 2016, doi:10.1101/080986.

women, and before the results are published in the academy, they are presented in a community meeting in which the group (including both the researchers and the local community) can provide feedback on research that would be useful, and whether it is beneficial to the community to publish at all.[86] How does research like this sit within the demystificatory, multi-directional, transferable, constructionist framework of Critical Community Technology Pedagogy?

On the one hand, research is always ostensibly demystifying: it should make something that is unclear clearer. However, within critical community technology pedagogy, the process must also demystify the meta-level of the research, in which the power structures, inequalities, and biases in the research process and the broader society are also made clear. Does the pedagogical process demystify power structures and biases to participants in order to empower participants, especially those from groups marginalized in and through scientific research? I would argue that the process of destabilizing the organizational structure of the lab itself has a demystificatory effect. Rather than relying on academic customs and "this is how it has always been done," the laboratory structures are always up for discussion and modification. "How can this process be made more equitable?" appears to be a driving question for all of the the marine lab's work. This appears most saliently in the CLEAR guidelines for determining author order on publications. While everyone listed as an author worked on the study and would be able to talk about it if asked, the order is determined by consensus. Less prestigious, but equally or more difficult work, like gutting fish or cleaning the lab, is given equal weight with work like data analysis and writing, and if someone needs first authorship more, they may move up in author-order. The process seeks to compensate for,

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[86] See Terry-Lee "Refusal as Research Method in Discard Studies," Discard Studies, March 21, 2016, https://discardstudies.com/2016/03/21/refusal-as-research-method-in-discard-studies/, for a discussion of ethnographic refusal as a decolonzing research dissemination (or non-dissemination) method.

and in the process demystify, unevenness that already exists.

The second question is that of multi-directionality. Are power-structures reconfigured at the site of pedagogy and in society more broadly? Is learning taking place on multiple levels and through many types of interpersonal and organizational relationships? For CLEAR, as for other academic labs, there is an expectation that basic research will be published in journals and other academic outlets in order to inform the global scientific community, and specifically in the field of pollution and microplastics. However, unlike many other academic labs, there is also an acknowledgement that this research will have specific implications for the local community, including potential loss of fishing jobs and health effects. While most of the fishermen and women will not, by default, have access to these outlets, they still have a critical stake in the outcomes of the research. Additionally, while they are not professional researchers, they have their own questions and knowledge of the marine environment. Because CLEAR focuses not only on basic research, but also on the social and power dynamics of the research process itself, the lab engages in a dynamic and multi-directional learning, data collection, and research design process. In one study that measured marine plastics in the guts of Atlantic Cod, fishermen and women were trained in how to gut fish specifically for marine plastics analysis, and then were asked to name and send the guts of fish they caught to CLEAR to be analyzed. Before the results could be published in academic outlets, they were first brought to a public meeting with the community, including the fishers who collected GI tracts for the study. These results not only could shed light on the potential health implications of eating local fish (in this area of Newfoundland, 82% of people report consuming local fish at least once a week, with cod making up a significant portion of that), but also could impact the local economy and livelihoods if it was revealed to the global community that Newfoundland Atlantic Cod contained high concentrations of plastic. In this study (and

others in CLEAR), the community had the right of *refusal*: through a public meeting, people may ask that the research not be published, or not be published in certain outlets because of potential adverse effects on the community. Multi-directionality can be seen in the ways in which multiple audiences were engaged in learning from one another (fishers, marine scientists, academic community, and the local fish-eating community), and in the ways that power was reconfigured by shifting the final control over dissemination to the community most affected by that research.

Were the skills learned through this process transferable, or are people alienated from their labor? In many citizen science projects, the role of the "citizen" (or more accurately, amateur scientist) is that of a "glorified sensor," who is involved in a project because unlike graduate students, they will work for free, and are therefore seem as economical ways to collect data. Though some of CLEAR's projects stray towards this type of potentially exploitative relationship, they recognize and actively seek to avoid it. CLEAR designs its technologies according to the following guidelines: "Open source and online," "Can be built and *used* by accredited and citizen scientists," "Cost less than $50 to make," "Made of materials you can get in rural Newfoundland," "Repairable yourself, with local materials," and "No plastics."[87] This set of guidelines is meant to ensure that rural Newfoundlanders will be able to answer their own research questions, even without CLEAR's intervention. The skills learned in one CLEAR project can then be used by people in the community to answer their own questions. Additionally, CLEAR's work towards standardizing and popularizing an international Open Hardware license is intended to lower barriers to reuse and build upon

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[87] Max Liboiron, "CLEAR Guidelines for Designing Equitable Scientific Tools," Civic Laboratory, April 26, 2017, https://civiclaboratory.nl/2017/04/26/clear-guidelines-for-designing-equitable-scientific-tools/.

hardware, in much the same way the open source movement has done for software.[88] This transferability of knowledge and skills is a core component of a critical community technology pedagogy.

The fourth question to of a critical community technology pedagogy is, are learners building and constructing knowledge by constructing technologies? Many of CLEAR's projects center on developing technology "that is small-scale, simple enough to be easily maintained, cheap enough to be accessible, environmentally aware, and compatible with human creativity."[89] One of these project is the educational and marine plastic monitoring tool called *Ice Cream Scoop*.[90] Through the process of building this trawling instrument with everyday materials, children learn about marine science and scientific technology, and contribute to a real-world scientific research study, with professional scientists. The type of active learning that happens as part of a contextualized real-world problem context has been shown to be meaningful and intellectually challenging for students.[91] By building technology like the *Ice Cream Scoop*, learners create interdisciplinary connections, and contribute meaningfully and materially to equitable and liberatory technology development.

While Critical Community Technology Pedagogy should not be conceived of as a binary "is it or isn't it," CLEAR provides several examples of ways to conduct research while integrally incorporating criticality, community, technology, and pedagogy.

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[88] Shannon Dosemagen, Max Liboiron, and Jenny Molloy, "Gathering for Open Science Hardware 2016," Journal of Open Hardware 1, no. 1 (April 25, 2017), doi:10.5334/joh.5.

[89] Pursell. "The Rise and Fall of the Appropriate Technology Movement in the United States, 1965-1985."

[90] Max Liboiron, "Ice Cream Scoop," Civic Laboratory, December 18, 2015, https://civiclaboratory.nl/2015/12/18/ice-cream-scoop/.

[91] Lisa M. Bouillion and Louis M. Gomez, "Connecting School and Community with Science Learning: Real World Problems and School–community Partnerships as Contextual Scaffolds," Journal of Research in Science Teaching 38, no. 8 (October 1, 2001): 878–98, doi:10.1002/tea.1037.

CCTP as Participation: Data Discotechs

In Sherry Arnstein's foundational 1969 text on the levels of meaningful (and conversely,

exploitative) participation, "A Ladder of Citizen Participation," she criticizes the wide variety of

interactions, some manipulative or harmful to communities, that masquerade under the banner

of "participation," or "community involvement."[92] The ladder consists of the levels

"Manipulation," "Therapy," "Placation," "Partnership," "Delegated Power," and "Citizen

Control," ranked in order of how much power citizens have to determine the end product. In

Arnstein's paper, the role of education is mentioned primarily within the context of

manipulation; specifically, manipulation of the powerless by the powerful. "In the name of

citizen participation, people are placed on rubberstamp advisory committees or advisory

boards for the express purpose of 'educating' them or engineering their support."[93] My

question now is, within a critical community technology pedagogy framework, is it possible to

move the role of pedagogy *up* the ladder of participation in order to ensure meaningful and

substantive participation in a political process? Can a skillshare environment shape public

policy? Let us explore these questions further through a series of events organized in

2015-2016 to engage with Detroit's newly launched Open Data Portal.

One of the organizations that organized these events, the Detroit Digital Justice

Coalition, was formed in 2009 in order to implement federal stimulus funding to increase

broadband access among marginalized communities. The organizations and people involved in

the coalition chose to implement that funding according to the Digital Justice principles of

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[92] Sherry R. Arnstein, "A Ladder of Citizen Participation," AIP Journal, July 1969, https://isites.harvard.edu/fs/docs/icb.topic980025.files/Wk%203_Sept%2016th/Arnstein_1969_Ladder %20of%20Participation.pdf.

[93] Ibid., 218.

access, participation, common ownership, and healthy communities.[94] The DDJC pioneered a

model of community technology pedagogy called DiscoTechs, or Discovering Technology fairs.

In response to Detroit's creation of an open data portal, the DDJC organized a series of

DiscoTechs to share skills and discover technology in an intergenerational neighborhood

space. While participation as a concept is most useful when trying to understand how policy is

shaped in a centralized democratic entity such as a government, Data Discotechs can still

provide a valuable insight into the ways in which policy *could* be shaped by critical community

technology pedagogy.

The first of the four goals of the Data Discotechs was to "Demystify Data."[95] In what

ways do (or don't) Data Discotechs engage in demystification of power structures, biases, and

inequalities? While many data-centered events, such as Brigades and Maptimes, celebrate the

affordances and possibilities of open data portals, relatively few create a space for critical

questioning of who is harmed by opening certain datasets, how data is collected, who has the

skills to access the data, and what the privacy implications are. Because of this lack of

criticality, these events run the risk of hovering at the lowest levels of Arnstein's Ladder, and

manipulating communities into either accepting a particular data configuration, or alienating

people critical of open data from entering the space. At a DiscoTech these questions, among

others, are raised through skillshares and activities such as the creation of Data Murals, which

"[engage] community members in a dialogue about data-driven representations and

misrepresentations of their community," Your Data Body, in which participants "[discuss] who

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[94] Detroit Digital Justice Coalition, Communication Is a Fundamental Human Right: Issue #2, 3-4.

[95] The other three are "Understand the risks of open data," "Understand how to use data in community organizing efforts," and "Use data in creative ways; Alex B. Hill, "Event: Open Data DiscoTech," DETROITography, April 22, 2016, https://detroitography.com/2016/04/22/event-open-data-discotech/.

collects this data, where it's stored, and who makes decisions about it," and Transit Justice, in which participants "identified interactions with their own transit routes and explored alternatives."[96] Unlike manipulation, the form of non-participation at the bottom rung of Arnstein's ladder, this process involves multi-directional knowledge-sharing that demystifies the potential social and political complications of open data, while also giving participants the power to use, manipulate, and understand data.

Can the skills learned in a Data DiscoTech be used to empower people once they leave the context of a DiscoTech? The DiscoTech model is explicitly designed to be useful to people in their everyday lives. The workshops included several stations in which people learned how to access and use different types of city datasets, as well as how to apply for assistance with utility bills, and how to scrape and visualize data. Unlike most hackathons, the cultural space of a DiscoTech is designed to be comfortable for children, elders, non-techies, and people who are otherwise underrepresented in the tech industry and technology development spaces. By sharing these concrete skills, people can be more informed participants in a civic decision-making process.

Finally, in a Data DiscoTech, construction is privileged over instruction. Rather than telling people what data can be used for, or what story the data tells, people construct their own knowledge and meaning from the data.

These DiscoTechs indirectly influence the future of data portal policy in Detroit through the "Recommendations for Equitable Open Data" report published by the Detroit Digital Justice Coalition and Detroit Community Technology Projects, but are not directly responsible for city open data policy. Could a city run an egalitarian, redistributive, demystifying pedagogical

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[96] Detroit Community Technology Project, "Video and Photos from the Data DiscoTech," Allied Media Projects, October 27, 2015, https://www.alliedmedia.org/news/2015/10/27/video-and-photos-data-discotech.

process as a form of political participation? This is an open question, but so far, it does not seem as though any municipality has come close, except by proxy.

CCTP as Design Process: Center For Urban Pedagogy's Urban Investigations

The Center for Urban Pedagogy, in New York City, uses pedagogy as a design process, and as a goal of designed and produced objects. In their Urban Investigations series of projects, a teaching artist leads a group of (usually) high school students on an investigation of some fundamental question in the city, and then the group collectively produces a teaching tool to teach people what they learned through the investigation. These projects are demystifying, in that they illuminate a complicated process involving power in the city, like "who decides where homeless shelters go?" "why are some boroughs taking on more shelters than others?" and "who makes decisions on how public schools in New York are run?" Through interviews with stakeholders on many sides of an issue, learners/co-investigators reveal and demystify complicated political dynamics in the systems that affect them (and that they can affect) every day.

Additionally, the learning process is multi-directional. Through the process of creating educational materials, students become teachers of the general public. In many of these investigations, the people interviewed also share questions that they want answered through the investigation and design process, which are then taken up by students/investigators. People who are not served well by a particular system share their workarounds with other people who might be in a similar situation. In this way, even in a highly bureaucratic system, knowledge can be decentralized and democratized.

Are the skills learned in an Urban Investigation transferable to other kinds of work? The interdisciplinary projects purportedly involve interviewing, writing, graphic design, audio

production, film production, and other skillsets. Through the construction of an object, either a film, a foldout pamphlet, or some other teaching tool, students learn both concrete skills, such film production, and skills like how to engage in active citizenship. Much like in the CLEAR Ice Cream Scoop project, students become engaged in the learning process through impactful creation of useful objects in a real-world context.

The Center for Urban Pedagogy design process is one in which a group (which may be as small as a classroom) is engaged in listening to a community that has both questions and answers. This multi-directional, demystificatory process for constructing useful objects and developing transferable skills is a fruitful example of a design process that puts pedagogy at its core.

Conclusion

These four pieces of a critical community technology pedagogy: demystification, multi-directionality, transferability, and construction, add up to create a design process and an organizational process that privileges the development of new technologies that critically engage with structural issues, both in the ways they affect learners and doers of computing, and in the ways they reveal themselves in society. By structuring a design research, public participation, and design process around equitable and critical pedagogy, projects can address issues that organically arise from a community, and tend towards redistributive outcomes, and technology that reflects the values and needs of a community.

Conclusion

In the preceding chapters, I have developed a critique of dominant Civic Tech practices that do not meaningfully redistribute power and resources to marginalized communities, and outlined a methodology for integrating pedagogy into a community-based, critical design and development practice. Civic and community design practices that seek to meaningfully impact the material circumstances of people of color and other marginalized people need to incorporate those very people in the process as designers, developers, researchers, and decision-makers. The form of critical community pedagogy I have outlined (demystifying, builds transferable skills, is constructive and imaginative, and involves multidirectional and redistributive learning) is an important step towards a liberatory technology practice.

One limitation of this work is that my concise definition of Civic Tech does not reflect the diversity of viewpoints, people, and practices within (and in collaboration with) the field. Civic Tech, while it can act as a colonizing discourse that obscures how confined its own practices are, paradoxically includes people with a wide variety of political viewpoints and interests. I was able to make the argument that Civic Tech is homogenous only because of the relatively tight control by a few organizations over the messaging and narrative that ultimately comes out of projects. This does not mean that all participants who have associated with Civic Tech spaces or projects in some way share the same values.

Additionally, it is still inconclusive whether the design and development process I have outlined can work in governments. Civic Tech, as a government technology-focused discipline, may ultimately have little overlap with redistributive community technology. That being said,

practices within Civic Tech can still move towards greater inclusion of women, people of color and other marginalized groups in the cities served, while resisting the urge to celebrate technology above everything.

This thesis has aimed to constructively critique technology-based civic practices that reproduce societal injustices, and a tentative roadmap towards the design and development of civic and community technologies that lead to a more equitable society. I hope to see more recognition and support for those who place people over technology, and who recognize the need for redistributive practices not only in the outcomes of technology, but in the design process itself.

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