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The wiki way: prefiguring change, practicing democracy

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Abstract

The Internet is an unfinished and contested technology that reflects the duality of science and technology - the double aspect of transformation and innovation. Today there is an imbalance of this internal tension, resulting in a disconnect between modern technology and social values. Tech activists have appropriated Internet technology, inflecting it with the goals and concerns of the global justice movement. Through their development of free software - in particular their customization of wiki technology - tech activists have created a space and tool for communication in cyberspace. In turn, this has enabled the realization of new communicative practices offline, establishing a dialectical relation between the technological and the social, and restoring technology's transformative aspect. Democratic practice online prefigures the desire for a more just society; actualized as democratic interventions into the development and use of technology, it then manifests in alternative modes of social organization in the "real" world.

Introduction

What democratic potential does the Internet hold? This is a much-asked question, both within and outside academia. And yet the question remains unanswered, in part because the Internet remains an unfinished and evolving technology. The duality of science and technology - on the one hand its promise for a more humane and just society, on the other, its potential to dominate nature, and therefore humanity - reflects a similar tension between status quo power relations and alternative visions of the future. This tension plays out in the way recent progressive social movements have engaged with new information and communication technologies, in particular the Internet, within a framework of global capitalism. As such, it is not clear whether cyberspace will be fully colonized by corporate forces or whether it will be preserved as a virtual public sphere that can enhance "real world" democracy. Neither has

it been determined if the Internet will be controlled by the state, by its corporate partners or by citizens, although a decidedly less open Internet protocol, IPv6, is currently being tested.

Today, various actors compete for dominance on the web, as the commercialization of cyberspace continues apace. Among them, activists in the global justice movement¹ (GJM) have appropriated Internet technology in their struggle against the negative impact of corporate capitalism on a planetary scale [cite]. Since the eruption of the GJM at 1999's Battle of Seattle, much has been made about the impact of the Internet on progressive activism. Of particular interest have been the ways in which activists have used the Internet as a communication medium, as a forum for information dissemination and as a tool for organizing (Deibert, 2000; Kahn & Kellner, 2004; Meikle, 1999; Smith, 2001). Applications like Websites, email and Internet Relay Chat (IRC) have largely facilitated the new movement as a global phenomenon (Bennet, 2004; van Aelst & Walgrave, 2004). Cyberactivism - political activism on the Internet - is a new mode of contentious action, and new practices such as virtual sit-ins, online petitions and email campaigns have enhanced the repertoire of contention (McCaughy & Ayers, 2003). But what impact have activists have had on the Internet? "Tech activists" - programmers, coders, and hackers who subscribe to the philosophy of the free software movement yet are committed to the pursuit of a just society - are largely responsible for facilitating the novel combination of interactive digital technology and activism: They are responsible for the design of the virtual infrastructure used by activist groups. But in addition to building and maintaining websites, wikis, web logs, email accounts and mailing lists, these self-described geeks customize free software to meet the needs of activists engaged in the new global activism. In using and developing technology that augments the notion of cyberspace as a virtual public sphere, tech activists enhance the democratic potential of the Internet. Their work, therefore, alters not only the way people "do" activism; it is changing the face of the Internet itself.

How do we evaluate such a claim? I approach the problem by acknowledging first and foremost that technology is political - both in design and use. I further contextualize the problem historically, considering the origins of critical thought on the interrelation between modern technology and society, noting the inherent tension underlying the human-machine bond. Through the lens of critical constructivism, I then trace the rise of tech activism, which has roots in the free software movement but has cultivated its own ethically

¹ Variousy called the anti-globalization movement, anti-corporate globalization movement, pro-democracy movement and sometimes simply "the movement".

grounded and socially informed focus. Finally, I examine how and why tech activists have appropriated wiki technology, using it as a space and tool for democratic communication in cyberspace. In turn, this has enabled the realization of new communicative practices offline, implying a dialectical relation between the technological and the social. In other words, democratic practice online is prefigured by the fundamental desire for a more just society; actualized as democratic interventions into the development and use of technology, it then manifests in alternative modes of social organization in the physical world. Feenberg (2005) affirms the dual nature of technology. Where technical action is an exercise of power, it is manifest in designs that reflect and help reproduce capitalist hegemony. However, the wielding of technological power provokes a reaction from those "who suffer the undesirable consequences of technologies..." (p. 49). Will "opening up" technology to a broader range of interests and concerns inspire a radical reform of the technical sphere, as Feenberg suggests? It is with this question in mind that I consider the implications of tech activism for the generative process of Internet technology.

(Hu)Man against machine or the duality of science and technology

From the dawn of modernity, the promise of technological advancement has inspired awe and dread in seemingly equal parts. It signaled either humanity's triumph over nature or, conversely, humankind's impending doom. Francis Bacon was the first Western thinker to cut through the mystique of science with his formulation of the scientific method and his identification of the obstacles or "idols" that confounded the "true" understanding of nature in the 17th century. More than 200 years later, Bacon's approach finally prevailed. But popular opinion was divided: extravagant claims about the beneficent impact of technological "progress" competed with fearful predictions of societal breakdown and the corrosion of traditional institutions and values. Eager to shed its religious, social and ethical skins, the new "scientism" dispensed with the ethos of science identified by Bacon in favour of the promise scientific innovation held for the domination of nature. Leiss (2005) calls this the "two-sided significance" that science and technology hold for society; it is this duality that produces the "essential, internal tension in the epoch of modernity" between *inventive science* and *transformative science* (p. 4).

Leiss (2005) defines *transformative science* as the progenitor of cultural change, encompassing the diffusion of the ethos of the modern scientific method throughout society. It is vigorously challenged and its outcome is highly uncertain. *Inventive science* aspires to conquer nature and is the origi-

nator of scientific change. Uncontested in any meaningful way, it promotes a vision of the continual flow of new products and technologies that improve the material conditions of life. Inventive science also gave rise to the "idols of technology." Evocative of Bacon's idols, which were rooted in devotion to magic, religion and irrational social convention, these are "the false notions that have grown up around modern society's fervent commitment to technological progress" (Leiss, 1990, p. 5). Transformative science - innovation's better half - endured through the end of the 1800s in European culture, maintaining harmony within the project of science. Up until then, the new scientific methods were considered important not only as a toolkit for better understanding nature, but for their potential to positively influence social policy and social institutions (Leiss, 2003).

The society-technology disconnect

Today, however, the two sides of the internal tension within science and technology have become unhinged; thus separated, they no longer support and enhance one another. What Leiss (2005) calls the "cultural mission" of science has faltered. Marcuse (1964) recognizes this disconnection between modern technology and social values in his concept of the one-dimensional society. Here dialectical contradiction (the crux of true reason) is flattened and the Platonic *logos* of a technology - its rationale or reference to the good served - is lost. "The totalitarian universe of technological rationality is the latest transmutation of the idea of Reason" in which logic has become the "logic of domination" (p. 123). Thus technological rationality triumphs as reason - the basis for scientific thought and technical action - becomes unreason in the "closed operational universe of advanced industrial civilization" (124). For Marcuse, the only way to transcend this situation, this closed universe, is through a "catastrophic transformation" of society that is at once technological and political. "The political change would turn into qualitative social change only to the degree to which it would alter the direction of technical progress - that is, develop a new technology" (p. 227). Such a qualitative change would facilitate the transition to a more advanced level of civilization if technologies were designed and used for the "pacification of the struggle for existence" (ibid). What would emerge, Marcuse posits, is a new idea of reason, one opposed to modern scientific and technological rationality.

Feenberg (2005) similarly acknowledges the imbalance in modern times between the transformative and inventive sides of science - or technology and values - and the resulting tendency of technical action toward domination. "Technical action is an exercise of power," he argues.

Where, further, society is organized around technology, technological power is the principle form of power in the society. It is realized through designs [that] narrow the range of interests and concerns that can be represented... This narrowing distorts the structure of experience and causes human suffering and damage to the natural environment (p. 49).

What is necessary, therefore, is a reorientation of the basis for technical production, as indeed Marcuse (1964) notes, in order to create technologies that meet the full range of human needs. In response to the limited interests that feed technical design, a broader inclusion of human concerns into technology development would aid in the "pacification of the struggle for existence", as well as challenge unequal power relations in society.

A critical theory of technology

While Marcuse (1964) suggests a reordering of the technical principles undergirding technological rationality as a way to enhance peace, freedom and human fulfillment, Feenberg (1991) offers another response. He draws from a number of Western critiques of technology, including Heidegger and the Frankfurt School, deftly interweaving technology studies and philosophy of technology. The result is a hybrid theory - critical theory of technology, also known as critical constructivism - that rests on the central theme of democratizing technology to enhance human ideals of liberation, equality and justice. Technology, according to Feenberg's thoroughly historicized approach, "embodies the values of a particular industrial civilization and especially of its elites, which rest their claims to hegemony on technical mastery" (p. v). He dismisses the technologically determinist insistence on the neutrality of technology, stating that the real issue is not technology itself, but the variety of choices involved at the level of technical design and the numerous potential outcomes of the design process. At the same time, Feenberg points out the asymmetry of power relations between human and machine, or actor and object, suggesting modern technology embodies political values that promote hierarchy and domination. Here, he invokes Marcuse's claim that "technological rationality has become political rationality" (p. 16). But, following the constructivist position, he asserts that technology is subject to conscious social control. Openings for democratic intervention appear during the various stages of the design process, making possible a radically different technology that serves more broadly the needs of humankind.

Democratic control of technology suggests the possibility of an alternative industrial civilization based on values different than those that currently

underwrite global corporate capitalism. The critical theory of technology "charts a difficult course between resignation and utopia", seeking to explain how modern technology can be redesigned to support the needs of a freer society (Feenberg, 1991, p. 13). Feenberg retains the Frankfurt School insight that the domination of nature - or technological progress - is achieved through social domination. Indeed, as Langman (2005) points out, critical theory is useful as an emancipatory discourse that roots social injustice and human immiseration firmly within the "rationalized, reified, commodified culture of modern capitalism" (p. 48). The only remedy postulated by the Frankfurt School is democratic advance, leading to the conclusion that "the liberation of humanity and the liberation nature are connected in the idea of a radical reconstruction of the technological base of modern societies" (Feenberg, *ibid*). But critical theory lacks a concrete conception of a "new technology"; Feenberg's approach seeks to rectify this.

Technology as a scene of struggle

According to Feenberg (1991) the technical order is not merely a sum of tools but instead acts to structure the social world in a rather autonomous way. "In choosing our technology we become what we are, which in turn shapes our future choices. The act of choice is technologically embedded and cannot be understood as a free 'use'" (p.14). But critical theory is not fatalist and Feenberg retains this thrust; the future of civilization is not determined by the "immanent drift of technology" therefore, but can be, and is, influenced by human agency. Political struggle continues to play an important role, however tenuous and uncertain of success.

In societies organized around technology, such as modern Western nations, technological power is key to the exercise of political power. Feenberg (1991) explains how the ruling elite preserve their power through his concept of the *technical code*. Whereas earlier constructivist notions, like momentum (Hughes, 1987) and path dependency account for certain technological trajectories, the technical code is the embodiment of dominant social principles at the level of technical design. In other words, the technical code translates what are typically ruling class objectives into technical terms; it "invisibly sediment[s] values and interests in rules and procedures, devices and artifacts that routinize the pursuit of power and advantage by a dominant hegemony" (Feenberg, p. 14). A technology reaches closure when disputes over its definition are settled by privileging one over any number of possible configurations; these disputes often involve conflicting ideological visions. Their outcome

often aligns the technology with dominant social forces, rendering the technical code a direct reflection of status quo power relations (Feenberg, 1999).

However, the exercise of technical power engenders political resistance as disenfranchised or disempowered users react through resistance or protest. Here the technical code reveals an opening in the closed system of total domination envisaged by the Frankfurt School. Rather than a reified "thing", technology is cast as an "ambivalent process of development" (Feenberg, 1991, p.14), one pregnant with both liberating and oppressive possibilities. If technology is a process and not a series of finished products, the chance for intervention, and hence change, exists. The ambivalence of technology differs from neutrality in that it finds social values embedded in the design of a technical artifact, as well as its possible uses. In this way, "technology is not a destiny, but a scene of struggle. It is a social battlefield," wherein outcomes with weighty implications for civilization are decided (*ibid*). Technical devices and systems are indifferent to power; that is, there is no necessary, pre-given correlation between technology and social dominance. This highlights the ambivalence of technology: it can be used just as easily in alleviating the "struggle for existence" as in dominating humanity.

Toward liberation? The Internet considered

Feenberg's program for reforming technology to create a freer, more humane society calls for a more inclusive design process. This requires broad democratic participation, which suggests a deeper societal transformation rooted in technology itself. Feenberg (1991) posits an alternative conception of modern industrialism, one that does not rely solely on the current capitalist version of technology: "A fundamentally different form of civilization will emphasize other attributes of technology compatible with a wider distribution of cultural qualifications and powers" (p. 19). When applied to the Internet as a communication technology, these ideas form an exciting project: the construction of a virtual public sphere, developed and maintained by users, with important implications for democratic practice offline. Indeed, the creation of community through democratic practice in cyberspace prefigures alternative conceptions of social organization offline. As with many new communication technologies, the Internet was heralded by cyberoptimists as potentially revolutionary, holding new promise for civic participation - even a democratic utopia - online (Rheingold, 1993). This initial euphoria has been tempered by critical analysis, as well as the ever-encroaching corporate presence in cyberspace; nonetheless a community model of the Internet that envisions a virtual

space for the development of democracy suggests commercial domination is not inevitable (Feenberg and Bakardjieva, 2004).

These discordant models of the Internet indicate that it is an unfinished project (Feenberg and Bakardjieva, 2004); that is to say, conflicts over its design and meaning have not been resolved. Herein lies the "two-sided significance" or the dual nature of technology: With its potential to be both inventive and transformative, the future direction of Internet remains dynamic and very much contested. It is unclear whether cyberspace will be sold off to the highest bidder or whether it will be preserved as a place for public communication and interaction. The turf war in cyberspace is still being waged, and actors with competing goals, values and interests continue to battle for supremacy. Thus Internet has not reached closure, nor have the dominant norms of modern western capitalism sedimented into a technical code; both the social and technical definition of the Internet remain at stake. Many possible outcomes are visible on the horizon of the future, making this is an opportune moment to investigate the Internet's emancipatory and democratic potential.

Interpreting the Internet

Viewed through the lens of critical constructivism, the Internet's contingent nature is apparent. Its development is characterized largely by interpretive flexibility, and the concomitant notion of user agency in the arena of technological design. The Internet was originally conceived as a means for connecting government researchers at various military and academic institutions, enabling them to share expensive computing resources (Abbate, 1999; Ceruzzi, 2003). But it quickly developed into a medium for human communication, demonstrating interpretive flexibility. The designers of ARPANET, the progenitor of the Internet, were also first generation users, and as such, they intervened in the design process in ways that strayed from the official vision of military computer networking. What makes the Internet unique in the history of communication and information technologies is the openness of its design principles - in its standards, its software and its engineering - and the prospects this offers for user agency. This was a deliberate choice of its originators with profound impact on the Internet's social meaning. "From the very beginning these principles have been understood to have a social as well as a technological significance. They have, that is, been meant to implement values as well as enable communication" (Lemley & Lessig, 2004, p. 44). The value of openness that characterized the Internet's birth has endured, despite increasing contestation, and is apparent in its ongoing "invention" (Abbate, 1999).

Alternative conceptions of society such as those sought by the global justice movement will value other attributes of technology, beyond those currently upheld. These include "the vocational investment of technical subjects in their work, collegial forms of self-organization, and the technical integration of a wide range of life enhancing values, beyond the mere pursuit of profit or power" (Feenberg, 1991, p. 19). We see this in the continual development of Internet at its "content" layer (e.g. applications), undertaken by programmers in the corporate arena and hackers in the free software/open source movements. Tim Berners-Lee, who wrote the original prototype for the World Wide Web in 1990, designed into his application a value contrary to the norms endorsed by capitalist hegemony. "This space was to be inclusive, rather than exclusive" (in Ceruzzi, 2003, p. 302). Ironically, it was with the privatization of the Internet in 1995, and its subsequent release from the exclusive domain of universities and research facilities, along with the popularization of the personal computer, that this vision of inclusivity seemed ever more likely.

Tech activism's radical roots

The Internet is arguably well suited to the task of facilitating alternative, progressive conceptions of society and tech activists in the global justice movement are at the fore of the push to mold it into a medium for democratic intervention. They take seriously the idea that "another world is possible"², and that their activism in the realm of digital communication technology will aid in the quest to democratically reorder modern industrial society for (Feenberg, 1991). The current strain of tech activism is the second wave of a movement that emerged in the 1960s as a digital counterculture. Hackers working in the Artificial Intelligence laboratory at Massachusetts Institute for Technology developed the habit of sharing source code based upon a cooperative spirit and a belief that information should be free (Stallman, 1999). They were part of a student culture that took up computer networking as a tool of free communication (and later, a tool for liberation), which included graduate students who largely designed the protocols for ARPANET, the Internet's forebear. As Castells (2001) observes, most of these students were not part of the countercultural movement in the same way as many radical activists of the day. "And yet they were permeated with the values of individual freedom, of independ-

2 Taken as the official slogan for the 2001 World Social Forum, this phrase has become something of a rallying cry for the global justice movement. It is not a vision of a specific other world, as Naomi Klein (2001) astutely observes, simply the idea that, in theory, another one could exist. This contradicts the truism of capitalist hegemony, which states that the current socio-economic configuration of modern Western society is the only possible one, whatever its flaws.

ent thinking, and of sharing and cooperation with their peers, all values that characterized the campus culture of the 1960s" (p. 24).

By the 1980s, these values were increasingly marginalized as the computer industry became more and more proprietary. One of the MIT hackers, Richard Stallman, quit the AI lab in response to this change and founded the free software movement in 1984. This was, arguably, the formalization of a long tradition of openness in the computing community. Ceruzzi (2003) traces the custom of sharing source code as far back as 1955, to the forming of SHARE, a disparate group of programmers who banded together to tackle upgrading their IBM systems. Stallman (1999) took the moral stance that proprietary software was antisocial and unethical, rejecting the assumption that "we computer users should not care what kind of society we are allowed to have." He began developing an operating system, GNU (Gnu's Not Unix) that became complete with the addition of the Linux kernel in 1992 (gnu.org). The movement was based upon four essential freedoms: the freedom to run a program; the freedom to modify a program; the freedom to redistribute copies (gratis or for a fee); and the freedom to distribute modified versions of the program. Because freedom is considered in the context of liberty rather than price, the ability to share source code, and sell a finished program are not necessarily incompatible. The crucial point is that the source code always remains freely available - in proprietary and free software.

Free software vs. open source

Freedom, and not simply program development and use, is the central concern of the free software movement, making it an explicitly political project.³ In this way, it suggests "a digital revolution that is social before it is technical" (Obscura, 2005). But some in the tech community have purposely avoided the subversive potential of free software. In 1998, Eric S. Raymond launched the Open Source Initiative (OSI) in response to the value-laden approach of the free software movement. Although it assumes an apolitical stance, this movement reveals its bias in its support of the status quo.

The Open Source Initiative does not have a position on whether ideas can be owned, whether patents are good or bad, or any of the related controversies. We think the economic self-interest arguments for open source are strong enough that nobody needs to go on any moral crusades about it... (OSI, FAQ).

³ Another political project founded in defense of freedom on the Internet is the Electronic Frontier Foundation. Begun in 1990, the EFF works to protect the public interest in legal battles over digital rights in cyberspace. A discussion of this group, however, is beyond the scope of this essay. See www.eff.org.

While the two projects share a similar definition of what constitutes free software, their objectives are different. Activists in the free software movement focus on the user-technology relationship, founded on an implicit critique of corporate capitalism. Proponents of the open source project strive to facilitate the development of superior software through access to the source code, in alliance with capitalist hegemony.

In an effort to appear business-friendly, the Open Source Definition "logically abandoned all reference to the social and ethical means and motives of free software, not to mention the fight for freedom as a primary aim" (Obscura, 2005). The Open Source Initiative does not disguise its efforts to make free software more compatible with capitalist discourse, describing itself as "a marketing program for free software. It's a pitch for 'free software' on solid pragmatic grounds rather than ideological tub-thumping. The winning substance has not changed, the losing attitude and symbolism have..." (OSI, FAQ). For free software advocates, however, it remains about the ethics surrounding software use and development - what Stallman (1999) calls community practice and values. This vision extends beyond the computer industry and embraces the ideal of a better world. According to Stallman, some perceived a threat in this challenge to the status quo:

Talking about freedom, about ethical issues, about responsibilities as well as convenience, is asking people to think about things they might rather ignore. This can trigger discomfort, and some people may reject the idea for that. It does not follow that society would be better off if we stop talking about these things.

Despite its broad political program, the free software movement represents a minority of the tech community, which drifted away from its more radical origins and is today largely apolitical.

This divide within the tech community recalls the "essential, internal tension" of modernity, the disconnect between *inventive* science and technology, with its focus on innovation, and its *transformative* counterpart, which inspires cultural change. The Open Source Initiative, operating on the linear model of progress, supports the development of software technology based on a proprietary system that underwrites modern capitalist hegemony. The free software movement, however, offers a working example of an alternative social model, one based on decentralization, volunteerism, cooperation and self-empowerment, with the ultimate goal of creating a freer society. It is an example of what Feenberg (1999) calls *democratic rationalization*, the use of new technology (software) to undermine the existing social hierarchy. Put another way,

democratic rationalization highlights the political implications of user agency for technical design, suggesting the possibility of organizing society in ways that enhance democracy, rather than capitalist efficiency and control. In this case, democratic control of software suggests a different Internet and, broadly considered, a different world.

Second wave tech activism: Repoliticizing technology

The resurgence in tech activism in the early 2000s rested firmly on the foundation laid by the free software movement. It is unsurprising, then, that a similar rift exists between tech activists in the global justice movement and the generally apolitical advocates of open source. While both projects share an affinity for collaboration and coordination, with geeks often moving easily between the two, their political, philosophical and technical motivations differ. Programmers working on open source projects are rewarded by the creative expression, intellectual stimulation and improvement of technical skills acquired through programming (Lakhani & Wolf, 2005). Similar rewards may also inspire tech activists in their work but there is no question as to their overarching motivation: "technical means are directed toward political ends" (Coleman, 2004). These political ends include the pursuit of social, economic and environmental justice under the auspices of the GJM. This shift in focus signals a return to the radical tradition of the free software movement and the repoliticization of computer technology.

The reclamation of computer technology as a political frontier for contentious action is a hallmark of the global justice movement. The GJM comprises the latest wave of social justice activism, and seized the world's attention at the "Battle of Seattle", 1999's massive street protest against the World Trade Organization. Here, upwards of 50,000 activists from a variety of cultural, ethnic and political backgrounds formed an unprecedented alliance, united by their common opposition to the debilitating effects of neoliberal globalization, a world economic policy that has generated massive profits for a minority of the world's population at the expense of labour and human rights, environmental sustainability, democratic practice and national autonomy (Langman, 2005). In the face of increasing corporate dominance, there was increasing resistance, and a movement of movements swelled, embracing the vision of a people's global justice. This movement also produced an analysis that historicized their struggle, and therefore denaturalized neoliberal globalization: the global march of capital was not inevitable (nor inevitably "good") thus human intervention was possible. Activists quickly realized the potential

and power of the Internet for their burgeoning movement, beginning in Seattle, and continuing with other major citizen protests and people's summits at subsequent meetings of institutions of global economic power brokers such as the G8, International Monetary Fund and World Bank. The Internet facilitated the organization of campaigns and movements into "super movement spheres" (Morris & Langman, 2002), and enabled activists to communicate and mobilize without previous time, space and cost barriers. The importance of the Internet for the new global activism was further underscored by the creation of the Independent Media Centre (IMC), a web-based network of radical media making collectives that went live for the Seattle protest.

Tech activists have been central to the global justice movement since its inception, facilitating the novel combination of interactive digital technology and social justice activism, and bridging the divide between geek and activist communities. While their programming skills distinguish their contribution, tech activists share in the movement's overarching goals of social justice. One IMC geek summed it up this way: "I belong to a movement which strives for equal rights (not the written but the real ones) and conditions for all humans (and partially other beings, too) on this planet."⁴ IMC - also called Indymedia - was initially founded to give voice to activists' concerns during the anti-WTO demonstrations; indeed, Indymedia's mission statement reflects its origins in the GJM:

[IMC is] committed to using media production and distribution as tools for promoting social and economic justice. Through this work, we seek to... illuminate and analyze local and global issues that impact ecosystems, communities and individuals. We are dedicated to generating alternatives to the corporate media and to identifying and creating positive models for a sustainable and equitable society (Seattle IMC, n.d.).

While IMC was the dream of media activists, it was the geeks in the movement who developed and implemented the code to realize that dream. In particular, the innovation of open publishing software enabled anyone with an Internet connection to upload stories and images to the website, bypassing the gatekeeping function of editing and subverting journalistic norms. Indymedia thus emerges as more than an experiment in radical media making: it is clearly an example of the democratic rationalization of the Internet - activists appropriating Internet technology to not only challenge the dominant ideology (neoliberal globalization), but to foster alternative visions of social organization.

⁴ Personal communication with Alister, 2 December 2005.

The birth of Indymedia

There are numerous examples of tech activism, such as the construction and maintenance of activist websites (including mailing lists, email accounts and other functionalities), refurbishing old computers for distribution in technology poor areas/nations, and the hosting of hacklabs⁵ and other tech training events. Tech activists are also responsible for setting up media centres for major street demonstrations and during natural disasters, such as Hurricane Katrina.⁶ But Indymedia is arguably the most prominent, and perhaps best, example of tech activist work done under the banner of the global justice movement. The building of the first IMC in Seattle now approaches legendary status. The inaugural post, by founding geeks Manse Jacobi and Matthew Armison, acknowledges the novelty of the new movement: on 24 November 1999, they wrote: "The resistance is global... a trans-pacific collaboration has brought this web site into existence."⁷ But it was activists' prior use of the Internet as a communication tool that enabled the global resistance to unite in one locale.

Another geek, Eyan Henshaw-Plath, took part in the birth of Seattle IMC, which he had heard about from a friend of a friend at a pre-protest party. He describes the scene as "packed and hectic", with techies scrambling to shore up the server and code before the protests began:

Almost the instant I walked in to the Indymedia Center I had caught the IMC bug. Without knowing the organizing structure, extent of the projects, political background, I could experience the energy. I worked all night on the server and throughout the day of the protests. My experience of the protests was just a half hour when I managed to escape in to the streets...⁸

Since helping found seattle.indymedia.org, Henshaw-Plath, has been involved with dozens of IMC locals and wrote some of the code that would be incorporated into the open publishing platform that made Indymedia (in)famous. The first open publishing tool, Active, was originally coded by

⁵ Hacklabs are political spaces (often temporary) that provide community computer and Internet access. They are used for independent media, the promotion of free software and other emancipatory technologies. Here tech activists share skills with one another and the broader public. For example, see www.hacklab.org.

⁶ In Houston, Indymedia and low power FM radio activists set up a disaster information radio station. New Orleans IMC offered breaking coverage and activists set up a media centre in Algiers, a portion of the city that did not flood from the levee breaches. IMC USA created a topical site. Katrina.indymedia.us.org, which carried news from across the Indymedia network (<http://www.amradteck.com/articles/category/indymedia>).

⁷ For the full transcript, visit <http://seattle.indymedia.org/1999/11/24.html>.

⁸ Interview with Eyan Henshaw-Plath, 28 July 2003.

Australian tech activists. "Open publishing is the same as free software," notes Armison (2002), one of Active's developers. They're both (re)evolutionary responses to the privatization of information by multinational monopolies" (p. 329). As with free software, open publishing enables the free distribution and exchange of information - in its case, news stories. The process of creating news, like that of developing code, is made transparent by open publishing software; readers can contribute and redistribute stories, see and get involved in editorial decision-making, or copy and develop the software to address a shortcoming.

The choice of free software for the implementation of the global site, indymedia.org, was deliberate, and suggests a philosophical inheritance from the free software movement, if not direct lineage. It also shows with clarity the project's political objectives. At present, all the software on the global network, which includes more than 130 "nodes", is by charter free software. Throughout Indymedia's six-year history, free software has enabled the IMC tech collective to develop applications "that encourage cooperation, solidarity, an equal field of participation" in their brand of radical media making (Henshaw-Plath, 2002). In late 2001, the IMC Tech Collective discussed the rationale for committing to free software: "It's clear that the technology we use and process by which it's constructed and articulated is deeply political. We are creating the technical systems that prefigure the change we want to see in society" (Henshaw-Plath, 2001).

Tech activists thus understand coding as technical process with social implications. While they make an explicit attempt to imbue software with ideals that mirror their social justice goals, tech activists never lose sight of the social purpose of the software, nor of the user-technology relation. In the case of the continual hacking of Active⁹, "the geeks of IMC-Tech were keenly aware that each technological design or set of features creates a particular publishing structure and, as a result, empowers users... in an equally particular way" (Hill, 2003, p. 2). Here we see how users can intervene in technical design to transform a technology, making it more inclusive of human values and needs, which is central to democratizing technology. Thus in their software development, tech activists demonstrate insight into the power asymmetries inherent in capitalist socio-technical systems, as well as the knowledge that such asymmetries are both socially constructed and reflective of inequality in the broader social context. With Indymedia, it is apparent that the social and technical and tightly coupled; IMC geeks consciously attempt to create a

⁹ See Hill (2003) for a history of open publishing software development within IMC.

technical environment that promotes equality and democracy and that, in turn, supports the social changes goals of Indymedia, as well as the broader global justice movement.

Wild wild wikis: The latest frontier

Tech activists combat power imbalances in the technical sphere through their development and use of free software. Thus they carve out their own virtual terrain oriented toward the community model of the Internet, which is based on democratic practice. (Feenberg & Bakardjieva, 2004). Recognizing communication as key to achieving the goals of the global justice movement, activists created their own media system. Indymedia's philosophy is summed up in the now-famous slogan: "Become the media." However, it soon became apparent that the importance of communicating movement ideals of social, economic and environmental justice through a global digital newswire depended upon internal communication within Indymedia. The IMC tech collective initially communicated by email lists and Internet Relay Chat (IRC). By 2002, however, a number of wikis were set up in an effort to create a sustainable system for documenting IMC's history and ongoing activities. As one member of the Docs Tech Working Group observed: "Getting a functioning and used wiki is really vital for the network... Email lists just aren't cutting it for the level of organizing and information exchange and growth—we need to help facilitate."¹⁰ Techs maintaining the global site needed a virtual workspace with a constant online presence, where they could jointly yet asynchronously work on common projects and tasks. In addition to facilitating workflow, the wiki had the benefit of constructing and cohering an online community of programmers interested in contributing their skills to the global justice movement.

Wiki software originated in the mid-90s in the design pattern community as a means of writing and discussing pattern languages. Ward Cunningham invented the name and concept and implemented the first wiki engine in 1995. Because of its speed, he named the system wiki-wiki, a Hawaiian term meaning "quick". According to Cunningham and Leuf (2001), "a wiki is a freely expandable collection of interlinked Web 'pages', a hypertext system for storing and modifying information - a database where each page is easily editable by any user with a forms-capable Web browser client" (p. 14). Plainly put, it is a series of linked, dynamic web pages that can be created, edited and deleted by any logged-on user. All changes are recorded; thus the wiki documents

its own history, and stores it for future viewing. By the end of the 1990s, the business community had embraced wikis as a "conversational knowledge management solution" to foster an efficient and collaborative work process (Gonzalez-Reinhart, 2005, p. 5). In the business environment, wiki use can eliminate the need for conference calls, emails, discussion forums and instant messaging. As with physical communities, the virtual community facilitated by a wiki fosters socialization and information exchange, which in turn encourage collaborative knowledge creation (*ibid*).

For tech activists, building a community that jointly created and maintained knowledge via wiki technology was a breakthrough. But the implications of this new social software went beyond quick communication, increased productivity or cost/time savings. In essence, what IMC geeks discovered in the wiki was a new mode of communication. The concept of the wiki rests on the notion of collaboration, which in turn is based on trust. According to Cunningham (n.d.), trustworthiness is a principle that inspired his initial wiki design, and is built into the software's technical code. "This is at the core of wiki. Trust the people, trust the process, enable trust-building."¹¹ Wikis encourage trust because their ability to function is based on the assumption that participants have good intentions; the open-ended power to add, delete or alter content makes a wiki vulnerable, and dependent upon ethical conduct. Thus, as with any well-functioning community, a wiki is heavily reliant on norms of social behaviour.

Wikis can be used to communicate and exchange information with others in much the same way as online discussion forums and email lists. Uniquely, however, wikis create a virtual arena for project organization and documentation. Open editing allows for the collective authorship of material as well as co-production of the website in a way that other conversational Internet applications do not. The intent is to foster communal development in a virtual space that is jointly owned by all users, and for which all users are responsible. This accounts for the organic nature of a wiki page, where content changes as users add missing information, correct mistakes and delete erroneous or unnecessary material. In this way, the knowledge jointly produced in a wiki improves and grows over time. The "link as you think" feature, whereby a contributor creates links to existing and potential pages in a wiki, is one example of this organic collaborative knowledge production. It is a critical and deliberate design element that fosters the creation of a shared language. This shared language emerges instinctively and is fundamental to effective communication

¹⁰ John Windmüller posting a comment to the Indymedia Documentation Project Wiki, <http://docs.indymedia.org/view/System/IndocDocsReplaceWikiEngine>.

¹¹ For more on Ward Cunningham's wiki design principles, see <http://c2.com/cgi/wiki?WikiDesignPrinciples>.

within a wiki. (Kim, 2005). According to one tech activist, the "link as you think" feature is "a way of building a community-specific vocabulary that allows you to easily formulate complex thoughts by using the terms your community thinks are important" (Schroeder, 2005).

For tech activists, the wiki enables them to enact the social change they seek in the broader society. Here, democracy, equality and justice switch from being abstract ideals to concrete social practices. At the same time, wiki software is part of the digital infrastructure tech activists build and maintain in order to achieve more immediate movement goals, and as such is represents only one tool in the activists' repertoire of contestation. Considered thus, wikis emerge as an ideal mode of communication for distributed networks like Indymedia and the global justice movement, where participants from disparate geographical locales, with varying skill and commitment levels, as well as ethnic, class and technical backgrounds, work together toward a shared vision of a better world.

IMC meets TWiki

Indymedia made early use of wiki technology for the Global Indymedia Documentation Project, which gathers collective knowledge about IMC's history, its current role(s) and its short and longterm goals. Documenting their project is vital to the success of Indymedia; not only does it provide a public record, it creates a fluidity that facilitates participation at varying levels. "The Indymedia Documentation Project looks like a normal Web site... except that it encourages contribution and *editing* of pages, questions, answers, comments and updates" (IMC, *Welcome*). Importantly, participants are not required to know how to code in order to add, change or delete content. Because Indymedia is predominantly a web-based project, implementing a wiki addressed the persistent problem of how to organize communication within the disorganized environs of cyberspace. While mailing lists facilitated information exchange, and IRC enabled real time discussion, neither application provided a collaborative space where Indymedia volunteers could work asynchronously on common projects. Wiki technology appealed to IMC geeks because of its ability to facilitate information flow, which allowed distributed teams to work together seamlessly and productively, and eliminated the one-webmaster syndrome of outdated content.

In 2002, IMC techs adopted TWiki, a free software wiki clone aimed at the corporate intranet world, assembling a number of separately running wikis in

one website, docs.indymedia.org. Today it is one of the largest TWiki installations on the World Wide Web. The Documentation Project wiki is divided into sections made up of topic-based webs that contain links to the various working groups, documents and materials needed to understand, navigate and participate in the Indymedia multiverse. The Tech section is the home of the IMC Global Tech Team and features a variety of working groups focused on the numerous technical aspects of the Indymedia project, including system administration, IRC, security, mailing lists, and so on. There is also an FAQ, and information about Indy software and how to get involved in the tech team. Logs from past meetings, as well as drafts of policy proposals, are also stored here. The wiki's dynamism is apparent, as reflected in the "What's New" link, and the history of changes at the bottom of any given page. Its usefulness as a forum for discussing technical issues of varying degrees of importance to the smooth running of the network also becomes clear, with policy documents, proposals and meeting logs creating an invaluable store of cumulative knowledge.

While the Docs Project wiki has opened up a new mode of communication for IMC volunteers, and the tech activists that maintain the global site, it is not without challenges.¹² A common concern about the openness of the software is the fear of vandals who delete or deface content, either in sport or from spite. Indeed, the open philosophy does not protect the site from ill-intentioned users. But wikis are designed to make it easy for users to correct mistakes (rather than making it difficult to make them), thereby providing ways to insure the validity of content despite the ease of modifications. Most wikis have a "recent changes" page that records the latest edits, or all changes made within a specific timeframe. "Revision history" shows previous page versions, and the "diff feature" highlights the changes between two versions. This allows users to deal swiftly with attacks such as wiki spam or insults, correcting and malicious changes or restoring older, more appropriate content. On a small wiki, it typically takes more effort to vandalize a page than to revert it to an acceptable version. On a large installation like the IMC Docs Project, vandalism can be more of a nuisance, creating daily, tedious work. In either case, the "infinite undo" function ensures that no modification is ever permanently destructive (Luh, 2004, p. 10).

¹² In fact, the IMC Docs Project was read-only (editing function disabled) from March-September, 2006. However, this had more to do with deeper problems plaguing Indymedia as a globally distributed, volunteer-run collective, such as activist burnout and conflict over best practices, than shortcomings in the wiki technology itself.

The emancipatory power of wikis?

What, then, are the implications of wikis for tech activism in today's global justice movement? Glaser (2004) assesses the emancipatory power of wikis, concluding that participating in a wiki is a political act with consequences that extend beyond cyberspace. The egalitarian structure of the wiki is based on decentralization of authority and horizontal self-organization. Much like Indymedia, wherein the gatekeeping power of editors and news producers to control the flow of information is obliterated, "wikis are administered by a group of people with equal rights who control each other and whose work and decisions are subject to all users' discussion" (p. 4). This egalitarian structure is characteristic of the GJM, which eschews formal leadership and is configured rhizomatically in loose networks of autonomous nodes. Decentralization of power is critical for undermining social hierarchies common to modern capitalist societies, where the few rule over the many. In modern Western capitalism, this elite minority typically dominates the production of information (as well as technology), with the majority of citizens relegated to the passive, disempowered role of perpetual consumer. In a wiki, there are no access barriers: as with Indymedia, producers of content are its consumers, and vice versa.

The elimination of access barriers facilitates participation in wikis as does the purposely designed ease-of-use. "As you edit there is very little to get in the way of clear thinking and writing... The easier we can make a wiki to use, the more participants we can attract and the greater the value of the system" (Why Wiki Works, n.d.). Participation is further enhanced by the self-organization that wikis require, which in turn leads to empowerment. "Everybody feels that they have a sense of responsibility because anybody can contribute" (ibid). A community grows up around well-used wikis, and users are invested in keeping their wiki relevant and functional. As discussed above, this is largely due to the collective production of content. In the process of organizing their wiki, users discover shared interests and begin work on common projects that reflect the concerns and needs of the community, and that promote social cohesion in the virtual environment. Key to this collaboration is the feedback generated through the wiki's interactivity. Unlike the dominant communication technologies of radio and television, the internet is highly interactive. Building upon this functionality, wiki software enables not only adding comments to existing content, as in a weblog, chatroom or email exchange, but the complete restructuring of the entire website, including its deletion. If modifications are not deemed an improvement, however, they are easily "undo" by other users. This interaction of users with each other (via content changes) for the

broadly good of the wiki contributes to the community model of the Internet as a space for democratic practice.

The wiki is a social and organizational phenomenon that contrasts modern western society and prefigures alternative conceptions of social organization, making their subversive political implications clear. The process of refining and defending views in a collaborative context leads to a deeper understanding of complex ideas, an understanding with the potential for application in the "real world" As Glaser (2004) observes, "the recognition of this might lead some people to take the organization of work in a wiki as a model that could succeed in the real world as well" (p. ??) The "wiki way" of self-organization and collaboration produces high quality work without capitalist incentives like competition or money, revealing other ways to live with and value technology not currently promoted by the dominant social order. The "two-sided significance" of technology - its Janus nature of innovation and transformation - is thus evident in the wiki. The Platonic logos - the rationale for the good - as well as the Baconian ethos are realized in the design process, which in turn informs technological use. In technical terms, the wiki represents an advancement in digital communication, but in social terms, it both models and facilitates new modes of social organization. Feenberg conceptualizes Marcuse's call for a new rationality in just this way - democratically, as customizing technology to fit human needs.

Conclusion

The Internet remains an unfinished and contested technology in that it is still subject to intervention and transformation by users. Tech activists in the global justice movement bridge the divide between geek and activist communities, creating and maintaining the digital infrastructure that supports progressive activism on a planetary scale. Through their free software development, tech activists deliberately oppose the commercial take-over of cyberspace and adapt it to democratic purposes. In the case of Indymedia, tech activists re-deployed wiki software to facilitate movement goals - by creating a public space for online collaboration and by challenging inherent power inequities reflected in the broader society. The wiki's open and decentralized structure mirrors that of the GJM (and the Internet, for that matter) and remains in direct opposition to dominant societal norms based on capitalist hegemony. It is social software that prefigures progressive social change, hinting at more egalitarian, humane ways of organizing our modern industrial world. It is also free software, and as such, it is indicative of how tech activists are working at the level

Agricultural laborers and technological innovation (TI): a case study of horticultural production in Sinaloa, Mexico

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Abstract

This article details a case study of agricultural laborers and the technological innovation (TI) effects on their working conditions and the labor process. By way of introduction, there is first a theoretical discussion, seeking new approaches to this issue, and an overview of the Mexican labor market. The case study consists in a survey carried out in 2001 in the state of Sinaloa in Mexico, of 142 non-qualified workers employed in horticulture production, one of the most competitive and well-organized exporting agricultural sectors in Mexico. TI operates at the most modern levels in this market sector and is used by business as a strategic part of the production process.

Introduction

This paper investigates the complex social network present in the generation and application of technological innovation (TI) to intensive agriculture and its relation to the labor market, focusing also on its operation in respect of the working conditions of agricultural laborers and their perceptions of TI. To begin with there is a brief theoretical assessment of the existing literature on the subject, with the classical proposals of flexibilization and segmentation, and alternative approaches to an understanding the new employment and labor conditions in contemporary agriculture, such as Long's (2001) agency. Callon's (1995), Latour's (1987) and Elzen's (1996) social networks. Ruvenkamp's (2005) bio-power, and Feenberg's (2005) operational autonomy. It is not a coincidence that this paper reports a case study of horticultural production in the state of Sinaloa, Mexico, where TI combines with the notorious presence of migrant laborers employed for unskilled work.

This theoretical assessment is followed by a brief characterization of the employment situation and agricultural labor market in Mexico, contextualizing the horticultural laborer and production situation, at both national and

- Lentley, M. A. & Lessig, L. (2004). The end of end-to-end: Preserving the architecture of the Internet in the broadband era. In Mark N. Cooper (Ed.), *Open architecture as communications policy*. Stanford, CA: Stanford Law School. Retrieved 21 November from <http://cyberlaw.stanford.edu/blogs/ecompr/archives/openarchitecture.pdf>
- Lih, Andrew. (2004). *The foundations of participatory journalism and the wikipedia project*. Paper presented at Association for Education in Journalism and Mass Communication, Toronto, Canada, 7 August 2004. Retrieved 10 November 2005 from <http://jmsc.hku.hk/faculty/alih/publications/aejmc-2004-final-formpub-3.pdf>
- Marcuse, Herbert. (1964). *One dimensional man*. New York: Oxford University Press.
- McCaughy, M., & Ayers, M.D. (2003). *Cyberactivism: Online activism in theory and practice*. New York: Routledge.
- Meikle, G. (1999). *Future activist: Media activism and the Internet*. New York: Routledge.
- Morris, D., & Langman, L. (2002). *Networks of dissent: A typology of social movements in a global age*. Paper presented at International Workshop on Community Informatics, Montreal, Canada, 8 October 2002. Retrieved 2 December 2005 from <http://www.is.nyu.edu/kevlin/lixwell-sec.html>
- Obscura, V. (2005). *From free software to street activism and vice versa: An introduction*. Retrieved 25 November 2005 from <http://gati.eviolence.org/lix/dkve-fs2sah.html>
- Open Source Initiative. (n.d.). *FAQ*. <http://www.opensource.org/advice/faq.php>.
- Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Reading MA: Addison-Wesley.
- Schroeder, A. (2005) *Comment: The brilliant essence of wikis*. Retrieved 21 September 2005 from <http://www.eekin.com/blog/2005/09/>
- Seattle IMC. (n.d.). *Press pass policy*. Retrieved 5 January 2007 from <https://docs.indymedia.org/view/Local/Seattle/MCPressPassPolicy>
- Smith, J. (2001). *Cyber subversion in the information economy*. Dissent, spring, 48-52.
- Stallman, R. (1999). The GNU Project. Retrieved 22 November 2005 from <http://www.gnu.org/multimedia/project.html>
- Van Aelst, P., & Walgrave, S. (2004). New media, new movements? The role of the Internet in shaping the anti-globalization movement. In W. van de Donk, B.D. Loader, P.G. Nixon and D. Rucht (Eds.), *Cyberprotest: New media, citizens, and social movements* (123-146). London and New York: Routledge.
- Wikipedia* works. (n.d.). Retrieved 25 November 2005 from <http://www.2.com/scripts/WikiWikiWorks>