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Civic hacking as data activism and advocacy: A history from publicity to open government data

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Abstract

The civic hacker tends to be described as anachronistic, an ineffective "white hat" compared to more overtly activist cousins. By contrast, I argue that civic hackers' politics emerged from a distinct historical milieu and include potentially powerful modes of political participation. The progressive roots of civic data hacking can be found in early 20th-century notions of "publicity" and the right to information movement. Successive waves of activists saw the Internet as a tool for transparency. The framing of openness shifted in meaning from information to data, weakening of mechanisms for accountability even as it opened up new forms of political participation. Drawing on a year of interviews and participant observation, I suggest civic data hacking can be framed as a form of data activism and advocacy: requesting, digesting, contributing to, modeling, and contesting data. I conclude civic hackers are utopian realists involved in the crafting of algorithmic power and discussing ethics of technology design. They may be misunderstood because open data remediates previous forms of openness. In the process, civic hackers transgress established boundaries of political participation.

Keywords

Activism, hacking, hacktivism, open data, politics, transparency

"Civic hackers" participating in creating and modifying digital infrastructure have garnered increased attention over the last 5 years. They are generally described as a more positive-valenced (Newsom, 2013) cousin of more overtly oppositional activists and

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hacktivists (Taylor, 2005). Earliest definitions lauded civic hackers as "white hats" that create technology to foster stronger social bonds, reflecting a libertarian perspective on mutual aid (Crabtree, 2007). Other definitions capture broader notions of civil society. A 2010 study backed by the Open Society Foundation described civic hackers as "deploying information technology tools to enrich civic life, or to solve particular problems of a civic nature, such as democratic engagement" (Hogge, 2010: 10). Simultaneously, federal and local government entities warmed to the notion of collaborating with tech-literate geeks who could create, interpret, and use data. Anthony Townsend (2013) describes civic hackers as being essential change agents in urban environments. Organizations such as Code for America (CfA) rallied support by positioning civic hacking as a mode of direct participation in improving structures of governance. However, critics objected to the involvement of corporations in civic hacking as well as their dubious political alignment and non-grassroots origins. Critical historian Evgeny Morozov (2013a) suggested that "civic hacker" is an apolitical category imposed by ideologies of "scientism" emanating from Silicon Valley. Tom Slee (2012) similarly described the open data movement as co-opted and neoliberalist. Looking past the respective hype and cynicism, where did the progressive bent of civic hacking come from? What does it have to say about the potentials and pitfalls for political participation through and around data?

Civic hacking can broadly be described as a form of alternative/activist media that "employ or modify the communication artifacts, practices, and social arrangements of new information and communication technologies to challenge or alter dominant, expected, or accepted ways of doing society, culture, and politics" (Lievrouw, 2011: 19). Ample research has considered how changes in technology and access have created "an environment for politics that is increasingly information-rich and communication-intensive" (Bimber, 2001). Earl and Kimport (2011) argue that such digital activism draws attention to modes of protest—"digital repertoires of contention" (p. 180)—more than formalized political movements. A similar middle ground focused on shared histories and practices is suggested by Molly Sauter's work on distributed denial of service (DDOS) attacks, which traces histories of civil disobedience and a nuanced relationship between evolution of tools to support activist goals (Sauter, 2013b). Similarly, the focus of this article is on how the political practices of civic hackers emerged from a particular legal and historical trajectory. Government entities increasingly encourage and foster the civic hacker as an essential part of this system. They started to follow a unitary rather than adversary model of democracy. Yet, I argued that the movement from informational to data can potentially lead to quite different forms of political action. Tracing how open government data emerged in the United States is thus a necessary first step to explain the beliefs participants place in civic hacking and the fraught institutional tensions they must navigate.

Hacker politics

Definitions of "the political," formalized politics, and political participation are expansive and endlessly debated. Writing on the intersection between hackers and politics has focused on a more confined set of motivations and goals. Hackers are not simply computer super-users. Rather, over time technology has become integral to hackers'

informational practices (Thomas, 2002), material engagement (Jordan, 2008), and use of tools for collective action (Sauter, 2013b). Two overall framings of hackers' engagement with the political have dominated discussion: "hacktivists" or activists who leverage instrumental uses of online technologies for direct political action such as protest and disruption (Jordan and Taylor, 2004), and geographically distributed communities of practice where principles of openness enable forms of political action (Coleman, 2004). Gabriella Coleman (2012a) argues that pragmatism enables action on issues related to informational freedoms and reflects liberal democratic tenets such as freedom of speech. According to Coleman (2004), explicit involvement in "politics" in a formalized sense is distasteful to free and open-source hackers, as it is viewed as "buggy, mediated, and tainted action clouded by ideology" (p. 513). Civic hacking represents a third mode of participation among a group that often explicitly engages with political causes through designing, critiquing, and manipulating software and data to improve community life and infrastructures of governance. Civic hackers therefore have distinct histories, contours, and conflicts from other genres of hackers, even as they share a certain family resemblance (Wittgenstein, 1953).

The civic hacker's institutionally collaborative nature is the foremost difference from other forms of hackers that are more defined as antagonistic (Söderberg, 2010) or subversive (Thomas, 2002). Paying close attention to practices of civic hackers, then, draws attention to possibilities for designing and modifying digital infrastructures that are often overlooked in prognostications about "big data" (Boyd and Crawford, 2012). For example, Zeynep Tufekci (2014) describes "computational politics" where governments and corporations negatively affect communication through tailored messaging, surveillance, and disrupted public spheres. John Cheney-Lippold describes "algorithmic citizenship" produced when the National Security Agency (NSA) constructed and imposed categories of "citizen" and "foreigner" through statistical processes. In each case data was framed as repressive of notions of civil society or enforcing an impoverished or constrictive notion of citizenship. The perspectives of Tufekci and Cheney-Lippold provide valuable insight into how algorithms and data are powerful shapers of modern life. Yet, they leave little room for a different form of algorithmic citizenship that might emerge where individuals desire to reform technology and data-driven processes. As Couldry and Powell (2014) note, models of algorithmic power (Beer, 2009; Lash, 2007) tend to downplay questions of individual agency. They suggest a need to "highlight not just the risks of creating and sharing data, but the opportunities as well" (p. 5). We should be attentive to moments where meaningful change can occur, even if those changes are fraught with forces of neoliberalism and tinged with technocracy.

The term "hacker" is a floating signifier, articulated and reinterpreted across communities and institutions. Scholars interested in hackers have generally navigated this definitional slipperiness by attempting to unite hackers under a common principle or researched a particular strand of hackers. Critical historian Doug Thomas (2002) unified hacker groups from the 1980s and 1990s through shared culture. He argued they were a postmodern "subculture that resists incorporation by turning incorporation into opportunity" (p. 152). Tim Jordan and Paul Taylor (2004) explored how "hacktivists" shared modes of political action, leveraging technical skills for explicitly political goals. Tim Jordan (2008) would focused on "the hack" as a uniting factor, arguing that hacking is

co-constituted by material engagement with technology and social agency (Neff et al., 2012). McKenzie Wark (2004) argued that hackers gained power in modernity because they are able to abstract property to intellectual property, which is used by "vectoralists" (similar to bourgeoisie) in processes of control and commodification. He positioned hackers as potentially collaborative, as both vectoralists and hackers have modes of exchange that reflect forms of power. Hackers create value through information, while vectoralists benefit financially.

The explosion of hacker politics worldwide presents a challenge to unification narratives. It pushed researchers to be attentive to specific historical, cultural, and political groups. Gabriella Coleman followed an anthropological mode of tracing the lifeworld and rich emic perspectives of free and open-source software (F/OSS) enthusiasts as a geographically distributed collective. She laid bare how an ethic of hacking (Levy, 1984), when used as a motivating force for all hackers, can become a convenient shorthand that disguises as much as it reveals (Coleman, 2012b). Coleman suggested scholars consider the diverse range of ways individuals organize, mobilize, and act politically. This move toward how political notions evolve within specific collectives can also be seen in Nathanael Bassett's (2013) writing on activist hackathons and Molly Sauter's (2014) work with online civil disobedience. Their mode of inquiry, and the one I follow here, focuses on a specific collective with a specific and traceable history with attendant tools, practices, and tactics.

This article initially traces a history of informational transparency from "information" to "data." The tools of participation by civic hackers are, as with other geeks and hacker cultures (Coleman, 2012a; Kelty, 2008), rooted in legal frameworks enabling the free flow of information. What we might call early civic hackers came from journalism and law, initially motivated by practices and goals of access to information (Kennedy, 1978). Later, the growing awareness of the Internet sparked interest in digital transparency, or what Lessig (2009) terms "naked transparency." Open government data became instrumentally and ideologically enabled by notions of transparency and specific legal tools such as the Freedom of Information Act (FOIA). Yet, the natural equating of "openness" or government transparency (Hood and Heald, 2006) with accountability increasingly became dubious (Tkacz, 2012). The move to "open data" was often an imperative that didn't make clear where the levers were for social change that benefited citizens (Lessig, 2009). Still, I argue that civic hackers are often uniquely positioned to act on issues of public concern; they are in touch with local communities, with technical skills and, in many cases, institutional and legal literacies. I conclude by connecting the open data movement with a specific set of political tactics—requesting, digesting, contributing, modeling, and contesting data.

Origins of open government data

Doug Thomas began *Hacker Culture* (2002) by outlining the culture of secrecy in the United States as a way to understand both the resistant nature of hackers and why they were vilified. Hacking is still deeply coupled with technology through particular historical trajectories (Coleman, 2012b; Jordan, 2008; Thomas, 2002). Narratives of hackers as deviants were desirable because they solidified support for the government (Nissenbaum,

2004). On one hand, "civic hackers" are welcomed in the current day because the fragility of government makes it increasingly necessary to recognize and invite their labor (Gregg, 2014). On the other, civic hacking is still influenced by a progressive political subjectivity among participants enabled by a specific historical lineage of openness. To provide context for the political participation of civic hackers, I briefly outline a historical arc that enabled the civic hacker as well as critical figures and debates around open government data. Informational freedoms have been given tangibility by laws and practices that enable its flow and utility within particular systems, such as journalism.

This history isn't intended to be a review of the deployment of technology for civic purposes, which has been covered elsewhere (Goldsmith and Crawford, 2014; Goldstein and Dyson, 2013; Townsend, 2013). Neither is it a philosophical exploration of openness (Birchall, 2012; Tkacz, 2012) or espousing the benefits of transparency in government (Hood and Heald, 2006). Rather, this article is oriented around the movement of specific legal frameworks for open information in the United States and practices of actors in engaging with open government data that enabled what is now termed "civic hacking." Open government data therefore provides a specific lineage to compare and contrast with the multitude of "open" concepts in circulation, including open standards (Russell, 2014), open source (Coleman, 2012a), and open systems (Kelty, 2008: Chapter 5). While the open government data movement in the United States is kin to these other lineages, it is conceptually and historically distinct. It also bears mention that this history is confined to the United States. Practices with openness have been differently interpreted by grassroots participants across the world, from Asia (Lindtner, 2012) to the global South (Chan, 2013).

Early informational openness: from sunlight to flashlight

Transparency has a variety of definitions, but at its core refers to "the degree to which information is available to outsiders that enables them to have informed voice in decisions and/or to assess the decisions made by insiders" (Florini, 2007: 5). What we now call transparency has its roots in progressive-era notions of "publicity" where business was performed in public. In 1902's *What is Publicity?* political professor Henry Adams described publicity as "an essential agency for the control of trusts" (p. 895). Woodrow Wilson, long a campaigner for governmental and financial reform, in 1918 beginning his "fourteen points" memo for World War I by calling for an "open convent of peace, openly arrived at" where "diplomacy shall proceed always frankly and in the public view." Justice Louis Brandeis, with his well-worn aphorism that "sunlight is the best disinfectant" that would inspire the Sunlight Foundation, very much supported and informed Wilson's position, particularly as discussed in a 1913 Harper's article and successive book *Other People's Money.* Brandeis believed that bankers' compensation should be publicly disclosed to encourage investors to negotiate more reasonable terms. This "full disclosure" would provide information that enables the system to function more efficiently.

By the 1920s, the meaning of publicity had shifted from a universal notion that "sunshine" would bring about smooth functioning and encourage trust toward something more nefarious. Wariness about publicity emerged from the public becoming leery of

mass communication. The First World War drew attention to how communication could be wielded to push specific opinions. The publicist became a professional occupation. Progressive Walter Lippmann (1922) famously described the "publicity man" that is "censor and propagandist, responsible only to his employers, and to the whole truth responsible only as it accords with the employers' conception of his own interests" (p. 218). In 1928's *Propaganda* and a series of public debates, Edward Bernays defended the role of the publicist as necessary for the smooth functioning of a democracy. The definition of "publicity," previously lauded, acquired negative connotations of promoting a viewpoint that more benefitted the status quo than provided information that enabled individuals to make rational choices. Journalism historians Stoker and Rawlins (2005) extended Brandeis' metaphor of light to describe this as a move from "searchlight to flashlight"—a narrower and less powerful beam that only illuminated what corporations wanted. Yet they also critiqued progressive beliefs that publicity was synonymous with purification and backers such as Adams for placing "too much faith in information's power to produce public action" (p. 186). The struggle for meaningful social change shifted toward obtaining "correct" publicity, and working within the system also led to an unintended consequence: the progressive movement became a training ground for publicists.

The FOIA

Post-World War II, the United States concentrated power in a secretive national security complex, notably the Central Intelligence Agency (CIA) and NSA. Citizens were left with few methods to obtain information. The most well-known and often utilized legal tool for obtaining information about government operations is the Freedom of Information Act. While this is hardly the only method we might connect with "open information"—there are local, state and national efforts, as well as public interest groups and scientific uses of data harkening back to the 1960s—it is the one that has most closely informed the emerging ecosystem around open government data. For example, radical transparency web advocates such as Carl Malamud in the 1990s used FOIA requests to make large caches of information publicly available for free. The replacement of FOIA requests by open data is still touted by data platforms such as Socrata as a savings of labor and money (Quigg, 2014). Participants in civic data hackathons conceptually connect open data with accountability, to "keep city hall honest" as one participant put it.

In *Advocates of Openness*, George Penn Kennedy (1978) described the freedom of information movement that began after World War I and led up to the creation of the FOIA in 1965. The American Society of Newspaper Editors (ASNE) led a sequence of policy statements in the late 1940s centering on the importance to journalism as a profession to freedom of information, culminating in their soliciting Harold L. Cross to write *The People's Right to Know.* Cross concluded that "there is no enforceable legal right in public or press to inspect any federal non-judicial record." This text was published in 1953 and circulated mostly at the federal level, promoting the idea of freedom of information within and outside of journalist circles as being beneficial to the public good. Congressman John Moss' commission then garnered the attention for President Johnson to sign FOIA into law on 4 July 1966.

Perhaps the most surprising facet of this movement now is its small size. Kennedy (1978) notes that "in the first 10 years … the movement got its impetus from the efforts of a tiny handful of men" (p. 40) in legislature and journalism. Johnson wasn't particularly enthusiastic about signing, and the executive branch pushed for provisions permitting the withholding of information for a wide range of exemptions. FOIA was only strengthened after Nixon's resignation in 1974 when it was amended over Ford's veto. Even afterward, it didn't match with the complete vision of ASNE. At times requests to comply stretched well beyond 10 days and requests are still frequently denied. Despite claiming to embrace openness, Obama's presidency has been notoriously secretive, with record numbers of whistle-blower cases and FOIA requests being denied or censored. Despite FOIA's flaws, implementing a philosophical stance of Americans' "right to information" was notable for several reasons. First, FOIA provided accessible tools to put abstract ideas into practice. Everyday citizens started to attach various political notions to these activities. Second, information flowed into a journalistic ecosystem that was prepared to process and interpret it for everyday citizens. Information obtained through FOIA was being interpreted in stories that changed public opinion (Leff et al., 1986). Third, ability for individuals to request information led to alternate uses for activists, public interest groups, and non-profit organizations.

Late informational transparency

A small cadre of journalists organized and lobbied for legal reforms to cement the concept that citizens had a right to information produced by government entities. FOIA produced a multitude of important stories that changed the course of history, and informational transparency became a mode of political activism (Figure 1). In the early 1990s, government transparency became something of a fad, spawning similar legislation overseas. Leading transparency activists started to view the potential of the Internet for increasing accessibility as a natural extension of this freedom of information movement. The efforts of Carl Malamud and the Sunlight Foundation applied right to information principles to the Internet, facilitating public access to vital information on law and government before individuals requested it. They took a more overtly ecological perspective on openness where information could be integrated into as-yet unforeseen processes. For example, Carl Malamud put Securities and Exchange Commission filings online in 1993. In 2006, Mike Klein founded the Sunlight Foundation, taking its name from Louis Brandeis' well-worn aphorism. They began a well-heeled effort to use "21st-century information technology and Web 2.0 energy" to improve access to information about elected officials.

Lessig's notion that code had regulatory capacities was influential on this early stage of defining open data. Yet, memorable phrases such as "code is law" and quotes such as "to the extent that code becomes open, government's power is reduced" (Lessig, 2006: 152) were often misinterpreted on face value. His stance was not cyberlibertarian (Barbrook and Cameron, 1996). As his successive refutation of transparency in this shift toward open data indicates (Lessig, 2009), he was quite concerned about efforts with software becoming distanced from tangible outcomes. Lessig might regarded as a hacker in the mold of Tim Jordan (2008), taking a progressive perspective on how we might regulate technologies—alongside laws, norms, and markets—that affect behavior.

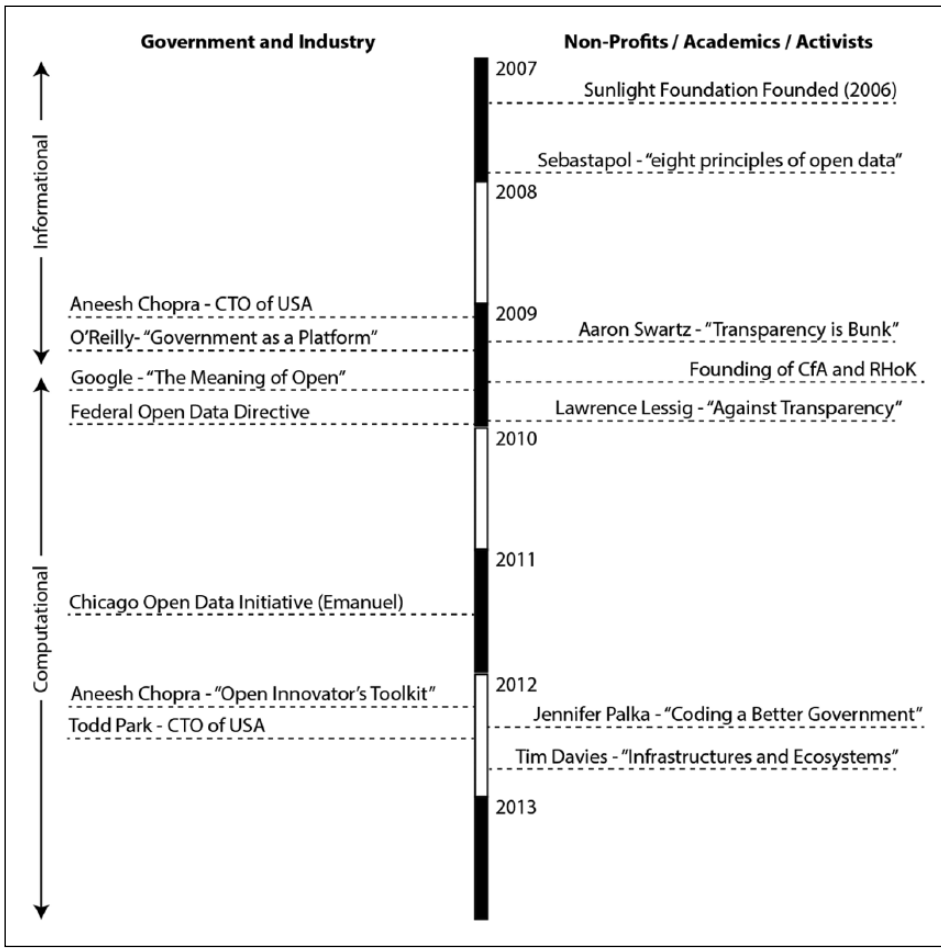

Figure 1. Timeline of openness from late informational transparency to computational open data.

Definitions of "open data" were successively codified through informal standards that were influential to successive implementations of open data initiatives at the federal and municipal levels.[1] In 2005, the Open Knowledge Foundation produced what they term "the open definition," which could be applied to content, data, and information. Carl Malamud and Tim O'Reilly, backed by the Sunlight foundation, assembled a team of thinkers in 2007 at Sebastopol, north of San Francisco. Participants included Lawrence Lessig and a young Aaron Swartz. The open data definition drafted at Sebastopol describes data's completeness, primacy, timeliness, ease of physical and electronic access, machine readability, non-discrimination, use of commonly owned standards, licensing, permanence, and usage costs. This description made it clear what the properties of data were, even as outcomes, fitting with an open-source model, were more

ambiguous. Still, Tim Davies' (2010) taxonomy of open government data of this period includes mechanisms based on political participation, collaboration, and choice. Vocabulary from Sebastopol made its way into the 2013 executive order "Making Open and Machine Readable the New Default for Government Information." On the level of municipal governments in particular, the movement from information to data focused on new uses that emphasized collaboration and utility over accountability (Yu and Robinson, 2012), signaling what I term the computational shift of openness.

The computational shift

The computational shift of open government data refers to the move from governments fulfilling information requests to automatically releasing data to fulfill a range of more speculative uses. While promises about the Internet (Morozov, 2013b) encouraged this move, so too did notions of open government from previous decades. For example, David Osborne's notion of "reinventing government" involved hallmarks familiar to open data initiatives: "catalytic" public–private relationships, connecting with communities, and decentralized collaboration (Osborne and Gaebler, 1992). In 1995's *What Comes Next* republican deputy director of domestic policy for the Bush Administration Jim Pinkerton, frustrated with New Deal era centralization, identified "bugs" with the "operating system" of bureaucracy to reduce bloat. For obvious reasons, civic hackers have gained traction among government officials by promising to streamline processes for allocating funding. Others focused on generating value from new sources. The notion of "network governance" proposed that government officials are responsible for "producing public value rather than managing inputs," assembling packages that are "most useful for the customer" (Goldsmith, 2005: 57). The emphasis on innovation is also visible in Tim O'Reilly's (2010) influential notion of "government as platform," which positioned systems of governance as being similar to technical systems, subject to constant observation and tweaking to improve inefficiencies. He applied a biological model to government, where "information produced by and on behalf of citizens is the lifeblood of the economy and the nation" (O'Reilly, 2010: 14).

Definitional tensions during the transition from informational to computational modes can be seen in writing of both enthusiastic backers of open data and more wary law-based analyses of critics. Jeffrey D. Rubenstein (2013), CEO of procurement analytics platform Smartprocure, claims that release of FOIA information in data form can be "more than transparency; it can be the basis for true collaboration" (p. 81). Crowdsourcing is often used as a metaphor for open data initiatives with emergent and vaguely defined goals of collaboration rather than specific ones (Brabham, 2013). Open data came increasingly referred to an ecosystem of production rather than accountability. In *The New Ambiguity of Open Government*, Harlan Yu and David Robinson (2012) note that open data signals a movement toward "politically neutral public sector disclosures that are easy to reuse, even if they have nothing to do with public accountability" (p. 178). An ecosystemic metaphor was then familiar to e-government practitioners aligned with David Osborne, as well as to urban planners (Light, 2009).

Not all Sebastopol supporters were on board with this shift. Lawrence Lessig and the late Aaron Swartz, important early supporters of the digital transparency

movement, were leery about the detaching of informational transparency and accountability. Lessig doubted whether the "naked transparency movement" provided the context for citizen decision-making because it makes unreasonable expectations on their existing knowledge and time. For example, in their analysis of transparency efforts, Fung et al. (2007) found that the most effective policies provided data on which the public can make informed choices. Swartz objected because transparency for transparency's sake shifted labor from government entities to everyday citizens, and the connection of transparency to accountability had been irrevocably altered: "the pipeline of leak to investigation to revelation to report to reform has broken down." In their opinion, flows of information became detached from their uses to gain leverage against corruption.

In 2009, open data received recognition from the federal level, and many state and local efforts followed. In a general sense, optimism among the tech-friendly Obama and his supporters, who used in his first campaign, buoyed interest in open data. Obama appointed Aneesh Chopra as the first chief technology officer (CTO) of the United States and released executive orders defining open government in 2009 as entailing transparency ("conduct its work more openly and publish its information online"), participation (in decision-making), and collaboration (both internal and external). In 2013, he emphasized machine-readable data as a "default for government." While these orders were more a set of progressive clarifications, they were mirrored by similar orders on the municipal level in Chicago (2011), New York (2012), and Los Angeles (2013).

Proponents of open government data tend to view municipalities as being more receptive to these possibilities. In *The Metropolitan Revolution*, Bruce Katz and Jennifer Bradley, beating a decades-old drum, describe the federal government as "partisan, hopelessly fragmented and compartmentalized, frustratingly bureaucratic, and prescriptive." The non-profit Code for American (CfA) was also founded at this time with goals of increasing government effectiveness and transparency and has been effective in connecting volunteers to sympathetic municipal governments and funding. The organization has become something of a pipeline for young talent to quickly rise up the ranks of government; in 2014, 26-year-old Abhi Nemani, ex-co-executive director of CfA, was selected to be the chief data officer for Los Angeles. CfA founder Jennifer Palka became deputy CTO of the United States. Open data, like open information before it, promised fixes for bureaucratic problems and leveling power asymmetries (Fenster, 2012). Municipal governments strapped for funds and in dire need of more efficient frameworks have, of course, welcomed the message that open government data can alleviate time-consuming FOIA requests, make services easier for residents to use, and drive hackathons as a form of public outreach.

The first National Day of Civic Hacking in 2013 cemented the concept in the public mind, even as it revealed hackathons as an odd overlap between do it yourself (DIY) culture and Silicon Valley modes of problem-solving (Gregg and DiSalvo, 2013). Peeking through the cracks was enthusiasm that open data could be a form of financial innovation. This speculation was solidified in a McKinsey Institute report that claimed potential revenues of three trillion dollars in open data across multiple markets (Manyika et al., 2013).

Data activism and advocacy

Civic data hackers emerged from this historical trajectory to operate through a range of data-driven political modes, or what I term "data activism and advocacy," to bring about systematic change. Their collaborative nature is particularly important to prompt academics to revisit debates about how critical and empirical traditions have historically spent insufficient time evaluating possibilities for institutional reform (Melody and Mansell, 1983). Data activism and advocacy ranges from civic engagement (Putnam, 2001) to more oppositional activism (Jordan, 2001). In this sense, it is a specific association of technologically mediated participation with particular political goals (Lievrouw, 2011) resulting in a wide range of tactics. Although open government data is still evolving and is constrained by predictions for economic growth and self-regulation, I argue it enables civic hackers to participate in civic data politics. This is particularly important because data-driven environment is often distanced from providing individuals a sense of agency to change their conditions (Couldry and Powell, 2014). Data activism and advocacy can take place through organizing on related topics, online through mediated data repositories such as Github, and in-person events such as hackathons. The evolution of open government data has left traces on the beliefs individuals place in data as a particular object or system. *Digesting* and *requesting* are modes in many ways carried over from the FOIA and tend to be aligned with anticipated uses of data by government. *Contributing, modeling*, and *contesting* stem from residents leveraging possibilities of open data and software production to attempt to alter process of governance.

Requesting

Open data advocates initially focused on the imperative of, as one civic hacker put it at an open data summit, "sucking [data] out of its database and exposing it." Civic hackers widely view machine-readable data as more useful because it drives a wider variety of potential uses, even as the shift from informational uses raises the bar to the literacies required to interpret it. In civic hackathons, knowledge of government operations was as useful as technical knowledge. Ironically, many data sets considered "open" are not easily findable by outsiders, as government employees often fail to consider how the sets might be found or their value to others. Requesting, as an extension of informational transparency, is still necessary. The FOIA enabled individuals to obtain information from within government and feed into a receptive system of journalists and organizations. Connecting informational and data paradigms can be made on an infrastructural level as well, as platforms like Socrata tout their ability to provide a cost savings through predictively fulfilling FOIA requests and preventing duplication. The concept of "open data" is built on legal frameworks and numerous open data initiatives at the federal, state, and local levels. Processes that at one point were reliant on FOIA have become increasingly automated, drawing suspicion of one-enthusiastic proponents who connected transparency with accountability. Carl Malamud's desire to make government information radically accessible through the web is more than a symbolic desire. After all, "government transparency cannot be defined as only the information that governments deign to share

with the public" (Sifry, 2011: 186). Requesting data still holds a place in the repertoire of civic hackers.

Digesting

Hackers have long been viewed as experts capable of applying technical knowledge to bring about systemic change (Söderberg, 2010). Digesting is a process of interpretation and use that was previously served in an informational fashion by journalists in pursuit of a story. The move toward open data raises the challenge of apprehending the meaning and possible uses of data and hence the need for civic hackers (Townsend, 2013). Civic hackers can be viewed as kin to the right to information movements (Beyer, 2014) and operations such as Wikileaks (Sifry, 2011), although they embrace a more overtly local and ecological model (Light, 2009). Michael Schudson (1999) argues that the progressive-era model of the "informed citizen" dissuaded participation when compared to the previous rowdy spectacle of the party era and was weakened during the post-war period. He proposes that "monitorial citizens" act as a watchdog for specific issues, ready to take action. From this perspective, civic hackers could be considered a monitorial elite, watching data streams and processes of algorithmic regulation for injustices and engaging directly with local politics. "The local" operates as a point of collaboration (Dunbar-Hester, 2013) and point of entry for geeks to engage with neighborhood issues. In retrospect, the threat of the online community debates of the 1990s (Baym, 1995) was not that online communities could be as meaningful as offline communities. Rather, as Craig Calhoun (1998) notes, disputes over community as a particular category threatens to distract from a general focus on solidarity by activating "social bases of discursive publics that engage people across lines of basic difference in collective identities" (p. 374). A mutable, popularized hacker identity may have this potential, capable of processing and interpreting abstract systems of regulation.

Contributing

Stephen Goldsmith and Susan Crawford (2014) argue that resident voice should be heard through data and around issues concerning data. Contributing to data sets is often paired with local grassroots use of mobile devices and amplification of local knowledge (Gordon et al., 2011). Using an app that contributes to a shared data resource provides a low barrier to participation. The most popular apps to date have been highly instrumental ways to request services to fix city infrastructure, such as SeeClickFix, a platform that lets residents take pictures of issues that need repair, that are delivered to the appropriate city department as an actionable item. We might think of this as a base-level civic act similar to picking litter off the ground or painting over graffiti. Other activities are thicker modes of participation by generating data or metadata. The primary effort of the 2014 *CodeAcross* effort was to map existing sources of open data. The leader of the event, D.W. Ferrell, described "our role as citizens is to complement" efforts by the government and organizations such as CfA. Contributing to data repositories served purposes for multiple stakeholders: the

group created a resource, communicated how well (or poorly) municipalities were releasing data, and came together around ways to digest data. Modes of data activism and advocacy are often interwoven, and it might be rare for groups or individuals to pursue just a single one.

Modeling

Modeling refers to using code and open data to create working or partly working prototypes. Civic hackers such as Jacob Solomon (2014) view apps and software as examples of effective process, driving the idea that government services might be more just, humanistic, and effective in reaching residents. That "hackers" can model beneficial process disrupts the often presumed subversive nature of hacking as much as it does easy assumptions about a Foucaultian notion of governmentality. Prototypes act as working evidence to lobby for changing government process, particularly those that improve digital infrastructure or direct communication with citizens. The capability of code to act as a persuasive argument has long been noted, and modeling can produce charged debates about the very meaning of "civic." For example, The Detroit Water Project connects individuals unable to pay their water bill with those willing to pay it. The website sparked a conversation that spread through news and social media: how might we take collective action to help those deprived of a basic quality of life? How is the deteriorating infrastructure of Detroit a result of larger geographic and economic conditions? On a level of hackathons, prototypes can be speculative (Lodato and DiSalvo, in press) rather than an "outcome," revealing conflicting notions of "civic tech" (Shaw, 2014).

Contesting

Contesting refers to the creation of crowdsourced data or prototypes for not yet existent uses for data. It is similar to modeling but with an oppositional rather than persuasive tone. For example, the shooting of Michael Brown in Ferguson, Missouri, led to protests paired with data activism. Jim Fischer, who has long noted that there are limited national-level data on officer-involved shootings, suggested that data sets on officer-involved shootings be crowdsourced. In other words, data could be aggregated by individuals who would, where necessary, request additional documentation. The various levels of government are "transparent" about these incidents to a point; the data provided only neutral and in some cases outright false descriptions. Deploying a data-driven vision—what is missing? What can't we see in the data and why?—was a rallying cry for participation to bring about increased accountability. In response to Ferguson, a group of African-American youth created an app "Five-O" to rate local police, receiving national-level attention. It was a simple app created in the spirit of online apps rating goods and services such as Yelp. The juxtaposition of rating and lack of trust highlighted an alternate definition of "safety" that was markedly absent in the previous example of using government data on crime to make residents safe. One relied on a government-sponsored vision of "safety" while the other sought to foster increased accountability among law enforcement officers.

Conclusion: civic hackers as utopian realists

Data activism and advocacy provides a mode of participation in digital infrastructures that debates and confronts the politics of technology for governance. Proponents of open data revive progressive-era claims of transparency as "sunlight" where open data leads to accountability. I suggest that this canard shouldn't lead us to entirely dismiss the movement as encapsulating meaningful modes of political engagement. "Hacker" poorly describes the emergence of civic hackers' tactics from informational transparency, particularly as they are not "white hats" in the historical sense of reformed hackers joining the workforce (Sauter, 2013a), nor simply an inversion of "black hat" information security experts. Rather, civic hackers seek to ease societal suffering by bringing the hidden workings of abstract systems to light and improve their functioning. Part of the academic discomfort with recognizing civic hacking might stem from their activities cutting across political categories that have traditionally been passionately defended: unitary and adversary, citizen and consumer, horizontalist and institutionalized, and prefigurative and strategic.

Civic hackers might be most appropriately described as utopian realists (Giddens, 1990: 154), a term Giddens employed to capture how assuaging negative consequences in a risk society required retaining Marx's concern of connecting social change to institutional possibilities while leaving behind his formulation of history as determining and reliance on the proletariat as change agents. He positioned utopian realists as sensitive to social change, capable of creating positive models of society, and connecting with life politics. Giddens received criticism for applying the term to movement-based politics. Might "utopian realist" be applicable to the practices of civic hackers, intertwined with particular repertoires, technologies, and affective publics? McKenzie Wark (2014) suggests that the relationship between utopian and realist might be mutually constitutive rather than dialectical. He re-frames utopia as a realizable fragment or diagram that re-imagines relations. From this perspective, civic hacking gets traction not because they were ever intended to be the sole "solution" to a problem, but they are ways of acting and creating that are immediately apprehensible. Prototypes capture the imagination because they are shards of a possible future and can be created, modified, and argued about (Coleman, 2009).

The rise of civic hackers from informational transparency and the inversion of the negative valence of "hacker" were not by chance. As the history outlined here suggests, their politics are the result of the evolution of informational openness and move toward "big data," leading to new possibilities for collaboration even as it slides toward neoliberalism. The perspective that there is civic potential in freeing data has been enabled by a particular historical moment with a rise of alternative modes of political engagement outside normative roles (Schudson, 1999), increased numbers of technically literate with free time (Neff, 2012), and a desire among governments to re-frame "civic hackers" using a positive valence (Gregg, 2014). To civic hackers, changing one part of a system drives humanistic design processes and services for those in need, influencing other parts. While there is not sufficient time to discuss this more systematic perspective, the appeal of open government data is that it acts as a soft form of power to bring out the positive qualities of cities. Despite their fetish for speed (in rapid production and

hackathons), civic hackers often act as the "slow food movement" of digital political action, embracing local sourcing, ethical consumption, and pleasure of community work. Civic hackers are hardly responding to a new narrative of technological change. Matthew Wisnioski (2012) notes that the normative framing of rapid technological change leading to institutions being unable to catch up has been surprisingly stable over the last 60 years. Civic hackers thus speak against those who propose that the application of technology to politics produces a meta-category of activist.

Civic hackers tackle a difficult and timeworn problem: participation in humanistic technology design. Perhaps their greatest achievement is showing how "publics suited to renewed discussion about technological choices and policies might be constituted" (Winner, 1992: 355). Currently, open government data and its emergent ecosystem jostle uncomfortably between liberal democratic and cyberlibertarian perspectives; open data can be viewed as an opportunity to help communities be more justly governed or a justification for complete government disintermediation. A growing awareness of these divergent views has led to civic hackers actively debate ethics of representation and how to articulate shared political values (Shaw, 2014). As should be clear, I don't view civic hackers as simply pragmatists who have adopted a cybernetic ideology embedded in the Internet (Morozov, 2014). To put Giddens in conversation with Morozov, the threat of civic hackers is not that they naively employ "solutionism." Quite to the contrary, they debate ethics of technology design, seek collaborations with local organizations, and attempt to re-think how government services might be more sensitive to resident needs. The more pressing threat is that a fear of solutionism and neoliberal connotations of "open data" together might dissuade political participation. Systemic social disparities are often intractable. The route to alleviate them has never been detachment or abandonment. Looking forward, we should pay attention to how data activism and advocacy might result in meaningful systematic change beyond the usual claims of "transparency." To fulfill the possibilities for meaningful social change hinted at in their history, civic hackers might have to coordinate around specific mechanisms for change and articulate a deeper sense of democracy than the language of technology provides.

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Note

1. Although I am focused on the United States, it bears mention that the United Kingdom preceded the United States in several initiatives and uses of open data—see Tim Davies' fine work on this subject: http://www.opendataimpacts.net/report/

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