"Freedom from Jobs" or learning to love to labor? Diversity advocacy and working imaginaries in Open Technology Projects

¿"La libertad de empleo" o aprender a amar al trabajo? Incidencia diversidad e imaginarios de trabajo en proyectos de tecnología abierta

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ABSTRACT

This paper examines imaginaries of work and labor in "open technology" projects (especially open source software and hackerspaces), based on ethnographic research in North America. It zeroes in on "diversity initiatives" within open technology projects. These initiatives are important because they expose many of the assumptions and tensions that surround participatory cultures. On the one hand, these projects and spaces are organized around voluntarism; in theory, everyone who wishes to participate is welcome to do so. On

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the other hand, diversity initiatives form in order to address the "problem" of imbalance in the ranks of participants. Technology is a unique domain for the discharge of political energies. In collective imagination, it has been vested with the power to initiate change (even as this belief obscures the role of social and economic relations). Multiple ideas circulate about the relationships between diversity in open technology projects and paid labor. This paper argues that in part due to the legacy of technical hobbies as training grounds for technical employment for much of the twentieth century, as documented by historians of radio (Douglas, 1987; Haring, 2006), voluntaristic technology projects are vexed sites for imagining political emancipation. To a large degree, diversity initiatives in open technology projects are consistent with corporate values of diversity as a marketplace value. At the same time, collectivity formations around technology that incorporate feminist, antiracist, or social justice framings may begin to generate connections between diversity advocacy in tech fields and social justice movements or policy changes in order to effect deep social change.

KEYWORDS

Activism; diversity; open source; technology studies.

RESUMEN

Este artículo examina los imaginarios del trabajo en los proyectos de "tecnología abierta" (especialmente software de código abierto y espacios hacker), basándonos en la investigación etnográfica en Norteamérica. Se centra en las "iniciativas de diversidad" dentro de los proyectos de tecnología abierta. Estas iniciativas son importantes porque exponen muchas de las asunciones y tensiones que rodean a las culturas participativas. Por un lado, estos proyectos están organizados en torno a la participación voluntaria; en teoría, cualquiera que quiera participar es bienvenido. Por otro lado, las iniciativas de diversidad surgen para hacer frente al "problema" del desequilibrio entre las categorías sociales de los participantes. La tecnología es un espacio único para la descarga de las tensiones políticas. En el imaginario colectivo, se ha asociado al poder para iniciar un cambio (incluso a costa de ocultar el rol de las relaciones sociales y económicas). En este sentido, son muchas las ideas que se han generado en torno a la relación entre la diversidad y los proyectos de tecnología abierta. En este artículo argumentamos que debido a la importancia de los hobbies técnicos como campo de entrenamiento para el trabajo técnico durante el siglo XX,

tal como ha sido documentado por los historiadores de la radio (Douglas, 1987; Haring, 2006), los proyectos tecnológicos voluntarios se relacionan con la idea de la emancipación política. En gran parte, las iniciativas de diversidad en proyectos de tecnología abierta son consistentes con los valores corporativos de la diversidad entendidos como un activo de mercado. Al mismo tiempo, las formaciones colectivas en torno a la tecnología que incorporan marcos propios del feminismo, el anti-racismo y la justicia social, empiezan a establecer una conexión entre la promoción de la diversidad en el la tecnología y los movimientos de justicia social y de cambio político, con el objetivo de lograr cambios sociales más profundos.

PALABRAS CLAVE

Activismo; diversidad; código abierto; estudios de la tecnología.

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1. Introducción

On an email listserv devoted to "diversity" issues in a community of software developers, one person wrote in 2011,

> I just want to see more of a diverse crowd of hobbyists/enthusiasts playing with electronics, writing code for fun, and discovering that they can use these skills to actually make a living, like so many people currently do. … I've tried over the past seven years, running several women-only development efforts, but have not been able to sustain such a group for longer than a year. The response is generally: "Well, this was a fun, great resume building exercise. Now I have to get back to real life. Bye!"
>
> (--- to [Python list], 2 February 2011)

This quote deserves special attention for the multiple issues at stake in centering on "diversity" as a primary concern in her software community (centered around Python, a programming language common in software development including many free and open source projects). First, we note that the list poster invokes "a diverse crowd," but goes on to refer specifically to "women-only" development efforts. Second, the poster writes that development "is fun" and suitable for "hobbyists/enthusiasts" interested in "playing with electronics." Last, the poster laments that the projects she has spearheaded have tended to founder, suggesting that participants may have viewed them as mere "résumé-building exercises." Her disappointment with participants' conception of women-only development efforts as résumé-building exercises seems puzzling when we consider that earlier in her post, she writes "they can use these skills to actually make a living."

As Sara Ahmed writes, the "mobility of the word 'diversity' means that it is unclear what 'diversity' is doing, even when it is understood as a figure of speech" (2012, p. 58). The above diversity advocate's quote underscores Ahmed's point, that even though we understand what "diversity" means, it is not clear what work it is doing, or is meant to do. In the Python organizer's quote, the mobility and polysemy of "diversity" gives rise to ambiguity and tensions over *who* should participate in the development and production of electronics and software, as well as *why* participation in these pursuits is meaningful to participants, or within the wider society.

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Technology is a unique domain for the discharge of political energies. In collective imagination, it has been vested with the power to initiate change (even as this belief obscures the role of social and economic relations) (Marx, 2010, p. 577). Many technologists, especially those in activist geek circles, are specifically motivated by political concerns and seek to build technologies that they believe can redress social imbalances or inequalities. The impulses to "open up" technological participation span a range of political motivations. At one end of the spectrum is something akin to Sandra Harding's critique of "value-free" science, which shifts the burden of science away from "neutrality" and towards a starting point that takes into consideration the needs of disenfranchised groups (2016); by extension, democratized technology requires alternative perspectives and practitioners. At the same time, because "diversity" is such a protean concept, it can easily shade away from this more radical stance and into very different political valences. Another salient critique that diversity advocates often make is one where labor, production, and consumption are foregrounded. Diversity is commonly mobilized as a good in market relations, as in, expanding the pool of technologists will result in the entry of underrepresented groups into the workplace, which will change what gets built, which will in turn capture (or serve, depending on the perspective) a wider consumer market. These motivations for diversity work are potentially divergent at their cores, but sit together well enough that both are consistently found in diversity advocacy around open technology. One should not, however, be mistaken for the other.

This paper explores a range of present-day efforts to "open up participation" and challenge the history of exclusion found in technical cultures built around electronics and computing, taking diversity advocacy as its object of focus. Diversity advocacy exposes many of the assumptions and tensions that surround participatory cultures. On the one hand, these projects and spaces are notionally organized around openness and voluntarism; in theory, everyone who wishes to participate is welcome to do so. On the other hand, diversity initiatives form precisely in order to address the "problem" of imbalance in the ranks of project contributors and participants, which are often heavily skewed towards men, for example.[1]

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[1] Due to space constraints, I do not break down the issues of representation and how diversity is con-strued in this paper, though this is a very important topic. Gender diversity receives much attention, though North American and European diversity initiatives also attend to race, ethnicity, class, disability status, and nationality to lesser degrees. Some mobilizations around "gender diversity" also include grow-ing conscientiousness of nonbinary gender constructions and discomfort with propagating "women in tech" as a discourse without problematizing an essentialized notion of "women."

A salient strand of discourse about diversity in open tech, which is of special interest in this paper, concerns the workplace. Participants commonly hold that diversity is important because it empowers members of underrepresented groups to claim jobs in technical fields. This can be equated with equity, but it is also consistent with companies' desires to capture a diverse consumer market; many hold that having a wide range of people in product development is conducive to courting a wide consumer base. Others de-emphasize work preparedness, wishing to see voluntaristic technical communities composed of a diverse range of participants for more inchoate reasons, generally framed as strengthening open source software projects and an attendant movement through pluralism. Still others undertake collectivity formation around open technology as an expression of radical politics, hoping that diversity work can serve as a mode of intervention into and critique of the dominant social order, including questioning capitalism and formulating alternatives to it. This paper zeroes in on ideations surrounding work and labor relationships within diversity initiatives and illustrates that various motivations for diversity advocacy sit in tension with one another. It argues that the imagined relationships between "diversity in tech" and workplace preparedness are important because they expose the generative potentials, or lack thereof present in diversity advocacy.

2. Background

2.1. Politics of Open Technology Projects and Their Relationship to Paid Labor

Many scholars of hacking and tinkering have focused on the fact that these activities often take on meaning as communal and shared actions (Coleman, 2012; Dunbar-Hester, 2014). Anthropologist Gabriella Coleman has argued that hackers deploy a range of stances including agnosticism and denial of formal politics (exceeding software freedom), though implications for intellectual property in particular are at least implicit and often explicit in the technical and social practices of hacking (2012)[2]. Scholars have noted that the denial of formal politics makes free and open source software (F/OSS) an unlikely site for gender activism, at least historically (Nafus, 2012; Reagle, 2013). But F/OSS projects are not monolithic, and have matured over time. They are also in dialogue with the wider culture,

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[2] Christopher Kelty writes that arguments among geeks about "technical" details are not restricted to technical issues, insofar as technical and political-legal structures are inseparable for these actors: "techniques and design principles that are used to create software or to implement networking protocols cannot be distinguished from ideas or principles of social and moral order (2005, p. 86).

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which is currently awash in "women in tech" discourses (such as the publication of and reaction to Facebook COO Sheryl Sandberg's 2013 book *Lean In*). The raft of initiatives around "diversity" must be placed within this context, keeping in mind that geek politics exist along a continuum.

The diversity initiatives discussed here are can be grouped under the umbrella category of "open technology," especially but not limited to F/OSS. Free software is a set of practices for the distributed collaborative creation of code that is made openly available through a reinterpretation of copyright law; it is also an ideologically charged mode of production and authorship that seeks to reorient power in light of participants' understandings of the moral and technical possibilities presented by the Internet (Kelty, 2008, p. 2). Hackerspaces are a cognate offline phenomenon, community workspaces where people with interest in computers, craft and other types of fabrication come together to socialize and collaborate.

The relationship between paid work and open technology projects is awash with contradiction. As has been amply explored elsewhere, many F/OSS projects proceed on the basis of contributors' volunteered time. Such participation can increase skills and reputational capital that can be useful when seeking paid employment. And paid workplaces encourage the participation in labor-of-love projects and pursuits. Google, for example, has allowed its developers to split their paid time on an 80-20 basis, working on 80% planned/assigned Google work and 20% on "their own" "passion projects" (though any products generated are, of course, still owned by Google) (Turner, 2009). As Anita Chan writes, "Few practices seemed to be so effective at generating the intense enthusiasm and heightened investments of global free labor that free software participants—as highly skilled information classes, no less —so extravagantly displayed" (Chan, 2014, p. 117). While this paper does not contribute to the discussion on open source as free labor for the IT industry, this is necessary background for the sites under consideration.

The history of these relationships is no less free of contradiction. According to George Dafermos and Johan Söderberg, "there is [a] line running from the white-collar engineers of the 1950s to the present-day hackers; [on the other hand,] another line connects hacking to the resistance of the machine operators working under those engineers" (2009, p. 56). Job precarity in tech fields is legion and has been for decades (Turner, 2009). For a variety of reasons, including programming's uncertain status flickering between craft and science, programmers have long struggled with issues of autonomy and managerial control

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(Ensmenger, 2010a). This occurs in spite of an often-invoked notion of programming as high-status work.

Lastly, amateur pursuits around electronics have a long history as sites of not only affective pleasure, but as sites where skills and an affective attachment to technology are learned that are additionally useful in paid employment in technical fields. Such practices were stable through much of the 20 century, as documented by historians of radio (Douglas, 1987; Haring, 2006; see also Marvin, 1988; Oldenziel, 1997). Men's and boys' leisure activities allowed masculinity to refashion itself, transforming from mastery over rugged nature to mastery over electronics; brains outstripped brawn in a modern, technological masculinity (Douglas, 1987). Early computer workers and hobbyists often tinkered with radio electronics as young men. Preceding hobbyist and PC computing, Ensmenger (2010b) argues that main frame computers' "off hours" use by men and boys in evenings and weekends grew out of labor practices—in keeping with propriety, women were sent home after business hours ended in order to not mingle with male employees—which shored up the association of computing with masculinity (even though computing work was conducted by both genders).

2.2. Diversity Advocacy in Open Technology Cultures

In "diversity" advocacy in F/OSS and hackerspaces, self-consciously feminist activists and allies, among others, have identified low rates of participation by women in particular in these spaces. Here they confront technical cultures around the issue of "diversity" itself. These initiatives begin with a critique of the liberal Habermasian citizen in how the activists frame and address the problem: they openly admit that there is inequality in their communities, and acknowledge the effects of positionality in producing different rates of participation between men and women. (Not everyone in these technical communities agrees with this assessment, but amongst the advocates addressing "diversity," it is not controversial [see Nafus, 2012; Reagle, 2013].) This is consonant with the acknowledgement by feminist STS researcher Wendy Faulkner and others that context matters, and "one size does not fit all": "the same measures [to improve gender inclusion in work with communication technologies] may not be effective with different groups or in different settings" (Faulkner, 2004, p. 14; Sørensen, Faulkner, & Rommes, 2011). Such a framing stands in contrast to forms of technologically-engaged activism that present technical engagement in universalizing ways (Dunbar-Hester, 2014; Haraway, 1991; Suchman, 2003).

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Our contemporary moment is saturated with exhortations for women (and members of other underrepresented groups, but particularly women) to take up participation in science and technology (the common abbreviation is STEM, for Science, Technology, Engineering, and Math). Rationales for this push vary, but common ones are national competitiveness, and women's economic empowerment. Both can be found on the United States White House's Office of Science & Technology Policy website in 2015: 1) "Supporting women STEM students and researchers is… an essential part of America's strategy to out-innovate, out-educate, and out-build the rest of the world;" and 2) "Women in STEM jobs earn 33 percent more than those in non-STEM occupations and experience a smaller wage gap relative to men" (White house, n.d.).

Industry, too, often regards increased women's participation as desirable. Google neatly summarizes the corporate agenda surrounding women in the technology on a webpage: "Technology is changing the world. Women and girls are changing technology… We always believed that hiring women better served our users" (Google, n.d.a). In other words, the corporation's full market potential is not being realized without a developer base that can cater to diverse users. On another page, entitled "Empowering Entrepreneurs," Google explicates the global reach of its vision and reiterates that "technology" is a route to "empowerment": "Archana, an entrepreneur from Bangalore, shows how women are using technology to better their businesses, improve their lives and make their voices heard around the world" (Google, n.d.b). (Note that while my research sites are predominantly North American, Archana is in India; technical work is used to bring people in to globalized capitalism, literally and figuratively [see Freeman, 2000].)

These agendas provide a backdrop for the object of focus in this paper. Consciousness about diversity (including but not limited to gender) is evident across a wide swath of groups and sectors, including F/OSS development projects, informal hacker groups, and technology-based collectives (loosely lumped together as free culture or open technology projects). Among some free and open source software (F/OSS) practitioners and media activism groups, there has recently been a veritable explosion of interest in holding conversations and debate about the gender implications of their work with communication technology.

As historians of computing have shown, women were programmers of electronic computers in their earliest days, assisting the Allied wartime efforts in Great Britain and the United States (Abbate, 2012; Light, 1999; Misa et al., 2010). Nonetheless, programming was predominantly associated with masculinity within a decade after the war; women's wartime

work in computing had been effectively effaced (Abbate, 2012). Men flooded the growing computer-related workforce[th] and established the academic field of computer science (Ensmenger, 2010a). In 1991, MIT computer science researcher Ellen Spertus famously asked, "Why are there so few women in computer science?" By the first decade of the 21 century, women's rate of participation in academic computer science had declined even further in the United States. U.S. Department of Education statistics indicate that in 1985, a few years before Spertus' essay, 37% of computer science majors were women; in 2009 this number had dropped to 18%, and held steady at 18% in 2012 (Raja, 2014).

Beginning in the mid-2000s, many in F/OSS reacted not only to this longer trajectory of men's dominance in computing but to a policy report released by the European Union in 2006. This report showed that while women's presence in proprietary software was around 28%, in F/OSS it was an astonishing 1.5% (Ghosh 2005). The reasons for this disparity were wide-ranging, probably including such factors as domestic divisions of labor that set up men in heterosexual partnerships to have more leisure time to pursue affective technical passions, wider historical and cultural factors that gendered computing masculine, and the persistent notion that F/OSS projects were liberal, egalitarian spaces where social identity was irrelevant, among others (Karanovic, 2009; Lin, 2006; Nafus, 2012; Reagle, 2013).

The numeric breakdown provided by this report served as a rallying cry. Practitioners mobilized the statistics to justify increased attention to women's participation in F/OSS. As one person stated in 2009 on a newly launched listserv for women in F/OSS: "There is nothing particularly male about either computers or freedom-- and yet women account for fewer than 2% of our[st] [F/OSS] community" ([Womeninfreesoftware] listserv, 24 September 2009; see Kelty, 2014). These interwoven cultural and historical threads account for the heightened attention to "diversity" in open technology communities in the contemporary moment.

3. Research Methods and Position

Diversity advocacy is multi-sited and multi-vocal (Marcus, 1995). My research methods here are informed by an ethnographic sensibility, but lack the "deep hanging out" component that

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[th] Even through the late 1960s, many women worked in computer programming, though they tended to be clustered in lower-status positions such as punch-card operators (Ensmenger, 2010b).

[st] Within the United States, women's presence in academic and industry computing fields fell in the 1990s and 2000s. National context matters and there are significant cultural and national variations in whether women do tech work (see for example, Lagesen, 2008; Mellström, 2009).

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is a hallmark of traditional single-site ethnographic studies (Geertz, 1998). Instead, I have sought to mirror the distributed nature of this advocacy, conducting participation observation at a number of sites (North American hackerspaces, fablabs, software conferences, "un-conferences" for women in open technology, corporate events, and software training events/meetups). An alternative approach would be to embed myself and closely attend to a single F/OSS project or hackerspace, but the networked nature of this phenomenon means that to "follow the actors" I traverse multiple sites. What this approach loses in granularity at a single site is offset by the benefits of a comparative approach, wherein differences and commonalities in diversity advocacy are revealed across a variety of sites (though all in the present study are situated within a common cultural milieu)[3]. Since multiple emphases and orientations within diversity advocacy are occurring, comparison is a valuable enterprise, allowing meaningful analytical points to be made.

My own subject position and social identity is highly relevant to this research. As a white, middle-class, highly educated and literate person who teaches in a university in North America, these communities and their conversations are relatively accessible to me and hospitable to my presence. I do not need much justification for my presence in these spaces; that said, my training, expertise, and commitments are those of the academy, specifically interpretive social science, not computer coding, geeking or hacking, navigating NGOs or startups, or feminist activism. Of special importance is my position as a person with a feminine gender identity. Many of these sites are literally closed to people who do not identify as women (though most are explicitly genderqueer- and trans*-inclusive, some require that people identify as women "in ways that are significant to them") (Adacamp toolkit, 2015). Thus my gender is implicated in my ability to conduct this research; such strictures draw out quite plainly the fact that the knowledge I make here is situated (as all knowledge is).

Fieldwork and data gathering spans 2011 to 2016, with continuous attention to listservs and online traffic, and punctuated conference attendance and interviewing. This period is meaningful because it has seen several feminist hackerspaces appear as well as growing attention to gender in mainstream open source; at the same time, it is a snapshot of an unfolding story with both a prehistory and a future that are outside the scope of the present

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[3] In the words of Karin Knorr Cetina, "Using a comparative optics as a framework for seeing, one may look at one [site] through the lens of another. This 'visibilizes' the invisible; each pattern detailed in one [site] serves as a sensor for identifying and mapping (equivalent, analog, conflicting) patterns in the other. A comparative optics brings out not the essential features of each field but differences between the fields" (1999, p. 4).

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research. It is significant that several initiatives that became research sites were born during this period; while this indicates that I "have my finger on the pulse" of a meaningful social phenomenon, it also means that the objects of study were a moving target and hard to identify before the fact.

I have interviewed participants in these activities as well as founders of hackerspaces, open source software projects, and initiatives to promote women's participation in technology (twenty semi-structured and informal interviews to date), mainly in North America but including a few Europeans. And I follow much online activity, lurking on project lists and following social media, which again mirrors the fact that much of these efforts are coordinated and distributed across space, even as they also include local, static components "in real life" such as hacker- and maker-spaces, or project- or programming-language-based meetups. Conferences, of course, are important for participants (and researchers) for the ritual elements that occur when a community comes together for a short time, not only for the information that is transmitted within them (Coleman, 2012). (Software and hacker conferences can also be occasions for scandal, including controversy over behavior and boundary policing within a community, which are of anthropological interest.) In weaving together these threads of activity, I gain the ability to map the meaningful (and contested) discourses that surround diversity advocacy, situating them within varying social contexts. It is not an exhaustive or "god's-eye" perspective on these initiatives, but it is not wholly idiosyncratic either; I trace multiple skeins of distinct and interwoven activity in order to draw out meaningful contrasts, and interpret the implications of these varying positions for the groups staking positions within the space of this advocacy (Haraway, 1991).

4. Working Imaginaries

Having established context, I now turn to the imaginary of paid work within these sites of voluntarism and advocacy. What is curious is that there is enough of a shared social imaginary to bring people together in these common spaces, but there is little coherence regarding the ideation of work. The shared ideation has to do first with technology as a worthwhile enterprise, and second involves a notion of social change, especially in terms of challenging technical cultures as sites of social exclusion.

Diversity initiatives in open technology projects represents a wide range of impulses, practices, and goals. This paper aims to take seriously the heterogeneity of diversity-centered efforts and not take for granted the multiple principles that orient them. It zeroes in on the

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imagined relationship between employment and open tech diversity efforts in order to evaluate open tech diversity efforts' generation of value and values. Rather than focusing on outcomes or outputs, here I examine the motivations and imaginaries of diversity advocates. It is apparent that ideations drive participation, and that the factors that motivate diversity work in these contexts are neither monolithic nor entirely straightforward. What exactly do advocates hope to change, and why? What is the relationship between envisioned change and work or labor relationships?

At first blush, the answer to these questions is underspecified. One typical practice is illustrated in the following image (Figure 1). The photo depicts a workshop held over one evening and one weekend day (hours when students or people with "regular" work hours are not at work or in school, though of course family duties etc. do not cease), geared towards women who were interested in learning to program in Python ("This workshop will be a great way for you to explore both programming and Python," read an email from organizers, 6/21/12). It was held in a university classroom in Philadelphia, PA, in June 2012, and attended by about twenty people.

FIGURE 1. PYTHON TUTORIAL GEARED TOWARDS WOMEN PROGRAMMING NOVICES, PHILADELPHIA, PA, USA, JUNE 2012
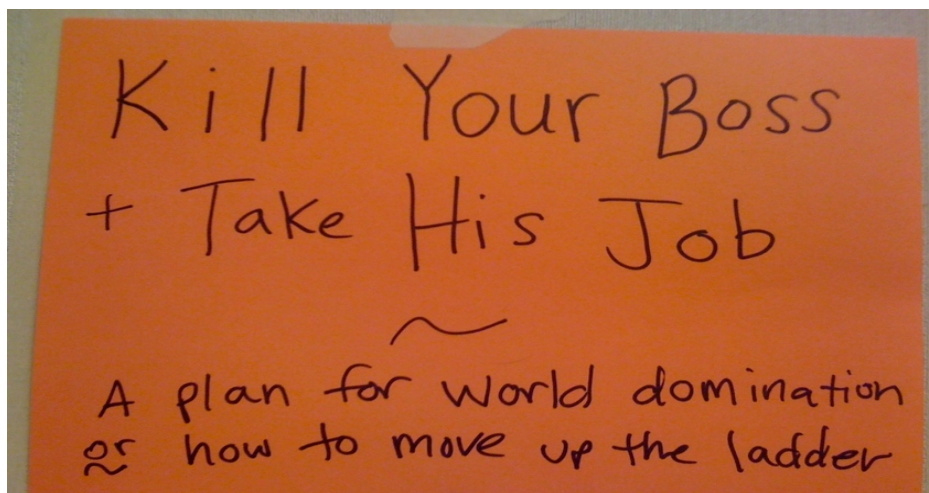

Source: Own production.

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This represents a wholly typical event within F/OSS diversity activism. In open source spirit, the tutorial module was borrowed from a group in Boston, MA, which ran similar women-focused events in their city and shared their model. It was taught by unpaid volunteers in a borrowed space. Around twenty people attended. Other than women "exploring programming and Python," no explicit goals for the workshop were set.

At another event that summer, a two-day "un-conference" dedicated to "increasing women's participation in open technology and culture" held in Washington, DC, around two hundred participants self-organized into various sessions based on attendee interest. One session was titled, "Kill your boss and take his job: A plan for world domination, or, how to move up the ladder" (Figure 2).

FIGURE 2. KILL YOUR BOSS AND TAKE HIS JOB, UNCONFERENCE FOR WOMEN IN OPEN TECH, WASHINGTON, DC, JULY 2012

Source: Own production.

Though of course this session title is tongue-in-cheek, it overtly references workplace relations, specifically women's ascension of the corporate ladder and to wresting control from male managers. Its reference to "world domination" is humorous, but it notably circumscribes its reimagining of power relations as having to do with workplace relations.

And this goal of workplace advancement was reinforced many times: in a post-unconference email, one of the organizers wrote to all of the attendees,

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"Another thought from dinner: a jobhunting and career planning session. Not a theoretical 'how women hunt for jobs' session, [but] a practical session you go to if you are jobhunting or hiring right now, or want to help women get a job. Activities are things like 'oh, I could find out for you if my friend at COMPANY knows of any openings.' So, um, I guess they call that networking :)"

(Email, --- to Alumnae list, 7/10/12).

Another example is this email sent to the alumnae list in 2015, where a poster wrote, "a few months ago, I think [Name] had this idea for a workshop where people critique each other's resumes?" (Email, --- to Alumnae list, 3/23/2015). Repeatedly, both un-conference attendees and organizers reinforced the notion that a primary motivation for this diversity advocacy was to advance women's standing in the workplace. "Networking" and "résumé critique" were proposed as appropriate activities for collective engagement to follow from in-person un-conference gatherings.

At the same time, other goals and values are commonly expressed around diversity advocacy. A person who had worked to develop the unconference said in an interview that the social critique she believed in ran deeper than changing gender balance in terms of employment in the IT industry. She spoke of her personal history that had led her out of high-status programming work and into full time diversity advocacy:

[People have] faith in progress, science and technology… People want to do something with a purpose, that has a point. I think people want to believe they're doing a good thing. [But now I see it as,] if you're defining [progress] as building a better product that's concentrating wealth for a few, [the status quo] is working great, [but it's wrong]. When I started [as a programmer] I was doing capitalism [and I was fine with that]. I no longer make the argument about [building] a better product. There is a collision between science kids with a nerdy mindset who want to do good, who work for an industry that is corrupt.

(Interview, 24 July 2014, San Francisco, CA)

She said that her thinking had changed over time, and she had evolved from someone who was gratified by puzzle-solving in coding work and even the "transcendent" ideas of open source, in which good code will be put to use over and over, into someone who no longer felt that solving technical problems or "building better products" would, in itself, induce social positive change. But she felt that she needed to tread lightly around her choice to "no

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longer do capitalism" *vis-a-vis* the IT industry; for example, in the interview she insisted on speaking to me "as herself," expressing personal beliefs, and not as someone affiliated with her foundation that was working to increase women's participation in open technology. Another person active in a feminist hackerspace told me that she wondered about the degree to which the "jobs for women in IT" rhetoric could be cover for more radical activist goals, a discursive Trojan horse that could attract funding and allow activists to build institutions around their values (Personal conversation, 3 March 2011, New York City).

It is challenging to think through these limits and possibilities. One person who had recently lead the Boston-originating Python tutorial for novice women in her city, Columbus, OH, reported back on her experience via email. She said:

> At the Columbus Python Workshop, some of the students and I talked about how we could use workshops for not just gender diversity, but economic diversity. But [this raises lots of questions]…
>
> - Is this really a practical skill for people in tough economic straits? Obviously programming is a great career; just as obviously, nobody's ready to start at Google the Monday after a weekend workshop. The workshop is obviously not just about careers –it's also about having fun, building self-confidence, understanding our computerized world better, etc.– but I don't know if those noneconomic motives will ring hollow.
>
> - And if it is practical, how can I *sell* its practicality to get agencies onboard and students in the door?
>
> (Email, --- to [Python list], 26 January 2013)

She reflected on how the workshop offered "fun, self-confidence, understanding our computerized world better" to attendees, but noted that to "sell" it to would-be funders and many attendees, economic benefits would need to be emphasized. At the same time, she correctly pointed out that to actually reap economic benefit, novices to programming would need to put in much more time and effort than a weekend workshop. (I as utterly novice programmer can attest that the similar event I attended as participant-observer in Philadelphia left me a long way from attaining working proficiency in Python, let alone contributory expertise.) And she touches on a harsh reality when she wonders about whether this is realistic for people in "tough economic straits": the exhortation that various groups underrepresented in tech "learn to code" in order to improve their social position shoulders

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individuals with the onus to bootstrap or lean in. Furthermore, this exhortation draws attention away from social and economic policies that contribute to their occupying more marginalized social positions in the first place, and places an immense burden on people most afflicted by conditions of precarity and structural inequality.

By contrast, other diversity advocates have elected to confront diversity issues in ways that are explicitly at odds with generating value for the IT industry within prevailing social and economic relations. In an announcement of a 2016 event in Montreal, Canada, centering on diversity in tech, organizers wrote: "The event aims at addressing the lack of women, queer, trans [people,] and diversity in technological fields in general and hacking more specifically. But even more so, it aims at creating a community that critically assesses the hegemonic narratives around technologies, the modernity aspects of its underlining Western assumptions and its inherent capitalist inflections, among others" (Email, --- to [List], 1 June 2016). Along similar lines, an Oakland-based people of color-led makerspace listed the following during a discussion of values and vision for the space: "[to be a] welcoming place for poor women, trans, low income, formerly incarcerated... of and for [the] immediate community… political education, social justice… *freedom from jobs*" (Fieldnotes, 24 July 2014, Oakland, CA; emphasis added). In both of these examples, advocates for diversity begin to articulate an alternative value system they hope to implement around technology and technical practice, wherein not only *who* participates in technological production is changed, but *why and how* people engage with technology is altered.

Members critique how capitalism has shaped hacking and making, and present the underspecified but provocative notion that a makerspace can provide "freedom from jobs" as opposed to conscripting members of marginalized groups (such as people of color, low-income people, and formerly incarcerated people) to be better producing and consuming subjects within capitalism. Critics such as Angela McRobbie have noted that in contemporary knowledge work and creative fields, "work has been re-invented to … become a fulfilling mark of self." These makerspace participants reject what McRobbie characterizes as an "attempt to make-over the world of work into something closer to a life of enthusiasm and enjoyment" (2002, p. 521). The makerspace is understood not as a training ground for work, but as a place to experience making as both politicized and distinct from capitalist production; they reclaim their enthusiasm and enjoyment for making from contiguity with work selves. These goals are consonant with Virginia Eubanks' claim that many low-income women of color do not lack experience with IT, but do not experience IT work as empowering because for them it is often low-status, casualized, and heavily surveilled (2012).

Now I return to the quote that opened this essay:

> I just want to see more of a diverse crowd of hobbyists/enthusiasts playing with electronics, writing code for fun, and discovering that they can use these skills to actually make a living, like so many people currently do. …. I've tried over the past seven years, running several women-only development efforts, but have not been able to sustain such a group for longer than a year. The response is generally: "Well, this was a fun, great resume building exercise. Now I have to get back to real life. Bye!"

This post to the diversity email list neatly encapsulates many of the values of diversity advocacy, including those that essentially contradict one another. If the poster meant for participants in her women-only development groups to mainly derive workplace-relevant training from her efforts, she would not decry inconsistency when they left the group having gained a line for their résumés. And yet she is palpably disappointed by this, even though she also sings the praises of writing code for its potential to help one make a living. Something is missing for her, though she does not say what.

5. Conclusions: Building Social Infrastructure To Do Scary Work?

This paper has argued that the political motivations of diversity advocacy in open technology are ripe for analysis, and that the work imaginaries of advocates are a lens into the differing, sometimes conflicting impulses for opening up technical participation. Diversity advocacy represents a wide swath of activity and is flexible enough to encompass a variety of practices and discourses. Discourses about workplace empowerment are common enough to warrant sustained scrutiny. While job security, or value as a worker is hardly something we can fault people for pursuing, the wider emancipatory politics imagined by some who pursue and promote technical engagement is not consistently audible here.

What should we make of all this diversity within diversity work? On the one hand, people enjoy hacking, making, and coding, and they wish to open that enjoyment up to others, in particular to create safer spaces for people who might be drawn to hacking or making but intimidated by hegemonic (white, male, elite) tech cultures. What people then choose to do with those skills—how they choose to enjoy them—is left relatively underspecified. That said, it is routinely acknowledged that it is discursively easy, and sometimes strategically useful, to

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align "diversity in tech" advocacy with industry goals and market values, nominally funneling programmers, makers, and hackers towards jobs in IT, and using voluntaristic pursuits to suture leisure time to work and vice versa.

On the other hand, it is clear that diversity advocates intend for outcomes beyond technical training for IT industries. As Chris Kelty has written, "[Making has been given] an immediate, ethically inflected, political urgency. Furthermore it hails subjects who desire to engage (and take pleasure*)* in this kind of making: contemporary subjects of capitalism who want individual agency to be combined with … collective experience" (Kelty, 2013). "Collective experience" is plainly part of what draws people to participate in the "transcendent" aspects of F/OSS, as noted by the un-conference founder, and to identify as makers in other contexts. A founder of a Seattle hackerspace that emphasized inclusion remarked, "Hacker spaces are a sort of gateway into exploring everything. By encouraging the taking apart of 'closed' objects… we can begin to form mindsets which make exploration and understanding necessary joys in life" (Brugh, 2009). "Exploration" and "taking apart closed objects" are politically inchoate, but they potentially point to realignment of power relations, especially when experienced collectively.

And yet as Kelty rightly identifies, these subjectivities are formed within and suffused by contemporary capitalism. This is explicitly acknowledged by the Montreal event organizers and the Oakland makerspace, in service of articulating alternative formulations and challenging the relations of production that drive so much tech participation, even volunteer production. It is evident that market values, diversity advocacy, and other goals including social justice or recuperation of nonmarket value are not neatly separated. It is also apparent that whatever the goals of diversity advocates, some of the people drawn in by diversity initiatives saw an obvious utility in the workplace-related aspects of diversity outreach, as noted in the "Kill your boss" session and "résumé critique" proposed by unconference volunteers.

Thus, while some of the rhetoric in diversity advocacy imagines the possibility of deep social critique, much reads as politically agnostic beyond a redistributive impulse that will bring people underrepresented in the IT industry into paid tech work. Why does any of this matter? We might reasonably say, we don't care if a bunch of do-good geeky people lack a clear or unanimous picture in mind when they come together to widen the ranks of technical participation. And yet it matters because at the core of these efforts is a belief in technology as a site of political potential. Technologists, especially politicized technologists, often want to

build tools to do good (Wisnioski, 2012). Instead, the vocabulary of political imaginary in diversity initiatives largely recapitulates notions of expanding economic opportunity and configuring underrepresented people as tech workers, especially for corporations that ultimately hope to capture a diverse consumer market.

This has a number of problems. Representation in particular as a goal has limits as a project of empowerment, as noted by scholars of post-feminism and race such as Angela McRobbie (2008) and Herman Gray (2013). With regard to technology in particular, as Ron Eglash et al. argue, underrepresented groups' participation in technological production or consumption from which they had previously been excluded is not necessarily indicative of a change in social power or social status (2004, xv). It is easy to conflate elite social power and technical participation, but they are not interchangeable (Dunbar-Hester, 2014, p. 188).

"Diversity" appears to operate as a "discursive boundary object," bringing together people whose politics and agendas might not otherwise align (Dunbar-Hester, 2013; Star & Griesemer, 1989). This could be viewed as building capacity and social infrastructure for sustained political challenge to prevailing technical cultures and industries. Another possibility, though, is that "diversity" is part of the problem: as Ahmed writes, diversity can "detach from scary issues, such as power and inequality" (2012, p. 66). In other words, open technology-centered voluntarism geared towards "diversity" is potentially of a piece with market values. In itself, it can do little to dismantle structural inequality, even at the level of rhetoric. Its technologies and practices would ideally be coupled with social justice movements, national policy changes, or other broad social forces in order to effect deep social change, as Ron Eglash writes in the introduction to this special issue (2016, p. 17).

To bring this point home, it is worth expanding on Eubanks' points about IT work among low-income women in the United States. Especially globally, IT work can hardly be said to have a "diversity" problem.[4] Much offshore IT work is "pink collar," low-status and performed by women (Freeman, 2000; Huws, 2001). This should immediately give rise to the recognition that rather than advocating for "more women in tech work" (in North America or elsewhere), it would be more to appropriate to advocate for more high-status, well-remunerated work to go around ("more women in tech" could easily be realized as more feminized labor, which is not what advocates have in mind). To call for more "women in tech" alone is to miss the point that "computer technology is pivotal in the neoliberal reformation of capitalism that most

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[4] Thanks to Paula Chakravartty for discussion on this point.

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people have encountered as weaker unions, flexible labor markets, and deskilling" (Dafermos and Söderberg, 2009, p. 67).

It is interesting to reflect on the cultural space of "diversity in open tech," which can attract and hold people whose beliefs and aspirations may diverge so greatly. Open technology voluntarism simultaneously produces capitalistic relations and produces a fantasy of social relations outside of capitalistic relations. This means that it can simultaneously support an imaginary in which capitalistic relations may be rewritten or destabilized, and more commonly, in which they are reinforced rather than destabilized. In order to maximize the potential for generation of social justice, not only redistribution, both "diversity" and "technology" need to be reexamined as platforms for social change. If they are to be used as orienting concepts, it needs to be with a stronger acknowledgment of their potential to maintain or reinscribe prevailing social and economic relations. While neither "diversity" nor "technology" is without redemptive and generative potential, they are often implicated in an impoverished politics where "activism" is cast in market-friendly terms. Advocates serious about social justice must take on the hard work of hitching both diversity and technology to "scary" concepts like power and structural inequality.

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