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Civic Hacking: A Motivation Framework

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Civic hackers are a newly emerging community, working to bridge the gap between technology and government. They gather together to work on projects using publicly available data and technological expertise to devise apps, programs, and data presentations for the benefit of the community. I use primary data collected from ten semi-structured interviews with current participants as well as observations of civic hacking events and grounded theory to answer the question, "what are the motivations of people who participate in civic hacking?" I then suggest a framework. The framework includes unique identities and motivations of this particular community. Motivations are divided into three typologies: "hackers," volunteers, and activists. The typologies correspond to motivations that are intrinsic and extrinsic in nature. While exploratory in nature, this study takes a preliminary look at this new form of social engagement and the reasons that people participate. This newly emerging phenomenon is of interest to public administrators and scholars as it suggests ways to partner with this community to achieve the benefit of a technologically savvy community that would like to contribute to civic causes.

Introduction

As individuals and communities with technological expertise and savvy have emerged, a movement designed to use these skills for the good of the community has followed. This movement is often called "civic hacking" or "civic technology." While there are many possible avenues available for research into this community, a fundamental question involves the reasons why people choose to devote time and talent to these endeavors. This paper begins to explore this question through interviews with participants and observations of meetings.

This paper presents a background regarding the phenomenon of civic hacking; a literature review of the relevant concepts of motivation, volunteering, activism, and hacking; a presentation of the study methodology and findings including the framework; and implications and future research suggestions. As this is a newly emerging phenomenon, it is important to explore the potential implications of civic engagement with motivated technologists due to the possibility of future partnerships with public administrators and government officials.

Background

Civic hacking is a relatively new phenomenon,

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with much of the early momentum tied to Code for America, founded in 2009. Code for America, a non-profit organization, cites one of its central impacts as using technology to create interfaces with government that are functional and effortless (Code for America: About, 2013). It was called "the technology world's equivalent of the Peace Corps or Teach for America" (Wadhwa, 2011) and consists of full-time fellows working directly with cities, local brigades consisting of individuals who come together to build civic technologies approximately once a week, and financial and technological assistance to civic start-ups. Code for America was also a sponsor, along the White House and corporations such as Facebook and Intel, of the first National Day of Civic Hacking, an event that attracted over 11,000 individuals in 83 cities in the US (National Day of Civic Hacking Report, 2013). There is no current data regarding the demographics of participants, however a 2013 audit of CivicIdeas – a blogging site for connecting government and community – users showed that almost 60% of users were under age 44, approximately 60% of the users were male, and 84% of users had at least some college education (Horgan, 2013).

As this paper uses the term, civic hacking occurs when people come together to "collaboratively create, build, and invent new solutions using publicly-released data, code and technology to solve challenges relevant to [their] neighborhoods, cities, states and country" (National Day of Civic Hacking: About, 2013). While there is some question as to the best terminology for these events and groups due to the potentially exclusive or negative connotation of the term civic hacking, this paper uses it in the above manner.

One-time events such as the National Day of Civic Hacking and ongoing group meetings such as those of the brigades of Code for America attract individuals who spend several hours, months, or longer working on a technological product of some kind. Past and ongoing projects include a website that enables people to find their local food pantry and an annotated listing of state laws. One of the first successes for Code for America was the adopt-a-hydrant app and website (adoptahydrant.org). The site is available for the residents of Boston to volunteer to shovel out fire hydrants during snow storms, a task that is relatively easy to do as people are shoveling their sidewalks, but onerous for the fire department to do citywide during storms. Using data regarding the locations of hydrants from the city of Boston and coding skills, volunteers were able to build and maintain a site that benefits the community because fire department resources do not need to be diverted to a task that is more efficiently delivered by citizen volunteers. As the coding is open source and available to other Code for America brigades, the model was adopted for other purposes in other cities, such as tree and storm drain adoption.

A hackathon typically occurs over the course of a weekend with groups of individuals often coalescing around a project that could be suggested from a team member or another interested party, such as a public administrator. The organizers often provide resources such as food and equipment, but unlike most other hackathons that are organized for individuals to work on different types of technological projects, financial incentives or other prizes are not typically awarded at civic hackathons (Tao, 2013; National Day of Civic Hacking: About, 2013). In this sense, direct financial incentives are not available to participants and projects are typically not judged against one another, leading to a more cooperative atmosphere than hacking events sponsored by companies that offer venture capital or other large prizes to winners. Hack nights are often held weekly and function as a communal gathering of interested individuals to work on ongoing projects together or start new ones. Occasionally there is a connection with local government either from a public employee coming to a meeting or a meeting set up with a public official to discuss data, however this is not the norm. Based upon my observations and interviews, at hack nights individuals typically decide upon projects and utilize available public data without input from government officials.

While these events occur in a communal space, such as a library or donated office space, some of the work associated with civic hacking occurs remotely and collectively in cyberspace. Weekly hack nights present the opportunity for coding and collaborating in the same space for several hours at a time. For some individuals this is the totality of the resources they are able to dedicate to civic hacking, however some civic hackers spend a great deal of time working on a project outside of this dedicated time. While not a

requirement to participate, often civic hackers have a high degree of technological expertise in the form of computer coding or design knowledge.

Literature Review

My analysis rests on the theory that individuals who lend their time and talent to "civic hacking" fit into one or more motivational classifications; activists, volunteers, and "hackers." Each of these identities has corresponding motivations. Available literature addresses the areas of motivation generally, activism and volunteerism, but scant literature exists on hacking. However, the open source movement provides insight into the motivation of a community with many similar features.

Motivation Generally motivation can be thought of as intrinsically or extrinsically based. Intrinsic motivation can be further broken down into enjoyment-based or obligation/community based motivation. Enjoyment-based intrinsic motivation is associated with flow (Csikszentmihalyi, 2009) and task accomplishment (Lakhani & Wolf, 2003). Obligation-based intrinsic motivation is associated with individuals acting on matters of principle (Lindenberg, 2001). Extrinsic motivation is linked to external reward; for example revenue from related products or positions, human capital, and peer recognition (Hars & Ou, 2002).

Activism My use of the term activism or activist is taken from the work of Klar and Kasser (2009). It includes the advocacy for a political cause or issue such as protecting the environment, opposing war, or championing the rights of children. This may be expressed in any form of action ranging from signing a petition to participating in strikes or sit-ins (p. 3).

Participation for activists is linked to political opportunity. Platt (2008) expects rational activists to participate in events when economic, social, and political conditions are more favorable to their objectives. Duncan (1999) presented a model of activist motivation that includes intrapersonal variables, such as personality and life experiences, as contributing to group consciousness. The collective consciousness helps individuals identify with a group and then leads to cooperative solutions to group problems and collective action. In other words, while not explicit in prior research, we might characterize activist motivation into the intrinsic category, both with enjoyment-based and obligation-based elements. Extrinsic motivation is not strong even when examining economic conditions because activists are looking for the specific condition that will further their cause as opposed to their financial outcome.

Volunteering The definition of volunteering used in this work comes from the President's Task Force on Private Sector Initiatives in 1982 via Thoits and Hewitt (2001):

> Volunteering is the voluntary giving of time and talents to deliver services or perform tasks with no direct financial compensation expected. Volunteering includes the participation of citizens in the direct delivery of service to others; citizen action groups; advocacy for causes, groups, or individuals; participation in the governance of both private and public agencies; self-help and mutual aid endeavors; and a broad range of informal helping activities. (p. 116)

Clary & Snyder (1999) find that the motivation to volunteer can be described as fitting into six categories: values, understanding, enhancement, career, social, and protective functions. These functions can be aligned with the intrinsic and extrinsic typologies of motivation generally, with the primary factors being intrinsic.

Activism is sometimes subsumed by volunteering, but can also be thought of as a separate endeavor or identity. Unlike volunteers, activists may be paid. For the purposes of this paper, I view them as potentially overlapping with the possibility of distinction outside of the overlap.

Hacking The definition of hackers and hacking is the most interesting of the terms for the purposes of this paper because the terms are used within the community differently than by the public. I will be using a

definition of hacking that is common to the population I interviewed: "repurposing something, usually of a technological nature." Additional discussion of this term can be found in the findings section.

As there is not currently any literature dealing directly with hacking motivation, there are several studies (Hars & Ou, 2002; Hertel, Niedner, & Herrmann, 2003; Lakhani & Wolf, 2003) that discuss the motivation for participating in open source software, a community that shares many individuals and traits with hackers (interest in solving problems and puzzles, using computers and technology to perform tasks, interacting with and perfecting code) that is useful for this study. The civic hacking community is sometimes subsumed by the open source community as civic hacking typically has an open source philosophy and protocol (Levitas, 2013). Researchers have found that internal factors such as intrinsic motivation, altruism, and community identification are important motivators as well as external factors such as aiding in a job search, compensation and anticipated return (Hars & Ou, 2002; Lakhani & Wolf, 2003). Additionally, building personal human capital and self-marketing were also important motivational factors for individuals' decisions to contribute to open source software (Hars & Ou, 2002; Hertel, Niedner, & Herrmann, 2003; Lakhani & Wolf, 2003).

The Study

As a newly emerging community and area of study, there are many interesting elements of civic hacking. However, when approaching this topic one basic area of inquiry involves determining why people are in this community. The research question that developed from this line of reasoning was:

> What are the motivations of people who participate in civic hacking?

Due to the developing nature and the lack of literature on the subject, this study was designed to be exploratory in nature, using qualitative interviews and observations to gather primary data.

Methodology

The study included ten in-depth interviews with adults who participate in civic hacking activities in the greater Boston area as well as observations at six weekly meetings of a Code for America brigade and the National Day of Civic Hacking. Interviews were semi-structured, during which individuals were asked about their personal history and involvement in the tech community, projects they engaged in, their introduction to civic hacking, volunteer activities, political leanings, and other open-ended questions. Interviews lasted between 45 minutes and two hours. I chose semi-structured interviews due to the exploratory nature of this research, specifically including the possibility that additional lines of inquiry could present themselves throughout the interview. While survey data would be an excellent research method for the research question, I believed building a theory through in-depth interviews would allow for a deeper understanding of the community.

I recruited interview participants in person at various civic hacking events. During these events I asked for volunteers who would be willing to speak with me and received offers from more than ten individuals. I scheduled interviews based upon subject and interviewer availability, and interviews primarily took place at coffee shops or other mutually convenient locations. Interviews were recorded and partially transcribed due to time and cost considerations. Additionally, I observed the interactions of individuals during meetings, asked occasional questions, and took notes during the six meeting I attended.

Intragroup Diversity The sample had one woman and nine men; one Asian, one Hispanic, and eight white individuals; one unemployed and nine fully employed individuals; and all were aged between twenty-two and thirty-eight. I do not claim that this is a representative sample for all civic hackers. However, it was a fairly representative sample of the individuals attending regular meetings of Code for Boston, based upon my observations of the group being predominantly male and white. Nationwide, men hold approximately 75 percent of STEM field (science, technology, engineering, and math) positions (Beede, 2011a) and non-Hispanic Whites make up approximately 72 percent of the field (Beede, 2011b).

Data Analysis

I recorded the interviews on a digital recording device except one in which I used extensive note taking after the interview to overcome a taping failure. During most interviews I did not take many notes to allow for a conversational style. I listened back to the interviews and took notes on them once I finished the series of interviews. I also transcribed key portions of the interviews for use in data analysis. Partial transcription where the researcher retains detailed interview notes and has key passages of the tape transcribed is a valid method of qualitative interviewing particular when the researcher has time and/or financial constraints (King & Horrocks, 2010, p. 143).

Through the use of grounded theory (Barney & Anselm, 1967), I developed a coding scheme based on motivations and identity, and eventually a framework. Previous motivational literature regarding intrinsic and extrinsic motivation (for example see Hars & Ou, 2002; Lakhani & Wolf, 2003) provided a useful structure for examining the typologies of hackers, activists and volunteers, which emerged from the interviews and observations. Additionally, the motivational characteristics of hackers (represented by the open source literature), volunteers, and activists emerged from the individuals I spoke with in this population. During the interviews, individuals sometimes self-identified as one or more of the categories. Additionally, based upon responses to particular questions, I characterized individuals as having traits indicative of one or more identities. From these identities, I created a Venn diagram (see Figure 1) with proportions and overlaps in rough representation of the identities of those I interviewed.

Findings

The conceptual framework represents the anticipated and major finding of this study, however additional issues grew out of the initial research agenda and I present them here as well.

The Framework The primary finding of this study was a new conceptual framework for examining the motivations of individuals who participate in civic hacking. As illustrated in Figure 1, people in this community are conceptualized as falling into one or more of the following identities: hackers, volunteers and/or activists, and are expected to identify motivations that fit within these identities. Often motivations and identities are overlapping.

All individuals with coding skills self-identified as hackers. The individuals who did not identify with the moniker did identify with the activity of civic hacking. As there appears to be a strong overlap of the hacker and volunteer identities, many people also identified with volunteer traits; however some were reticent to embrace the label. When asked if they considered civic hacking volunteer work, people had a variety of responses. For example:

> Yeah, I guess so . . . I hadn't really thought about it in that context. I guess I think of it in a similar way to my participation in Fedora [open source group], being part of a community. It's definitely volunteer, I'm not getting paid!

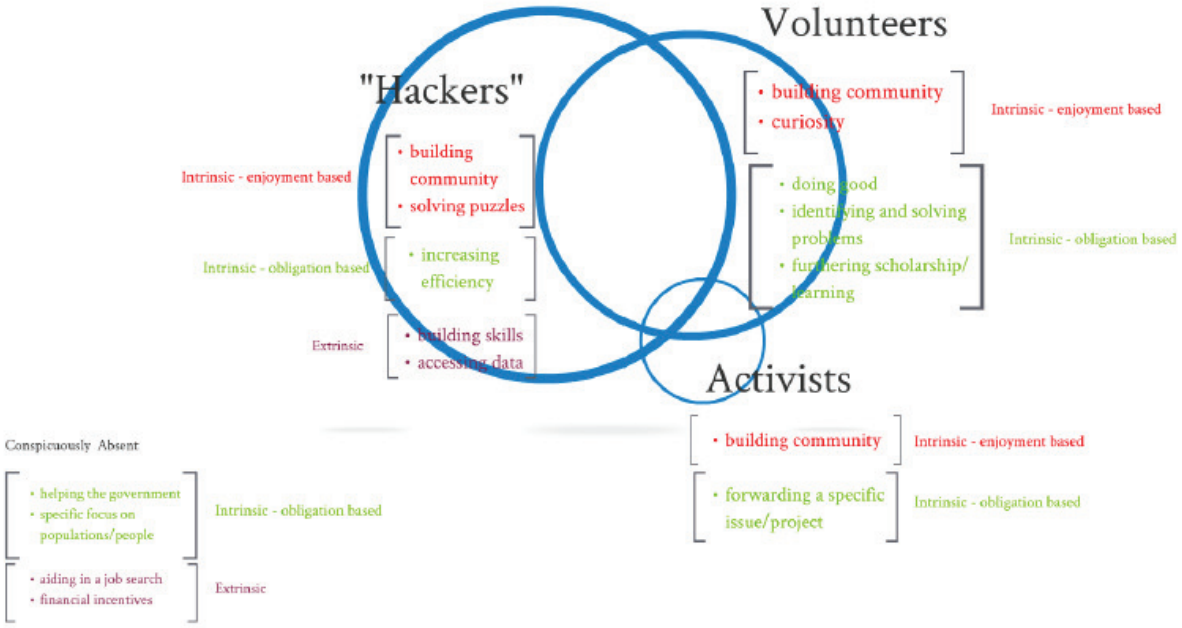
> I didn't think of it that way, no. That was not the motivation. It was not – I was doing this or I was volunteering in a soup kitchen. Having said that, now I'm going to tell my girlfriend I volunteer.

As approximated by the size of the circles, there appears to be only a small contingent of activists represented within the community. Occasionally an individual would show up for a meeting and pitch an idea for a project that he appeared passionate about. However, if no other group members also shared an interest in the project, the individual would not return to a subsequent meeting. The few activists who had longevity with the group had overlapping hacker and/or volunteer motivations.

Motivations Using (Lakhani & Wolf, 2003)'s motivational typologies, I put each identified motivation into a category, either intrinsic – enjoyment based, intrinsic – obligation based, or extrinsic based motivation. These motivations were then grouped into corresponding identities. As somewhat anticipated, volunteers had a

majority of intrinsic – obligation based motivations. Hackers have varied motivations, comprised of intrinsic – motivation, intrinsic – obligation based, and extrinsic motivations. The primary intrinsic – obligation based motivation is distinct from those found in volunteers, however. Hackers see a great deal of value in increasing efficiency for its own sake as opposed to using it to help the community. While there is the possibility that some of the projects could be monetized, no one expressed any interest in using any of the knowledge or data they accessed during a civic hacking session for financial gain. As activists were not as prevalent as the other identities in this community, identified motivations are fewer and no extrinsic motivations were identified. However, one can imagine with a wider sample that extrinsic motivations such as finding funding might be present in this group.

Figure 1
Civic Hacking Motivation and Identity Framework



Conspicuously Absent I observed that the civic hackers did not identify with several motivations present in the literature. These absent motivations could be considered either intrinsic-obligation based or extrinsic factors. Under the intrinsic-obligation based category, we see that helping either the government or a specific population was not present. Most people discussed community generally, but there was no talk of helping a specific class or section of people, for example the disabled or a particular neighborhood. Additionally, during the times when I questioned individuals regarding the government, there was usually a mild negative reaction:

> I'm not doing this to help the government.
> . . .staunchy, government bureaucrats . . .

There were also several extrinsic motivation factors that were conspicuously absent; there was very little discussion of aiding in a job search or financial incentives, motivations sometimes present in the open source community. While this might have been due to the high employment rate of the individuals I spoke with (no

one was actively seeking a new job), I found that very few people articulated a desire to use the activity or group to help find new employment. These absences could be indicative of the motivations within the community or a result of my small sample size.

Conceptual difference between charity work and volunteering In a substantial number of interviews I experienced people distinguishing from the type of work they were doing as civic hackers and the type of work one might do as "charity" work. While a substantial number of people did not self-identify as volunteers, when probed they showed characteristics of volunteers. I asked one civic hacker whether he thought of his time as volunteer work and he responded:

> I don't know . . . I don't see it as charity though. I don't want to be judgmental, but I think when people think of charity, there's less of an investment somehow. You can just give money to a solution or do a walk for 20 miles and then go home and eat whatever you want.

Based upon this and similar responses, this conceptual distinction between volunteer work and charity work is likely connected to the overlapping identities of volunteers and hackers. People who identify with both of these monikers believe the activities they are engaging in are more specialized than doing charity work, activities anyone without any particular skill can engage in. Instead the volunteer work done by hackers in this environment is more technically skilled and thus deserving of a different conceptual role in their head, one that some people labeled as "charity work."

"Hacker" definition As I was aware that a common definition of the words "hacking" or "hacker" has a negative connotation, an important part of my research question was inquiring into the community's collective definition of these terms. This was especially important for an activity that usually uses the term to define itself (i.e. "National Day of Civic Hacking," "Hacking Night").

There was a general consensus with some nuance among the individuals I interviewed regarding the term. Generally, the closest approximation for "hacking" is "repurposing something, usually of a technological nature." It implies trying to solve a problem using the tools currently available to you. Often this means that tools and items are not used in the way they were intended. Some individuals stated that there are usually elements of puzzling and fun involved:

> Hacking is solving problems as quickly and efficiently as you can. You're not necessarily evaluating what the best method is; you're finding the best method by trying things out.

> The context I hear it used in is 'making something work in a way that it wasn't necessarily intended to or designed to work' . . . it used to just be called 'bootstrapping.'

> There has to be an element of fun to it, almost that feeling of 'what happens if I push this button?'

A "hacker" is someone who employs these methods. While one person called himself a "social hacker," implying he attempts to introduce and network with people in unexpected fashions, the individuals I spoke with who were not coders were hesitant to identify themselves as hackers.

This has potential implications as most civic hacking events are so labeled. Some interviewees expressed some concern that this might exclude interested individuals who do not code and do not consider themselves hackers in this narrower definition. A couple individuals suggested that using "civic technologists" or another such term might be more appropriate and inclusive. Additional impacts relate to the public and government's perception of the term, which often differs from those within the tech community. If we do not currently have the same vocabulary, it is difficult to distinguish between "good" hacking and "bad" hacking, also called "cracking."

Few activists and some dearth of project ideas Only one individual I spoke with could accurately be classified as an activist. He also had overlap with the volunteer and hacker identities and was content in the group learning new coding skills and helping out on projects that appealed to his altruistic nature. He was waiting until he was further entrenched in the group to bring his own personal ideas concerning ecology to the group for them to potentially work on. Therefore, he was functioning as a hacker/volunteer in the meantime.

I was able to observe several people I would classify as activists at the meetings and hack-a-thon I attended. Unfortunately, I was not able to interview any of these individuals. Partially, this was because none of them returned to any subsequent meetings. Generally, activists would pitch their ideas (regarding clean air monitoring, open data policy, etc.) to the group toward the beginning of the meeting or hack-a-thon. If there was no substantial support or buy-in from the group, they tended to move on, perhaps to other spaces where they would receive more support.

The consequence of a dearth of activists – as well as a dearth of administrators and policy scholars – is a lack of ideas that people are passionate about or that are demonstrably useful to the greater community. The projects that are acted upon are generally those that are the most interesting to the hackers and/or volunteers. Occasionally individuals encounter data that is interesting to them and try to figure out a way that it might potentially be useful to the community. However, a system of feedback regarding the actual value of an app or website is lacking.

Limitations and Future Areas for Study

As this study was exploratory in nature and had a relatively small number of interviews, the results cannot be considered generalizable. This study was also not able to address issues of representativeness across a variety of measures. The sample was overwhelmingly white, male, employed, and aged twenty to forty. While I suggest that this likely mirrors the tech community generally, it cannot be considered representative.

Additional interviews and/or surveys of participants would be appropriate next steps to confirm or further explore these preliminary findings. Additional research into the correlations of individual backgrounds and motivations could also be illuminating for public administrators. The conceptual difference between volunteer work and charity work, as well as the consequences of the lack of activists in the community, present potential additional research areas.

Discussion

As this is a new phenomenon and relatively unknown to public administrators, insight into the typologies of individuals who are interested in contributing to their community and government presents new possibilities. Merely identifying this community helps public administrators find a portion of the community with specific skills and motivation. A community of civic hackers presents recruiting possibilities for public administrators, scholars, non-profit administrators and other civic-minded groups. In order to recruit individuals for a hackathon or similar events in individual communities, knowledge of the motivations of potential participants is valuable. For instance, many individuals who can be classified as volunteers want to participate in "doing good" for their community, as illustrated by the identified intrinsic-obligation based motivation. A strong emphasis on the community benefit of each project would likely be well received. Monetary factors are not particularly important to people with any of the individuals attending such events. Additionally, a project that is too structured and does not allow for flexibility and creativity will not attract hackers who are interested in problem solving, one of their intrinsic – enjoyment based motivations. Some space could also be made for activists who bring their own ideas of what might best serve the community. As we see that many individuals share the traits of hackers and volunteers simultaneously, enticements such as the opportunity to build community, an intrinsic-enjoyment based motivation shared by the two groups, would likely be effective.

There appears to be a great deal of space available for collaborations of civic hackers, community members, administrators, and scholars. The perceived dearth of active collaborations means that future

collaborations might bring about projects that are more in-tune with governmental and community needs while still engaging the important motivations of individuals with the necessary skills to build technological innovations. With a relatively new phenomenon, public administrators should be involved in shaping the movement, since this affects the population that public administrators serve and utilizes the data that public administrators collect. Working to identify new projects that could benefit residents as well as engage the hacking community, and harnessing some of the energy toward initiatives that have languished due to a lack of funding or expertise, could help achieve more than administrators or civic hackers could do separately.

Civic hacking projects emerging from this community may not represent the actual needs and desires of the community or governments. Volunteers appear to genuinely want to help increase efficiency of government and to help their neighbors. If they do not know what their government is doing or needs in these regards, they cannot help in an efficient manner. They might be creating programs that are redundant or could easily come to fruition with more collaboration. Additionally, government might have appealing and needed projects that civic hackers could be working on, but do not know about. This presents possibilities for the future.

Conclusions

These motivations of civic hackers include building community, increasing efficiency, doing good, and solving puzzles, among other related motivations. The framework as presented in Figure 1 includes these motivations classified into intrinsic (both enjoyment based and obligation based) and extrinsic motivations mapped onto three typologies of individuals found at civic hacking events: activists, volunteers, and hackers. This framework emerged from the use of a grounded theory analysis of interviews with ten civic hackers as well as observations of civic hacking events. It attempts to answer the initial research question of "what are the motivations of people who participate in civic hacking?" Along with this framework, I found additional insights regarding a conceptual difference between charity work and volunteering held by members of this group, a definition of the terms "hacker" and "hacking" specific to the technology community, and the absence of project ideas which corresponded with the presence of few activists. This exploratory research provides a foundation for future research into this community and presents public administrators with insight into potential partnerships with people in their own community who would like to contribute their technological knowledge toward a civic cause.

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