The Process of Networked Civic Innovation: Examining the Role of Values, Resources, and Power in Community-Based Technology Projects

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Abstract

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This dissertation examines the social organizational implications of community-based innovation processes. Expanding upon existing literature, I study new forms of organizing in new innovation contexts. I call this process *community-based networked civic innovation*. This comparative case study analysis is based on participant observation of the process of innovation as it occurred in four informally organized civic networks (Living Voters Guide, Occupy TempCheck, Puget Sound Civic Communication Commons, and the Tea Party Technology Collaboration). The aim of each project was to transform community communication practices through technology implementation. This dissertation aims to explain why some projects achieve intended adoption outcomes while others fail to do so. In particular, it investigates the role and interactions of *values*, *resources*, and *power* across the innovation process.

Using ethnographic methods, qualitative network analysis, and value sensitive design methods I conducted process analysis to evaluate both social and technical components of innovation. Looking across both design and use stages of innovation, I found that the primary work of civic technology projects is the organizing of a diverse set of actors to effectively complete innovation tasks. I found that the process of innovation is shaped by a series of *micro-processes*: formation of the network, establishment of governance rules, visioning, translation, and encoding. Each of these micro-processes is both shaped by and shaper of *conditions* of values, resources, and power. The outcomes of these micro-processes, which occur in early stages, continue to affect and shape innovation outcomes at later stages as actors respond to conditions. Under certain conditions networks *configure* or *reconfigure* in a manner that either supports or undermines the organizing work of innovation.

Analysis demonstrated the importance of engaging the intended user community throughout all stages. I found *technological frames* and *community technology champions* to be integral in supporting intended adoption outcomes. Findings also showed that projects that "failed" in one context found life elsewhere, suggesting the need to account for how ideas travel through civic networks and expand our definitions of success and failure. This study is relevant to scholars of communication and technology, organizational communication, innovation studies, and design studies. From a communication perspective, it reveals the communicative practices at the heart of innovation processes that support and inform the organizing work required to achieve intended outcomes.

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"If I have seen further it is by standing on the shoulder of giants." – Sir Isaac Newton

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Chapter 1: The Problem of Networked Civic Innovation

Introduction

Designing, developing, and implementing technology within any given context is a complex process. The process is embedded within a sociotechnical system of the activities and interactions of social actors and the technical artifacts that they produce and use. Transformation of communicative practices of a given community of actors— be it employees, activists, or citizens— through technology is difficult. Such projects require coordination of a wide variety of actors, artifacts, and resources, to not only design and develop technology, but then to deploy it successfully into a given community. When such efforts are undertaken by largely volunteer groups, organized in informal networks, that coordination of diverse groups of actors is complicated. Yet, it is paramount for success. This dissertation is fundamentally about that "work" of organizing to bring forth transformation through technology.

This dissertation is based on participant observation of the processes of innovation undertaken by four civic networks aiming to transform community communication practices through technology design, development and implementation. The underlying premise of these projects is that technology can serve to connect communities and support their organizing, mobilization, and communication capabilities. This study examines the organizational and social implications of civic technology innovation as it occurs in informal networks. It aims to provide insight into why some projects are able achieve intended innovation outcomes while others fail to do so.

The conceptual framing of this study is based on three premises: 1) conditions of values, resources, and power shape innovation outcomes; 2) one must analyze values, resources, and power in both social actors and technical artifacts and their mutual shaping relationship across all

stages of innovation; and 3) network forms of organizing matter to understand the processes of innovation.

I employ process analysis in this study, which contributes significantly to our understanding of innovation as a dynamic and iterative process of which communication is at the heart. Process analysis of four cases of civic technology innovation reveals the communicative practices that occur within *micro-processes* that take place in each stage of innovation**.** These micro-processes include formation of the network of innovation, establishment of governance rules, visioning, and translation and encoding of values into material artifacts. Process analysis also demonstrates how the actions and decisions made in early stages of the process affect subsequent stages that can ultimately support or undermine achieving intended outcomes. Findings show that the primary work of innovation is to organize and coordinate diverse sets of actors to support completion of tasks necessary to achieve successful design, development and adoption of technology.

This dissertation contributes to our understanding of this organizing work by advancing a framework that focuses specifically on the interactions and impact of three facets of the innovation process: *values*, *resources*, and *power*. In applying this framework it reveals how conditions of value cohesion, resource capacity, and power sharing are shapers of and shaped by the micro-processes as actors progress through the stages. Qualitative network analysis is used to trace the relationships and influence of actors in each case. It reveals how configurations of actors involved within each project first contribute to shaping early conditions of values, resources, and power. Then, when conflicts or decision points emerge, it shows how actors respond to those conditions and reconfigure in ways that support or undermine innovation efforts. The sustainment and effective coordination of those networks proves necessary to

achieve intended outcomes. Effective coordination, this study finds, requires maintaining a delicate balance of values, resource, and power dynamics within the network.

As will be discussed, much of the literature on innovation and technology adoption outcomes is examined with two lenses. The first lens focuses on implementation stages of innovation and the second explores innovation in formal organizational contexts, such as firm settings or political organizations. This study expands upon existing literature by extending analysis to incorporate design *and* use stages to explain innovation and technology adoption outcomes. Additionally, it contributes to existing literature by examining the process of innovation as it is undertaken by informal networks of civic actors. These actors are not bound together by bureaucratic rules or structures but rather motivated to create change within a given community as volunteers. This new type of organizational context is increasingly common and, as this study demonstrates, operates by a different set of norms and rules than is undertaken in formal settings, that warrants scholarly attention. I call the process of innovation undertaken in this new organizational context, *community-based networked civic innovation*.

Based on case study analysis of the process of community-based networked civic innovation in four community technology projects, this dissertation contributes new understanding of how innovation processes and paths are influenced by the relationships and communicative practices of relevant stakeholder groups. It extends the frame of time that we analyze to explain outcomes and traces actions, actors, and artifacts across the entire trajectory of innovation including ideation, design, development, implementation and post-implementation stages. It also offers new insights by investigating new and emerging contexts for such processes to occur. The goal of this dissertation is to study how innovation occurs within informal civic networks across time. To better support intended innovation outcomes in this context, I argue we

must account for the role of values, resources, and power to better understand the organizing work required for such technology projects. As is discussed below, in the digital age innovation is fast becoming relevant to many different communication and organizational contexts. Understanding how the process unfolds in community-based efforts is the aim of this dissertation.

Innovation in Political and Journalistic Communication Contexts

After the turn of the 21st Century, the word *innovation* began showing up in places where little had changed for decades: in politics and in journalism. For example, the Obama for America (OFA) 2008 campaign effectively utilized a suite of digital tools, organizational approaches, and practices innovated by the unsuccessful Howard Dean campaign of 2004 to empower and mobilize grassroots supporters to claim the bid for presidency (Kreiss, 2012). This digital initiative continued to evolve and transform through the Obama years and became Organizing for Action after Obama's 2012 victory, advertising itself as an online grassroots movement. Meanwhile, in journalism similar changes were occurring. The John S. and James L. Knight Foundation, a prominent journalism foundation, announced a shift in purpose, from saving the news industry to emphasizing media innovation and experimentation to support the future of news and information (Lewis, 2010).

Innovation, according to those involved with OFA and Knight, was essential and the driving force to address problems that affect the way we interact, share information, organize, and engage the public in civic and political life. Both OFA and the Knight Foundation emphasized the power of digital tools and technology to do so. Both were also, importantly, propelled by a philosophy that supported the collaboration of networks of groups that drew together individuals, organizations, and communities who shared a common problem and goal but represented diverse backgrounds and interests. For example, in the initial Obama campaign,

political strategists, technologists, campaign advisers, and officials were all contributing members to the innovation process of the campaign, tools, and tactics. Similarly, the Knight Foundation called for citizens, journalists, and news organizations to collaborate around innovation, pulling together a variety of resources and perspectives of stakeholders in information innovation.

Several recent studies have examined in great detail and depth how political organizations (Karpf, 2012; Kreiss, 2012) and journalism organizations (Anderson, 2013; Boczkowski, 2004; Chadwick, 2013; Seth Corwin Lewis, 2010) innovate and use technology in political and journalistic practices. These studies, however, are based on organizations that have pre-existing rules, norms, and practices, or *structures*, that influence and guide innovation and decision-making processes (Giddens, 1984). These existing structures become important means to negotiate the dynamics of different actors involved with the innovation process and provide mechanisms to address potential issues such as delegating resources or identifying key decision makers when conflicts arose. Kreiss' (2012) study showed how the innovation energies in the 2004 Dean campaign, marked by informal and fluid organizational structure, allowed for grassroots innovation in campaigning tools and practices. Yet, the value of these innovations only became clear when they coalesced formally, guided by the organizational context of the Obama for America (OFA) campaign. Though many of the innovations credited to the Obama campaign originated from the Dean campaign, the lack of coordination in the informally organized networks involved in the Dean campaign undermined the ability of campaign workers to successfully implement the innovations. In OFA's formalized context, the full power of the innovative tools and practices was successfully implemented to accomplish campaign goals. In both campaigns, innovation was based in networks of individuals dedicated to supporting goals

of the Democratic Party, however, in OFA established hierarchies within the campaign, including power holders such as campaign managers and chief technology officers, organized the networks. These individuals were able to define the broader goals of the innovation project, assess and designate where resources should be allocated, and ultimately, decide which projects to pursue and which to shut down. Formal rules guided the coordination of actors to achieve innovation goals.

Innovation by and for Communities

Innovation occurs, however, in many different contexts. Communities connected by shared goals, interests, or geographic location, often innovate formally or informally to address common needs. For example, in crisis situations, communities have created new forms of communication when established channels are unavailable, as was the case with the formation of the '3e32' citizens committee that emerged in the days following the 2006 L'Aquila earthquake in Italy. An informal group of citizens organized, using social media platforms like Facebook, and constructed online spaces for communication and debate. Later, the project evolved and the group created an amateur media center to organize and communicate with the local community to rebuild the city (Farinosi & Treré, 2011). In building this space, the informally organized citizen group challenged the government's top-down approach to communication and reconstruction of the city. Well-documented changes in technology and the media, political, and economic environment have led to markedly different communication practices between citizens, institutions, organizations, and communities, as was demonstrated in L'Aquila (Bennett & Segerberg, 2013; Earl & Kimport, 2011). Traditional top-down, hierarchical, and one-way communication models were replaced by disruptive digital technology that democratized information, challenged existing power dynamics, and supported transformation and change in communication strategies and processes across many sectors of society.

Perhaps one of the most profound and visible marks of disruptive technology is reflected in the way information is exchanged in the digitally enabled communication environment. Use of digital technology by the broader public shifted the way news was produced, gathered, and disseminated (Anderson, 2013) and traditional/legacy media organizations lost critical sales revenue. As a result, many long-standing pillars of journalism collapsed entirely or drastically reduced their newsroom staff and coverage (The Knight Commission on the Information Needs of Communities in Democracy, 2010). While many celebrated the democratization of media, citizens had to deal with very real consequences of changes in the media landscape such as the loss of news coverage, which resulted in information gaps. Citizens were challenged to find new ways to meet their information needs without the support of these institutions (Fancher, 2011). For example, Seattle citizens found that they had lost coverage of local issues after the *Seattle Post-Intelligencer*, a long-standing daily newspaper, closed down print operations and the other daily, *The Seattle Times,* cut staff in the late 2000s.

Many communities responded to such changes by innovating through adapting and adopting pre-existing technologies such as Facebook for their information needs or to support their organization and mobilization efforts (Federal Communications Commission, 2011). However, some groups found these tools either did not fulfill the needs of the community or were contradictory to the values of the community. It was the former challenge that motivated a group of journalists and Seattle bloggers to create their own network of blogs to share information across neighborhoods (Fancher, 2011) after the loss of local newspaper coverage. The latter issue led activists involved in the Occupy Wall Street protests to create their own open-source tools that supported their privacy values in ways that Facebook policies failed to do (Agarwal et al., 2014).

Both of these communities found existing communication tools were not one-size-fit-all and, instead, elected to create entirely new ways of communicating through the design, development, and implementation of new information communication technologies (ICT). The intent of these technologies was to challenge and/or transform existing communication practices. However, while the Seattle bloggers were able to successfully implement a new form of communication and transform how the community gathered information, many of the tools generated by the Occupy Wall Street activists were left unused. *Why was one group able to successfully design, develop, and implement communication technology to address communication gaps in the community while the other was unable to do so?* This question is the central concern of this dissertation. Through comparative analysis of four cases, this study examines the process of innovation undertaken by informally organized community networks and evaluates why some projects succeed and others fail in implementing transformative technology to change community communication practices.

This chapter is divided into two sections. The first section provides an introduction to the cases, concepts, and research questions guiding this study. The second half builds the conceptual and analytical framework, drawing on literature across various disciplines, including communication, design, innovation, and management and organizational studies.

Four Cases of Civic Technology Innovation

The first project, The Living Voters Guide (LVG), involved collaboration between researchers and developers from the University of Washington (UW) and representatives from the civic organization, CityClub of Seattle. The goal of the group was to create a tool to support online, deliberative communication concerning the ballot measures in Washington State. The second project, OccupyTempCheck (OTC), was a collaborative innovation effort between researchers and developers at the University of Washington and participants of the Occupy Wall

Street movement in Seattle and in New York City. The intent of the project was to develop a tool that supported decision-making processes to help activists organize and coordinate effectively.

Puget Sound Civic Communication Commons (PSCCC), the third case examined in this study, was a project led by a small group of geographically connected individuals including journalists, citizens, civic leaders, and technologists. The goal of this project was to fill news and information gaps by providing a platform for citizen-led community news and information exchange in the Puget Sound region of Washington State. The final project, the Tea Party Technology Collaboration (TPTC), similar to the Occupy case, involved collaboration between UW developers and a group of individuals in the Tea Party Patriots (TPP) organization. Initially, the project was focused on increasing use of technology within the TPP community and connecting leadership and lay members to one another during decision-making processes. The outcomes of each of these cases differed and the intent of this study is to examine why some informal civic networks were successful in achieving innovation goals while others were not.

The Process of Networked Civic Innovation

Community-led technology innovation and implementation, such as is exemplified in the four cases in this study, is increasingly common and is situated in a set of dynamics and contexts that bear little resemblance to the organizational contexts guiding the OFA campaign innovation or the Knight Foundation's innovation projects. Yet, if successful, the outcomes of such project can be equally impactful on civic and political life. The primary difference is that these projects occur within an informal network of actors who come together solely to create ICT solutions for their community and cannot rely on pre-existing structures and organizational processes to guide their interactions and innovation-related decision-making processes. This dissertation is concerned with revealing underlying sociotechnical mechanisms and interactions that shape *the*

process of innovation within informal community networks that organize to design, develop, and implement technology in a given community.

I call this particular type of innovation process*, community-based networked civic innovation*. First, I define *networked civic innovation* as the process that occurs when loosely bound, informal networks of actors come together to solve community information and communication problems through the design, development, and implementation of information communication technology. This study is concerned particularly with networked civic innovation that is *community-based*. By this I mean that community members, as opposed to outside actors such as government agencies, state or city councils, or private companies, largely drive innovation efforts.

The concept of networked civic innovation assumes a particular ontological stance that contends that when evaluating innovation, one must consider innovation outcomes as the result of ongoing interactions between social actors and arrangements as well as artifacts. I will elaborate further later in this chapter but the framing of community technology implementation as a product of both social factors, technical factors, and their engagement with one another over time within a sociotechnical system provides an alternative methodological and analytical account of the process of innovation and community technology implementation. Acknowledging both social and technical factors and their intertwined relationship provides a richer account of the innovation process, therefore, revealing new and different concerns than most socio-centric innovation and organizational theories provide.

This study conducts process analysis of community-based networked civic innovation to reveal actions, activities, and interactions that take place through design, development, and implementation processes and contribute to different innovation outcomes. Using *temporal*

bracketing as a strategy to evaluate how the process of innovation occurs, I identify specific time periods in each case to see how actions, events, and contexts at one point in time leads to subsequent actions that reshape contexts in later time periods (Langley, 2009). Process analysis provides an opportunity to examine how the process of innovation unfolded in each case and creates a framework to compare how and why different outcomes occurred as a consequence of events, actions, activities, and contexts particular to each project. In tracing how events in one time period affected later time periods, analysis, in part, shows how actors moved into and out of each case, reconfiguring the network and changing the course of the innovation path as a result. In chapter 2, I will elaborate further as to how process analysis is implemented in this study.

Defining Values, Resources and Power in Networked Civic Innovation

In particular, applying the framing of sociotechnical systems to the processes of networked civic innovation reveals three distinct, yet interconnected facets of innovation that influence community technology implementation outcomes: *values, resources,* and *power*. Several disciplines have examined and identified values, resources, and power as independently relevant to understanding innovation processes and outcomes including communication studies (Flanagan, Howe, & Nissenbaum, 2008; Nissenbaum & Gaboury, 2012), organizational studies (Ibarra, 1993; Markard & Worch, 2009; Orlikowski, 1995), information sciences (Knobel & Bowker, 2011), computer science (Friedman, Kahn, & Borning, 2006), and science and technology studies (Brey, 2008; MacKenzie & Wajcman, 1986; Winner, 1980). Here, I briefly define the concepts of values, resources, and power as they are implemented in this study. Later in this chapter, I will further elaborate upon each concept in light of community-based networked civic innovation.

Defining *values* is somewhat disputed across several of the disciplines mentioned above. While some focus on the idea of "enduring beliefs" (Rokeach, 1973) others see values as

"conceptions" (Kluckhohn, 1951), and still others suggest that values are "operating criteria for action" (Hutcheon, 1972). As Cheng and Fleischmann (2010) show in their review on values, there is a general agreement towards defining *values* as guiding principles of "what people consider important in life," (Cheng & Fleischmann 2010 p. 2; Friedman, Kahn & Borning, 2006). It is this broad definition of values that I adopt in this study. In chapters 3 and 4, I demonstrate the role of values in the networked civic innovation process across each of the four cases of the study, demonstrating how values continuously weave throughout all stages of the innovation process.

Much of the discussion regarding innovation and resources is embedded in the field of organizational communication and management research. Resource-based theories of innovation are tied closely to network theory, but resources are under-conceptualized (Markard & Worch, 2009). According to their review of resources as a concept, the authors find that resources in firms have been conceptualized as assets, capabilities, organizational processes, information, knowledge, or anything that is of strategic value to a firm or organization (Barney, 1991; Wernerfelt, 1984). Barney (2001) suggested that resources are tangible *and* intangible assets used by firms while Teece (1997) noted that resources should be inimitable. These definitions suggest that *resources* are assets that are not easily substituted and have strategic value to the entities that use them. Later in this chapter, I identify particular resources of consequence in the process of networked civic innovation and discuss the relevance of resources in shaping innovation outcomes in the LVG, Occupy, Civic Commons, and Tea Party cases.

Power is a multi-dimensional and complex concept. Innovation and organizational studies define power in a variety of ways. Some define it as the ability to overcome resistance to achieve a desired result (Astley & Sachdeva, 1984; Dahl, 1957) while others define it as a force

that results in a behavior that would not have otherwise occurred (Mechanic, 1962). Still others define *power* as the ability to affect outcomes (Brey, 2008; Mintzberg, 1984; Salancik & Pfeffer, 1977), which is the conceptual definition of power employed in this study. In later pages I will identify more specific conceptualizations of power focused on how decision-making power is shared in groups that can be used to reveal the distribution of power between relevant groups throughout the innovation process in each of the four cases.

Using process analysis of four cases of community-based networked civic innovation, this dissertation shows how different conditions of values, resources, and power weave through the stages of civic innovation, producing varying outcomes in each case. By tracing the interactions between actors and artifacts in each of the cases and conducting comparative analysis, I demonstrate how values, resources, and power serve to connect or disconnect members throughout the process of innovation in ways that lead to network formation, breakdown, or reconfiguration. I argue that these moments or "events" where the network expands, implodes, or remains stable are valuable sites of analysis to understand the process of networked civic innovation and to explain why some projects are able to achieve their goals when others are not. This dissertation sheds light into the distinct process of innovation that occurs when informal civic networks organize to innovate. In the section below I discuss the cases in this study and highlight the values, resource, and power conditions that evolved and informed the process of innovation in each case.

Values Resources and Power in Four Cases of Community-based Networked Civic Innovation

In the Living Voters Guide project, a small group of actors solidified a strongly shared vision of the tool based on a set of aligned values and adoption of consensus-based decision-making processes. Actors involved in the project had access and were able to leverage necessary and relevant resources throughout the trajectory of the innovation process. The configuration of

values, resources, and power in the mostly stable network of actors involved in the project supported organization and coordination of actors to complete innovation tasks. As a result, The Living Voters Guide launched in the fall of 2010 with successful and iterative redesign following every year since. The tool introduced new means of engaging citizens in deliberative dialogue and voting information exchange. Since the initial launch, the platform has continued evolving to include fact-checking features, expanded commentary space, and the opportunities for users to engage in ongoing dialogue with one another.

In Occupy, consensus-based decision-making rules were also adopted to govern the project. In the earliest stages of the project, some value conflicts arose which led to a reconfiguration of the network as some participants stopped working on the project. After reconfiguration, the remaining members were able to move relatively smoothly through the design and development stages of the process. Ultimately, this resulted in the successful creation of Occupy TempCheck, a deliberative tool intended to streamline decision-making processes within Occupy camps, while also inviting input from a broader group of supporters that were unable to attend face-to-face meetings where decisions were made. However, upon deployment into the community, the value conflicts that surfaced in the early stages of the project emerged again. A severe disconnect existed between designers of the technology and a large portion of the most committed activists in Occupy who valued face-to-face and on-the-ground action over online participation. The tool that was built did not address this value conflict and thus proved difficult to deploy in the community. Ultimately, value tensions, resource shortages, and the inability to engage the user community's support for the project stalled the implementation process and led to relegation of the tool to a secondary website where it was never used.

The intent of the Civic Commons project was to create an online "civic commons" that would serve as a connective space where community members could access and exchange relevant community information. The effort initially included a group of citizens, civic leaders, journalists, and technology developers. However, the original network quickly collapsed when a group of former journalists took over the project and, in doing so, excluded the voice and values of other relevant groups of citizens, civic leaders, and developers. The constant reconfiguration of the actors shaped by the ongoing negotiations of values, resources, and power as actors joined or disconnected from the project, undermined the ability of actors to coordinate effectively to complete innovation tasks. This proved fatal for the project.

In the Tea Party project, early discussions around the idea of connecting lay members to decision-making processes built the foundations of the project. However, as the ideation stage developed, those in decision-making roles in Tea Party Patriots backed down, as differences regarding the purpose of the technology emerged. Tensions arose as members began to question how power dynamics between high-level coordinators and lay members could shift as a result of technology implementation. Ultimately, with limited access to decision-makers within the Tea Party organization to discuss and overcome such concerns, the UW developer team was unable to sustain the project and it ended without moving past ideation.

Analyzing the Process of Networked Civic Innovation

To understand the complex organizational and social implications for networked civic innovation, I conduct a comparative analysis of the process of innovation and examine how values, resources, and power interact across the trajectory of the four community technology implementation projects discussed above. Process analysis is conducted in this study to examine these facets of the process of networked civic innovation. It also examines events, activities, and choices as they emerge and sequence over time (Pettigrew, 1992, 1997). Processes, the main unit

of analysis in this study, are defined as how a group accomplishes its desired goals (Crowston, 2000). In employing the process analysis analytical framework, I use both inductive and deductive logic to examine patterns across four cases.

Through qualitative ethnographic and participant observation, in-depth interviews, and feature analysis and assessment of technological artifacts, I evaluate how different stakeholders and groups of stakeholders engage with the process of innovation. Across the four cases, these stakeholders include designers and developers of civic technology, researchers, citizens, civic leaders, journalists, participants in Occupy Wall Street, and participants in Tea Party. I trace how different stakeholders and stakeholder groups engage or disconnect across all stages of the networked civic innovation process including ideation, design, development, implementation, and post-implementation. I follow the actors (Bruno Latour, 1996), tracing their ongoing, mutually-shaping engagement with technological artifacts. In doing so, I reveal how particular moments of formation, breakdown, and reconfiguration of relationships between actors and artifacts differ across the projects and lead to varied innovation outcomes that range from successful implementation within a community to failure to move beyond the ideation phase of the project.

The comparative view reveals the key conditions of values, resources and power across social actors and technical artifacts that support or undermine the process of innovation and intended innovation outcomes. This project moves beyond traditional political communication and technology studies that approach innovation by asking questions about the impact of technology on communities, to focus, instead, on considering how communities are actively engaged with—or even entangled with—the design, development, and implementation of communication technologies that aim to transform communication practices. Moreover, this

study, in following the process of innovation across all stages, examines how and why the organizational capacity of informal civic networks is supported, or undermined, by values, resources, and power. In asking and answering these questions, this dissertation provides alternative explanations to understand why some community-based civic innovation projects succeed when others do not. Chapter 2 further elaborates on the methods and frameworks employed in this study.

Configuring Innovation Outcomes

Process analysis revealed conditions of values, resources, and power in each project that contributed to and shaped innovation outcomes. One contribution of this study is that it demonstrates how values, resources, and power can, and as the cases in this study show, *do* affect the process of design, development, and implementation of civic technology. I also argue that while each of these concepts provides useful insight independently, my analysis uncovers important interactions between the three throughout the innovation process that shape the innovation path in each case.

Through analysis of micro-processes that occur throughout stages of innovation, this study demonstrates how values, resources, and power dynamics are first established within the informally organized networks and then shows how those configurations create conditions for operation throughout subsequent stages. Chapter 3 focuses especially on how conditions are established within the networks and influences the design and development of the tool. Chapter 4 focuses on how those conditions influence interactions with the community upon deployment of the tool, supporting or undermining implementation goals. Understanding and examining the interactions between the three facets of networked civic innovation prove important to explaining innovation outcomes.

For example, concentration of power in a small group of actors or, conversely, power shared and distributed too widely across a large group of actors, can seriously affect the capability to achieve intended communication outcomes as demonstrated in Occupy. However, when power is concentrated and resources are limited, value cohesion becomes crucial. As was observed in LVG, cohesive values identified at the start of the project can support retaining and leveraging important resources. On the other hand, when strong value alignment is missing and power is somewhat concentrated, creating and maintaining connections that could help gather and leverage resources becomes difficult. As a result, members fall away or drop out of the network of innovation, requiring remaining members to shift attention to filling resource gaps that result from the loss of members. This takes away time and energy from innovation tasks. This issue plagued PSCCC as it attempted to revive the project several times over the course of two years. Resource access, however, is not enough to sustain a project. In the Tea Party case, when power sharing is highly concentrated in a small network with divergent values, even access to necessary resources cannot overcome value tensions. The lack of trust built between the network of innovation members also interfered with our ability to progress the project forward to overcome issues.

The challenge of creating ideal value, resource, and power conditions to support innovation processes is not unique to community-based networked civic innovation, but the organizational dynamics at play are distinct from innovation processes undertaken in bureaucratic and hierarchical organizations. The stakes in these transformative technology projects are high with the possibility to change not only the community but also potentially increase the impact of the community on the wider world. Had either the Occupy or Tea Party projects been successful, increased coordination amongst participants may have led to broader

consequences such as impact on policy. The goal of this dissertation is to provide insight into the process of networked civic innovation and to reveal the mechanisms that produce varied outcomes of such projects through examination of values, resources, and power across actors and artifacts in each case. Thus, the following questions guide this study:

RQ 1: *How do values, resources, and power affect paths of technology innovation in informal civic networks aiming to change current communication practices?*

RQ 1a: How are value tensions mediated in informal civic networks, and with what outcomes?

RQ1b: How does resource access within informal civic networks affect technology decisions and innovation outcomes?

RQ 1c: How do power dynamics in informal civic networks shape technology decisions and innovation outcomes?

RQ2: *Why are some conditions of values, resources, and power in networks of innovation able to produce desired technology-driven transformations in community communication practices while others are not?*

Building Frameworks to Examine Civic Networks of Innovation and Values, Resources, and Power

In the previous pages, I discussed the problem of networked civic innovation and identified how this project examines the processes involved in light of values, resources, and power. To answer the research questions driving this study, I first lay groundwork relating the key concepts: *civic networks, innovation, values, resources,* and *power*. In the following pages, I use previous literature to craft an argument for a new conceptualization of civic-oriented innovation. I argue the idea that examining the actions, interactions, and choices made within informal networks as they organize to design, develop, and implement technology reveals much

about the process. I do so by building from prominent theories in communication and technology studies, organizational communication, political communication, and innovation studies on *civic networks* and *innovation*. Building from existing literature, I argue that when civic-minded networks composed of various actor or institutional types organize to design, develop, and implement technology to solve community communication problems, they are operating in a process I call *networked civic innovation*. I show how the four cases in this study are examples of a specific type of networked civic innovation called *community-based networked civic innovation*.

Then, drawing further upon theories of communication and technology studies, I argue that the complex organizational system of networked civic innovation is best understood as a *sociotechnical system* composed of actors and artifacts that are engaged in a mutual shaping relationship as they interact and aim to co-construct communication practices within communities. In doing so, I develop an analytical framework for this study that involves examining social actors, processes, and structures as well as technological artifacts at both the micro-level and meso-level of analysis. Using process analysis, which I elaborate on further in chapter 2, as a parallel framework, allows for examination of how the sociotechnical relationships develop and evolve over time in each case.

Building from this framing of networked civic innovation as embedded within a sociotechnical system, I draw on diverse disciplines including communication and technology, organizational communication and management studies, political communication, science and technology studies (STS), and design studies to show how *values, resources,* and *power* have emerged as relevant facets of the process of technology design, development, and implementation. Finally, drawing upon these disciplines, conceptual definitions are provided that

are used for evaluating the role of values, resources, and power in networked civic innovation and how they shape innovation and organizational outcomes within the four cases of community-based networked civic innovation. Identifying important gaps in this literature, I argue that this framework provides a necessary and alternative account of innovation processes by extending across stages of innovation to account for artifacts, actors, and social arrangements at both micro and meso-levels of analysis.

Networks and Civic Technology Innovation

Many actors involved in LVG, Occupy, Civic Commons, and Tea Party share a commitment to creating, improving, or transforming communicative practices of a larger community through designing, developing, and implementing technology. The underlying premise of these projects is that technology can serve to connect communities and support their organizing, mobilization, and communication capabilities. In the following section, I discuss the relationship between civic networks and communication technology.

Civic Networks and Technology

Networks of civic-oriented citizen groups, or civic networks, have existed in the U.S. in forms such as neighborhood associations, cooperatives, political groups, etc., as de Tocqueville discovered nearly two centuries ago. Traditional civic associations create networks of citizens who receive education in public affairs, create political power independent of the state, and engage in group decision-making on civic matters through many-to-many forums (H. K. Klein, 1999). However, over time we have witnessed steady declines in membership in traditional voluntary associations, in trust in government and media, and in political participation (Putnam, 2000). These traditional civic groups present high costs of participation such as finding time and physical space to meet face-to-face but there are signs of vibrant civic life in online spaces. Technology, and particularly, the internet, reduces costs by providing new ways to connect

citizens to one another in spaces that support many-to-many communication without the barriers of space and time (Zukin, Keeter, Andolina, Jenkins, & Carpini, 2006).

Digital and web-based technologies connect civic networks in ways that enable conventional participation in civic life. Electronic democracy initiatives support conventional forms of participation by providing easy access to information and connecting citizens to one another and to their elected officials in meaningful exchanges that can support informed decision-making. E-government projects, such as government websites, have provided opportunities to connect citizens to their local, state, and national government to access information and services in an efficient and transparent manner (Carter & Bélanger, 2005). These websites also facilitate citizen participation in political and civic processes by providing spaces for interactive communication between citizens and government through means such as online forums and meetings, e-mail exchanges with government officials, and online voting (Jaeger, 2003).

Technology also supports civic participation in non-traditional civic activities. Digitally-enabled social protests are one example of technology supporting connected groups of citizens in the evolving civic environment (Earl & Kimport, 2011). Networked technology provides citizens the means to create, organize, and participate in protests, acting together without requiring physical co-presence (Bennett & Segerberg, 2013). The low costs associated with the use of digital tools supports organizations in expanding who can participate and organize protests and how those protests are enacted (Earl & Kimport, 2011). Technology not only supports civic groups in connecting and organizing but also provides means to achieve their intended goals. Thus, in the digital age, communities often turn to technology to support their needs. They do so

by building new technology or identifying and implementing existing technology to connect, coordinate, and exchange information (Agarwal et al., 2014).

The cases in this study are driven by these same motivations as they attempt to help support and/or build community through implementation of information communication technology. In recent years, we have witnessed a surge of social projects headed by community activists, civic organizations, policy makers, academics, political institutions, and citizens that explore the transformational potential of information communication technology in building and meeting information needs of communities. These experiments aim to increase social cohesion, strengthen community ties, create new community structures, and increase diversity in democratic participation through the use of technologies (Keeble & Loader, 2001).

Increasingly, community-based groups explore the use of technology to address the information problems they face. Networked technology supports a variety of relevant communicative acts for different community goals, whether it is facilitating communication between geographically distant but like-minded individuals (Etling, Kelly, Faris, & Palfrey, 2010), creating goods through peer production and crowdsourcing solutions to problems (Benkler, 2006), or supporting organizing groups to engage in political and civic action (Bennett & Segerberg, 2013; Tarrow, 2011). Though it is not the only means of problem solving, communities often consider technology as a viable option to address gaps and voids in their information environment.

The goals of the four networks of innovation examined in this study are civic-oriented. The groups aimed to co-construct communication practices through implementation of technology that introduced new communicative norms and practices. LVG attempted to challenge existing voter information communication processes in Washington State to introduce

interactive and citizen-led deliberative dialogue. Prior to the deployment of LVG, Washington State's voter information centered on one-way communication voters' pamphlets distributed by the Secretary of State's office. The platform created by the members involved in the LVG project enabled citizens to access, assess, and identify information that was most valuable to informing voting decisions. Users could do so by using features in the tool, such as adding pros and cons to the system based on their own opinions and/or reading those offered by other voters. The platform served to connect citizens to one another, empowering them to discuss and deliberate about ballot measures that affect them directly as opposed to passively reading one-way communication mediated by a political institution.

PSCCC, as it was first envisioned, had similar goals of connecting citizens in the Puget Sound area to one another in online spaces where they could produce and exchange relevant community information. Participants in the innovation process envisioned the Civic Communication Commons as a platform that filled a gap in the Puget Sound information ecosystem that was plagued with shrinking news coverage as local newspapers shuttered or downsized. Actors involved with the PSCCC project sought to transform the current practices to engage citizens and community members to interact and connect with one another outside of mainstream media narratives.

Participants in Occupy TempCheck, similar to LVG, aspired to transform the existing communication patterns of the Occupy community. Challenging the lengthy, face-to-face decision-making process held during General Assembly (GA) meetings, members conceived of a platform that moved the process online. Participants could propose ideas on the online space and then GAs could allot a time period during which Occupy activists could add their own pros, cons, and discuss the proposal before putting it to a vote. Those involved with the design of the

tool hoped this would increase efficiency in decision-making processes and by moving the deliberation process online would create more time for coordination and mobilization efforts that required face-to-face time.

The Tea Party project originally focused on finding ways to connect lay members to decision-making processes to invite more communication between the coordinators of Tea Party Patriots and the grassroots activists they served. Ideas stemmed from the recognition that online participation was not the primary way activists engaged with the organization but coordinators felt that online activity was effective and should expand to increase the capability of the community.

The task to connect communities and support communication through technology is not simple. It is not enough to simply pick a tool (or design one) and drop it into a community with the expectation that the implementation will be successful (Agarwal et al., 2014). In fact, as the cases in this study show, successful implementation and adoption may more likely be the exception and not the rule. Up to this point, I have shown how technology can support and connect community networks. I have also discussed some of the challenges confronting informal civic networks attempting to create change through technology implementation. In the following section, I provide a conceptual framework for discussing the civic networks at the heart of the innovation process examined in this study. This provides the first building block of the framework used in this study that is further elaborated upon in chapter 2.

Civic Networks of Innovation

In this study, the groups of stakeholders organized to design and develop technology are conceptualized as informal civic networks. Throughout this dissertation they are referred to as *networks of innovation*. The means to achieve implementation and adoption of civic technology are complex. Once we acknowledge the network composition of actors involved in civic

innovation projects, we can begin to understand the unique values, resources, and power dynamics at play; those that are within the process of innovation itself that support or undermine the ability of the network to effectively organize to achieve intended innovation outcomes.

The networks of innovation examined in this study are focused on community-oriented goals. In particular, the groups analyzed here are composed of multiple civic-oriented stakeholder groups who are connected by their participation in the innovation process. While the groups may have organized to address one commonly shared goal of improving community communication practices through technology, they still represent various backgrounds, values, and desires. All stakeholders, whether they represent themselves or a larger group, bring to the table a distinct set of values and motivations that guide and inform their participation in the project and that contribute to shaping the process of civic technology innovation. Each case in this study consisted of several different types of stakeholder groups; for example, designers and developers, community members, and other relevant stakeholder groups, such as journalists in PSCCC and activists in Occupy. In chapter 2, I will provide in-depth discussion of each of the relevant stakeholder groups involved in each project in the case study overviews.

As discussed above, increasingly, communities are organizing to design, develop, and implement information communication technology to support their information and communication needs. That process of innovation is already complex and when it is embedded within an organizational environment consisting of diverse stakeholders, such as those represented in this study, complexity increases exponentially, especially when the intended outcome is focused on transforming communities through changes in their communication practices. As a result, the question informing the next section is *how does technological innovation occur in these diverse and informal civic networks?*

Networked Innovation in Organizational Contexts

Thus far, I have made the case that the process of innovation in LVG, OTC, PSCCC, and TPTC is driven by civic-oriented, loosely-bound networks that organize to solve a shared community problem. To understand the process, we need to consider the networks and their interactions over time. The cases in this study share another common trait in that they organize to focus on a single task: transforming community communication practices through technology innovation. In this section, I review how network approaches to innovation provide the theoretical framing to understand and examine the process of civic innovation.

Swan and Scarborough (2005) propose, "Networked innovation occurs through relationships that are negotiated in an ongoing communicative process that relies on neither market nor hierarchical mechanisms of control" (p. 11). This definition changes the study of innovation in a top-down or hierarchically organized body to one that emphasizes and acknowledges the role of informal *and* formal network forms of organizing that occur in innovation processes. It also moves the focus from the broad category of inter-organizational "collaboration" relationships, (which may include many types of organization including networks but also alliances, joint ventures, or consortiums), to a more narrow emphasis on relationships that are purposefully focused on innovation efforts (Swan & Scarborough, 2005). Though Swan and Scarborough first used the term networked innovation, several studies have examined the links between innovation and networks within and between organizations (Alter & Hage, 1993; Powell, Koput, & Smith-Doerr, 1996).

Networked innovation has been studied in small and large firms (Perrow, 1993; Swan & Scarbrough, 2005) and industries including, but not limited to, biotechnology (Stuart et al., 1997), the banking industry (Podolny & Phillips, 1996), and the computer industry (Hannan & Freeman, 1989). These studies have identified key characteristics useful to understanding the

dynamics of and impetus for networked innovation including the role of resources, knowledge integration, social networks, and technology. A number of studies have examined these concepts from a structural perspective. Focusing on innovation and the relevance of networks and their facilitation of information and knowledge transfers, Powell et al., asserted, "A network serves as a locus of innovation because it provides timely access to knowledge and resources that are otherwise unavailable" (p. 119). These studies suggest networks support innovation efforts by drawing together resources and knowledge that one group or corporation may not have access to on its own. Networked approaches to innovation are thus advantageous in expanding resource capabilities.

Others have shown that networks perform boundary-spanning functions, allowing and supporting knowledge transfer across inter- and intra-organizational boundaries (Conway, 1995; Tichy, Tushman, & Fombrun, 1979). In examining network interactions, scholars have focused on the strength and scope of ties within networks of innovation (Alter & Hage, 1993); flow of information through networks (Albrecht & Ropp, 1984) and levels of interaction between individuals within organizations and across organizations (Oliver & Liebeskind, 1998). These studies suggest that the relationships between the nodes of the network, which are either the individual actors or whole organizations, offer valuable insight into innovation outcomes.

The actors in the four cases examined in this study organized in informal networks to support innovation goals. The network formation of the groups allowed for different types of skills and resources to be applied to the advancement of the shared goal through innovation. For example, developers provided necessary technical skills to create the LVG platform while civic leaders provided network connections to the intended user community. As is demonstrated in chapters 3 and chapter 4, both types of resource proved valuable at different stages of the

process, contributing to the successful deployment of the tool.

Similar to the collaborative organization of the firms and businesses examined in networked innovation studies, the networks of innovation in this study did not operate under formal hierarchical organizational rules, instead, operated in informal relationships established through ongoing communication. However, none of the projects in this study were embedded within any type of formal organization either. In this way, they differed from the types of networked innovation cases studied thus far. Examination of this informal type of networked innovation process has yet to be undertaken and this dissertation addresses that gap. It is at this juncture that I connect the literature on civic networks and technology with networked innovation reviewed above to construct the concept of networked civic innovation.

Conceptualizing Networked Civic Innovation

Networked civic innovation, as defined earlier, is the process of innovation that occurs when loosely-bound informal networks of civic-oriented stakeholders organize to solve a commonly defined community communication problem through the design, development, and implementation of information communication technology. The goal of networked civic innovation is to produce transformations in the information or communication practices of a given community through implementation of technology. In developing this concept, I build a bridge between communication and technology scholarship, which focuses on the relationship between communities and technology, with innovation studies and organizational communication and management theory. I also challenge current definitions of civic innovation that limit it to innovation that is focused solely on government and citizen engagement. This limited definition ignores a host of projects in which communities innovate by and for themselves, as the cases in this study exemplify.

The concept of networked civic innovation provides a heuristic through which we can deepen our understanding of how new technologies integrate, or *fail* to integrate, in civic and community information contexts. Analysis of the process of innovation and the events that trigger changes in the configurations of the relevant actors who are organized in informal networks, reveals how the social and organizational implications of civic technology are enacted through interactions between actors and artifacts across all stages of the innovation processes. Applying the networked civic innovation concept to different types of innovation networks, such as those driven by communities, or others led by government, NGOs, or private companies, shows how unique configurations of actors across time and stages of innovation can shape civic innovation trajectories and outcomes. Accounting for the network orientation of the actors involved in the civic innovation projects examined in this study creates means to examine how the relationships, connections, and disconnections between actors influence the organizational capacity of actors and process outcomes.

The four cases examined in this study are examples of *community-based networked civic innovation*. Community-based networked civic innovation is driven by individuals who belong to the community, as opposed to projects largely supported by government agencies, NGOs, or private companies, which much of the scholarship on non-industry sector innovation tends to focus on (Yildiz, 2007). However, networked civic innovation is a portable concept and opens up opportunities to evaluate these other types and configurations of civic-oriented innovation networks. Though examining different types of networked civic innovation is beyond the scope of this study, in chapter 5, I point towards a typology that can be built upon in future studies.

New Analytic Approaches to Studying Innovation Outcomes

This project is concerned with not only the process of community-based networked civic

innovation but specifically seeks to explain *why* it produces varied outcomes. As discussed earlier, these types of projects are becoming increasingly common and can potentially have far-reaching social and organizational implications for civic-oriented stakeholder groups. Yet, these projects do not always achieve their intended goals. *Why do some networked civic innovation projects succeed when others fall short?* To answer this question, many of the studies in the literature reviewed above focus on the macro- and less often at the meso-level of analysis to evaluate social factors to explain differences (Ahuja, 2000; Hansen & Wakonen, 1997; Hargadon & Sutton, 1997; Porter, n.d.; Powell et al., 1996). This approach is flawed in two important ways.

First, it overlooks how the interaction of network members play out at the individual, group, or team level of analysis within the innovation process. In the case of informal networks such as those in this study, researchers may miss the important interpersonal or even political factors that can shape innovation paths and outcomes. In the context of community-based civic innovation, organizational boundaries are not so easily defined and evaluating the informal processes that guide interactions between individuals and groups at the core of the innovation process is necessary. Micro-level analysis follows how decisions are made, how actors exert or attempt to exert influence in the process, and how outcomes are shaped by these different actions. This lends important insight into the organizational processes and dynamics that shape the process and outcomes of networked civic innovation. Much of the current literature ignores these micro-level dynamics, missing opportunities to gain knowledge concerning how individuals affect and shape the innovation process. Process analysis that is focused on the micro-level interactions of actors involved in the innovation process provides an opportunity to reveal and analyze these key actions, events, and interactions (Langley, 2009).

In reviewing the current literature on networked innovation, a second flaw in our

understanding of networks and innovation surfaces, that is, the socio-centric explanations of innovation and innovation outcomes. Several disciplines examining communication and technology have made a strong case for evaluating technological artifacts, their use, and their relationship with social actors in shaping processes and structures. These perspectives, reviewed in the section below, suggest that network approaches to evaluating technology innovation should include analysis of both social and technical factors. They also suggest it is necessary to account for the relationship between both and examine their intertwined nature as it is nearly impossible to understand one without acknowledging and accounting for the other. Connecting to my previous point regarding levels of analysis, this perspective suggests that to evaluate these interactions, methodological and analytical lenses should focus on micro- and meso-levels of analysis.

Communication Theory, STS, and Sociotechnical Configurations in Innovation

During the 20th century, communication theory and research on the relationship between technology and society progressed from techno-deterministic questions about the "impact" or "effect" of communication technology in society (Lasswell, 1927; Lazarsfeld, Berelson, & Gaudet, 1968; Lippmann, 1922; Shannon & Weaver, 1959) to acknowledging humans as more than passive receivers to account for their behaviors, attitudes, and interactions with others to explain communication technology use (Katz & Lazarsfeld, 1955; Livingstone, 2004; Shaw & McCombs, 1977). Communication research has since expanded to recognize communication technology as products of *networks* of structures and relations (Lievrouw, 2014).

The network perspective of technology recognizes technology as *embedded within* and the *outcome of* a network of relationships between individuals, institutions, and the rules and resources—or *structures* (Giddens, 1984)—that guide their interactions. The network perspective of technology, best applied to ICT adoption and use outcomes through Diffusion of Innovation

Theory (Rogers, 2003), opened up opportunities to evaluate the relationships of relevant social actors in addition to the technical and social environment in which the technology is embedded. Organizational communication theory shows that changes in work practices and organizational structures are often connected to technological innovation (DeSanctis & Poole, 1994; Orlikowski, 2000; Yates & Orlikowski, 1992). Technology, these studies show, disrupts and changes communication dynamics by shifting practices that support new structures for social interaction.

The communication network perspective carries strong commitments to the notion that physical artifacts, social relations, and social practices are critical to evaluate in technology studies (Lievrouw, 2014). Examining innovation through the network perspective has been limited to traditional contexts, primarily focused on the impact of technology on communication within bureaucratic organizations. This dissertation, in part, seeks to extend theory by examining if and how technological artifacts and the innovation processes involved in developing those tools impact and transform the existing communication structures in a given community. Chapter 4 addresses these questions.

Science and Technology Studies (STS) is another discipline that has, over time, evolved from techno-determinist (Ellul, 1967; Winner, 1993) and socio-deterministic (Akrich, 1992; Pinch & Bijker, 1984; Woolgar, 1991) views of technology towards acknowledging the intertwined and mutually shaping relationship between social factors and technical artifacts (Boczkowski & Lievrouw, 2008; Lievrouw, 2014). The different perspectives from communication studies and STS discussed above ultimately focus on the process and construction of technological artifacts, which is the main concern of this dissertation. The framework of this study builds from and aims to extend scholarship from STS and

communication researchers, such as Boczkowski (2004) and Lievrouw (2014), who account for and advocate for examining the co-construction of technology and society.

Drawing upon mutual shaping and co-construction studies (Boczkowski, 2004; Kreiss, 2012; Lievrouw, 2009, 2014), this dissertation connects the processes of technology construction and adoption of technology. This study draws especially on Boczkowski's framing of technology innovation in which he states, "shaping of artifacts should not be seen as disconnected from how their diffusion is intended to unfold and how it actually occurs, and their diffusion should not be examined in isolation from processes of technical construction that do not stop when artifacts are adopted" (p. 256). Additionally, Lievrouw's framework of mediation articulates the perspective this study adopts in acknowledging the interconnected relationship between the social and the technical. Lievrouw (2014) discusses her theory of mediation as an "ongoing, articulate, and mutually determining relationship" between technological artifacts, people, and social arrangements—the patterns of relations, organizing, and institutional structure. Artifacts develop through a process of *reconfiguration*, enabling or constraining people's ability to communicate. People engage in communicative practices that "change in an ongoing process of *remediation*" and social arrangements develop in conjunction with both artifacts and practices through a process of *reformation* (p.45). Throughout this study, I employ these frameworks to examine the entangled relationship between the activities of social actors and the affordances and features of technical artifacts in each case of networked civic innovation. The social and technical factors of innovation are viewed then, as interdependent and mutually constructive.

Thus far, in this chapter, I have introduced the concept of networked civic innovation. I argue that networked civic innovation is best evaluated as a sociotechnical system. By employing the sociotechnical system framework to the evaluation of community-based networked civic

innovation, I ask a different set of questions than are commonly posed in existing research to understand varied outcomes of civic innovation. My questions focus on how actors and artifacts engage across the trajectory of the innovation process, and examine why particular interactions result, or *fail to* result, in intended outcomes. To this end, I study both the social actors involved in each innovation project, as well as the material artifacts they produce. Moving beyond effects-centric approaches, I evaluate the emergent outcomes of the dynamics found at the interstices of material artifacts, social actors, and social arrangements.

The design and goal of this dissertation is to examine how values, resources, and power shape the process networked civic innovation outcomes and produce particular outcomes that provide insight into why some communities are able to successfully implement ICT while others are not. In the previous pages, I have developed a framework for studying the process of innovation in civic contexts. In the following section, I focus on the evaluation of values, resources, and power in that process in light of the framework that examines both actors and artifacts and their entangled relationship. The literature outlined in the following pages show the promise of bridging together several research disciplines including, STS, media and information studies, and design studies to study values, resources, and power in community technology innovation processes.

Values, Resources and Power in Innovation

Through retroductive analysis, moving from theory to the cases and back again (Ragin, 1994), I identified *values*, *resources*, and *power* as three facets of networked civic innovation that emerged as vital to understanding why some projects failed to produce their intended results while other succeeded. The following section provides a review of what previous research has

revealed about the role of each in relation to technology and innovation and provides relevant conceptual definitions that are employed in this study.

Values and Technology

The relationship between values and technology is a concern of several disciplines including media and communication studies (Flanagan et al., 2008; Nissenbaum & Gaboury, 2012), STS (MacKenzie & Wajcman, 1986; Winner, 1980), information studies (Knobel & Bowker, 2011), and computer science and human computer interaction studies (Friedman et al., 2006). Scholars across these diverse fields answer the question of whether values are embodied in technology with a resounding *Yes*. However, each perspective differs on their answer in regards to the definition and the source of values (Shilton, Koepfler, & Fleischmann, 2013). This section briefly reviews how values and technology have been studied, thus far, in light of three questions and controversies across different disciplines: What are values? How does technology embody values? And what is the source of values in technology? In evaluating the answers, I identify useful conceptualizations employed in this study to examine values in the engagements between actors and artifacts across all stages of the innovation process.

Identifying the source of values is an area of contention across disciplines. Scholars in information science, communication, and science and technology studies examining values in sociotechnological systems suggest values are identifiable entities of technology that are embedded intentionally or unconsciously by designers through features of the technology that either afford or constrain user actions (Feenberg, 2002; Friedman & Nissenbaum, 1996). From this perspective, the sources of values are based in the social components—human designers and users—of sociotechnical systems. Another perspective on the source of values turns to values embedded in technology or the artifact itself to explain how social values are shaped through technology use (Friedman & Nissenbaum, 1996; Manders-Huits & Zimmer, 2009; Wetmore,

2007). Since this study recognizes both the social and technical components of networked civic innovation as critically intertwined in a sociotechnical system, I contend that values in technology are sourced from designers, users, other key stakeholders, and the technological artifact itself.

Value Sensitive Design (VSD) (Friedman, 1997) is one framework that acknowledges that both social actors and technological artifacts matter when considering values and provides useful analytical methods and concepts to analyze the interactions between both. In examining the social influences in technology innovation, VSD and other design studies examine designers, users, and potential users. Much of the terminology employed in this study is developed in VSD. VSD uses the term *stakeholder* to identify different relevant groups, expanding beyond just the user and designer categorization to include both *direct stakeholders* and *indirect stakeholders*. Direct stakeholders include any individuals or groups that directly interact with the technology or system. Indirect stakeholders include anyone that may be affected by the system but who do not interact directly with it (Friedman, Kahn & Borning, 2006). VSD provides methods to identify values of different stakeholder groups, *stakeholder values*, through empirical investigations. Additionally, VSD conceptualizes *designer values*, which are the values of the designers that are relevant to the domain at hand. Finally, explicitly supported values are a third type of value of relevance to this study. *Explicitly supported values* are those that the designers and developers decided to adopt into the system. As Borning and Muller (2012) discuss, it is important to distinguish the three to identify should differences or value conflicts arise between these three groups. A broad range of stakeholder values surfaced across the diverse groups of actors involved in the LVG, Occupy, Civic Commons, and Tea Party projects.

VSD also acknowledges that values of different stakeholders may not be aligned and provides the concept of *value tensions* to identify potential value conflicts between different stakeholder groups that may affect the design and or adoption process of the system (Miller, Friedman, Jancke, & Gill, 2007). In this study, I employ the VSD concepts of stakeholders, stakeholder values, and value tensions to reveal the role of values within different stages of innovation cycles in the LVG, Civic Commons, Occupy, and Tea Party projects. By identifying different types of stakeholder values and revealing both the value tensions as well as the outcomes of those value conflicts in each of the four networks of innovation, I show how values play a vital role across all stages of innovation as they shape outcomes from the earliest stage of ideation and extend into the post-implementation stage.

For example, the tension between intended users of the Occupy TempCheck platform and the actors involved with the design and development of the tool surfaced in the implementation stage. During deployment, it became clear, through the strong negative response to the tool, that activists felt technology undermined the importance of face-to-face interactions. This important tension, which had been expressed in the ideation stage by Seattle participants, became the biggest obstacle to implementing the platform in the community. These moments of conflict and their mediation are sites in which the networks can expand, implode, or reconfigure, altering the path of innovation. In examining value tensions, I highlight how those moments of breakdown or alignment are critical to shaping outcomes of the technology implementation projects in this study.

Value Sensitive Design moves beyond theory[1] and provides a method that is useful for examining values in technology as well as within the social aspects of innovation. Borning,

[1] Though VSD is ultimately focused on design, some communication scholarship that is focused on values and technology has also emerged that supports the sociotechnical view and similar approaches to

Friedman, & Kahn (2004) distinguished between the stakeholder values explained above and *explicitly supported values*, which are those values that designers intend embedding in design. VSD advances a set of methods called "technical investigations" (Friedman et al., 2006) that researchers can employ to conduct analysis of explicitly supported values in design. The theoretical assumption underlying this conceptualization of technology and values suggests that values are encoded through design. Through technical investigations of the features of artifacts, VSD asserts one can identify articulated explicitly supported values and compare or assess whether those values are the values designers intended to embed in the technology. In chapter 3, I conduct technical investigations to identify values embedded in any technological artifacts produced by the four networks. As the framework of this study is based in the mutual shaping of both the social and the technical components of the innovation system, I also evaluate how the encoded values are supportive of, or in tension with, the values of different stakeholder groups. This can reveal important insight into why technology implementation produces user adoption, appropriation, or rejection outcomes.

Resources in Innovation

From earlier review on networked innovation, we know that organizational and management literature findings show that formation of networks of innovation often occurs when there is recognition that other actors have resources necessary to achieve a goal and without those resources the goal often cannot be met. This provides the impetus to cross boundaries

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evaluating values in design. Nissenbaum (2005) identifies three modes of inquiry required to consider how values are embodied in technology. The technical mode is focused on designers, recognizing both their capability and their power in carrying forward values through design processes. Philosophical modes of inquiry are required to examine the social, political, or moral charge of the values and how they shape and are shaped by society. The empirical mode provides opportunities to evaluate which values are actually embodied in technical artifacts to reveal whether the values designers intended to embed are actually reflected in design. Though I use the framework of VSD in this study, much of the analysis speaks to three modes of inquiry suggested by Nissenbaum.

(between departments, across firms, or across industries) to create a network through which resources can flow (Robey et al., 2001). This begs the question, *what types of resources are useful to support civic innovation processes?*

As the cases in this study are not firms or managed organizations, the innovation process and the types of resources they require may be somewhat different than what the above literature suggests. For example, labor or volunteers are likely not a concern for firm-based innovation, but these are vital resources for the informal grassroots type of organizing efforts that are undertaken in the four civic innovation projects in this study. These projects are often volunteer-based and such support sustains the projects. To acknowledge the unique circumstances that this informal type of organizing for innovation requires, I draw upon literature on resources and collective action that better reflects the resource needs of the cases in this study.

In their review of conceptualization of resources in social movements in early collective action and social movement literature, Cress and Snow (1996) note that resources were most often regarded as anything that social movement organizations needed to mobilize and deploy to achieve their goals (McAdam, McCarthy, & Zald, 1996; McCarthy & Zald, 1977; Oberschall, 1973; Tilly, 1978). Through their study of 15 social movement organizations, Cress & Snow (1996) identify four functional dimensions of resources, of which I adopt the following three: *material* (tangible goods and services such as supplies, space, money etc.), *informational* (knowledge capital in the form of strategic or technical support, or referrals), and *human* (people who donate time, energy, or other listed resources).[2] In light of the network orientation of this study, I also draw upon Granovetter (2005) to include *network connections* as a relevant resource required for innovation. Network connections refer to the ties to other actors that can contribute

[2] I elected to drop the category of moral resources as it pertained to the solidaristic support that

to the progress of the innovation process. In studying the process of innovation in each case, I trace the actors and their access to resources to show how resources flowed into and out of the four networks of innovation throughout the stages of innovation in chapter 3 and chapter 4.

In this study, I evaluate the role of resources at both the micro-level of analysis and the meso-level of analysis. At the micro-level, I identify which actors had access to which types of resources throughout the ideation, design, and development processes of innovation. I also trace how these actors moved into and out of the network, gaining insight into whether resources were actually leveraged for the project. For example, in the Civic Commons network of innovation, Mike Fancher was a central figure who had connections to most other participants in the project. Mike also had valuable network connections to potential funders that could support the civic commons platform. However, Mike's focus was primarily on journalistic innovation and less so on community efforts. As a result, he diverted potential resources to another project, laying a critical blow to PSCCC network of innovation. Consequently, the remaining members were constantly seeking new partners with resource capabilities and had difficulty in finding any who aligned with the early visions of the project. The results of Mike's diverting resources affected the coordination and organization capacity of the network of innovation.

I address resources at the meso-level in chapter 4 where I examine how the network as a whole was able to gather resources from the community to support implementation when the technology is introduced and deployed into the user community. To this end, analysis focuses on whether and how the networks of innovation engaged with the community to gain support and access to their resources for the implementation effort. Engaging with the community and gaining access to community resources proved important to the success of the LVG project. In contrast, the lack of community support and resources had a negative impact on the Occupy

project outcomes. Process analysis of each case and following the actors throughout the stages of innovation reveals important underlying mechanisms that lead to the formation, expansion, or breakdown of networks of innovation, specifically in relation to resources capacity and resources needs that contribute to differing outcomes in each case.

Innovation is Political and Power-laden

All of the cases in this study are community projects aiming to create change in the communication practices of a community. They intend to do so either by creating new ways of interacting or by transforming current patterns of interaction through technology implementation. To assume that these change-oriented projects are neutral is naïve. Change suggests the desire for something different from, or resistance to, current practices. Change-oriented collaboration requires exposure of interests of all vested parties, which uncovers potential areas of conflict between groups and individuals (Hislop et al., 1998). When change is enacted through the introduction of technology, the technological artifact becomes a site of politics. In the four cases examined in this study, the goal of each network of innovation was to implement technology to enact change, yet some projects succeeded and some projects failed. According to Provan & Kenis (2007), understanding the functioning of networks reveals why networks produce certain outcomes. Focusing on how networks are governed and how power is shared, distributed, or concentrated across the network lends insight into how networks function and are able, or unable, to support network goals.

As Hislop, Newell, Scarborough, & Swann (1997) argue, the political process of decision-making is both inherent in organizational processes and a critical factor in innovation outcomes. The authors argue that technocratic or "management as neutral" stances in organizational studies makes invisible the conflicts, hierarchical power, and control that management has over networking and knowledge management. Any attempt to bring change into

an organization or community draws attention to the intentions, desires, and goals of different stakeholder groups which can be in conflict with other groups. Therefore, examining decision-making processes is useful in identifying how power is distributed amongst relevant actors in innovation contexts.

Lukes (1974) summarized three dimensions of power: power based on resources, processes, and meaning. As this is a process analysis, power related to the process dimension is of relevance to this study. According to Lukes (1974), process power is closely linked to decision-making. "Power resides in organizational decision-making processes which incorporate a variety of procedures and political routine…" that can give actors access to, or prevent actors from, participating fully in decision-making. When networks are formed, information channels between individuals and groups are developed that provide different actors access to decision-making. According to Hislop et al., (2005), decision-making power can be evaluated by examining these communication channels in the network.

Thus, in this study, group decision-making processes are evaluated to assess how power is shared across, or concentrated within, relevant groups throughout each stage of innovation. By tracing how actors participate or are unable to participate in decision-making processes related to the design, development, and implementation of civic technology, this study examines how relevant groups and individuals are able to influence innovation outcomes.

To evaluate the power dynamics between actors that shape the innovation process, I first turn to the micro-level analysis of the individual actors directly engaged in the design and development phases of the innovation process in each case. Through process analysis, I examine who, within the network of innovation, is able to influence decisions related to the technology design and development and how they are able to do so. Hence, analysis focuses on whether

decision-making processes reflect concentration of power within a small group of individuals, as is seen in hierarchy-based governance models, or if decision-making processes reflect distribution across actors, as is seen in consensus-based governance models.

At the meso-level of analysis, power sharing is examined by evaluating how the community is able to influence the outcomes of innovation process during and after implementation. Power in technology innovation processes is not held solely by designers, as is evidenced in many studies focused on the adoption and use of ICTs. Users also have the ability to adopt, adapt, appropriate, or reject, technology (DeSanctis & Poole, 1994; Orlikowski, 2000). Therefore, when accounting for power in decision-making processes, it becomes relevant to assess how the community is able to influence innovation outcomes through decision-making that results in supporting or undermining intended outcomes of the network of innovation. Thus, in this study, power sharing between the network of innovation and the intended user community is assessed at the meso-level of analysis. Examining how on-the-ground activists, the intended users in Occupy, respond to technology and influenced network outcomes by rejecting the tool, demonstrates the value of accounting for power between the community and the network of innovation. The types power-sharing configurations evaluated are based on whether power is concentrated or distributed across relevant groups.

Building from Brey's (2008) work, I also evaluate *artifact power,* specifically by examining the affordances and constraints present in the technological artifacts envisioned or developed in each of the four projects. According to Hutchby (2001)*, affordances and constraints* are the functional and relational aspects that frame the possibilities for user actions. Affordances suggest the range of possibilities, while constraints prevent or discourage behavior (Brey, 2006). The underlying theoretical implication of this conceptualization of power and

technology is that technological artifacts are not neutral to society but have the capability of influencing or transforming the behaviors, attitudes, and modes of social organization of the social contexts within which they are embedded (Brey, 2006). In examining the artifacts and their use (or non-use) in the cases, I am able to determine if and how the artifacts distributed power to shape social relationships and processes in the manner intended or unintended by the designers. Additionally, in examining the artifacts' distribution of power, we can also understand how and why some intended users may be resistant and attempted to influence outcomes that were in tension with the goals of the network of innovation.

To summarize, in employing the mutual shaping framework, I examine power as it is exerted by social actors and reflected in social processes, and how artifacts, if implemented, may affect existing power sharing arrangements within intended user communities. In chapter 4, I examine how the use of LVG reflected some of the intentions of the network of innovation, but transformation of practices was ultimately limited in that users did not change certain behaviors, but rather supplemented these behaviors by appropriating technology to fit their own needs.

Through my review of relevant literatures that inform this study, I have identified several key concepts and definitions that are used throughout the different types of analysis in this project. Table 1.1, below, provides a summary of the key terms and the observed interactions analyzed in this dissertation. It shows which patterns are observed at different levels of analysis to answer the research questions posed in this study. In chapter 2, I elaborate on this table further by identifying how each concept is examined across the various components involved in the sociotechnical process of community-based networked civic innovation.

Chapters Outline

In the coming pages, I articulate an argument and provide evidence for examining the sociotechnical process of networked civic innovation through the lenses of values, resources, and power. In chapter 2, I further develop conceptual and analytical frameworks that were deployed in this study and also include in-depth reviews of each of the cases. In chapter 3, I examine the first three stages of the networked civic innovation process and reveal how micro-processes informed by values, resources, and power create conditions that support or undermine the design and development of technological artifacts in each case. Chapter 4 then focuses on the stages of innovation when technology is introduced into the community and provides meso-level analysis of the implementation process and what, if any, transformation occurs within communities as a result of technology implementation. Conclusions, implications of this study, and directions for future research are provided in chapter 5.

Chapter Summary

In this study, I provide an in-depth analysis of four community-based technology implementation projects to answer the research questions posed at the beginning of this chapter. In the previous pages, I have revealed the connections and relationships between the following central concepts in this study: *networks, innovation, sociotechnical systems, values, resources*, and *power*. Arguing and advocating for a trans-disciplinary approach that draws disciplines together to inform this process analysis, I connected literature in communication studies, management studies, innovation studies, STS, and design studies to inform the theoretical and methodological frameworks of this study. Transcending disciplinary boundaries creates opportunities to interrogate and examine events, actors, and artifacts in the innovation process that may not be accounted for in more narrowed theoretical frameworks. Though drawing from these diverse disciplines, this project ultimately informs communication disciplines, especially

communication and technology theory and organizational communication theory, by focusing on how communication practices occur across informal organizational contexts to inform the process of designing, developing, and implementing communication technology in civic communities.

TABLE 1.1 Primary Concepts, Types of concepts, and Observations

Concept	**Type**	**Observations at Micro and Meso Levels of Analysis**
Values	*Stakeholde*r: values held by stakeholders or stakeholder groups *Designer*: values held by designers *Explicitly supported*: values that the designers and developers decide to support in the system	*Micro-level* Alignment of values between different actors within the network of innovation (RQ1a) *Meso-level* Alignment of values between the network of innovation and the community (RQ1a)
Resources	*Material*: tangible goods and services such as supplies, space, money etc. *Informational*: technical or project management skills *Human*: people who donate labor, time, skills *Network Connections*: ties to other relevant actors, groups, or organizations	*Micro-level* Distribution of access to resources within the network of innovation (RQ1b) *Meso-level* Ability of network of innovation to leverage resources from the community (RQ1b)
Power	*Decision-making:* ability to influence	*Micro-level* Ability of actors within the network of innovation to influence innovation decisions (RQ1c) *Meso-level* Ability of actors and groups in community and network of innovation to influence innovation decisions (RQ1c)

I extended the concept of networks to include those beyond just actors involved in the design, development, and implementation stages of innovation to consider the broader group of stakeholders that emerge in later phases as well, such as potential users and non-users. Each of these groups moves into and out of prominence at various stages, playing critical roles in shaping the outcomes. Using process analysis, I show how innovation unfolded differently for each case, based on the unique values, resources, and power conditions of the projects. Process analysis uncovers how network dynamics, informed by the configurations and interactions of values, resources, and power, shaped each case and its subsequent outcome.

The configuration of actors and artifacts involved in the innovation process at a given moment in time reflects unique conditions of values, resources, and power that interact to produce varied outcomes. This study demonstrates that these configurations can sustain or create fractures in the network of innovation, potentially undermining intended innovation goals as it attempts to implement technology into the community.

I argue that to fully understand the outcomes of the LVG, Civic Commons, Occupy, and Tea Party projects, we must analyze the social actors *and* the technical artifacts and their ongoing, mutually shaping relationship across all stages of the innovation process. The platforms envisioned and developed by the four civic networks are not neutral and are shaped by, and shapers of, the social contexts in which they are embedded. The actors and their social arrangements and interactions influence how the artifact is designed. In essence, the social is encoded, in part, through design. In turn, upon implementation, technological artifacts are able to define the range of actions of users and can enforce or reinforce social arrangements and power structures existing within each community. The interactions of values, resources, and power can

be examined in both the social and the technical components of the innovation process and in their mutual shaping process across stages of innovation.

To summarize, the conceptual framing of this study is based on three premises: 1) network forms of organizing matter to understand the processes of innovation; 2) conditions of values, resources, and power shape innovation outcomes; and 3) one must analyze values, resources, and power in both social actors and technical artifacts and their mutual shaping relationship across stages of innovation to best understand innovation outcomes. In the chapters that follow, I show how different configurations and conditions of values, resources, and power at the micro-level configure and reconfigure the network of innovation enabling or constraining actors as they attempt to complete subsequent steps in the innovation process. At the meso-level of analysis, I demonstrate how the relationship between the community, the network of innovation, and the technology itself influences implementation outcomes.

Chapter 2: Frameworks, Methods, and Case Study Descriptions

Over the course of three years I observed, participated in, and analyzed four community networks organized to design, develop, and implement technology to solve community communication problems. Several methods were employed to evaluate the role of values, resources, and power in the process of civic innovation. This chapter expands upon the conceptual definitions presented in chapter 1 to show how concepts were examined and analyzed. The intent of this chapter is four-fold. First, a conceptual framework is outlined to demonstrate the relationships between the key concepts of processes, values, resources, and power as they are examined in the context of community-based innovation. Second, the multi-method approach used to observe and analyze these relationships is reviewed. Third, the reader is introduced to conceptual and analytical modeling that provides rigorous and systematic means of analyzing and comparing the role of values, resources, and power within and across the four cases of community-based networked civic innovation. Finally, an in-depth review of each of the cases is offered to provide cultural and historical insight into each case, introduce the reader to key actors, and to further contextualize each project in light of the larger communication and technology environment within which they are embedded

In the previous chapter, several key concepts were introduced including *values*, *resources,* and *power*. Specific types of values, resources, and power-sharing arrangements were identified that are used to analyze the process of community-based networked civic innovation in this dissertation (see Table 1.1 in chapter 1). Here, I introduce the connective framework between key concepts that frames the research design of this study.

Conceptual Framework

This study examines the process of community-based networked civic innovation. The informal and loosely bound group of actors driving the innovation process in each of the cases examined in this study is referred to as the *network of innovation*. Networked civic innovation occurs in *stages* that are both iterative and, at times, recursive. Though these stages often seem progressive and linear, the actual process of innovation often includes movement back and forth between stages especially across the design, development, and implementation phases. The innovation process is rarely linear though it is often depicted that way (Pinch & Bijker, 1984; Williams & Edge, 1992). In this study I will show how the process of innovation was both iterative and recursive by revealing how the projects moved back and forth across the stages at various points in time.

Stages of Networked Civic Innovation

These stages of networked civic innovation include *ideation*, *design*, *development*, *implementation*, and *post-implementation*. The *ideation stage* occurs when the informal group of actors involved in the innovation process first connects and forms an initial network. This stage includes the visioning process and initial discussion of the goals and desires of the network as a whole. Ideas are generated during this stage, as members brainstorm about potential ways to solve the communication problems facing their community. In the *design stage,* possible solutions to move forward with are identified and design of features begins. This iterative stage often involves using mock-ups to identify key features of the ICT that are tested and redesigned if necessary.

In the *development stage,* the network of innovation moves forward with a particular design to develop a material technological artifact. Networks of innovation often move back and forth between this stage and the design stage as they test out particular features and decide

whether they are actually useful in practical application. In general, the first three stages of networked civic innovation are largely about moving from ideas to material artifacts that embody the goals and desires of the network of innovation. Understanding how the material artifact reflects the social processes and interactions between relevant groups during the ideation and design stages uncovers the relationship between the social and material worlds.

The fourth stage of networked civic innovation, the *implementation stage*, occurs when technology is initially deployed within the community. During the implementation stage, relevant actors expand to include more social actors than those involved with creation of technology to also include potential users, non-users, and indirect stakeholders that may be affected by the use of the technology though they are not directly in contact with it. Sometimes these groups are involved with the previous phases of innovation. However, they become more prominent players in the shaping of innovation outcomes during implementation, at which point, the interactions between the network of innovation and community become relevant to understand why some innovation projects succeed and others fail. Understanding how different groups contribute or withhold resources to support the implementation process lends insight into adoption outcomes. Deployment and communication strategy becomes relevant during this stage.

Post-implementation is the final stage evaluated in these four cases of community-based networked civic innovation. During post-implementation, we can evaluate how a technology is put into practice and understand its transformative effects on community communication practices. Several different outcomes can result from implementation of technology into a given community. One result can be adoption of the technology as intended by the designers leading to continued iterative development and potential diffusion. Another outcome could be that in-practice technology is adapted or appropriated by users to serve different means than designers

intended. Users can also reject the technology. Either of the latter two responses by intended users can result in the network of innovation going back to any of the first three stages to attempt to address any potential barriers of deploying the technology further. Alternatively, if the network of innovation is without sufficient resources to redesign the tool, rejection by the community can result in failure, ending the process of networked civic innovation entirely.

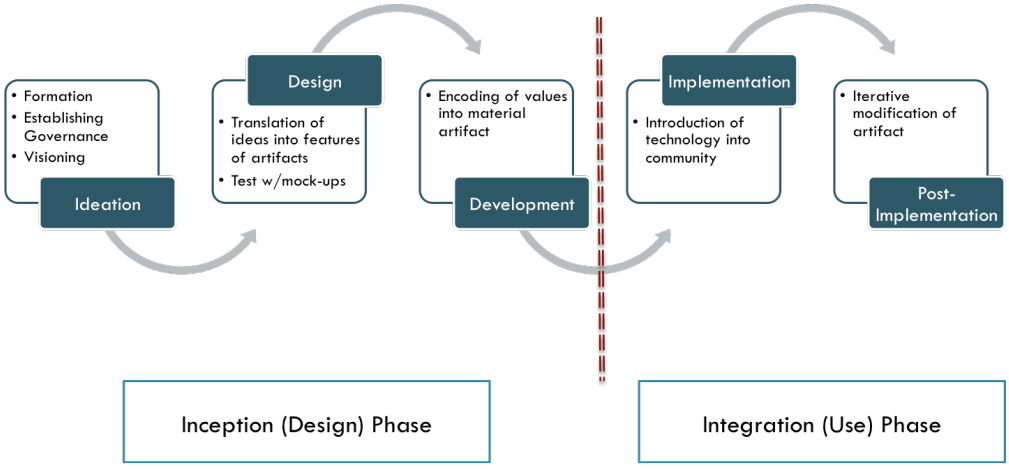
The process of innovation is rarely straightforward and often shifts back and forth through different stages. For example, while a project may move from ideation to design quickly, during the design stage it may be come clear that there are conflicts or capabilities that are difficult to translate through design. In those instances, actors may return to the "drawing board" or the ideation stage and reconsider the vision of the technology. Similarly, once a tool is developed and deployed in a community, particular features may be flagged as problematic. In those cases the designers may return to design stages and reimagine features based on the feedback from users and then develop new affordances and constraints into the system. The process is rarely as linear as moving through each stage one by one. However, as is demonstrated in this study, particular processes within each stage must eventually be completed to achieve intended outcomes.

After adoption or adaptation of the technology, communities may transform their communication processes in radical or limited ways as a result of the implementation of the technology. However, transformation may also not occur. After implementation of the technology, if there is little traction within the community, the network of innovation may abandon the project altogether. In fact, as the cases in this study show, these projects can be abandoned at any stage of the process. It is, in part, the intent of this dissertation to identify why

some of the projects end in earlier stages of the innovation process while others are able to achieve their intended goals and transform communities.

Figure 2.1 below sketches out a hypothetical process of networked civic innovation as it progresses and key actions that take place through different stages. In this figure the process is shown as it would occur in the most favorable conditions where each stage progresses smoothly into the next. As was discussed above, this is rarely the case and one can imagine arrows from any given stage to return backwards towards especially ideation and design stages. Analysis shows how different conditions of values, resources, and power created organizational conditions that led to different paths of innovation for each of the cases in this study. I examine, in this study, the process of innovation as it occurs across the stages identified above. Below, I discuss how process research provides useful tools and methods to analyze and compare these interactions within and across the different cases of community-based networked civic innovation.

Figure 2.1: Process of Networked Civic Innovation



Methods to Analyze the Process of Networked Civic Innovation

This study is based upon the premise that networks matter in understanding the process of community-based networked civic innovation and the outcomes it produces. To that end, in this study, I examine not just actors, artifacts, and communicative practices, but also the relationships and arrangements of actors over time. I employ multi-method ethnographic and qualitative approaches to contextualize the actions and expressions of networks at the meso-level and their members at the micro-level. Qualitative ethnographic methods are well-suited to this study as it is concerned with questions of *how* actors guide and shape the grassroots innovation process and *why* different conditions of values, resources, and power produce differing outcomes. Here, I discuss process analysis, briefly introduced in chapter 1, as the primary analytical frame employed to evaluate the process of innovation in each of my cases. Then temporal bracketing is explained as a strategy employed to provide useful comparisons within and across the cases. I then discuss how qualitative research provides relevant methods for examining the evolution of the networks of innovation in each case that lends valuable insight into the process of innovation.

Process Analysis

Process analysis is a method used to develop process theory, which explains why and how a phenomenon occurs (Crowston, 2000). Process theory examines how the interactions of multiple entities shape how things are used, organized, or developed (Crowsten, 2000). In this study, those multiple entities include values, resources, and power *and* actors, actions, and artifacts. Process research focuses on the study of "how and why some significant temporally evolving phenomena unfold over time" (Langley, 2010). In contrast to variance theories that focus on identifying causal mechanisms, process research examines the emergence of events, activities, and choices as they sequence over time (Bizzi & Langley, 2012) to explain outcomes.

Temporal Bracketing

One important tool process analysis provides that is implemented in this study is *temporal bracketing.* Temporal bracketing is derived from Giddens' structuration theory and the notion that "the actions of individuals are constrained by social structures but that actions simultaneously reconstitute those structures over time" (Langley, 2010). Temporal bracketing deconstructs case study data into time periods to enable analysis of how actions in one stage affect actions, events, and interaction in later stages. Langley explains temporal bracketing as a:

> "...heuristic device for segmenting the data into comparable units of analysis, enabling the exploration and replication of theoretical ideas. This strategy is particularly useful when it appears that mutual shaping, structuration, feedback loops, and multi-directional causality may be contributing to observed temporal patterns" (p. 920, Langley, 2010).

Using temporal bracketing, longitudinal data on processes can be broken down into blocks that have a "degree of unity" that allows researchers to analyze and compare them systematically while considering contexts. This provides means to conduct structured investigation of complex data of dynamic processes. Temporal bracketing "involves decomposing timelines into distinct phases where there is continuity in activities within each phase and discontinuity at the frontiers" (Langley, 2010). Process analysis emphasizes change and temporal evolution and, recently, researchers have extended the framework to evaluate the dynamics of networks as they evolve and participate in the shaping of process outcomes (Baraldi, Gregori, & Perna, 2011; Berends, Van Burg & Van Raaji, 2011; Ellis & Ybema, 2010). In this study, networks are also examined, however, only to the extent that the evolution of the network shows how the process of innovation unfolded differently in each case. The unit of analysis then, is the process of innovation and not the network.

In applying the temporal bracketing framework, there are two layers of bounding that take place in this study. At the first level, each of the different *stages* outlined above are created.

Continuity in the type of activity occurring during each stage to support the innovation process bounds together the different stages. For example, the activities that occur during the ideation stage are focused on brainstorming ideas and visions. The boundary for design stages shifts to focusing on a particular idea with activities and discussions focusing on identifying specific features of the technology to support that idea.

Then, at the second layer, the first part of the process of networked civic innovation that includes the first three stages outlined above. Thus, ideation, design, and development are bound together. These stages are primarily focused on and driven by the micro-level interactions of the network of innovation. I create a temporal bracket around these stages and call the combined group the *Inception Phase* of the process of networked civic innovation. During the Inception Phase, the primary interactions are focused on actors within the network of innovation who are involved in the ideation, design, and development of the material artifact. In the second temporal bracket, I include the stages of implementation and post-implementation—the stages in which actors in the broader community become relevant to shaping innovation outcomes. I call this the *Integration* stage, referring to the part of the process that requires taking the material artifact to the community for use and examining what occurs during that process and afterwards. The integration stage is where the network of relevant actors expands to include the intended user community as well as other partners that may support the implementation and potentially successive and iterative stages. The meso-level interactions of the network of innovation between the network of innovation, the intended user community, the material artifact, and other relevant stakeholder groups are considered in this phase. Applying this second level of temporal brackets to the cases provides useful means to compare outcomes across the four cases. Using this framing, all four cases are discussed as they participated in the Inception Phase in chapter 3.

The only projects that progressed to the Integration Phase, LVG and Occupy, will be the primary focus of chapter 4.

Using the temporal bracketing strategy I identify the relevant time periods for each case in this study in relation to the different stages, and additionally include the key actors that were prominently involved during that phase. These time periods are discussed and tables are included at the conclusion of each case study overview found at the end of this chapter. As mentioned earlier and as is illustrated in Figure 2.1, the process of innovation is not strictly linear, thus the time periods identified may be recursive as the processes moved back and forth between stages for some of the cases.

Networks and Qualitative Research

As the evolution of the informal networks is evaluated over time to provide insight into the process of civic innovation, attention is paid to the formation, breakdown, and reconfigurations of the networks. Hollstein (2011) identifies six areas of network research for which qualitative research is most suitable, including exploration of networks, network practices, network orientations and assessments, network effects, network dynamics, and validation of network data. This dissertation addresses several of these areas of network research that inform theory about the process of networked civic innovation.

To understand the process of innovation in each case, I evaluate the "concrete acts, practices, interactions, and communication patterns," in community-based networks that organize to design, develop, and implement ICTs that Hollstein (2011) identifies as the scope of network practice research (p. 406). In using qualitative methods such as ethnographic participant observation, informal and formal interviews, and analysis of relevant documents, I examine what actors actually do throughout the process of innovation and in their engagement with technological artifacts. These forms of analysis are explanatory in that they provide opportunities

to understand why and how networks evolve and change over time and to what effect on process outcomes.

Additionally, ethnographic participant observation provides means to longitudinally trace the mechanisms and configurations of network organizing to reveal how networks matter in community-based innovation processes. Hollstein argues that "the question of how networks function, issues related to the formative conditions, dynamic processes, and change of networks pose the greatest theoretical and methodological challenges for network research" (p. 409). She argues that observation across time "can be expected to deliver the best data for this type of work" (p. 410). I employ qualitative methods to conduct longitudinal analysis of interactions between actors, their arrangements, and their practices in relation to values, resources, and power. In doing so, I provide insight into how the networks of innovation develop and evolve over time and to what effect on community information outcomes. Networks are evaluated in this study only to the point at which they can help to reveal the underlying mechanisms within each case that led to different innovation outcomes. The focus is on how network evolution can influence and impact the process of civic innovation.

Thus far, I have discussed the methodological approach of examining processes and network activities through conducting process analysis and employing temporal bracketing strategies. In the section below, I review the methods I used to conduct, gather, and analyze data from each case. Conducting comparative case study analysis and using temporal bracketing as a heuristic for comparing the cases, I build theoretical models of the process of networked civic innovation drawn from qualitative data that is systematically gathered and analyzed and takes into consideration different contexts of innovation processes. In addition to qualitative methods, and to address the critical mutual shaping process of actors, arrangements, and artifacts, I also

conduct careful investigation of the technical artifacts and tools imagined, designed, and developed in the four cases examined in this study.

Observing and Analyzing Values, Resources, and Power in Community-based Networked Civic Innovation

Comparative Case Study Methodology

The research questions guiding this dissertation are questions of "how" and "why," which are answered using case study research design (Yin, 2011). To answer the research questions posed in the last chapter and to develop an understanding of the process of networked civic innovation in relation to values, resources and power, I use comparative case study analysis. Employing a multi-method research design, I draw conclusions based on careful analysis within each case and across all four cases. My analysis of networked civic innovation builds from participant observation of four different community information projects introduced in chapter 1: Living Voters Guide (LVG), Puget Sound Civic Communication Commons (PSCCC), OccupyTempCheck (OTC), and the Tea Party Technology Collaboration (TPTC). In this chapter, I delve deeply into each case to provide both historical contexts as well as provide insight into my role within each project. In review, LVG focused on creating a citizen-powered online voters guide to support deliberative information exchange amongst voters in the state of Washington. The Civic Commons was an effort centered on developing an information hub and communication platform to connect citizens in the Puget Sound area of Washington. The Occupy Project targeted streamlining information exchange in the proposal process of Occupy Wall Street camps and expanding input from a broader audience. The Tea Party project attempted to bridge the communication gap between leadership within the Tea Party Patriots leadership and grassroots members.

While each case differed from the others in significant ways, they shared three fundamental characteristics. First, each project developed out of the connection of an informal network of individuals who identified a communication problem within their community but did not formalize the organization of the network. Second, there was a collective belief that technology could potentially solve the identified problem. Finally, each case involved a group of individuals based within a community, who undertook the process of innovation of an information communication technology with the intent to transform existing communication practices within their community.

These cases were also selected because of some characteristics they did not share. The scope of each project differed in terms of the intended user audience, ranging from large and diverse groups of citizens and voters (Civic Commons and LVG), to smaller groups of individuals who were like-minded and aligned on a common vision of society (Occupy and Tea Party). Some of the projects focused on local populations (Civic Commons) whereas others focused on coordinating populations across geographic distance (LVG, Occupy, and Tea Party). This combination of shared and divergent characteristics allowed opportunity to make sensible comparisons of cases while also providing opportunities to reveal different technical, communication, and organizational patterns across the networks.

Participant Observation

Over the course of three years, I conducted ethnographic case studies of four community information projects as a participant observer. Each of the cases varied in length between one-three years and with the exception of LVG, I was a part of each project from the initial formation of the network through the final outcome. I joined LVG eight months into the formation of the network and continued working on the project through 2013. I joined the Occupy and Tea Party projects from the first meeting of each network and I joined PSCCC during the first public

meeting of the project.

Through participant observation, I captured the dynamics connecting communication, technological choices, and organizational processes over time across the evolution of each project. In the case of LVG, I conducted informal and formal interviews and evaluated key documents to gather a sense of what occurred within the network of innovation prior to my involvement. To contextualize each project in their historical context, I also collected relevant historical information through interviews and analyzed relevant documents produced in each case.

Through my participation and observation in each project, I gathered insight into the organizational and communication processes that informed the innovation trajectory of each case. To reveal the way values, resources, and power shaped each project, I focused my observations on four primary indicators: *actors*, *processes and outcomes*, *network assemblages*, and *tools*. In observing actors, I focused on how we expressed, identified, and attempted to assert values. I also examined how relevant actors gained, provided, or denied access to resources. Observing relational dynamics, I captured data on how actors influenced, or attempted to influence processes across the stages of innovation.

Evaluating processes and outcomes, I focused my reflective observations on how decisions were made across relevant stakeholder groups during each phase of innovation. In my assessment of decisions, I asked, "Who is involved in decision-making processes, to what degree, and to what affect on decision outcomes?" I identified sites of conflicts or communication breakdown and evaluated what issues led to these conflicts and how and if they were ultimately resolved. Regarding values, I observed how actors expressed their values through meetings, vision statements, and through my formal and informal interviews. During

these interviews, I discussed and listened for how the values represented were cohesive or in tension with one another. I also looked to the technological artifact to understand how values were represented through the features of the tool, identifying how value conflicts amongst stakeholders were reflected and encoded through the design of the artifact. I observed tools in-practice to understand how potential value conflicts arose through use in the implementation and post-implementation stages. I drew evidence regarding the role of resources by tracking who had access to what resources and how they leveraged them by either providing or denying the network of innovation access to them. I further evaluated technological artifacts through technical investigations of features that I elaborate upon further in the following section. By studying closely the visioning, the designing, and the development of the tools and the ultimate use or non-use by the community, I gathered insight into the intertwined relationship between the social processes and the technical artifacts.

Since this dissertation is focused on the process of innovation undertaken by informal civic networks, I paid special attention to assemblages of actors and artifacts across time. By this I mean, I observed how relevant actors assembled, connected, and expanded or how relationships fractured across the different stages of the innovation process. In evaluating these phenomena, I paid close attention to how actors moved into and out of the projects, bringing or taking with them access to resources and inserting differing or shared values into the innovation process. In evaluating the network assemblages, I observed how reconfigurations of the networks informed values, resources, and power conditions which, in turn, shaped the process of innovation. I also observed how actions and events in the networks of relevant actors, at one point in time, informed values, resources, and power conditions in later stages. I paid close attention to the technological artifact itself to understand how the artifact was the product of network

configurations and relations and how the artifact itself negotiated relationships between relevant actors.

As a participant observer in the different projects, I took an active position in the process of innovation in each project. However, my participation in LVG began during the post-implementation stage of the project, so much of the analysis of that particular project is based on interviews and analysis of relevant documents. For each of the other projects, I was actively engaged with meetings, took on tasks to support innovation goals, and regularly interacted with other network members. Thus, data and analysis includes my first-hand accounts and understanding of processes in each project. I made it clear from the start of each project that I was acting as both a participant and a researcher and proactively reached out to participants in each project identifying my research interests. Across interactions, participants recognized and accepted my position. In conducting fieldwork, I recognized that my role as a participant and researcher put me in a unique position at different points in the process for each project. I accounted for my own role in every case and included my own interactions with actors as a participant in the project. In chapter 5, I reflect on this role of the "engaged researcher" and discuss how it became necessary to reflect on, acknowledge, and balance my own values and commitment to network goals throughout my fieldwork. Ultimately, by acting as a participant observer I was able to gather insights from my embedded perspective that may have gone unaccounted for otherwise.

Interviews

The interviewees in this study included two distinct groups: members of the network of innovation in each case study and other relevant stakeholders, including especially, the intended or actual users of the technology. A team of researchers, including myself, conducted one set of interviews that included participants in Tea Party and Occupy Wall Street. Though I did not

personally conduct every interview, I held meetings with researchers on a weekly basis to follow-up on interviews and reviewed memos written up by other interviewers to become generally familiar with each interview as it occurred. I reviewed and analyzed every transcribed interview in its entirety for this analysis, conducting all other interviews myself. In all, this study includes analysis of in-depth semi-structured interviews and informal interviews with over 70 stakeholders across the four projects; sometimes I conducted interviews with key actors several times over the course of the project. Interviewees outside of the network of innovation were recruited for this study in several ways: I would interact with them at events and meetings where they would agree to participate in formal or informal interviews; they were recruited through snowball sampling based on recommendations from previous interviewees; or they responded to email requests sent out to listservs of the community groups involved or affected by the innovation process (e.g., Occupy Seattle listserv).

Informal conversations that took place with relevant actors during meetings or at events were captured in both my meeting notes as well as in memos written following interactions. At the conclusion of my participation in the different projects, I conducted more formalized semi-structured interviews that covered a range of topics. At times, the interviewees would lead the conversation, identifying what they saw as critical moments or reflecting on processes or issues that they identified as important to understanding the trajectory of the project. At other times, I led the conversation, asking questions about their experiences or perspectives on the processes and actions undertaken by the group, or probing them on their views on technology and other such issues that I had identified as important. In taking this approach, I worked to triangulate my own observations with others who were involved as well. In the final interviews I held with participants, I specifically asked interviewees to reflect and respond to questions regarding

values, resources and power dynamics, to triangulate my own observational understanding of the dynamics within each case with the perspective of interviewees to be sure I accounted for assumptions. Formal interviews were recorded using a digital recorder whenever possible and when participants gave permission to do so and then interviews were transcribed in their entirety for analysis.

In my participant observer role and as an interviewer I made clear to the participants in the study of my role as both a researcher as well as a vested participant in the process of designing, developing, and implementing civic-oriented ICT. Taking this overt position, I interacted with over 100 individuals at meetings, events (such as Occupy or Tea Party protests), and in conducting interviews. Many participants elected to have their real names and positions used in this study. When individuals asked for anonymity, however, I created pseudonyms and generic position titles where relevant.

Coding

To analyze the data I collected through participant observation and interviews, I conducted emergent and thematic coding of transcribed interviews, meeting notes, relevant documents, and memos written during data collection and analysis phases of this project. Through this emergent coding process, I identified relevant and distinct themes related to the broad and overarching categories of values, resources, and power. I used emergent and inductive coding to conduct a two-step analysis. I analyzed the data to assign codes from the raw data and combed through transcripts to identify codes in a comparative manner that allowed me to constantly go back to previously analyzed data to ensure I had systematically assigned codes and to ensure distinction in codes. An ongoing list was created through this emergent coding process that I referred to regularly throughout all phases of analysis. As new codes emerged, I revisited previously coded texts to re-apply new codes. After coding raw data, I engaged in the second

level of coding which involved identifying similarities and patterns across codes, which were then categorized into broader overarching themes (Saldaña, 2012). In chapters 3 and 4, I reveal the significant themes I uncovered in relation to values, resources, and power within the four cases of community-based networked civic innovation. Themes focused on actions and processes such as network formation, types of values and value cohesion, as well as indicators of types of resources and power-sharing rules. Themes also addressed broader patterns that emerged across the cases such as the inclusion or exclusion of voice or use of technological frames in communication. To conduct coding of the documents, I used Dedoose, a web application for managing, analyzing, and presenting qualitative and mixed method research data.

Technology Assessment and Feature Analysis

In this study I evaluated technical artifacts in two ways. First, I focused on the technical artifacts that each network of innovation envisioned or produced. In both LVG and the Occupy cases, I was able to evaluate an actual artifact that was developed by the network of innovation to conduct a technical investigation of the project to specifically analyze the role of values. According to Friedman's blog post on the "Public Sphere Project" website (n.d.), "Technical investigations involve analyzing current technical mechanisms and designs to assess how well they support particular values, and, conversely, identifying values, and then identifying and/or developing technical mechanisms and designs that can support those values." I focused on the first type of analysis Friedman discusses and conducted retrospective analysis of existing technology, identifying, through analysis of the features, how each tool represented values of different stakeholder groups and how design supported or undermined these values.

In alignment with the mutual shaping approach, I observed and analyzed the interactions between users and technology. In observing the actions enabled or constrained through use of the Living Voters Guide and OccupyTempCheck tools, I carefully accounted for how technical

decisions reflected values of certain stakeholders and undermined power of other groups throughout different stages of innovation. Neither the Tea Party nor the Civic Communication Commons networks of innovation were able to progress to the point of developing a tool. However, the evaluation of discussions, meeting notes, design discussions, decisions, and interviews were analyzed to identify how various stakeholders envisioned the tool and how they reflected both values and power dynamics within the network of innovation as well as extended to the broader community.

Another way I accounted for the mutual shaping of technology and social actors was to examine the communication and technological ecology of each of the cases. In using the term "communication and technological ecology," I refer to the notion that the innovation process was embedded within an existing communication and technology environment in which a spectrum of communication forums and tools are available to a given community. Drawing from the media ecology perspective, I suggest that to understand the outcomes of each set of actors' attempt to innovate a new ICT for their intended community we must consider the broader communication and technology environment within which the innovation occurred. The envisioned or realized tools in LVG, PSCCC, OTC, and TPTC needed to account for the existing information environment and consider how their tool would fit into the system. Thus, I spent time assessing the communication and technology environments that existed at the time each case began the innovation process.

In assessing the communication environment, I drew from both offline participant observation of community meetings and gatherings as well as reviewing the online environment by examining the websites, platforms, and tools available to the different communities examined in this study. To that end, I provide a brief overview of the communication and technology

ecology within which each project was embedded in the case study overviews provided at the end of this chapter. I also refer to the ecologies throughout chapter 3 and chapter 4 as the contextual communication and technology environment surface as relevant to understanding the outcomes of the projects.

Identifying Indicators for Values, Resources and Power in Networked Civic Innovation

Using the qualitative mixed methods reviewed above, I collected and analyzed a wealth of data from the four cases studies. As patterns emerged in the data, I created useful constructs to provide comparison points across the cases. To this end, I developed indicators of the key concepts in the four cases in this study that reveal patterns within each case that I then compared to the other cases. In this section, I elaborate further on the concepts outlined in chapter 1 to identify how they are identified and evaluated in this study.

Distributions of Value Cohesion, Resource Capacity, and Power Sharing Across Cases

As I have demonstrated in the previous chapter, values, resources, and power—three facets of networked civic innovation evaluated in this study—can be examined at both the micro-level and meso-level of analysis. In chapter 1, I also reviewed the different types of values, resources, and power-sharing arrangements examined in this study at the different levels of analysis (see Table 1.1). I assessed the types of values at the micro-level by focusing on the level of *value cohesion* of members within the network of innovation. Analyzing values at the meso-level of analysis extended my examination beyond individuals to consider the level of cohesion between different stakeholder groups (e.g., network of innovation versus community members, users, or non-users) as well as between actors and the embedded values reflected in the technological artifact.

In analyzing resource capacity at the micro-level, I evaluated the *level of access* and the *types of resources actors within the network of innovation had and were* able to leverage. At the meso-level, I examined the network of innovation as a unit to ascertain the ability of the actors to leverage necessary resources and assessed if and how resources within the community of intended users were available to support the goals of the project. I examined power at the micro-level by identifying how different types of decision-making and power-sharing arrangements were established within the group and to what outcome. At the meso-level, I focused my analysis on the distribution of power between the network of innovation and other stakeholder groups, especially community stakeholders who influenced outcomes by adopting, adapting, or rejecting the technology upon implementation.

While each of the projects in this study have complex and unique dynamics to account for, I have made the case for their comparison based on both their shared traits as well as their differences. In this study, I show that the *distribution* of these types of values, resources, and power-sharing arrangements across the stages of innovation described above provide further and deepened understanding of the complex dynamics that shape innovation outcomes. To this end, I have operationalized the distribution of values, resources, and power as existing on a continuum from low to moderate to high. Table 2.1 below summarizes the operationalization of each of the three facets of networked civic innovation examined in this study.

For values, low distribution indicates that value tensions are most prominent in the communication and activities of relevant groups. When communication and activities are informed by both value tensions and values cohesion, distribution of values is considered moderate. When most actors shared most values and tensions were low, activities and communication are guided by value cohesion and distribution is considered high. When resource

capacity (access and ability to leverage for innovation goals) is limited to a minority of relevant actors, distribution of resources is considered low. Moderate distribution indicates a plurality of actors have resources capacity. Resources are considered highly distributed when a majority of actors have resource access and leverage resources to support innovation goals. Power is defined as the ability to affect decision-making outcomes and is focused on how power is shared across the group of relevant actors. When a minority of actors affects decision-making outcome, distribution of power is considered low. When a plurality of actors affects most outcomes, power is considered moderately distributed. When a majority of relevant actors affect decisions and power-sharing is dispersed across the group, distribution is considered high.

In operationalizing the distribution of value cohesion, resource capacity, and power-sharing in this way, I provide a framework to systematically account for and compare the complex dynamics between the three concepts across each of the cases. By tracing how the patterns of distribution of different types of values, resources, and power change and interact across the stages of networked civic innovation, I provide a longitudinal analysis at both the micro and meso-level of analysis. In applying this framework, unique conditions of values, resources, and power sharing that are generated by the actions of each group are identified. In the coming chapters, I argue that these configurations are important indicators that reveal why some civic innovation projects succeed and some fail to achieve innovation goals.

TABLE 2.1: Distribution of Values, Resources and Power

	Low	**Moderate**	**High**
Values	Value tensions are prominent in communication and activities	Both value tensions and value cohesion are present in communication and activities	Value cohesion is prominent in organizational communication and activities
Resources	Capacity to leverage and access relevant resources is limited to a minority of actors	Capacity to leverage and access relevant resources is distributed across a plurality of actors	Capacity to leverage and access relevant resources is distributed across a majority of actors.
Power	Ability to affect decision-making outcomes is concentrated in a minority of actors	Ability to affect decision-making outcomes is distributed across a plurality of actors	Ability to affect decision-making outcomes is distributed across a majority of actors

By analyzing how values, resources, and power are distributed during each of the periods identified through temporal bracketing, I provide insight into why and how LVG and Occupy TempCheck evolved and progressed from the Inception phase into the Integration phase while the Civic Commons and Tea Party projects stagnated during the Inception phase. I am also able to lend insight into how different distributions of values, resources, and power in the Integration phase contributed to the difficulty the Occupy network of innovation's experience in implementing their technology. In contrast, configurations of value cohesion, resource capacity, and power-sharing in LVG supported some degree of success in implementation as well as a return to design stages to iteratively update the tool to support the needs, concerns, and values of users.

I apply this model to the different stages of the process of innovation illustrated in the hypothetical model of the process of networked civic innovation offered in Figure 2.1. Thus, for each stage, indicators of value cohesion, resource capacity, and power-sharing distribution within

each network of innovation is provided. In doing so, opportunity arises to examine how the three facets of networked civic innovation interacted throughout different stages and how that led to or affected steps that occurred in subsequent stages of the process. Through my analysis in chapter 3 and 4, I show how the distributions lead to or are the result of different activities, actions, and events that occur in each case.

Furthermore, using this method, I show how distributions changed over time, then, linking to the process analysis framework, identify how changes reflected the actions, events, and activities that shaped changes in the network and eventually outcomes. Table 2.2 below illustrates a hypothetical application of the distribution model to the stages of innovation. In the hypothetical model, the process flows from one stage to the next. In the four projects in this study, however, this is not always case.

Table 2.2 Hypothetical Application of Distribution of Values, Resources, and Power across Process of Networked Civic Innovation

	Ideation	**Design**	**Develop-ment**	**Implementation**	**Post-implement-ation**
High	◆ ■ ●	■ ●	■		
Medium		◆	◆ ●	◆	
Low				■ ●	

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

In employing the various methods I have described above, this dissertation provides both breadth and depth in evaluating the complex dynamics between social arrangements, artifacts, and people across the process of civic innovation. Triangulation of data, collected with qualitative mixed methods, demonstrates how values, resources, and power interact within the context of community-based networked civic innovation to produce differing outcomes across four cases. In the following pages, I provide a detailed, in-depth review of the four cases studied and compared in this dissertation.

Case Overviews

In this section, I present each of the four cases I evaluated in this study of community-based networked civic innovation. I provide the background narrative for each case, including details of how the project began and contextual information that explains the environment within which the technology was developed. Additionally, I will introduce relevant actors and briefly discuss their role and engagement throughout the project trajectory.

Puget Sound Civic Communication Commons (PSCCC)

Background

In January of 2010, hosted by the Journalism That Matters (JTM) community in Seattle, a group of journalists, academics, citizens, and civic leaders from the Pacific Northwest gathered to discuss the future of journalism at an "unconference" held at the University of Washington. In small group discussions, large group workshops, and in private conversations, attendants shared their experiences, hopes, and fears regarding the changing information environment. They addressed some shared high-level concerns: How can we support communities to thrive in the changing information environment? What is the role of the community? What is the role of the journalist? Over 250 participants in the three-day conference focused on the topic of "Reimagining News and Community in the Pacific Northwest," which resonated deeply with the recent closing of the city's long-standing daily newspaper, the *Seattle Post-Intelligencer* and the local *King County Journal* and the recent downsizing of the *Seattle Times*. That day, a serendipitous introduction by the co-founder of Journalism That Matters, Peggy Holman, led to conversation between former journalist Anne Stadler and University of Wisconsin civic engagement scholar, Dr. Lew Friedland. This first conversation marked the beginning of what would be a two-and-a-half year project originally dubbed the Puget Sound Civic Communication Commons.

The original conversation between Anne, Lew, and Peggy focused on imagining something new and different that, as Anne described, "connected the collective energy and spirit of the PNW community with the deep tradition of journalism." Lew, well-versed in civic engagement and community building efforts, brought to the conversation a passion for civic innovation and presented his deep knowledge of "the commons" approach to connecting communities. Anne, a seasoned and retired PNW journalist committed to civic engagement, shared her ideas of "a hub" to connect communities and neighborhoods that cultivates civic culture and space. The chance conversation between the three flowed easily into a larger group discussion on day two of the conference where well over twenty people joined in the discussion. As the originally informal and private conversation expanded to a larger group of conference attendees it turned into a broader discussion of how to meet information needs of the Puget Sound community while capitalizing on the strength of both online tools and offline connections in a time where many felt the traditional means of civic and community information exchange were failing citizens.

As ideas bubbled up over the weekend, a few key players joined the conversation, either actively or as peripheral players, as the ideas generated resonated with their own goals and values. Mike Fancher, the former executive editor of the *Seattle Times*, a highly respected and well-connected member from the journalism community, had been thinking about the decline of the media environment for some time. Mike was particularly conscious of some of the well-established norms of journalism, including credibility of information and professional standards of information quality and sought opportunities to support those values in the new information environment. Jeff Vander Klute, a self-titled technologist, was drawn to the idea of the hub because of a deep interest in enabling community connection through technology. Rick Vander

Knyff, who was at the time a senior producer and project manager of MSN at Microsoft, was especially interested in developing an idea around the food community in the PNW and saw connections between the commons, his work with MSN News, and as a board member of a local non-profit dedicated to preserving local organic farms. Peggy Holman, who originally connected Anne and Lew, was motivated by her interest in supporting journalists as well as her thinking on social technology and engaging communities. Peggy was keen on pointing out that there was a need to connect online engagement to offline interaction.

The six original members of the network of innovation continued to informally discuss the project and decided to set up a series of public meetings in September 2010 designed to push the project forward. The three-day conference at Seattle City Center between September 23-25th was my first official engagement with the project. Twenty-two participants, including journalists, citizens, academics, and civic leaders joined, and notably, Diane Douglas, executive director of CityClub Seattle was in attendance. Diane's initial peripheral engagement in the early iterations of the project waned eventually, though she resurfaced during a final attempt to get the project off the ground in 2012. However, her attendance and engagement in the early meetings reflected the excitement of civic leaders in the Seattle area who were keen to participate in the creation of "the hub." In fact, her presence at the meeting gave some of the original network of innovation members more confidence in the project, as Lew explained:

> "… this is a certain form of evidence that this vision that these folks are articulating on the ground to people in the city is not kind of idiosyncratic. But there is something here, something here more than just sort of a couple of good utopian-sounding ideas. That in fact, the idea of a common platform for building civic connection across the community was at least making prima facie sense to people with resources and influence and willingness and ability to mobilize."

The meeting focused on understanding the notion of "the commons," grounded in both Lew's scholarship and Ostrom's (1990) work on common pool resources. This framing led to a

series of questions: What are common pool resources? How do we share resources? How to navigate the information overload environment to get people the information they need? How to catalyze and sustain the commons? At this first public convening, the potential network for the project included a diverse set of stakeholders. Major players in the Seattle technology field offered to help the group think through what kind of technology would best support the project, indicating willingness to volunteer time and effort to building a platform. Civic leaders offered to use their connections to citizen groups to gather information about what kinds of tools and services would be useful. Former and current journalists offered to connect their existing projects on mapping the news ecology to assist in designing the information components of the project.

However, the diversity represented in the earliest meetings waned significantly as the project progressed. As the core group of involved community members continued to convene, the project directions began to shift away from an information hub to smaller projects that in actuality reflected the goals and values of a few members of the original group as opposed to the diverse goals reflected in the first public meeting. As the network shrunk so did access to critical resources.

Visions of the civic commons platform underwent much iteration over the course of the two years as access to resources waxed and waned across time. Early on, we discussed creating a website that would have different portals focused on the key issues in the community. The portals were envisioned as something that anyone in the community could easily access and contribute to through easy uploading features and wikis. “Any community member could easily contribute a news story or share a resource they think others may need. The idea is the community creates the space together and contributes information they find relevant,” Anne said in an early meeting.

However, decisions made by a small group of actors shifted away from this vision. As is discussed in chapter 3, that decision resulted in reconfigurations of the network of actors involved with the project, which proved to be detrimental to fulfilling the goals of the project. A few remaining members attempted to revive the project after the initial loss of members, however, the need for resources continued to plague the effort. As resources were sought, new groups were brought into the project that had differing visions of the tool leading to ongoing value tensions that became the focus of network activity. Without the ability to effectively coordinate and organize actors to complete necessary innovation tasks, the project ultimately failed.

In the coming chapters, I show how the PSCCC project was one of strong intent, however, with ongoing value tensions and low resource capacity, network members had little ability to follow-through on those intentions. I demonstrate how value tensions and resource gaps overwhelmed the actors' ability to organize time and again, leading to network collapse at different points. As Table 2.3 shows, the PSCCC process of innovation never broke past the Inception phase, recursively cycling through ideation, design, and back to ideation again. In my own notes, I often referred to PSCCC as "Phoenix Rising," alluding to the ongoing attempts to revive the project at various times over the course of two years. However, ultimately the constant negotiation of values and the low access to resources in a network where a minority of actors held significant decision-making power was too much for even the most determined in the PSCCC network to overcome, despite their best efforts.

Contextual Environment

The communication and technology ecology, within which PSCCC developed was one that may have been ideal for such a project to thrive, had it been able to get off the ground. The 2009 Pew report, "The State of the News Media," sounded the death knell for traditional

journalism, reporting declines in revenue and staff across newspaper, local television, and ethnic press (p. 1). Audience migration to the web and the collapsing economy juxtaposed with the reluctance of journalism organizations and actors to innovate and embrace technology suggested a bleak outlook for creating sustainable revenue models. Cuts in staff and coverage contributed to growing concern regarding the information needs of citizens to act in their personal, civic, and political life. That same year, the Knight Commission on the Information Needs of Communities released a 2009 report acknowledging the critical moment in U.S. journalism history and called for stakeholders to recognize it as an opportunity to reimagine and reinvent journalism. The Knight Commission posed the following question to news organizations and journalists: "How can we advance quality, skilled journalism that contributes to healthy information ecologies in local communities?" (Knight Commission, 2009, p. xv). The PSCCC network of innovation took this question and the other recommendations of the Knight Commission to task in their endeavor to deploy new tools to strengthen the information ecology of the Seattle and Puget Sound region.

2010 was a difficult year for the different actors represented in the direct stakeholder group of the PSCCC project. With the 2009 closing of the *Seattle Post Intelligencer*, it became difficult to ignore how the changing economic and information environment was affecting the journalism community in Seattle. However, as Lew noted during the meeting at the Seattle Center, Seattle was a "remarkable space in that the information environment was vibrant with both the civic and tech sector flourishing." The presence of technology giants like Google, Microsoft, and Amazon, and a growing and strong local online community served as evidence of this. The intersection of technology, news, and community was rich ground for developing an abundant, local, and diversely representative information ecology. Mike Fancher developed a case study of the state of media in Seattle and found thriving, hyperlocal news communities

across the region (Fancher, 2011). He found evidence of collaborations between neighborhood blogs and legacy news media like KOMO TV and Radio and the *Seattle Times*. The Seattle news ecosystem also included independent place-based news sites and networks such as Next Door Media, which connected a group of popular Seattle blogs like myballard.com and queenanneview.com. Additionally, Mike highlighted collaborations between news organizations, non-profits like the Gates Foundation, and local universities like Seattle University as examples of innovative approaches to funding civic-minded news projects.

Moving beyond journalism and to provide a broader outlook on the state of Seattle community during the PSCCC project, I turn to the *Greater Seattle 2010 Civic Health Index* report from CityClub of Seattle. Using data from the national census and local data, the report provides analysis of six civic indicators—volunteering, neighborliness, belonging to groups, philanthropy, political voice, and voting—of the greater Seattle area (p. 1). Seattle, considered a leader in philanthropy, entrepreneurism, and innovation was also the city with the highest number of college-educated citizens (54%), an important indicator of civic engagement (Seattle CityClub, 2010). According to the GSCHI report, the percentage of Seattle citizens that participated in one or more non-electoral political acts (40.2%) nearly doubled that of the US/National average (21.6%). In fact, Seattle was higher than the national average across all of the other civic indicators except for neighborliness, and even that difference was not significantly lower. Importantly, the report found that Seattle was also extensively connected, with high levels of internet use.

However, the report noted significant differences in the civic engagement of educated Seattle citizens and those who were less educated. The report suggested that increased attention and resources to providing access to education was critical for sustaining high levels of civic

health. Generally, the report suggested that the civic environment for Seattle was flourishing but reflected inequality. The 2010 report provided important fodder to activate citizens, communities, and public and private actors to engage in projects that would support more sustainable civic engagement.

Given the state of the local media and information environment and the promising level of community civic engagement, Seattle, in 2010, appeared to be a ripe space and time for taking on new civic technology projects aimed at filling information gaps and connecting communities. As was described at the September meeting, to address the gaps in the information environment and build from the rich civic environment, "The Civic Communication Commons…wants to create an online commons that will serve as an information hub and conversation place for news topics and connecting citizens to one another." It appeared that the goals of the PSCCC project were well aligned with the existing communication and information ecology.

Table 2.3: Temporal Bracketing of Significant Time Periods in the Civic Commons Innovation Process

Civic Communication Commons	**Ideation** ***Fall 2010***	**Design** ***Spring 2011***	Ideation *Fall 2011*
Participants	Peggy, Mike, Anne, Lew, Rick, Leif, Jeff, Diane, 3 other Civic Org leaders, 5 journalists, 3 citizens, 3 technologists, Sheetal	Peggy, Mike, Anne, Lew, Rick, Jeff, Sheetal	Anne, Rick, Jeff, Chris, Diane, Sheetal

Living Voters Guide (LVG)

Background

In 2009, a group of researchers at the University of Washington began a conversation about developing a system to support effective public engagement and deliberation online. Travis Kriplean, a graduate student in the Computer Science and Engineering program at the

time, envisioned building a system to support a new type of engagement portal with the Seattle city government. Travis identified an important gap in public deliberation processes embedded in the networked public sphere: there was a tension between how citizen-generated information and input was collected and how it was then analyzed and used by public agencies. Public comment processes were often broken in that citizen input was collected late in decision-making processes and agencies did not develop useful mechanisms to collect, analyze, and respond to input, leaving citizens feeling disconnected and left out of decision-making processes. To address this problem, Travis began to develop the idea of a "socket" or a space in which information gathered from the networked public sphere could be collected by public agencies in a manner that allowed for iterative communication between citizens and public officials throughout decision-making processes (T Kriplean, Beschastnikh, Borning, McDonald, & Zachry, 2009)

In early 2010, Dr. Alan Borning, a professor in the Computer Science and Engineering program at UW and Travis' advisor, connected with Dr. Lance Bennett, a professor in both the Political Science and Communication Department, to further develop the idea with Travis. The researchers agreed to apply for a grant from the National Science Foundation (NSF) and developed a proposal for a project aimed at creating a public engagement system for the Seattle City Government. The grant was accepted under the Social-Computational Systems NSF unit in early 2010. The researchers aimed to answer a variety of questions of import to computer science as well as communication and political science scholars. The original proposal intended to address several questions of interest to researchers, as well as civic organizations, citizens, and communities:

> "How can systems effectively support mechanizing some tasks and making the remaining tasks easy for human participants to work on? How can systems effectively support understanding a range of positions, and highlight who is agreeing or disagreeing and why? How can engagement systems allow and encourage effectively building on others'

> ideas and opinions? How can they handle strategic activity in which interest groups may seek to undermine the input process by flooding the system with duplicate posts or by creating multiple accounts to create the impression of widespread support? How can input be effectively summarized and presented?" (NSF proposal, p. 1)

According to Alan, Lance, and Travis, the team originally proposed to work with the Seattle City Government, but a variety of "bureaucratic barriers" stood in the way of the team making progress on that front. The team then met with Diane Douglas, executive director of CityClub Seattle and a civic leader dedicated to community engagement in Seattle, to discuss collaboration. In shifting partnerships from a public agency to collaborating with Diane, some of the goals of the system shifted as well. Through a series of meetings in early 2011, a consensus-based decision was made to develop a citizen-powered voters guide instead of a public commenting system. The goal of supporting efficient aggregation of input from the networked public sphere was still primary, as was the desire to support public deliberation, by allowing users to not only share their own posts but to also read posts of others who may or may not have the same perspective. Additionally, there was an added goal of shifting power from political elites to citizens by creating a space where individuals could bypass top-down information flows and hear from one another without interference. The network of innovation expanded throughout 2011 to include UW graduate students Deen Freelon from the Department of Communication, Jonathan Morgan from Human Computer Design and Engineering, and Jessica Jones, a program director at CityClub Seattle. I joined the project in late 2010. Over time, I become more involved in the project, increasing my attendance to meetings and heading various mini-projects related to data collection, analysis, and marketing efforts.

The story of LVG is an important one to understand because, unlike the other cases in this dissertation, the network of innovation was able to achieve the intended goal of creating a citizen-powered voting information platform. According to Travis and Diane, since its initial

launch, the site has attracted over 20,000 unique visitors, growing and iteratively updating the tool every year. As an outlier case, some key characteristics of how the participants communicated, made decisions, and identified strategic partners helped to support, maintain, and sustain the project across various stages of the innovation process. For example, Diane's role as the head of a civic organization proved valuable at various points when network connections were necessary to either gather resources or connect to potential users.

In the coming chapters, I show how strong value cohesion, high resource capacity, and highly distributed power-sharing within this relatively small network of actors contributed to producing most intended innovation outcomes. LVG managed to transition relatively swiftly and smoothly across the Inception to the Integration Phase of innovation as is illustrated in Table 2.4. With the opportunity to trace this network's evolution into the post-implementation stage in the Integration phase, I provide relevant insight into how networks of innovation and the communication practices they attempt to transform continue to change and evolve, beyond initial deployment of technology into a community. In this way, this dissertation demonstrates, that technology is never entirely stable, as the actors continuously engage in the mutual shaping of communication practices, artifacts, and social arrangements across time. In examining how users put LVG into practice during the post-implementation stage, however, this study shows how transformation of community practices is difficult to achieve even for the most promising projects.

Communication and Technology Ecology

LVG was developed in a contentious political environment in 2010, with political polarization in Congress at an all-time high (Brownstein, 2011). In 2010, Republicans met President Obama's election in 2008 and the Democrat-only passage of the Healthcare Reform

bill with swift sweeping of Congressional power by capturing 691 legislative seats, 63 House seats, and 6 U.S. Senate seats (Silver, 2010; Murray & Montgomery, 2010). Voter polarization was prevalent and left important partisan marks on the political landscape, demonstrated by the emergence of the Tea Party, a conservative social movement that formed in early 2009, largely in response to the election of President Obama. Republican candidates voted into office in 2010, who aligned themselves with the Tea Party activists, moved significantly to the a more extreme level of conservatism than of the previous class of Republican congressmen and women (Skocpol & Williamson, 2012). Beyond voters and Congress, in early 2010, the U.S. Supreme Court also played into the partisan atmosphere by rejecting spending limits on corporations and unions in candidate elections, commonly known as the Citizens United ruling, in which the court was divided along liberal and conservative lines (Liptak, 2010). Partisanship and polarization had achieved record levels across the U.S. political landscape.

Moving to the local environment where LVG was first designed and deployed, Seattle appeared a prime area to deploy a citizen-powered voters guide. As mentioned in the previous case study on PSCCC, Seattle's civic health index scores were high and the general online connectedness of the community was also high. Additionally, there were few interactive online voters resources available to Seattle voters. Seattle and King County voter resources in 2010 included access to online voters guides and pamphlets from state organizations and institutions (e.g., King County Voters Pamphlet, Washington Secretary of State Voters guide) from various political parties and groups (e.g., Progressive Voters Guide, King County Republicans Endorsements) that were all one-way forms of communication with which the user cannot engage. The Video Voters guide, made available by the Seattle Channel (a local Government Access station) was one exception to text-based voter resources available to Seattle citizens.

Ballotopedia was recognized as the only other relevant online voting information tool. The platform describes its intent and purpose on its website as:

> "…an encyclopedia about American politics and elections. Our goal is connecting people to politics by providing accurate and objective information about politics at the local, state, and federal level" (Ballotopedia.org, About page).

The website is run as a wiki in which registered users can contribute information about ballot measures that then undergo a process in which additions are evaluated in regards to veracity, neutrality, verifiability, and accuracy. The neutrality position adopted by Ballotopedia in particular differentiated the goals of LVG from Ballotopedia, creating a space for a symbiotic relationship between the two platforms as opposed to competition. LVG's development was thus situated in a contentious political environment at the national level and in a city where citizens were tech-savvy, educated, civically active, and well-connected but had little opportunity to participate in online political expression on electoral matters. The LVG network attempted to leverage the existing environment and was ultimately able to build a platform that fed a particular niche in the existing communication and technology ecology.

Table 2.4: Temporal Bracketing of Significant Stages during LVG Innovation Process

Living Voters Guide	Ideation *Winter 2010*	Design *Spring 2010*	Development *Summer 2010*	Implement-ation *Fall 2010*	Post-Implementation Iteration 2 *2011*	Post-Implement-ation Iteration 3 *2012*
Particip-ants	Diane, Lance, Travis, Alan, Deen, Jonathan, Jessica	Diane, Lance, Travis, Alan, Deen, Jonathan, Jessica	Diane, Lance, Travis, Alan, Deen, Jonathan, Jessica	Diane, Lance, Travis, Alan, Deen, Jonathan, Jessica, Sheetal,	Diane, Lance, Travis, Alan, Sheetal	Diane, Travis, Alan King County Librarians,

Occupy TempCheck (OTC)

Background

In October 2011, Steven Ochs and Mark (pseudonym), two participants in the Occupy Seattle movement, separately contacted the researchers and developers behind ConsiderIt and Reflect (the same core technology used in LVG), regarding their desire to discuss ideas for new technologies to support the goals of the local Occupy group. I was involved in this project from the first meeting held on November 16th, with Steve, Mark, Travis Kriplean, Dr. Alan Borning, and Dr. Lance Bennett where we met to discuss potential opportunities for collaboration. Over the course of the discussion, we found shared interest in supporting the needs of Occupy participants through design and development technology.

During the meeting the group discussed broad goals, desires, and concerns of the Occupy participants who laid out several important priorities and goals for whatever technology development the larger group took on. These included: the desire to build the Occupy movement in ways that are consistent with Occupy principles and practices, keeping emphasis on the face-to-face nature of the Occupy camps, increasing engagement, overcoming apathy issues within the community, promotion of listening and sharing of information, and supporting honest and non-disruptive engagement through transparent communication and participation.

Early discussion focused on the development of web platforms and potential mobile phone apps to support Occupy members' participation in different activities and tasks to promote the message of the movement. Over the course of two more meetings in late December 2011 and January 2012, the group continued these discussions, zeroing in on possibilities for the technology. In early January 2012, Steven Ochs suggested inviting Dana S., an Occupy contact he had in New York City, to the conversation via Skype. Dana was part of the Occupy Wall

Street community in New York City and an active member of the National Tech Operations Working Group for Occupy Wall Street. This group was comprised of individuals who were dedicated to "facilitating communication within the Occupy movement" by developing new and organizing existing platforms to support connection, interaction, and engagement across Occupy camps.

Through the early Skype calls, we learned that the National Tech Ops team was interested in identifying ways to support General Assembly decision-making processes[3]. A well-documented issue with Occupy, and one that I witnessed through my attendance at several local Seattle Occupy meetings, was the difficulty General Assemblies met in developing an efficient way to debate and make decisions on proposals presented by participants and camp members. The general consensus-based decision-making approach, together with the decentralized power structure adopted by many Occupy camps, led to lengthy discussions and conversations regarding each proposal. It proved to be a time-consuming process that many participants felt took energy and momentum away from the important organizing, coordinating, and mobilizing work that could occur during face-to-face meetings. Capturing this frustration, one attendee turned to me at a GA meeting held on the UW campus. "Are we ever going to make a decision and do something, or is this going to be all we do for the next two hours? I have to get home to my cats."

Additionally, as Dana pointed out in our first meeting she attended, holding decision-making votes only during GA meetings left out any supporters, sympathizers, or participants who were unable to attend on-the-ground meetings. As of January 2012, few Occupy camps had

[3] General Assemblies were the primary decision-making body of the Occupy Wall Street movement. Meetings of the GA were organized to bring together participants to discuss, debate, and act upon initiatives proposed by members of the assembly. Assemblies were often locally organized and face-to-face meetings.

devised systems or processes to address these issues. As many camps had been shut down by this point, these GA meetings were necessary to keeping people connected but time-consuming processes weighed them down. Through my interviews with Occupy participants around the country, I learned that the Occupy camp in Portland had developed a proposal to allow for participation via LiveStream, granting remote voters the opportunity to participate in GA meetings. Elsewhere, Boston camps experimented with live blogging and NYC experimented with digital polling through wireless remotes. It was clear that camps were innovating new ways to communicate during GA meetings and some of these methods accounted for remote participation. The OTC network of innovation saw potential for the ConsiderIt and/or Reflect technology to support their goals of providing a tool that could be implemented across camps nationwide. The issue raised by Dana was a shared concern of the UW developer team though less of a concern for the local activists.

As is discussed in chapter 3, the original network reconfigured by early 2012, as a result of this value tension regarding remote participation. Two different visions of the purpose of the technology illuminated a key difference in the two groups assessment of varying forms of activism and participation. Steven and other Seattle-based participants communicated a strong desire to build a mobile app that would increase face-to-face participation, underscoring the firm belief that ultimately, mobilizing on-the-ground activists was the most important task at hand for the local Occupy camp. While there was broad recognition that it was important to increase this type of mobilization, the developers needed to weigh their available resources to identify what would be the most effective and productive use of their time, skills, and labor. One of the UW developers, Christoph, decided to spend his time supporting the local Seattle project, while the rest of the developer team focused their energy on pursuing the development of a web-based

platform for the National Tech Operations team. The non-Seattle focused team decided to use ConsiderIt as the foundational platform for the tool. Thus, the newly reconfigured network of innovation shifted their focus to developing a tool that allowed online Occupy participants or sympathizers to participate in deliberative communication regarding GA proposals. The remaining members felt this would allow for broader input and participation while also streamlining the face-to-face deliberation process by moving parts of it online.

The OTC network of innovation seemed to constantly reconfigure as new members moved into and out of the project, creating new connections and then disconnecting. This reconfiguration occurred in both the Inception and the Integration phases of the process as is evident in the different actors that cycle in and out of the project throughout the process of innovation (see Table 2.5). The fluctuations in the group proved to be somewhat problematic for the project even though they adopted consensus-based communication processes similar to LVG. Despite delays caused by developing consensus in a large group, a tool called Occupy TempCheck was ultimately developed and launched into the Occupy community. But, as I will demonstrate in the coming chapters, the reasons for the early cleavage in the network of innovation in the Inception phase proved important to identifying a value tension and an underlying power tension within the activist community. Those conflicts of interest ultimately truncated the potential of the project during the Integration phase, as is discussed in chapter 4. The same concerns Steven and other local activists held regarding remote participation were present within the broader community when we deployed the project, which led to resistance to implementation that we could not counter.

Communication and Technology Ecology

When the Occupy TempCheck project first began, the Occupy Wall Street movement appeared to be in a state of slow decline with lower levels of coordinated action and participation

when compared to the high levels of protest activity that took place in September and October of 2011. The Occupy communication and information ecosystem was composed of a complex network of online and offline spaces for interaction. Offline, the local physical camps were critical for maintaining the message of the movement to physically occupy spaces and were sites for participants to congregate, hold GA meetings, mobilize action, and coordinate camp activities. As camps were shut down across the nation, Occupy participants began finding alternative sites to meet. For example, the Occupy Seattle camp relocated several times between Westlake Park, City Hall, and the Seattle Central Community College campus. Eventually, General Assembly meetings were held during the day at the Washington Trade and Convention Center in downtown following the shutdown of the camps. People continued meeting for months following camp shutdowns as offline and face-to-face activity was a crucial means of communication for Occupy participants. Standing in the lobby of the Seattle convention center on a particularly wet and dreary February night, I asked one relatively young activist to explain to me why he came to the meetings held in convention center each week. He responded, "Face-to-face meetings matter the most. It's where I connect and see who stands in solidarity with me…" The ability to connect, have direct communication, and develop trust-based relationships was valuable for many Occupy participants and offline meetings supported these needs.

Online, Occupy had a wide range of tools and platforms available to support local and national efforts. In conducting an inventory of the different types of tools used by Occupy participants, I found a wide range of technologies including: local and national level coordinating websites, Facebook pages, Twitter accounts, Livestream feeds, Meetup group pages, and importantly, a suite of open source tools created or sponsored by the National Tech Operations team who hosted a wide array of tools on the Occupy.net website. They describe the purpose of

the website as,

> "Occupy.net provides people with the software tools that align the values of the #occupy movement. All of the tools offered here are free/libre/open source; part of the global information commons, maintained by communities, not corporations" (Occupy.net, Homepage).

Given the diverse tools available through this one website, it is evident that the communication and technology ecology of Occupy is robust. Categorized by headings including "wiki," "map," "notes," "campaigns," "forum," "classifieds," and "directory," the website offered many tools to support organizing, meetings, connection-making, and communication. In addition to these tools, many local groups had developed their own tools or spaces using simple technology like emails, online web meeting websites, and Facebook pages. However, as I navigated through the Occupy.net website, it was clear that it was possibly overpopulated as many of the tools didn't seem to get much use, with very few contributions or indications that groups were actively integrating the tool offered into their processes. In hindsight, this may have been an important indicator for our network to account for in ensuring there was a clear need and purpose for the tool articulated by the community.

The communication and technology ecology in Occupy was diverse and robust, which suggested that the OTC tool would likely be in competition with other tools, despite providing novel means of supporting GA decision-making processes. In fact, as I show through my analysis, this did become a significant barrier to implementing the technology in the Occupy community. Whether it could be considered overpopulated is up for debate, but it was clear that there was no shortage of technology available to support participant communication, organizing, and mobilizing activity.

Table 2.5: Temporal Bracketing of Significant Time Periods in the Occupy TempCheck Innovation Process

Occupy TempCheck	Ideation *Nov 2011-Jan 2012*	Design *Spring 2012*	Development *Spring 2012-Summer 2012*	Implementation *Summer 2012*
Participants	Travis, Alan, Lance, Steven, Marc, Dana, Ed, Christoph, Sheetal	Travis, Lance, Alan, Sheetal, Dana, Ed, 2 members of NYC Technology Group,	Travis, Alan, Lance, Sheetal, Dana, Michael, 7 other Technology Group members,	Michael, Dana, Travis, Sheetal, National Gathering participants (users)

Tea Party Technology Collaboration (TPTC)

Background

On April 21st, 2012, the University of Washington's Librarian Symposium "Taking it to the Streets" brought together a panel of activists and scholars to discuss recent activism in both Tea Party and Occupy. Though I presented my recent research on Occupy Wall Street during the panel, I had a chance to connect with Tea Party scholars and activists. After listening to my in-progress ethnographic-based observation of Occupy's organizational and technology practices, a local Tea Party activist named Woody approached me after the panel. Woody, who was a National Level Coordinator for the Tea Party Patriots organization at the time, thanked me for conducting embedded research of the community I studied and then suggested connecting me to local and national level Tea Party activists if I had any desire to conduct similar research with them.

Building from my presentation, which focused on the Occupy TempCheck design and development process, I suggested that potential collaboration with the UW developer team to develop tools to support the Tea Party activists might be fruitful for both parties. Woody enthusiastically explained that it could be a timely project as he was just discussing with other

coordinators how to improve the online presence and tools that Tea Party Patriots offered to their supporters. He invited me to attend an upcoming Tea Party Patriot meeting to get a sense of how they meetings are run and then introduced me to several other Tea Party activists in the room, including Sally Oljar and the co-founder of Tea Party Patriots, Jenny-Beth Martin. Alan Borning was also in attendance that day and connected with the activists.

Alan and I reconnected with Lance and Travis after the meeting and as a group, decided to pursue the collaboration further. However, our ability to connect with the Tea Party team was limited from the start as an outsider of the community. However, Woody graciously invited me to attend several TPP meetings he led, providing an opportunity to understand the importance of face-to-face meetings to members of the movement. I was able to observe how and if technology was implemented either during or as follow-up to meetings. I also had a chance to observe the value of trust within the organization. However, my attempts to connect with lay members, local coordinators, or even the national coordinators that Woody had already introduced me to, were frustrated and often required multiple follow-ups. The UW team attempted to reach out to several different coordinators, including those I met at the meeting, but our communication stopped short with the TPP team agreeing to review and discuss the collaboration but postponing actual meetings.

Serendipitously, in the summer of 2012, one of my undergraduate students, Nathan, asked if he could get involved with the project, as he had worked closely with the Americans for Prosperity group. Nathan helped reconnect the UW team to Keli Carender, who was Jenny-Beth Martin's co-founder of the national Tea Party Patriots organization and a Washington state coordinator for the group. Keli, somewhat younger than the other individuals we had connected with at that point, felt strongly that technology could support the broader goals of the Tea Party

community. At one Seattle Tea Party Patriots meeting she presented at, she challenged the members to, "…acknowledge the power of the Obama 2008 and 2012 campaigns and embrace technology to fight tooth and nail to have our voices heard. Not just in Seattle, but around the nation."

In my individual discussions with the various coordinators, including Steven Davies who was the National Technology Coordinator for TPP at the time, I learned there was interest in finding ways to connect leadership to lay members. During early discussions and in interviews, Keli and Steven both discussed the difficulty they had with getting their supporters to track on their current websites, Teapartypatriots.org. The idea of integrating a polling tool to the website emerged as we discussed means to connect lay members to coordinators. The developer team proposed integrating a platform similar to what he had developed with Occupy that allowed for members to provide input and indicate on a scale their support of proposals offered by the coordinators. Originally, members of the coordinator team voiced support of such a project. However, in subsequent conversations and interviews, there was a degree of caution expressed around how much to get everyone involved with every decision. Despite what appeared to be making critical connections for Steven and Keli to move the project forward, this project failed to move past ideation as different visions of the tool emerged between the UW developer team and the National Coordinators, which is discussed further in chapter 3.

In the coming chapters I will detail how values and important, and often overlooked, resources like network connections are critical at even the earliest stages of innovation. Additionally, a major barrier to progress from even the earliest stage of the Inception phase in TPTC was the challenge that early visions of the technology posed to existing power dynamics across the Tea Party Patriots organization.

Communication and Technology Ecology

Tea Party Patriots is just one of many loosely affiliated organizations under the banner of the Tea Party. While the Tea Party Technology Collaboration focused on designing and developing technology within TPP, the communication and technology ecology that is relevant expands beyond the TPP microcosm (Skocpol and Williamson, 2012). Through participant observation of meetings and websites, platforms, and tools and through extensive interviews with Tea Party members, I identified a large network of communication spaces that were at times connected but more often existed in silos.

In attending Tea Party meetings, it became clear that face-to-face meetings were often the only means of communication for certain participants. One woman at an Issaquah meeting told me she learned about meetings because of the newspaper announcements. "I don't subscribe to emails or anything. Not worth my time." Other interviewees shared this sentiment, also indicating their apprehension to participate in forums or listservs. Face-to-face meetings were important sites of connecting members to one another, sharing relevant information, and importantly, coordinating and organizing members to participate in various forms of action. Often, meeting leaders would indicate that more information could be found on the local website, but it was clear that few individuals went to these websites. Participants primarily preferred meetings and email.

Regardless of the use of such online spaces, the Tea Party affiliated online network is expansive. For example, 1.3 million users "like" The Tea Party Patriots' official Facebook page and over 100,000 accounts follow the official Twitter for Tea Party Patriots, @TPPatriots. Additionally, Tea Party Patriots has an organizing website (www.teapartypatriots.org) as well as a robust community on the Ning social networking platform. These spaces are used to exchange information, provide opportunities for supporters to share their stories and opinions, and to

connect and organize activists. These different online platforms are rarely connected to one another nor are they highlighted during meetings.

One particular communication forum, however, surfaced through interviews as uniquely connective of both offline and online TPP communication practices: weekly conference calls. Tea Party Patriot national level coordinators organize weekly phone calls with regional and local coordinators to exchange information with the grassroots organizers and to announce upcoming actions. During the call, the national coordinators use a web conferencing tool to chat with one another and write notes. While the chatting remains private, notes are later sent out via email to regional and, sometimes, local coordinators. Access to the phone calls is limited to regional directors who are provided information for log-in. As is discussed in chapter 3, this was due to privacy concerns that were often voiced by Tea Party activists at all levels in informing their technology use.

The communication and technology ecology within which the TPTC project was embedded was rich and robust, but also in many ways disconnected. Websites were siloed off from other affiliated Tea Party organizations, and in some ways, the Ning community was redundant to the TeaPartyPatriots.org website. Most importantly, it was clear that at the time of our connection, the TPP members were not using the Tea Party Patriots' main website. In regards to the original intent of the project, building a tool to connect local members to the decision-making processes, the only other tools to collect input from lay members were Facebook polls and the weekly conference calls. In many ways, the technology discussed in early conversations with TPP coordinators would have filled a particular niche left void at the time.

Table 2.6: Temporal Bracketing of Significant Time Periods in the Tea Party Innovation Process

Tea Party Technology Collaboration	Ideation *Spring – Summer 2012*
Participants	Sheetal, Alan, Travis, Lance, Woody, Nancy, Keli, Steven,

Chapter Summary

In this chapter I have provided conceptual and analytical frameworks that are applied to the four cases examined in this study. Using temporal bracketing strategy I identify both *phases* and *stages* across the process of networked civic innovation. These temporal boundaries provide means to both compare across cases, as well as examine the different activities that take place within each temporal unit. I also situated this study as one focused on *the process* of civic innovation, which means analysis focuses on the actions, activities, and actors involved in each case in addition to the technological artifacts that are produced. As this is a comparative case study analysis, I reviewed the goals of case studies and showed how the questions of "why" and "how" are applicable to understanding the process of networked civic innovation and how it unfolded in each case. I also discussed the particular methods used to conduct process analysis that include participant observation, interviews, and coding. Qualitative methods, I argue, provide appropriate means to assess the networked nature of the innovation processes examined in this study.

Additionally, in this chapter, I offer a framework for measuring the distribution of values, resources, and power. Applying this model provides rigorous means to identify and assess patterns in the process of networked civic innovation across the cases. Thus, in the following

chapters I apply this model to analyze how different conditions of values, resources, and power shaped the innovation outcomes for each case.

I closed this chapter with an in-depth overview of each of the cases examined in this study and contextualized each project within cultural and historical settings. In the case study overview I introduced both the temporal boundaries examined in each study and identified the key participants in each case. In the following chapter, I evaluate each of the four cases during the Inception Phase of the projects, providing analysis of the processes that occur during the ideation, design, and development stage.

Chapter 3: Formations, Translations, and Encoding: The Micro-processes of the Inception Stage of Networked Civic Innovation

Introduction

Designing and developing communication technology to create change in community communication practices is a dynamic process involving a set of actors representing a wide range of interests. Successful coordination of largely volunteer-based networks of actors with diverse—and at times divergent—desires, values, and goals for the implementation of technology in a given community is especially resource-intensive. A wide range of barriers threatens the success of the project throughout the process of innovation. The four cases examined in this study resulted in varying outcomes with all but one project resulting in failure to achieve intended outcomes. However, some projects progressed further in the process of innovation than others did. The broad aim of this dissertation is to provide insight into why some projects advanced in their goals and why others did not. In this study I demonstrate how the interactions of values, resources, and power across *all* stages of the innovation process can lend researchers and practitioners deeper understanding into the varying outcomes of innovation.

Van de Ven (1995) described the process of innovation as achieving desired outcomes through "the development and implementation of new *ideas* by people who over time engage in *transactions* with others within an institutional *context*" (p 591). This chapter focuses on the analysis of the first stages of the process of innovation in informal civic networks by examining how ideas, people, transactions, and interactions lead to civic innovation outcomes. These interactions are examined in the four cases introduced in the previous chapters: the Living Voters Guide (LVG), Occupy TempCheck (OTC), Puget Sound Civic Communications Commons (PSCCC), and Tea Party Technology Collaboration (TPTC). The need for explaining why the *process* of innovation succeeds or fails through a network perspective has been expressed in

previous literature, most notably by actor-network theorists (Latour, 1998; Latour & Woolgar, 1979; Law & Callon, 1992). I expand upon these studies by examining the role of values, resources, and power and demonstrating how their interactions create organizational conditions of innovation within informal civic networks. As findings show, these conditions must be negotiated sufficiently or the actors risk failure in achieving innovation goals.

In the previous chapter, two distinct phases of the process of networked civic innovation were identified: the Inception Phase and the Integration Phase. The types of actors involved and the activities undertaken to achieve distinct innovation goals characterize and distinguish each phase from the other. This chapter focuses on the *Inception Phase*. In this phase, analysis of values, resources, and power is examined in the context of the first three stages of networked civic innovation: Ideation, Design, and Development. Others have identified this phase of innovation as the "design mode" as opposed to the later stages called the "use mode" (Orlikowski, 1992), also acknowledging that human action occurs both before and after implementation of a technology. However, much of technology implementation study focuses on the later stages, ignoring the effect of social and political processes that occur during the early stages (Leonardi & Barley, 2010). This chapter addresses that gap. Analysis focuses on the actions, activities, and the interaction outcomes of the group of actors—the network of innovation—that lead the effort to design and develop a communication technology in a given community.

Social Construction of Technology (SCOT) research has provided some insight into the influence of actions and choices of producers and users on innovation outcomes in industry contexts. These studies show that in such contexts the power of producers in influencing the design of technology is higher than that of consumers (Klein & Kleinman, 2002). Consumers, as

Williams and Edge (1996) explain, "have little opportunity to engage upon the design and development of such artifacts (e.g., domestic goods) other than veto power to adopt or not," (p. 878). However, in the context of community-led civic innovation this is not the case. In the projects examined in this chapter, actors representative of user communities are deeply involved in design and development and are, in fact, *leading* the process. Designers, then, are not a homogenous group of engineers or technologists, and in this study are not treated as such. Whereas previous studies draw such boundaries, in these cases actors are not confined to "producer" or "user" roles. In fact, as Value Sensitive Design (VSD) literature notes, at times individuals can fulfill multiple roles, acting as both a user *and* a designer, thus blurring the lines of power. The range of actors who are involved in and influence the trajectory of community-led innovation efforts is broader than those involved in traditionally examined settings and, as is demonstrated in this chapter, the power dynamics between them can be more complex. This is the case for participants in the projects evaluated in this study.

Through analysis of the dynamic processes involved in community-led innovation, this study extends upon previous research and demonstrates how values, resources, and power interact with one another, configuring in unique ways that create a set of organizational conditions that can facilitate *or* undermine innovation processes. Additionally, this study shows how the *explicit* goal of the network—to create a technological artifact to support communication needs in a given community —requires that the network adequately address the *implicit* goal of coordinating and organizing a diverse set of actors to achieve tasks necessary to support the explicit goal. Analysis reveals that to address both the implicit *and* explicit goals, actors must negotiate the values, resources, and power dynamics created by the actions and interactions of actors within the network of innovation.

The aim of this chapter is to answer in part, the question: *how do values, resources, and power affect the first three stages of technology innovation undertaken by informal civic networks aiming to transform current communication practices in their community?* In answering this question, I have identified a set of *micro-processes* that occur in the early stages of the process of networked civic innovation. This chapter begins by demonstrating how these micro-processes both create and are created by unique configurations and conditions of values, resources, and power. A comparison of values, resources, and power is then provided for each stage of the Inception Phase. This reveals how distribution of value cohesion, resource capacity, and power sharing, created conditions that led to stabilization, expansion, or contraction of the actors in the network of innovation and supported progress, stagnation, or dissolution of the project. Connecting the social processes to the technological artifacts, values and power dynamics are also evaluated through technical investigations of the platforms successfully developed in two of the cases, Living Voters Guide and Occupy TempCheck. Here the connection between the social and technical is examined to show how the values of persistent stakeholder groups are encoded into technology.

Ideation: Creating Conditions of Innovation through Formation, Decision-making rules, and Visioning Processes

Through ongoing participant observation, I observed the process of innovation in four civic networks. Through fieldwork, I observed a series of micro-processes that were both shaped by and reflective of values, resources, and power dynamics within each project. In each case I identified three distinct micro-processes that occurred during the ideation stage, which I classify as: a) formation of the network, b) establishing governance rules through decision-making processes, and c) a process of visioning. Initial conditions and conditions of values, resources, and power were established during the ideation stage. In this section, discussion begins by

examining formative micro-processes as they unfolded in each case and with what outcome. Following is a discussion of the values, resources, and power distribution at the end of the ideation stage and an explanation of how these configurations resulted in ideation outcomes for each project.

Formation of the Network of Civic Innovation

Previous studies on the formation of networks of innovation have focused on bureaucratic settings and show that there are both informal and formal means to form networks (Freeman, 1991). Depending on the level of formality, the process is initiated either contractually or created through interpersonal connections and informal exchange of information and agreement to collaborate (Freeman, 1991). In the four cases in this study, the formation process was informal initially and participation was voluntary. Actors were not required to participate in the projects, but rather, elected to participate. The formation process of the initial network of innovation occurred similarly in each case.

As detailed in the previous chapter the initial meetings regarding the project occurred in conversations between a small set of actors. During those conversations the first step leading to formation of the networks was realized: the recognition that *resources* would be required to bring the project into fruition and that collaboration with others would be necessary to draw those resources to the project. This need for resources is a common motivation identified by other researchers who examine networks of innovation in firm settings (Powell & Grodall, 2005; Brass et al., 2004). Gaps in knowledge or lack of access to information or materials are antecedents to creating and forming collaborations between and within firms (Ahuja, 2000; Swan, Newell, Scarbrough, & Hislop, 1999). These same factors motivated the initial extension of invitations to other groups in each of the cases in this study.

In LVG, the desire to connect with a community organization was necessary in order to increase access to citizens that the developers and academics did not have. Diane's access to network connections as lead of a civic organization was a valuable resource that the developer team (Alan, Lance, and Travis) did not have. When Anne and Lew first discussed the Civic Commons project they also realized immediately that they needed a diverse set of participants that could provide access to material resources, informational resources (especially technical expertise), and network connections. In the Tea Party, the desire of developers to invite activists to participate was due to the knowledge gaps they had regarding the communication needs of Tea Party activists. Additionally, they needed network connections to the activist community. When Steve from the Occupy project explained his desire to connect to the developer group to create technology for the local camp, he identified his motivation for gaining access to technical expertise as the primary factor and material resources as a secondary factor. In each case resources were primary motivators for expanding the project and inviting a broader group of participants.

Extending invitations to potential resource connections was then the next step in the formation process. The groups differed slightly in how invitations were extended. As described earlier, the approach of participants in LVG was intentionally limited to a small strategic set of collaborators. In the Civic Commons case, invitations were offered less formally to anyone willing to engage. The approach to invitation in the Occupy and Tea Party cases ranged between invitations being extended strategically at first, then an open invitation to others remained in place throughout the interactions. Though a broad range of actors were involved with each project, the Civic Commons project attracted the most diverse set of actors using the open invitation approach.

Once the invitation to participate was extended what led others to engage in the project? The next step in the formation process was the decision made by actors to participate in the project. Studies on collaboration suggest that cognitive proximity, or the similarity in expertise and experiences, is a main driver of participation in collaborative innovation efforts (Boschma, 2005). However, the diversity of expertise and experiences of participants in LVG, OTC, PSCCC, and TPTC was prominent. Interviewees identified themselves as technologists, academics, designers, citizens, journalists, civic leaders, and activists. These varying roles represent a broad set of expertise, interests, and experiences and research suggests that some diversity is important in such efforts to avoid lock-in or groupthink that can hamper innovation (Visser and Boschma, 2004; Boschma, 2005). As is shown later in this chapter, the cognitive distance present within some cases proved challenging when it came time to narrow down the scope and goals of the technology. However, as is shown in the following chapter, high cognitive proximity prevalent in other cases limited their ability to achieve the explicit goals due to lock-in.

Given the diversity of backgrounds and experiences represented in each group (e.g., journalists, civic leaders, activists, technologists), cognitive proximity was not enough to explain participation in the civic innovation projects in this study. In conducting interviews and attending and participating in group meetings I observed that a different motivation emerged: resonance with shared technological values, or values as they play out with respect to technology, repeatedly surfaced as the reason participants across all four projects elected to participate in the civic innovation process.

Participants revealed that a commonality that drove their engagement in the civic innovation projects was the sense that the project reflected shared technologically-oriented

values, goals, and desires for the community. In addition to a common understanding of the communication needs of the community, participants shared a collective view that technology could play a central role in addressing those needs. These values, in the context of the goals and purpose for the project were communicated through emails, interpersonal conversations, group meetings, and informal discussions.

Participants in the PSCCC network, one of the most diverse groups in terms of types of stakeholders, were asked to share their reason for joining the project at the first meeting. One civic leader stated, "I was generally interested in using technology to support civic causes… I saw a need in the community to fill certain information gaps and creating an online commons was an answer that I could see as a plausible solution." Another participant, a technologist, echoed that notion and explained his interest in "the connection between technology and community-building plus journalism."

Similarly, the participants in LVG, OTC, and TPTC echoed key values they felt were resonant with the broad aim and purpose of the projects. Dana, a primary participant from the Occupy National Tech Operations Group in New York said, "I think what got me excited was the goal with this particular software. Prior to connecting [with the University based developer group] it was just a lot of emails and people talking loosely about improving decision-making. This project was actually supporting online participation and efficiency through the software and I liked that."

When a Tea Party Patriots national leader answered why she was initially interested in collaborating with the developers to create a communication tool, she also echoed the sentiment that technology was an opportunity to create connection in the activist community. Nearly every participant in the LVG network of innovation said they saw others in the group share a common

desire to increase participation and promote information exchange through technology. Additionally in LVG, a shared commitment to deliberative communication emerged in the very early stages. Participants believed technology could be used to support this value and improve web-based political discussion.

Resonance of technology-related values and goals was a fundamental reason for participating in the innovation effort according to participants across all four cases. Initial communication regarding the scope and goals of each project addressed the desire to use technology to *increase access to information*, *to connect community members to one another*, and *to increase participation in community processes*. In the section below I will briefly describe each of these values that played a prominent role in enrolling participants to engage in the civic innovation projects.

Civic Technology Values

Increased Access to Information

Increasing information access refers to the notion that technology can and should provide means for community members to easily access relevant information that supports their individual or community needs. Technology that provides or increases access to relevant information was highly valued by each group. In LVG, Diane articulated this value as she explained,

> "Well, first and foremost, creating an educational tool for voters around these prolific [laughs] ballot measures, taking back the power from political pundits and experts and partisan groups and corporate and other moneyed factors to say like, 'You know what citizens, fellow citizens? It's up to us. We need to have this conversation among us.' So that was key. 'It's up to us. We're all in it together. We have to decide together. To do that we need to share our ideas and thoughts with one another.'"

The early Civic Commons discussions focused on information access as the primary function of the tool, with materials explaining that the goal of the project was, in part, to "maximize

availability of relevant credible information…" (CCC Action Plan, 2011). Activists in Occupy and Tea Party also described technology as a means to create increased access to information across membership, which they felt better supported decision-making efforts within the community.

Connecting Community

Connecting the community was identified as a core value central to the primary goal of each innovation effort. Many interviewees shared the perspective that connecting community members to one another would increase the health, efficiency, and success of the community in achieving their goals. The notion that technology could connect and unite community members reverberated across each project. For LVG participants this was in the context of connecting citizens to one another to engage in political information exchange. In discussing the value of connecting community, I heard from members at every level of the Tea Party Patriots organization that creating channels of communication between all layers of the organization was important. Similarly, Occupy participants also suggested that community tools that served to promote more regular and unmediated communication between members and even between camps would be helpful. For both the Tea Party and Occupy groups, technology was viewed as helpful in connecting community but as secondary to face-to-face interactions. This distinction between online versus face-to-face participation will be discussed later in this chapter as it surfaced as a tension point in the Occupy movement.

Increasing participation in community processes

The notion that technology should support increased participation in community processes was a commonly shared technology-related value in each of the four cases. For LVG, the processes they wanted to increase participation in were voting, exercising political voice, and

engagement. In Occupy and Tea Party the focus was on decision-making. Participation in the Civic Commons project was primarily focused on information sharing, with participants suggesting that representation diverse voices in community affairs was crucial for the well-being of the community. These processes, stakeholders agreed, would be strengthened through the use of technology that could increase accessibility, allow for diversity in representation, and create more transparency and openness in community decision-making. Ultimately, these three technology-related values and goals were the rallying points that served to draw participants into the innovation process and anchored their desire to continue working on the project beyond initial interest. Analysis later in this chapter and in the next reveals how the *mode* of participation differed in some projects, which influenced user responses and ultimately affected innovation outcomes.

The importance of values to the formation process is paramount. While resources create the motivation to form and expand the network of participants in the innovation process, values created the means to connect individuals to the project and establish formation of the initial network of innovation. The prominence of resources and values in the organizing process was evident in even the most nascent moments of the innovation process. In the next section, I will discuss how the newly formed networks of innovation proceeded to organize and establish decision-making and governance rules almost immediately upon formation.

Establishing Decision-Making Rules and Governance Models

Throughout the process of innovation a series of decisions are made that affect the shape of the technology (Pettigrew, 2014). Power is defined in this study as the ability to affect outcomes; therefore it becomes relevant to examine who is able to participate in decision-making because the ability to influence decisions affects innovation-relevant outcomes. Once the innovation networks had formed, almost instantly each group established a set of norms guiding

the decision-making processes within the group. Literature shows that some form of governance becomes necessary to guide goal-directed networks such as those in this study (Provan & Kenis, 2007). In ideal bureaucratic contexts, network governance mechanisms ensure mutually supportive action and engagement by participants, means to address conflict, and efficient and effective use and allocation of resources. Though it is not always the case, as many bureaucracies are dysfunctional, such rules are nonetheless intended to support goal-directed projects. Introducing structures to guide activity across participants in the network, be it individuals, groups, or entire organizations, is necessary for effective coordination of a diverse range of actors (Provan & Kenis, 2007). Without formal structures to rely on, each network of innovation developed its own set of governing rules, largely based on decision-making processes.

Across the four groups, two distinct forms of governance emerged: consensus based decision-making and a form of hierarchical decision-making in which one subset of actors was ultimately considered final authorities. These two forms closely mirror what Provan and Kenis (2007) term "shared-participant network governance" and "lead organization network governance." *Shared participant-governed networks* refers to, in the context of organizational networks in bureaucratic contexts, a highly decentralized model of organizing in which every node participates and connects equally to other nodes. *Lead organization-governed networks* operate as a highly brokered system in which one node acts as a centralized broker regarding network maintenance.

The Living Voters Guide and Occupy projects established consensus-based approaches to decision-making processes, common to the shared participant-governed model. As Provan and Kenis (2007) explain, "When network governance is shared, it is the collectivity of partners themselves that make all the decisions and manage network activities. Power in the network, at

least regarding network-level decisions, is more or less symmetrical…" (p. 235). In this model, power is shared more widely and the ability to effect outcomes, was more dispersed across actors.

The Civic Commons and Tea Party projects established hierarchical approaches to decision-making, more common to the lead organization-governed model. Here decision-making power was more concentrated amongst a minority of actors. According to Provan and Kenis (2007), "In lead organization governance, all major network-level activities and key decisions are coordinated through and by a single participating member, acting as a lead organization. Thus, network governance becomes highly centralized and brokered, with asymmetrical power," (p. 235). Power distribution in this study is measured as a reflection of how many actors are able to participate in decision-making processes. It reflects both the decision-making approach as well as the governance model adopted in each network of innovation.

Studies examining the strengths and weaknesses of such models show that shared participant-governed models are the most flexible and adaptable form of governance. It can respond to changes in network needs and have been identified as most suitable for short-term project-oriented tasks (Jones, Hesterly, & Borgatti, 1998; Provan & Kenis, 2007). Lead organization-governed networks are most successful at maintaining stability, which is necessary to retain external and internal legitimacy, and is identified as a factor for explaining network effectiveness (Provan & Milward, 1995). However, such models can be less flexible and have difficulty adapting to changes in stakeholder needs or demands (Provan & Kenis, 2007). The effectiveness of the networks of innovation examined in this study will be evaluated in light of such assumptions. However, since the main goal of this study is to understand the processes by

which informal civic networks organize, the focus will remain on how such governing models came to be adopted by each project.

The process of establishing governance norms occurred in slightly different ways for each group. In the following section I first discuss how the more brokered approaches to decision-making were established in the Civic Commons and Tea Party projects. I then follow with discussion of how consensus and shared governance models were established in LVG and Occupy.

Lead Organization Governance in PSCCC and Tea Party

The decision to have a small group of actors act as managers of the Civic Commons project was the result of the use of the term "steering committee" according to many of the participants in the network. Early communication of the project charged Anne, Mike, Peggy, Rick, and Jeff as lead actors to facilitate discussions and convene stakeholders. Attendees to the first meeting seemed to welcome that approach and saw value in having a delegated set of actors tasked to maintain the project. "As far as I know, everyone was volunteering... we needed someone or some group to lead the charge and keep things functioning," explained one journalist.

The reluctance of the steering committee to accept that position was striking. When asked to reflect back on their position of power during final interviews, not one interviewee described him or herself as a "leader" of the project and instead suggested that others were in charge. Overwhelmingly, Anne was identified as the most prominent leader of the group. She was unaware of this however; "I just never saw myself in that position. I saw us as a collective working together. Maybe I would've done things differently if I saw my position as so vital to keep the project and process flowing."

The reluctance of the team to accept their leadership proved to be problematic for the project. Research on innovation processes suggests that project champions and ownership are necessary to sustain energy and momentum and to overcome obstacles that arise both in the process of organizing others and the process of innovating (Howell & Higgins, 1990). Project champions are necessary to promote progress and overcome indifference or resistance to innovation and often use informal network connections to do so (Schon, 1963). In institutional settings such as firms, project champions emerge informally but may be offered resources by management to remain in that position. In the case of PSCCC, resources were not initially available to support the steering committee members who participated on a voluntary basis, which may have led to the reluctance to take ownership of the project. The lead organization-governed model necessitates that particular nodes in the network take responsibility for it to be effective (Provan & Kenis, 2007). In volunteer contexts, such as in these four cases, there is no institutionalized or formal authority to enforce that responsibility and if actors do not step into that role the effectiveness of the network is threatened. This finding suggests that formalization of roles or positions within even informal networks is important as it creates commitment at a higher level.

The establishment of the lead organization approach to management in the Tea Party project took a different path. Whereas in the Civic Commons other participants gave authority willingly to the steering committee, existing structures in the Tea Party movement were imposed on the innovation project. The power dynamic and communication flow between the developers and Tea Party leadership was highly brokered with some individuals acting as gatekeepers in the ideation process.

Ongoing attempts by the developer group to connect with a wide range of potential participants were regularly disrupted by a deferral to leadership within the Tea Party Patriots organization. After my initial contact with Woody, I suggested that he and I meet with others in his organization to discuss potential projects. Woody did not immediately respond to such requests, leaving them unsuccessful. Other attempts made by myself and Alan to reach out to others in the leadership were also met with non-response. When I attended meetings of local Tea Party groups and interviewed activists around the country via phone, any attempt I made to create connections in order to advance the project was consistently deferred to leadership. As one activist told me, "It sounds like an interesting idea but I don't get involved with that stuff. Regional level coordinators handle that stuff, so you'd have to talk to them." This process of deferral led directly up to the national level coordinators. The resources the developer group could provide — informational, material, and human — though useful for innovation efforts, were not enough without network connections. However, the legitimacy and resources held by a small group of actors in the Tea Party Patriots organization was powerful enough to keep them in a position to maintain primary control of the process of innovation. Attempts to move the project forward without the support and participation of the national coordinators were fruitless.

Decision-making power was asymmetrically distributed in both Tea Party and the Civic Commons project with a minority of actors making major decisions. However, the degree to which actors involved readily accepted this approach differed between the two projects. Whereas in the Civic Commons project participants willingly gave up some degree of decision-making power, in Tea Party the developers had to accept the brokered flow of communication without access to alternative connections to the community. Our peripheral connection to the broader network created difficult conditions to organize effectively to complete innovation tasks.

Shared Participant Governance in LVG and Occupy

Establishing decision-making processes in Living Voters Guide and Occupy resulted in consensus-based approaches to decision-making in both projects. Participants in LVG said it was nearly seamless for the group to decide to work together in a manner that supported equal voice and participation. "We figured it out quickly. We were small enough that we could hash things out if necessary but we felt strongly everyone should have an equal voice," explained Alan. Power is more or less symmetrical and dispersed across all actors in the shared participant-governed model (Provan & Kenis 2007). The small number of individuals, the relatively high levels of trust based on interpersonal ties, and the prominence of shared goals and values created an opportunity for shared and decentralized governance of the project. This supports findings by Provan and Kenis (2007) that suggests size of network, goal consensus, and trust can be predictors of the effectiveness of particular forms of network governance. These conditions of shared governance, high trust, and shared goals in a small network indeed supported the implicit goal of organizing and coordinating within the LVG network of innovation.

Participants in the Occupy TempCheck project adopted established organizational structures from the larger Occupy movement. This was similar to how the Tea Party project transferred existing rules and norms of governance of the broader movement to the innovation project. However, where decision-making in the Tea Party was ultimately left to a small group of actors, Occupy approached decision-making through consensus. Whenever a new individual joined the Occupy network, someone communicated to that individual that consensus was the modus operandi for the project. This was to keep in congruence with the logic of the movement at large. In the ideation stage the number of participants was relatively small like the LVG project. However the clarity in the purpose and goals of the project were less defined at the start.

Goal-consensus is necessary for network effectiveness in shared participant-governed networks, according to Provan & Kenis (2007). Until the Occupy network of innovation could create goal consensus through organizing and coordinating (the implicit goal), they would find it challenging to achieve their explicit goal.

In the ideation stage each network of innovation established a governance model to facilitate decision-making processes and maintain the project. According to Provan and Kenis (2007), some of these models of governance should be more or less effective. Reaching goal consensus became necessary for effective organizing. In the following section, the micro-process of visioning reveals how some groups were much closer than others in identifying shared goals based on strongly aligned values, while other cases had more prominent value conflicts to overcome before they would be able to achieve goal-consensus.

Visioning: Surfacing Value Tensions and Technological Frames

Each project underwent a process in which participants communicated openly about their vision of the technology in brainstorm-like sessions. The goal of visioning was to support creativity by first sharing ambitious goals for the project. Then the process was used to create clarity through debate and deliberation, narrowing to more specific and concrete understandings of the technology, its purpose, and its design. The diverse groups of actors involved in the visioning process represented some shared and some conflicting goals, desires, and intentions for the technology. So far, analysis has shown how shared values regarding the role of technology in the community became an anchoring point for formation and created commitments from participants to engage in the innovation process. In this section, I demonstrate how a third micro-process, visioning, became a site where value conflicts emerged. I further demonstrate how these value conflicts were communicated as technological frames (Orlikowski & Gash, 1994) during

the visioning conversations. The conflicting values created decisive moments in the network that were addressed based on the governance logic adopted by each network of innovation.

Value Conflicts, and Technological Frames

Empirical studies of the values in design suggest that value tensions, when left unaddressed, can result in failure to adopt systems or even system sabotage (Miller et al., 2007). Value conflicts are often examined as an interaction that occurs among different stakeholders such as users and designers (e.g., Friedman et al., 1997). Similarly, social construction of technology scholarship tends to focus on differences between end users and producers of technology (e.g., Pinch & Bijker, 1987). However, focus on users overlooks how value conflicts may affect innovation paths much earlier in the process of innovation. As the cases in this study demonstrate, value conflicts can emerge prior to the implementation stage, especially when a broad range of stakeholders are involved with the designing and developing of technology.

While technologists and developers are certainly present in LVG, OTC, PSCCC, and TPTC they are not the only stakeholders involved in the process of design and development of technology in each case. Stakeholders such as journalists, civic leaders, and citizens also played a role. Each group brought to the project distinct values informed by their understanding of technology and the community. At times these values were in conflict with one another. Value conflicts amongst these different stakeholders and their mediation, governed by decision-making processes within the network of innovation, proved relevant to understanding the trajectory and outcomes of each project. Current literature tends to treat designers as a homogenous group (Leonardi & Barley, 2010) but as is demonstrated in this study, in civic innovation projects the designers themselves are a diverse group of actors, representing various values and beliefs and aiming to achieve unique innovation goals. In the cases in this study, it became necessary to

interrogate the distinctions between groups participating in the design and development of technology to fully understand the implications of involving such diverse groups of actors in the early processes of innovation. This framing of designers as a non-uniform group is especially important to evaluating civic innovation contexts. Many civic innovation efforts involve a wide range of civic actors including citizens, civic organizations, civic leaders, government agencies or institutions, and technologists: To treat these actors as a homogenous group risks overgeneralization at the expense of deeper insight into the political nature of the civic innovation process.

Through the visioning process, stakeholder groups communicated their interpretations of the community technology they envisioned building. Members shared their ideas of what the tool could do, how the tool might work, what types of platforms may be used to support the software, and described envisioned-use cases. These conversations and discussions revealed important frames that different stakeholder groups wanted to develop around the technology. Through communication of these visions of the technology, groups described both their understanding of the nature of technology and the technology strategy, two constructs that inform *technological frames* (Orlikowski & Gash, 1994). Technological frames is a concept applied by sociotechnical researchers to reveal different interpretations of the purpose, expectations, and use of technology held by relevant groups involved with development, implementation, and use of technology (Barrett, 1999; Orlikowski & Gash, 1994; Shaw et al., 1997). The nature of technology focuses on people's understanding of the capabilities and functions of technology. Technology strategy refers to people's understanding of the motivation or vision behind the implementation of technology.

Much of the literature on technological frames is focused on the implementation stage of innovation and examines the congruence of technology frames between designers and users (Leonardi & Barley, 2010). In those cases, frames are built upon pre-existing ideas of how systems work within an organization and the schemas users build to understand the technology in light of those ideas (Orlikowski & Gash, 1994). This analysis shows how technological frames are relevant to earlier stages of the civic innovation process as well. The technological frames offered by different stakeholder groups through the visioning process were informed by distinct values held by each group/stakeholder values. Where some groups developed shared technological frames built from shared values, some conflicting frames also emerged. These conflicting technological frames highlighted value tensions between stakeholders. The outcomes of those conflicts resulted in one or another frame advancing forward in the innovation process. Evaluating these early interactions and outcomes lends further insight into the political construction of technology that few researchers have examined before (Leonardi & Barley, 2010).

During visioning, the Living Voters Guide network of innovation became aligned relatively quickly on a shared vision for the platform they would create. The shared values of information exchange, connecting community, and increased participation were reinforced through discussion, alongside the strongly shared value of supporting deliberative communication through online technology. The visioning process in LVG brought clarity to the group regarding the general scope of the project. By the end of the process the group had a clearly articulated and shared technological framing of the platform due to the strong value cohesion exhibited in the group.

The technological frame articulated by the LVG network of innovation interpreted technology as supporting citizens in connecting to one another to participate in deliberative and civic information exchange that countered top-down, one-way communication of voting information. The project was intended to add to an existing set of tools available to users that provided citizens new ways to engage in the voting process. LVG provided a space for citizens to participate in creating voting information, interact with one another without interference from institutional figures, and promote deliberative communication. These niches were not otherwise filled in the existing communication ecosystem. The shared framing of the assumptions, expectations, purpose, and nature of the LVG platform was supported by all participants in the network of innovation, reflecting strong congruence in the technological frames of relevant actors (Orlikowski & Gash, 1994).

This experience of technological congruence across all stakeholders was not repeated in any of the other cases. In each case, incongruence based on underlying value conflicts emerged instead. The next section identifies the primary value conflicts that were revealed during the visioning process for Occupy, Tea Party and PSCCC.

PSCCC: Professional control versus Open Participation in Civic Communication

The actors represented in the PSCCC network of innovation included journalists, civic leaders, citizens, technologists, and academics. Though there was a relatively even distribution of participants from each group, journalistic values became dominant in the visioning conversations.

According to Mike and several other journalists, the technology that the network should develop would keep the production and dissemination of community news and information primarily in the control of professional journalists. The group articulated a vision of a tool that would allow only journalists to post relevant news and information for the Puget Sound

community. Separate spaces, such as community calendars, should be created for citizens and organizations to post or curate community information. Professional journalists would cover and control the news features of the technology. The technological frame that journalists developed was one in which technology would support existing and established professional journalistic norms regarding the production and dissemination of information and kept clear the boundary between citizens' and journalists' role in the community.

Meanwhile, Anne and other participants such as technologist Leif Utne envisioned the Civic Commons platform as a space where citizens could also participate openly in the process of information exchange. Leif suggested a blog-like feature where individuals could share relevant stories about their neighborhood that were not being covered in the mainstream news. Rick suggested a feature that allowed individuals to upload videos to share stories on either news topics or common themes. According to Anne, other civic leaders, citizens, and technologists in the room, the technology should support open participation in information exchange. Jeff and Anne discussed technology that supported convening and connecting diverse communities by highlighting their commonalities through storytelling. The technological framing of the Civic Commons was, according to this group, a means for citizens to overcome existing communication gaps left by the collapse of traditional journalism and would be a place where citizens could participate actively in creating and disseminating relevant news and information.

Professional control of information exchange versus open participation has been noted as a prominent tension facing the journalism community in the digital age (Lewis, 2011). Generally, the tension surfaces as journalists and journalism organizations seek to identify the boundaries of their profession in order to maintain control of what is identified as their "expertise" and role or function served. This "boundary work" is conducted through different means including

"jurisdictional disputes." More relevant in the digital age is boundary maintenance that occurs through tactics that marginalize non-professionals who breach professional barriers (Abbot, 1988; Lewis, 2011). It was the latter form of boundary maintenance that Mike and other journalists in the PSCCC network of innovation employed as they attempted to influence the shape of the PSCCC technology. The journalists' technological frame, as described through visioning discussions, articulated a technology strategy that would re-establish and confirm the role and function of journalists as primary controllers of information production and dissemination.

Despite pushback from non-journalists, the steering committee did not directly address the conflicts. Instead, after several meetings in which the value conflict continued to dominate discussion, the committee used the power deferred to them by others in the project and made an executive decision to move forward with the vision of the journalists. This led some individuals to drop out of the project immediately, especially those more convinced that supporting established norms of journalism was problematic. Informally, Anne explained the committee's decision. "We had to pull the trigger while we have this energy. We considered things like funding sources and felt our best shot might have been getting support from journalism organizations."

Some individuals in the network, such as Lew, expressed the need to slow down until a clear vision was more fully articulated. "We had these vaporware ideas and weren't listening to the need for a tool… but instead appeared motivated by funding for it." However, others in the group including Jeff and Anne wanted to act on the momentum of the group and felt it was necessary to move forward, regardless of the lack of clarity in the purpose and vision of the technology and the disagreement between participants. In reflection, Rick noted,

> "People quickly, maybe too quickly, moved to tunnel vision and ideation was cut short…we didn't spend time figuring out what is the need we are filling? What is the problem we are solving? If we had listened to the community representatives more, and less so to those who were itching to create a tool… trying to save journalism, who knows what might have happened."

The steering committee elected to support the technological frame of the journalists, supporting the value of professional control over the value of open participation. The consequences of this choice would be fully understood in the next stage of the process.

Occupy TempCheck – Online activism versus on-the-ground activism

Upon formation, the group involved in the Occupy Project included participants from the Seattle Occupy camp, developers, and members of the Occupy Tech Operations group based in New York City who were invited by local activists. The three relevant stakeholder groups shared a strong commitment to addressing organizational issues within the Occupy community through the implementation of technology. However, visions of how those issues should be addressed strongly differed. The local Seattle activists wanted to increase on-the-ground participation through technology. The technologists at the University of Washington and in New York City wanted to increase support through legitimating online participation and inviting broader input through online participation. This was informed, in part from Dana's observations and also from my experience in interviewing different activists who considered themselves committed to the cause but did not have the time or resources to attend every event on the ground. This primary value tension focused then on whether technology should ultimately lead to on-the-ground engagement and face-to-face communication or if it should provide an opportunity for online activists to participate as equals in Occupy processes.

During our meetings local activists consistently voiced their concern that online activism was not enough. The issue for Steven was based on his experience at the camp and during

General Assembly (GA) meetings. By the early weeks of 2012 much of the initial fervor around Occupy had begun to quiet as camps around the nation were shut down. He saw dwindling attendance to meetings and wondered how they could sustain the momentum of the movement. During meetings, Steven and his local collaborators would bring their own ideas to the table. One such idea was a mobile application that would track participation in Occupy activities according to a scale based on how much effort the activity took. For example, contributing a donation may merit an individual 1 "point" but an activity like "attending General Assembly meeting" would merit 3 points. As individuals accrued more points, the activists hoped the user would also become more visible in the offline community, diffusing the technology further. This vision of the technology allowed for both online and offline participation but clearly favored on-the-ground and face-to-face interaction; purpose being to bring individuals to offline activities and increasing on-the-ground participation. Steven and his fellow activists envisioned a tool that would bring people together in face-to-face contexts. He articulated this technological frame consistently through his time on the project.

The developer group at the UW and the Technology Operations team in New York City (referred to as "technologists" going forward[4]) shared a different framing for the technology. The two groups were committed to the notion that technology was important to achieve the goals and support organization within the Occupy movement. Online participation alone was a valid form of supporting the movement, according to this stakeholder group, and technology would create the opportunity to recognize online participants as equals. The technologists envisioned a tool that harnessed the power of a broader public. Online participation was important because it allowed people who could not attend meetings to still show support and participate, sustaining

[4] The two groups were distinct but in this instance had sufficiently overlapping values that make sense to group them together for this analysis.

energy in the movement that participants acknowledged was waning as camps were shutting down across the nation. Online communication tools could supplement or replace the loss of collective spaces to organize and coordinate action. Additionally, online tools could address the fact that face-to-face General Assembly meetings were problematic for many who sympathized with the movement but could not afford to miss work or time with family to attend lengthy meetings in person. The technology could potentially reduce the length of time spent on process allowing activists to coordinate more efficiently.

The technologists agreed that creating a tool that gave voice to those who could not attend in person, either due to lack of space or lack of resources, would support the values of diversity, inclusivity, and equality upheld by the movement at large. The framing of technology, according to this group, was that it could increase support for the movement and introduce efficiency into processes while simultaneously upholding the guiding values of the movement.

The tension between online and offline participation is well established by scholars of communication, social movement theory, and political and civic engagement. Where offline activity supports trust building and cohesion in the community (Diani, 2000), online activity may support broader participation (Christensen, 2011). The framing of technology as useful *only* in supporting offline participation versus legitimizing online participation was not easily overcome. The value conflict proved necessary to address before the project was able to progress further.

Reflective of the consensus-based decision making process, the Occupy network of innovation members addressed the value conflict collectively. After several meetings in which the different stakeholder groups seemed to talk past each other, a mutually agreed-upon decision was made to create two different projects. The decision was made based on all participants agreeing that the most productive way forward would be for the technologists to move forward

as one unit to work on an online tool and for one of the UW developers to join Steven's team to work on a mobile app. The decision to create a cleavage in the network would in some ways improve the efficiency of the process for both groups. On the other hand the move would create different conditions of innovation for the network in terms of resources and would also result in creating teams close in cognitive proximity, which could become problematic for innovative thinking. However, at the time all participants agreed this decision made the most sense in order to create an opportunity for the projects to progress. The shared participant-governed approach to decision-making facilitated the cleaving of the network in an amicable manner.

Tea Party – Control of information versus Open Participation

The process of visioning in the Tea Party project was unique in that there was never a meeting in which all members of the network formally met to discuss the project. As discussed earlier, attempts by the developer group to coordinate meetings and discussions were left unanswered or postponed. Instead, I was in ongoing conversations between the different individuals and served as the primary coordinator and communicator of ideas generated by different stakeholder groups.

One of the first things we learned from interviewing Tea Party lay members was that there was a deep trust in the leadership but there was also a desire to have transparency regarding how decisions were made. Lay members never wavered in their explanation of the decision-making process within the organization as "bottom-up." However, gaps existed in their understanding of how ideas discussed at local meetings filtered up to the national leadership level. Some of the regional level leadership had greater insight into the process as they participated in phone calls each week with upper level coordinators. During these phone calls, information and input from local level meetings was gathered and distributed between high-level coordinators and regional representatives. Based on interviews with lay members, there was not

transparency in this process as few knew about the phone calls and did not have clear understanding into how input was gathered and decisions about campaign efforts were made.[5] During a meeting I asked one attendee about his understanding of the decision-making process. "I show up and share my opinion when I'm asked. From there I leave it to [local coordinator] to get those opinions to the top."

Reflecting on this, the developers saw an opportunity to introduce a deliberative online tool to incorporate into the Tea Party Patriots decision-making process. The developers communicated a broad vision in which anyone within the organization could provide input on a given proposal. Then leadership could distill information from that input and implement or reject based on the amount of support, or lack thereof, voiced by participants. Transparency and broad input were technology-based values that informed the developers' vision. The framing of the technology from the developers' perspective was to use technology to increase community access to participation in Tea Party processes.

When I shared that idea with Tea Party leadership, at first it appeared to resonate. Soon however, it became clear there was hesitation regarding the control of information for several individuals at the top level of the organization. Steven, one of the people charged with handling technology for the TPP organization, discussed his concern with security and privacy of information as reasons he did not trust technology to organize activists. In discussing the telephone call process he explained that logins were required.

> "They have to log in online to get in because we do restrict the participation in that call so we don't get people on the call - either opposition that are just trying to find out what we're doing or thinking or that want to come in and maybe make inappropriate comments etc. etc. So we try to limit participation."

[5] During those meetings, regional coordinators were able to offer input from their local lay members. Additionally, during the calls, national level coordinators tasked regional coordinators to gather input from lay members on matters that would be addressed in subsequent meetings.

In a discussion with Keli, I shared the idea of creating a technology that could invite broader participation into decision-making processes. Keli showed interest but also wondered out loud about whom exactly would be able to propose ideas. She also suggested that it might be difficult to get others in the organization onboard, noting their skepticism of online activism. She pointed out her website as a place where the control-of-information tension plays out.

> "There's different levels of security on it so if you're just a general supporter and you sign up you have access to certain parts, if you're a local coordinator you have a little bit more access, if you're a state coordinator you have a little more access, and then staff members have more access and the admin and tech guys have more access. You know, but that's just more so that, it is... you have to find that balance between being inclusive and open and watching for that sabotage and infiltrators who are just trying to destroy things."

She explained that it was necessary for some individuals to be in charge to address those kinds of issues. Technology should support, not threaten, control-of-information by members or leadership, according to Keli and Steven.

The conflict between the control-of-information frame versus increasing-transparency-through-increased-participation frame represented by the developers in the network was evident. The conflict in technological frames appeared strong enough for the Tea Party Patriots leadership to decide not to engage further in the project. The developer team, unable to make headway in coordinating meetings to create relationships and increase trust in the network, had no option but to accept the choice to dissolve the network.

The trajectory of the Tea Party Technology Collaboration was short. Unlike the other projects, the network was not able to overcome the value conflicts and move beyond the ideation stage of the project. The technological frames advanced by the developer team ultimately did not resonate well with the Tea Party Patriot leadership. While the developers saw their idea more as

a springboard for conversation, they were unable to engage leadership in further discussion. Why did this happen? The role of trust emerged as a factor limiting the organization and coordination of the Tea Party network of innovation.

Trust built through repeated interactions (Gulati, 1995) was absent in this project due to the highly brokered approach to organizing. To build trust meant we needed time to interact as a group and that was not possible without all members agreeing to participate. The developer groups were not deeply embedded in the network to begin with; rather we were peripheral players with limited network connections that undermined our ability to influence the project path. According to Provan and Kenis (2007), the low levels of reciprocal trust in the Tea Party network are common to lead organization models of governance. In some cases, low levels can be overcome but they require shared goals and visions, which we were unable to build. The lack of shared vision and goals coupled with the low trust condition reduced the Tea Party network of innovation's effectiveness. The Tea Party network of innovation was characterized by high levels of instability, a condition that undermined the network's effectiveness by failing to mobilize commitment and develop shared understanding of goals of the project. Ultimately, the project failed to meet the implicit goals resulting in its dissolution.

The visioning process in three of the cases became a site in which the conflicts in values of different stakeholder groups surfaced relatively quickly. Each network of innovation responded differently to the conflicts, guided in large part by the nature of their decision-making process. The decisions regarding value conflicts however had very real effects on the configurations of each network of innovation. In the case of Occupy, the network reconfigured and at least temporarily contracted as the project cleaved into two. In the case of PSCCC the network lost a few members immediately, but appeared to be stable going into the next stage.

However, it was clear that non-journalist participants were wary of the direction of the project as the ideation phase closed out. Finally, the complete dissolution of the Tea Party network of innovation could be attributed in part to the inability to overcome value conflicts due to lack of trust between the different stakeholder groups. Value conflicts were crucial shapers of the trajectories of innovation in each project. This finding builds upon existing literature in values and design to show how projects can fail much earlier than the implementation stage as a result of value conflicts.

Technological frames reveal different interpretations of the purpose, expectations, and use of technology held by relevant groups involved with development, implementation, and use of technology (Barrett, 1999; Orlikowski & Gash, 1994; Shaw et al., 1997). The different frames offered by different stakeholder groups can explain innovation outcomes in terms of compliance and non-compliance and has been traditionally applied to the later stages of the innovation process. This study expands our understanding of technological frames in three ways: a) it identifies how technological frames are developed, articulated, and advanced in the earliest stages of the process of innovation as the result of social interactions, b) it shows how frames are influenced by and reflective of values and value conflicts, and c) it expands contexts within which technological frames are applied by looking at the role of frames in civic innovation contexts.

This study demonstrates how designer technological frames develop in the early communication between stakeholders relevant to the design process, as groups articulate imagined and envisioned technology together in the visioning process. Examination of these four cases reveals that technological frames are not always shared; suggesting that the assumption that "designer technological frames" are always consistent is misleading. The findings across

three cases show that there is a political process to advancing particular designer frames that occurs far earlier in the process of innovation than the implementation stage. That political process is informed by adopted governing and decision-making processes established in the group early in the process of innovation. Reflection on how the Civic Commons and Occupy Projects adopted and advanced particular frames demonstrates that the emergence of collective technological frames of designers is a complex process involving political and social interactions and choices that advance one frame over alternative frames.

Where examination of relevant stakeholder group frames focuses on implementation in previous literature (Kling & Gerson, 1978; Orlikowski & Gash, 1994, Pinch & Bijker, 1987), it is necessary to consider them earlier in the process within civic contexts. One can imagine that if a project similar to those examined in these cases was undertaken in a more formalized process between civic organizations, government institutions, and technologists, that the initial technological frames may be incongruent. The process by which one designer frame is advanced gives much insight into the political and social construction of the artifact. Leonardi & Barley (2010) argue that this gap is necessary to interrogate to fully apply social constructivist lenses to technology implementation.

Findings also show that the technological frames developed by each group of stakeholders were closely aligned and reflective of the technology related values they held and articulated throughout the ideation stage. Initial framing of the projects reflected shared explicitly supported values that the project was intended to support—increasing participation, connecting community, and increasing access to information. Later, through visioning, different stakeholders articulated clearer distinctions regarding the expectations of use and purpose of technology. This revealed incongruent technological frames based on conflicting values held by

stakeholders in three of the cases. The advancement of some frames over others was often supported by the governing logic and decision-making process adopted within each project.

Additionally, this analysis reveals how the values of some stakeholders are advanced in the innovation process when their technological frame is adopted over others. The technological frames of technologists in the Occupy Project and the journalists in the Civic Commons network advanced while the alternative frames of activists and non-journalists failed to do so. Thus, the values of online participation and journalists' control of information exchange were supported as the projects progressed. The activists and non-journalists lost voice in the innovation process at that point. As will be explained in the following pages and in the next chapter, the loss of those voices proves to be powerful in shaping subsequent stages and innovation outcomes.

Finally, this study shows how technological frames as a concept can be applied in non-bureaucratic settings. The application of technological frames in civic contexts is a new area of study. As mentioned earlier, the diversity of actors involved in civic innovation is broad and perhaps more so than is found in bureaucratic settings. Incongruence in technological frames between civic actors should be accounted for in such contexts as they are shown to have impact on innovation trajectories, reconfiguring networks of innovation in PSCCC and Occupy and destabilizing the Tea Party network of innovation altogether.

In this chapter the conflicts in values and incongruence in technological frames between different civic actor groups within the network of innovation affected ideation outcomes. The technological frames that persisted would continue to affect subsequent stages of the innovation process and will be addressed in the next chapter when users become directly involved with and influential in the innovation process. At this juncture, I will summarize the findings regarding the distribution and configuration of values, resources, and power in the ideation stage in each case.

Conditions of Values, Resources, and Power during the Ideation Stage of Networked Civic Innovation

Tables 3.1 through 3.4 below represent how values, resources, and power were distributed in each case during the ideation stage of the networked civic innovation process. Distributions are reflective of indicators outlined in the previous chapter (see Table 2.2). In general, the tables represent the distribution of value cohesion, resource capacity, and power sharing within each network of innovation. As the above findings show, even in the ideation stage the networks of innovation were dynamic and shifting. The data presented in the tables captures the general condition of each network of innovation during the ideation stage. The findings above show how shared values helped to form the original group of participation which then set original resource conditions in each case. Distribution of power between actors was set with the establishment of decision-making processes, effectively, governance rules, within each network. Those power dynamics affected the outcomes of value conflicts that arose through the visioning process.

In comparing the conditions of each network it becomes clear that in the ideation stage, resources were both available and well-distributed across actors in each case as a result of the formation process. At the most expansive state, each project was able to attract individuals with diverse sets of skills and resources. The participants included a wide range of individuals with access to necessary resources such as material, human, informational, and network connection. However, access to resources was not enough to sustain the projects, as was illustrated in the Tea Party case. Below I will briefly discuss the conditions during the ideation stage of each case individually and comparatively.

Table 3.1 illustrates the distribution of values, resources, and power in the LVG case. The high levels of value cohesion, resource capacity across all network members, and power

distribution allowed the network of innovation to organize quickly during the ideation phase. Upon formation, the resource capacity of LVG was highly distributed with each participant providing access to at least one or more material, informational, human, or network connection resources. From the formation stage, a strong set of shared values related to technology emerged between members of the project, which provided a sturdy foundation for the ideation process. A clear vision of the technology developed through ongoing communication in the small group of participants resulted in a shared technological frame of the LVG platform. The consensus-based approach to decision-making gave participants equal voice. The group was small and had already aligned in terms of values, which facilitated smooth coordination and organization of network members. The result of these conditions was a stabilization of the actors involved and advancement to the next stage of the innovation process.

The values, resources, and power conditions of the Occupy TempCheck illustrated in Table 3.2 below show how value conflicts and value cohesion were both present in organizational communication during the ideation phase. Ultimately, the value conflicts, resolved through consensus-based decision making, led to the reconfiguration of the network of actors involved in the project. Local activists dropped out and like-minded developers in Seattle and tech operations representatives in New York City continued to collaborate, creating a temporarily smaller network. The effects of the loss of the local activists' voice at this early stage would reverberate in later stages discussed in the next chapter. However, in order to progress to the next stage it was necessary to resolve the value conflicts. The Occupy network of innovation included enough diversity that nearly all participants provided access to key resources. The transfer of the power structures in the Occupy movement created an organizational environment in which all participants had equal voices and consensus was necessary to move forward with

any project. Given the small group involved in the early stage, this was relatively easy to facilitate. However, when the group expands in the design stage we will see how consensus in large groups becomes difficult to manage and can be detrimental to the innovation process.

Table 3.3 reflects the unique conditions of the Civic Commons project in which resources distribution was high, which was similar to the other cases. However the concentration of power meant value conflicts that persisted were addressed differently than in other cases. While commonly shared values drew participants and necessary resources to the project, value conflicts and their outcomes threatened to isolate some stakeholders, namely non-journalists. However, trust in the network, built from previous work participants had done together, led even wary participants to remain connected to the project as it moved to the next phase. This trust, based on network connections, was not prevalent in all the projects and proved to be a major reason that the PSCCC process was able to advance. The concentration of power in the hands of just a few members was also in part based on trust, as others deferred power to the steering committee. This was different than the power conditions in the Tea Party where concentration of power was more imposed rather than agreed upon.

As Table 3.4 shows, the conditions of the Tea Party Project included low power distribution, low value cohesion and high distribution of resources. Funding, technical skills and expertise, and human resources were well-distributed across the developers and the Tea Party Patriots leadership. The one resource that became most valuable however, network connections, was less accessible for the developer team. In general, organizational communication during the ideation stage was limited in this project compared to the others. Tea Party Patriots leadership acted as brokers and gatekeepers of information flow. This was not contentious necessarily, but rather based on low levels of trust, a result of the lack of network connections between

developers and activists. Though shared values existed between the participants, the developer group was unable to capitalize on those due to the lack of communication flow. Instead, the lack of value cohesion dominated communication, leaving little upon which the project could build. The asymmetrical power held by the Tea Party Patriots' leadership created a condition in which the developers could not effectively organize or coordinate individuals without the buy-in and support of the leadership. The lack of network connections created a condition of low trust, which as we see in the case of PSCCC was necessary to keep the project moving despite value conflicts.

During the ideation stage of networked civic innovation, important micro-processes take place that set the conditions for actors to organize and innovate. The findings here show how values are important to the process of innovation from the very start, providing a foundation for attracting resources to the project. These findings also show how low trust in a network creates barriers in communication flow and makes it difficult to overcome value conflicts. In the case of TPTC, this issue overwhelmed the organizational coordination of actors and ultimately the project failed.

Without formal structures commonly found in bureaucratic settings to guide the innovation process, the civic networks of innovation in this study developed their own set of governance rules based on various approaches to decision-making. From these four cases, two forms of governance-logic emerged—distributed power through consensus or concentration of power within a small group of participants. It is likely more forms of governance exist in such informal civic networks and further examination is warranted. The adoption of existing structures from broader civic networks in the case of Occupy and Tea Party is noteworthy. Rather than completely establishing new rules and norms for coordination, the structures and

norms of the broader community shaped the goal-oriented networks of innovation processes. The networks of innovation in these two cases were still embedded in larger structures and consequently, were not able to overcome or operate autonomously from rules and norms of the larger movements. These existing structures would continue to influence the trajectory of innovation for the Occupy Project, especially during the implementation stage that is discussed in the next chapter.

As a result of the choices and actions of actors during the ideation stage the values, resources, and power conditions of the networks of innovation in LVG, OTC, and PSCCC existed in particular configurations as they entered into the design stage. In the subsequent pages, I will show how the actions and outcomes that occurred in the ideation stage would affect the processes of design and development.

Table 1.1: Distribution of Values, Resources, and Power in the Ideation Stage of the Living Voters Guide Project (LVG)

	Ideation	**Outcome**
High	■ ◆ ●	Network remains stable; Project continues to next stage
Moderate		
Low		

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 3.2: Distribution of Values, Resources, and Power in the Ideation Stage of the Occupy TempCheck Project (OTC)

	Ideation	**Outcome**
High	◆ ●	Network cleaves and contracts; Project progresses to next stage
Moderate	■	
Low		

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 3.3: Distribution of Values, Resources, and Power in the Ideation Stage of the Puget Sound Civic Communication Commons Project (PSCCC)

	Ideation	**Outcome**
High	◆	Network contracts; Project progresses to next stage
Moderate	■	
Low	●	

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 3.4: Distribution of Values, Resources, and Power in the Ideation Stage of the Tea Party Technology Collaboration Project (TPTC)

	Ideation	**Outcome**
High	◆	Network dissolves; Project ends
Moderate		
Low	■ ●	

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Designing and Developing Civic Technology: Translating and Encoding Values into Technological Artifacts

The notion that technology is not value-neutral, but shaped by the morals and ideas of the creators of technology, and that technological artifacts and systems interact with values is widely accepted across various fields examining technology, politics, society, and communication (Hank, 2009; MacKenzie & Wajcman, 1985; Nissenbaum, 2003; Winner, 1980). Recognized as

shaped by both functional values (e.g., efficiency, reliability) and social, moral, and political values (e.g., democracy, authoritarianism), technological systems and artifacts become important to understanding how power dynamics are created and sustained or challenged in sociotechnical systems (Flanagan, Howe, & Nissenbaum, 2008). Technological systems can be explicitly designed to support specific forms of power and authority that then help shape the interactions between social actors (Orlikowski & Gash, 1994; Winner, 1980). In turn, social actors also shape these systems as they are implemented and put into practice (Barley, 1986; DeSanctis & Poole, 1994; Orlikowski, 1992). Through affordances and constraints, technology can allow or restrict certain actions by specific users, and in the process, support certain values regarding who can participate and how. Thus, technology is in fact value-laden.

Certain genres of design methods such as participatory design and value-sensitive design promote the incorporation of users in the design process, arguing that given the "many-voiced nature of design," users and direct and indirect stakeholder voices should be considered (Boedker & Burr, 2000; Friedman, et al., 2009). As was shown in the previous section, during ideation, certain decisions made in each network of innovation privileged the voices—and values—of particular stakeholders in the process of innovation. In some cases, namely Occupy and Civic Commons, the decisions also silenced the voices of other stakeholders. The role of voice continues to be relevant in the design stage of the networked civic innovation process.

If the goal of the ideation stage of networked civic innovation is to form a network of actors, attract necessary resources, and develop a shared vision of a technology, then the micro-process of *translating*[6] that vision into features of technology emerged as the goal of the design

[6] It should be noted here that though "translation" is a term also used in Actor-network theory there is a distinct and different use of that term in this study. In actor-network theory, translation refers to an ongoing process throughout innovation that "can be considered the general

stage. Subsequently, upon successful translation of vision into features, development processes are focused then on *encoding* those visions and values into technological artifacts. As Akrich (1992) notes, "A large part of the work of innovation is that of 'inscribing' this vision of (or predication about the world) in the technical content of the new object" (p. 208). I first discuss the micro-processes of translation and encoding. By examining whether the invitation to participate is extended to different stakeholders within the network of innovation in the LVG, Occupy and Civic Commons projects, I demonstrate how such choices regarding voice can influence the organizational capacity of the network of innovation to complete innovation tasks. With the understanding that values are encoded into design, I demonstrate how inviting the intended user community to participate in the translation process provides opportunity to include their voice in the shaping of artifacts. This, I argue in this chapter and the next, affects the likelihood of adoption. I then summarize the values, resources, and power distribution across each case. I conclude this chapter by connecting the social processes to the technical artifact by providing findings from a values analysis of the two artifacts that were successfully developed in the LVG and Occupy projects.

Translating and Encoding Values and through Design and Development

In examining the process of design in LVG, OTC, and PSCCC it became clear that the key task of the participants who remained committed to the project was translation. *Translation* is the term I use to describe how the networks of innovation through iterative design of affordance and constraints of systems, create a bridge between ideas and values surfaced in the

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movement of technological development over time" (Cressman, 2009). In this study, the term translation is used to explain a particular process that occurs during the design stage of the innovation process. Translation is limited in this study to the act undertaken by stakeholders involved in the design stage of innovation. In this stage they work to move from one condition where technology frames exist as ideas to a new condition where they exist as features or affordances and constraints of a technology.

ideation stage and technological artifacts created in the development stage of innovation. Translation is the act undertaken by stakeholders where they work to move from one condition where technology frames exist as ideas to a new condition where they exist as features or affordances and constraints of a technology. The translation process is a point where *invited* stakeholders participate in shaping the tool based on a set of guiding values and technological frames, their own or others, depending on the approach taken through different input-gathering mechanisms.

Prototypes and mock-ups are commonly used mechanisms employed to iteratively gather input and build out and test whether values and vision are translated properly through affordances and constraints of the technology. Through the design process, the designers consider how the tool will be used, imposing their own framing of the technology into constructing affordances and constraints of the system. At the same time, depending on the approach designers take with inviting different groups to participate in testing the tool, there is opportunity for different stakeholder groups' values and voices to be represented in the design of the artifact.

In the design stage, designers develop "programs of action" (Akrich, 1992) for the users, defining roles of the users and the system. Through testing, designers can learn from user responses to the programs of action and address conflicts through iterative design. Ideally, this process eventually leads to a clear set of features that designers then feel comfortable developing into an artifact. The selected features that are built into the artifact support particular values, thus through the process, values are *encoded* into the artifact. Through encoding, technology becomes value-laden. The outcomes of the design phase are not permanent until they are encoded in the development stage and the programs of action are inscribed into the technology (Akrich, 1992).

When different stakeholder groups are given the opportunity to participate in the process of translation they have the chance to shape the artifact in a manner that represents their own values, goals, needs, and desires for technology implementation. The invitation to participate proves to be an important action that influential members in the network of innovation can offer, or withhold, that has important consequences for innovation process. The LVG, Civic Commons, and Occupy networks took slightly varying approaches to inviting the voices of both groups involved with the process of innovation already, as well as the intended user community. In the next section, I discuss the two approaches, inclusion and exclusion, adopted by each project in regards to inviting both types of groups to the translation process. I then discuss the effect of such choices on both the implicit goal of organizing for innovation and the explicit goal of implementing technology into a given community.

Invitation to Participate: Inclusion and Exclusion of Voices in Translation

In examining the cases of LVG, PSCCC, and Occupy, I found that relevant groups either took an inclusionary or exclusionary[7] approach to inviting different groups to contribute to the design process of the platform. The extent to which invitations to participate are offered to groups already engaged in the project, findings show, affects the organizational capacity of the project vis-a-vis access to resources. The approach taken also contributes to the shape of the artifact itself as features are informed by input collected from different stakeholders.

LVG approached translation using inclusive methods to capture the input of all stakeholders involved. The choices made in PSCCC and Occupy that amplified the voices of some stakeholders involved in the network of innovation over other groups enacted a more exclusionary approach to incorporating the voice of relevant stakeholder groups. In Occupy, the

[7] I note here that the exclusive approaches are not necessarily intentional nor are they aggressive, but may reflect lack of resources or unintentional oversight.

decision made during the ideation stage to split from Steven and other on-the-ground local activists removed that group's ability to influence the design of the tool. In PSCCC, it was during the transition from ideation to design that the decision of the steering committee made choices that excluded the voice of non-journalist stakeholders involved in the project. The choice to incorporate or not incorporate the voice of the network of innovation members affected the resource capacity of the network as a whole, as I discuss below.

Voice, Resources, and Organizing Outcomes

Translation and encoding in civic networks requires resources such as informational and technical expertise, human labor, time, and material goods to create prototypes, to conduct testing, and to build actual artifacts. Both the LVG and the Occupy TempCheck projects had access to these particular resources throughout the design phase of the process. PSCCC started off with access but that changed relatively early in the design phase, affecting the project outcomes as is explained in the next section. As findings demonstrate, the decision to incorporate the voice of stakeholders involved with the process of innovation affected the resource capacity of the projects.

Inclusion

Diane and Jessica were regularly involved in the discussions around the affordances and constraints of the LVG platform throughout the design stage. Both felt they were able to incorporate their voice, ideas, and input on design features of the tool throughout the process, even though design was not their area of expertise. In part, this was due to the consensus-based approach the team had adopted. Decisions were based on ongoing discussion with all members of the network of innovation. As a result of everyone continuing to have equal voice in the project processes and goals, the network of innovation remained stable and members continued

to contribute resources to the project. Thus, resource capacity maintained at the same level of high distribution through the translation and encoding stages. As is often the case, according to value sensitive design literature, stakeholders can occupy multiple roles at once. So while Diane and Jessica were part of the network of innovation, they were also representative of particular users that the group hoped to enlist in using the tool. In the next section I discuss how they contributed to the process through that role.

Exclusion

In PSCCC, the decision to privilege the voice of journalists over non-journalists in the large network of innovation had more immediate effects on the project. The PSCCC steering committee's choice was reflected in the first communication shared with the group after ideation ended. According to the 2011 PSCCC Action Plan, distributed via email to participants, three pilot projects had been chosen to "demonstrate the value of the online commons concept." The three projects were titled, "Arts and community engagement," "Community gardens and the local food movement," and "News and community journalism," which was informally called the "Journalism Commons." This decision reflected the technological framing journalists had advanced which advocated for keeping the news component of the platform distinct from other sections of the website and under professional control of journalists.

By adopting the technological framing and vision of journalists, the committee advanced technological values that reinforced professional control of news and information exchange. This value overtly conflicted with the value of open participation, held by other participants. Though non-journalists were vocal in the ideation stage it was clear they were not represented in the adopted vision of the Civic Commons as communicated through the Action Plan. This framing of the project resulted in the rapid loss of other participants. Members who had lost their voice in

the project, who felt their values were no longer represented, left and by February 2011 only a handful of participants remained. “I was volunteering my time … I wasn’t interested in ‘saving journalism’ so I figured my time was spent better elsewhere,” said one technologist who stopped participating soon after the action plan was shared.

As a result of members leaving, the resource capacity of the network of innovation had been severely diminished. Participants leaving the project took with them access to necessary resources for completing the task of translation. Technologists who had technical skills and expertise to work on the translation process were largely absent from the network, with only Jeff remaining. Civic organizations, civic leaders, and citizens who had access to material and/or human resources to support the process of translation also left. At the end, Anne, Mike, Jeff, and Rick were primarily sustaining the project, and even Mike was less committed to the Civic Commons as he was to building the Journalism Commons. “I think there was always a tension between the people involved in the Civic Commons who wanted the Journalism Commons to be the storyteller for the Civic Commons. I saw them as distinct projects ... the Journalism Commons was my area of interest so that is where I devoted my time,” he explained. Without Mike drawing in resources to the Civic Commons, the remaining members were forced to return to ideation stages and began reimagining new paths for the project.

Resources were also lost in the Occupy case as a result of exclusion of the voice of individuals who were involved in the process of innovation. As described previously, when the Occupy network of innovation split into two projects, the actors that continued to work together were primarily technologists, either working at the UW or working for Occupy’s National Tech Operations team in New York City. By electing to continue working together and disconnecting from working with the on-the-ground activists in Seattle, the group made a choice to remove the

voice of that stakeholder group from influencing the design of the tool. As discussed earlier, this was not an actively aggressive move, but rather a means to overcome value conflicts. However, the loss of the on-the-ground activists resulted in a change in the assemblage of the network of innovation that momentarily contracted in size.

When the on-the-ground activists left the group they took with them resources, in particular, network connections, to on-the-ground activists who were part of the community of users the network of innovation intended to use our tool. This resource was not as integral to completing the design and development stages as material and informational resource were. However, during the implementation stage we would learn how valuable the resource network connections were to the intended user community. For now, it is enough to note that excluding the voice of on-the-ground activists led to the loss of their resources which did not directly affect the design and development process but would affect later stages discussed in the next chapter.

Findings from examining the three cases show that the voluntary nature of the innovation projects means individuals needed to feel a commitment to the project to continue expending their resources on it. If the connection that drew participants to the project, representation of their values and voice, was missing, they had little reason to continue working on the project. Absent a sense of shared motive in the project, participants left. This finding is consistent with studies examining the motivation for volunteers to remain committed to projects (Clary et. al, 1998). This is especially important to civic innovation processes where volunteers are vital to sustaining the project as they contribute valuable resources that were no longer available to the project once a participant elects to leave.

In both the PSCCC and Occupy cases the decisions that left some groups initially involved in the project excluded from participating in the design and development stage created

conditions where resource gaps emerged. For PSCCC, the gaps were too large to overcome and began to undermine the organizational capacity of the remaining members to continue supporting the project. As was the case with the Tea Party, the lead-organization model of governance failed to stabilize and achieve intended outcomes in PSCCC, countering expected results (Provan & Kenis, 2007). The process of networked civic innovation is resource-intensive and in this case the remaining network of innovation members were unable to adapt to the loss of resources easily. This lack of adaptability is noted by Provan & Kenis (2007) as a potential flaw to lead organization- governed networks.

Exemplifying the interactional and non-linear process of innovation (Williams & Edge, 1996), the Civic Commons project iteratively returned to the ideation phase of innovation with a much smaller group of individuals who were not ready to see the project end. Anne, Rick, and Jeff continued to work on the project for over a year, though not with nearly as much momentum as the first effort. Still driven by resource needs, they attempted to find a home for the project within different civic organizations; however, each group they encountered brought new values, which they had to constantly negotiate.

In its last iteration in the spring of 2012, Anne recruited the support of a local civic organization leader, Chris, who agreed to support the Civic Commons on his server. In one last attempt, Anne reached out to a group of individuals for input on a proposal she created with Chris. When no one responded over the course of a week, she acknowledged the end of the project via an email entitled "Declaring it 'over'".

> "Thank you each and every one for your contributions along the way of the Puget Sound Civic Communications Commons evolution... most recently called the Civic Commons Portal. We tried. We finally created a workable model. AND the silence is deafening! >:-) I guess Sanjay was right...there's no need for this. You've voted with your feet...moving on. Now I declare the process complete, and I thank you all."

The role of voice and its effect on shaping resource conditions is important to account for when examining the factors that undermine civic innovation processes. The unintended consequences of adopting the exclusionary approach to incorporating voice in the Civic Commons project contributed significantly to the failure of the network of innovation to organize effectively enough to progress with the project. For the Occupy Project, resource-loss also occurred as a result of exclusion of on-the-ground activists. However, the lost network connections did not directly affect the ability of the network of innovation to complete design and development of the tool, as they had sufficient material, informational, and human resources available to do so. Given the ability of the network of innovation to remain stable, the Occupy Project still had opportunity to incorporate the voice of the intended user community as it continued with translation and encoding processes, which is discussed next.

Voice, Artifacts, and Adoption Outcomes

The incorporation of the voice of the intended user community is another way in which networks of innovation can account for various stakeholder values in the translation and encoding process. When users are given voice in the design process, design studies suggest projects are more likely to succeed (Friedman et. al., 1997). As user input is incorporated through iterative testing and building of features, ultimately it results in a tool that accounts for the values and intentions of the user, which increases their likelihood to use it. Thus, incorporating users' voice in translation processes actively shapes the artifact itself, which affects the likelihood of adoption of the tool—the explicit goal of networked civic innovation projects.

In both LVG and Occupy, designers incorporated ways to gather input on the features of the platforms. However, only LVG was successful in doing so, although still to a limited degree. Though sincere in our attempts, with the Occupy Project we failed to account for on-the-ground

activists voices. What we did not realize until later was that in the Occupy Project, input was gathered primarily from technologists and not individuals participating in on-the-ground activities in New York City. As was revealed through an interview with Dana after the project ended, many of the technologists we worked with had been working solely on the technology side of Occupy, not really connecting to on-the-ground activists or attending General Assembly meetings or events at the camp. In hindsight, the UW developer realized we based our input gathering process on a faulty assumption that there was representation from the New York City on-the-ground activists. As I demonstrate in the following sections, this led to a particular shape of the artifact. I will show in the next chapter, the shape of the artifact and the explicitly supported values it supported affected adoption outcomes when it was introduced to the user community.

Inclusion

In LVG the group had identified intended users as not just citizens broadly, but individuals "who were likely to participate and were already educated in politics," according to Alan. In an effort to represent this type of user, the team designed and tested out features through prototyping exercises with three individuals, including Diane, Jessica, and a third person that was affiliated with City Club but not involved in the LVG project. The logic behind identifying Diane and Jessica in this capacity was that they were representative of the users the group hoped would use the tool. Having invited these three particular representatives, the network of innovation included potential *and* intended users of the

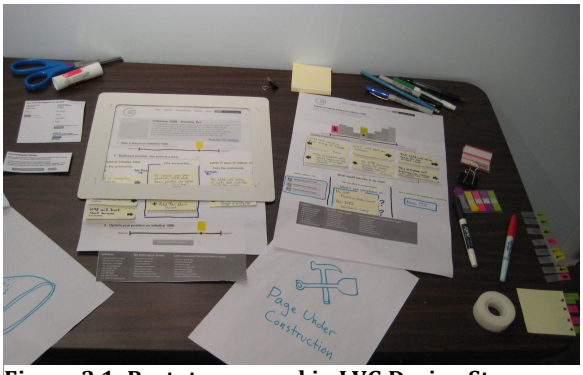

Figure 3.1: Prototypes used in LVG Design Stage (Photo courtesy of Jonathan Morgan)

technology in translation. They would respond to design features with the opportunity to provide feedback. “In some ways it’s a checks-and-balance system for designers”, explained Jonathan.

The feedback from the prototype testing was translated back into the design process iteratively. A result of the prototyping activity in LVG was the incorporation of a few features that are discussed in greater detail in the technical investigation of LVG provided later in this chapter. Some issues that users brought up however were not addressed, because, “… it’s not always reasonable to make every change that users suggest. Stories matter in technology, and if a user gets the story or the metaphor that is what matters most,” explained Travis reflecting on designer values. In general though, voices of those who may not have otherwise been incorporated were invited to participate in the translation process in LVG. The inclusive approach the group adopted integrated the voice of the community into the translation processes. The LVG platform materialized then, as an artifact informed not only by the values of designers but also community members.

During the development stage, opportunities to invite the voice of other stakeholder groups were limited. The turnaround time in which the Living Voters Guide had to change from idea into artifact was short. Even though the development process started in late summer 2010, the tool needed to be launched by early fall in order to be timely for the November elections. The tight turnaround meant users did not test the final product of the innovation process until launch. As is discussed further in chapter 4, user responses upon implementation revealed new values that went unaccounted for in LVG’s design and development processes.

Exclusion

Despite attempting to design a tool with input from activists who were organizing on-the-ground events, the Occupy network of innovation failed to do so and thus unintentionally

approached design without inviting the intended user community to participate in the translation process. The result was that they drew their input primarily from technologists.

The translation process involved having several discussions with Tech Operations team members. The focus was on what types of actions they wanted to see occur through the decision-making platform, what types of activities they foresaw participants wanting to participate in online, and what, if any, constraints they wanted to put into the system regarding who could participate and how they could do so. The developers also contributed ideas such as connecting the interface to social networking tools like Twitter so that actions and information could be distributed to wider online networks. Travis then designed mock-ups based on our discussions, after which Dana shared with a broad group of people via email or during the Tech Operations internal meetings held in New York City.

The UW participants were not privy to the processes that went on in New York City. Dana explained, that throughout the process first she would take the ideas and mockups to the smaller group directly involved in the project and they would make their own decisions about any changes. "Then, sticking to 'the process', I would share it at the meetings of the larger group. There were a lot more opinions to negotiate there." This process, dictated by the Occupy movement's group norms of consensus-based decision making, started to take valuable time as the UW developer group waited for consensus to develop in New York City. Achieving goal-consensus was difficult in OTC, supporting Provan & Kenis' (2007) assertions, that increasing network size reduces the effectiveness of shared-participant-governed networks.

Worthy of note was that building consensus around the technical features of the tool, such as the interfacing with Twitter, was relatively easy. This was potentially because the groups involved were primarily technologists and likeminded. The affordances and constraints of the

TempCheck system were largely aligned with the values of equality, diversity, and inclusivity that were important to Occupy activists (Agarwal et al., 2014). Instead, most of the translation time was spent on developing a theme to the platform that Occupy activists felt resonated with the values of the larger movement. Figure 3.2 below shows the iterative changes made to the Occupy TempCheck homepage. "It was essential to get the values of Occupy—equality, inclusivity, diversity—etcetera communicated through the interface. We had to spend time on that otherwise no one would use it," Dana explained.

Figure 3. 2: Iterative Changes to the Occupy TempCheck Theme

The outcome of the slow design process, reflective of the governance logic of the project, was consequential in ways that were both immediate but also would not be fully understood until deployment. The immediate effect was that the delay in progress drew momentum and energy away from the project. In effect, the slow design process diminished resources again as the UW developer team moved forward with other projects and had limited time to focus on this project. The long-term effects would be that the tool would be implemented much later in the year when momentum in the larger movement had further waned, leaving fewer use-cases scenarios for the tool.

Ultimately, the platform that was produced reflected the broad values of Occupy activists *and* especially those activists who believed technology was important to supporting the goals of the movement. The technologists who provided their voice to the process were aligned with the network of innovation that online participation was in fact a valid form of activism, thus the

tool's features reflected this. Since we were unable to gather input from on-the-ground activists we were not able to account for their values, which, as the next chapter will show, were congruent with those expressed by Steve and the other local Seattle activists with whom we parted ways. Chapter 4 reveals the consequences of failing to incorporate their values and voice on implementation efforts.

Role of Voice during the Inception Stage of the Process of Networked Civic Innovation

In examining the process of design and development, this study shows that voice matters. Previous examinations of the role of voice in innovation processes have focused heavily on the user (Azenkot et al., 2011; Friedman & Nissenbaum, 1997; Nissenbaum, 2009; Oudshorn & Pinch, 2005). However, examination of the PSCCC, LVG, and OTC illustrates the need to scrutinize how certain groups involved with design, within the network of innovation, are able to amplify their own voice over that of other groups and with what outcomes. While the outcomes may in the best cases result in design decisions, in the worst cases, as was evidenced in the PSCCC case, it can lead to failure to achieve intended innovation goals. The exclusion of voices of relevant stakeholders in the PSCCC network of innovation undermined the organizational capacity of the network of innovation, effectively keeping it from fulfilling the implicit goal of organizing and coordinating to achieve tasks.

In LVG and OTC, voice affected the shape of technology when users were able to participate in the translation of vision and values into features. The loss of the local activist community's voice that occurred as a result of choices made in the ideation stage meant they did not have a voice in the design of the tool. Unintentionally, we continued to exclude the voice of on-the-ground activists in the Occupy project, ultimately leading to the development of a tool that represented values of technologists that were in direct conflict with the values of the on-the-ground activists.

To connect the social processes that have been outlined in the previous pages to the technical artifact, I provide technical investigation of the LVG and Occupy platforms. Through analysis of features of each platform, these investigations show how particular values were encoded into the technology. First though, I summarize the values, resources, and power distributions of LVG, Occupy, and the Civic Commons projects through the design and development stages.

Conditions of Values, Resources, and Power in LVG, Occupy, and PSCCC during Design and Development

As Table 3.5 shows, the PSCCC's network of innovation's resources condition shifted during the design phase to one in which distribution was low as a result of the loss of network of innovation members. It was clear that the project could not progress further until it obtained material, informational, and human resources at the least. This was too difficult. As a result of the decision to choose the journalists' vision of the project, value conflicts became the focus on the organizing activities of the network of innovation. As Anne, Rick, and Jeff attempted to keep individuals involved with the project or to attract new resources, the process of translation was no longer the priority.

Value conflicts became more prominent during the design phase. The inability of the network of innovation to coordinate to complete design tasks led to the project returning to ideation. Even in the second ideation stage, value conflicts affected the organizing activities of the network as Anne, Rick, and Jeff attempted to work with different organizations to support the project. As Table 3.5 shows, resources were never well distributed in the network during the second ideation phase, though power was less concentrated and more evenly distributed within the much smaller network of actors.

Both the Occupy and the Living Voters Guide projects were able to successfully complete the translation process. While the LVG conditions of values, resources, and power remained stable from the ideation to the design phase, value cohesion rose in Occupy as a result of the actions that were taken during ideation that reconfigured the network. When like-minded technologists disengaged from working with local activists on the project, the main value conflict regarding offline versus online participation was resolved. The shift was the increase in value cohesion as like-minded technologists continued collaborating.

As is shown in Table 3.6 and Table 3.7, during the design phase, high levels of value cohesion, resource capacity, and power sharing characterized the conditions of both of the consensus-based shared participant-governed networks. This only slightly altered for both groups in the development stage when access to namely technical skills and expertise were most important and were slightly more concentrated with developers. Yet, material and human resources continued to play an important role thus resources were distributed at moderate levels within both groups.

Table 3.5: Distribution of Values, Resources, and Power during the Inception Phase in the Puget Sound Civic Communication Commons Project (PSCCC)

	Ideation	**Design**	**Ideation**	**Outcome**
High	◆		●	Network contracts; Project ends
Moderate	■		■	
Low	●	■ ◆ ●	◆	

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 3.6: Distribution of Values, Resources, and Power during the Inception Phase of the Occupy TempCheck Project (OTC)

	Ideation	**Design**	**Development**	**Outcome**
High	◆ ●	■ ◆ ●	■ ●	Network fluctuates in size; Project progresses to next stage
Moderate	■		◆	
Low				

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 3.7: Distribution of Values, Resources, and Power during the Inception Phase in the Living Voters Guide Project (LVG)

	Ideation	**Design**	**Development**	**Outcome**
High	■ ◆ ●	■ ◆ ●	■ ●	Network remains stable; Project progresses to next stage
Moderate			◆	
Low				

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

One of the notable implications of this study thus far is how it demonstrates the interactions of values, resources, and power across the early stages of innovation. In particular, In examining the micro-processes of the ideation, design, and development stage of networked civic innovation across the four cases demonstrates the entanglement of values and power in

design processes, which suggests fruitful expansions of current design theories. In their 2012 article, Borning and Mueller identified a set of next steps for the evolution of Value Sensitive Design as a theory and method. One expansion of VSD for which they advocated was to account for and acknowledging power differentials within design projects and processes. “Like design issues, issues of values necessarily involve differences in perspectives, and often involve differences in power.” (p. 7).

The power-sharing dynamics established within each project influenced how particular values were or were not addressed in the design process. The power-sharing models in which consensus-based decision-making was implemented we saw a deeper reflection on behalf of relevant stakeholders to account for a diverse range of values. In those cases where a minority of individuals held decision-making power the values of a minority of relevant actors were advanced.

This analysis of both the power-sharing dynamics and the value conflicts showed how particular groups gained or lost power through the process and across stages, leading to different value outcomes. Given that clear organizational boundaries were not present in these cases, identifying the power-sharing conditions was particularly helpful in evaluating and understanding how some design choices supported or ignored the values of particular stakeholder groups. Future research warrants further examination into the role of power in design processes.

Technical Investigations of LVG and OTC

In the previous pages of this chapter I have demonstrated how conditions of values, resources, and power actively shape, and are shaped by, the outcomes of micro-processes within the ideation, design, and development stages of the process of innovation. Analysis now shifts to focusing on the two cases in which a technology was successfully developed, Living Voters Guide and Occupy TempCheck. In the discussion of ideation a set of stakeholder values emerged

in each case. Through retrospective investigation of the affordances and constraints of each tool, analysis reveals which stakeholder values were encoded and which explicitly supported values were supported in the Living Voters Guide and Occupy TempCheck technologies.

The encoding of these values was the primary task of the development stage of the process of innovation. Encoded values are reflected in the affordances and constraints of the system, which in turn shape the programs of action of users (Akrich, 1992) through enabling or limiting their actions. According to Akrich (1992), *"*The technical realization of the innovator's beliefs about the relationship between an object and its surrounding actors is thus an attempt to predetermine the settings that users are asked to imagine…" The following is a discussion of how values were encoded through examination of the affordances and constraints of the LVG and Occupy platforms. Whether users successfully enacted those programs of action is discussed in the next chapter.

Encoded Values in LVG

The primary values held by LVG stakeholders regarding technology included: supporting *deliberative communication, civility, increased participation, information exchange, and connecting the community to one another*. These values were held in the context of voting-related communication practices. The intention, or technological framing, of the Living Voters Guide was to offer alternatives to the existing voters' guide that was created by institutions, was non-interactional, and was communicated through one-way channels that did not promote deliberation in an increasingly polarized information environment. According to Alan, "We wanted to get people with different views to be exposed to each other and to increase civility in their interactions and reflection in their thinking."

Several features of the LVG platform including the pro/con list function and interface and the slider-supported value of deliberation. The pro/con feature was a list (see Figure 3.3) that

encouraged users to create a set of pros and cons for each ballot measure they were considering. This was done by either adding their own pro or con "points" to the system or by adding points that other users had contributed to the system. The use of a pro/con list was to support reflection of users on whether their considerations regarding the measure were balanced. This reflection process and consideration of the "other side" is recognized as a core attribute of deliberative processes (Mutz, 2006).

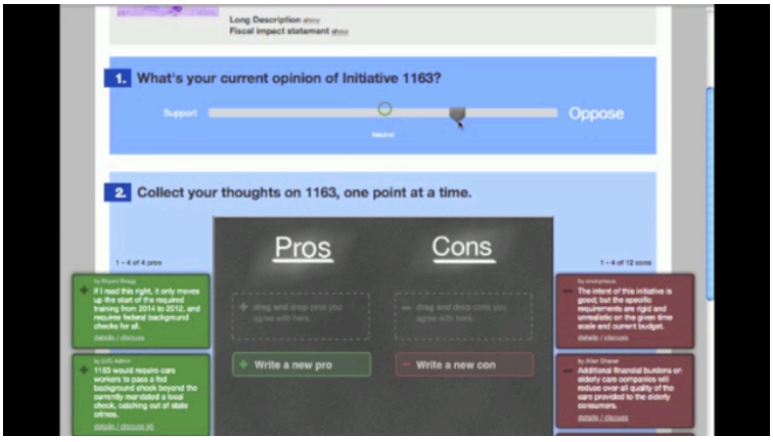

Figure 3. 3: Screenshot of LVG User Interface showing Pro and Con features and Slider

The reflection processes were also supported by the integration of a slider used to input user positions on a ballot measure before or after the pro/con list making exercise (see figure 3.3). When users first clicked on a ballot initiative they were asked, "What is your current opinion of…" and were prompted to use a slider to select a position on a scale between "Support" and "Oppose". If used, this feature would then invite the user to reflect on their current position. An identical slider was placed at the bottom of the pro/con list that users would encounter after reading through the points. If used in conjunction with one another, this would promote reflective thought on the part of the user in considering his/her opinions and how they

may or may not have changed as a result of exposure to different perspectives. Additionally, the slider supports more nuanced opinions than simple binary measures such as "yes," "no," and "abstain".

The pro/con list also functioned in a manner that supported the values of information exchange and increased participation. Users were able to read the pro and con points offered by other users as he/she considered the ballot measures. This exchange of information, though not direct and interactional in the first iteration of the platform, gave users opportunities to learn from each other. This was different than traditional static voters' guides that are filled with position statements from institutions and institutional figures. The ability to contribute one's own pro or con point offered users an opportunity to share his/her political voice and participate in political activity.

Civility was another important value for stakeholders involved in the LVG project and was supported through the inclusion of a civility pledge. When users first signed into the website they were prompted by a pop-up box to consider a civility pledge that reminded users to voice their own opinions and not those of an organization and to not engage in personal attacks. Users could not avoid seeing this pledge, forcing a moment of reflection to guide user communication practices.

Finally, addressing the desires of users who participated in the prototype activities to learn which user contributed points were popular or valuable to other users, a page was created upon completion of the pro/con list activity that identified such "Key" points. These points were populated using an algorithm devised by Travis and Jonathan. The algorithm balanced the persuasiveness, diverse appeal, and raw appeal of a given point (see Kriplean et al., 2012 for full explanation). "We created the algorithm to show which points resonated but tried to avoid letting

power laws take over…so that the most popular didn't stay the most popular just because their point was most visible due the feature," explained Jonathan. Travis also echoed the consideration of accounting for new points in informing the algorithm. Gillespie argues that algorithms may have political ramifications and political assumptions etched into their design (Gillespie, 2013). Interviews with Travis and Jonathan revealed how the choices they made about the algorithmic knowledge of the "Key Points" page support this perspective.

The values that were defined early on in the process of ideation in the LVG network of innovation remained consistent throughout the design and development stages. Through design of particular features, values were translated into features and then encoded into design. In the next chapter, I discuss how user testing during the first deployment of the tool revealed a value that users found important and not adequately addressed in the first iteration of the platform: trust.

Encoded values in Occupy TempCheck

The values of *increased participation and online participation*, *broad input and consensus building*, *inclusivity*, *information exchange*, and *connecting community* were the primary technology-related values that emerged from the ideation stage in the process of innovation in the Occupy Project. Through the translation process, the values of *diversity* and *equality* also emerged and were addressed primarily through creating visual themes.

The Occupy TempCheck platform did not include a login feature initially. The decision to have an optional login rather than a required login was in part due to the desire to increase participation. During translation, Dana and her team suggested users might be more willing to engage in proposal processes if they did not have to disclose personal information through login. So, while increased participation was the explicitly voiced value, implicitly the value of privacy was also supported through this feature design. This decision contradicted the value of

accountability, which was briefly discussed as relevant to the community. The idea that individuals should stand behind their positions was important, however accountability required some means of verifying whom an individual was that posted a point. The group agreed that privacy concerns were more important to address than accountability, which was not pursued further.

The Occupy TempCheck tool offered individuals an opportunity to propose ideas about which anyone using the tool could then provide feedback. Feedback was collected through first the ability for users to add pro or con points and then individuals indicating their level of support through using a slider bar that indicated their position between "support" and "oppose" (mirroring the interface of the LVG system). If the designers program of action was enacted, the interface allowed individuals to participate in the decision-making processes in Occupy whether or not they were able attend meetings in person. This supported the values of inclusivity, broad input, and increased participation.

Having identified Twitter as an important communication channel in the larger movement, members of the Seattle group built in functionalities to interface with the platform. Connecting community as a value was supported through a feature that added an automatically generated hashtag #occupytempcheck to any submitted proposal. Users could select to keep the hashtag, change or add new hashtags, or remove the hashtag. They were then prompted to share the proposal via tweet but had an opt-out opportunity if they did not wish to connect to the social network. The tweet would include a link back to the proposal, the hashtag(s), and other language the user wished to include. To minimize the burden on the user, the function also automatically generated the tweet to include as much of the proposal title as could fit within the 140-character limit. The underlying logic behind this feature was to connect to the wider Occupy activist

community via social media.

The technological tools built by the LVG and Occupy networks of innovation reveal the values that certain stakeholders championed for and were successfully encoded into the design of the tools they created. The attempts by designers in both groups to address the values of the intended user communities by incorporating their voice into the translation process shows those values were accounted for in Occupy to a greater degree than LVG.

These findings illustrate the political and social construction of civic technology (Berg, 1992; Winner, 1980, 1992). "Technology as value-neutral" arguments are undermined by the results of the technical investigations of the LVG and Occupy TempCheck platforms. Instead, these findings show the tools were both the result of power dynamics and value conflicts and the intentions of certain stakeholder groups were motivated by political and technological values. Participants in the LVG network of innovation advanced their strongly held belief that deliberative communication was important in political processes by encoding such values into the design of the platform. By deploying this tool, the designers clearly hoped to shape and influence political interactions in a manner that supported this type of communication.

The value conflicts in the Occupy network in the early stages resulted in outcomes that disregarded the importance of face-to-face interactions in the processes of the Occupy community. Local activists' values were not represented in the features of the Occupy TempCheck tool that did little to connect the community through face-to-face communication practices. In both LVG and Occupy, the systems that were created represented the values and politics of the networks of innovation that produced them.

Conclusion

In this study I analyzed the process of ideation, design, and development in four informal civic networks that organized to create technology to address communication needs in a given community. Through in-depth analysis of micro-processes, I have demonstrated how values, resources, and power and their interactions undermine or support the organizational capacity of the networks of innovation, leading them to failure or success in reaching innovation goals. The contribution of this process-based view is particularly valuable to a political analysis of technology construction as it highlights the ways in which actions and activities of actors involved in the process of innovation are based on prior actions and choices made in earlier stages. This study shows that divorcing implementation outcomes from preceding decisions and events gives limited and incomplete understanding of the political and social construction of technology, which begins as early as the ideation stage.

Goal-oriented civic networks, such as those studied here, create and respond to conditions based on shared values and technological frames, resource conditions, and governance logic. These conditions inform the actions and activities of the actors that advance or impede progress. The findings here show how the choices made in the formative stages of innovation processes carry weight across later stages of the project. It also shows the vital role values play in enrolling and sustaining actors' participation in such community-led projects. Additionally, findings presented here suggest values and voice are important factors to consider in understanding disengagement from civic innovation efforts, the consequences of which can leave networks of innovation vulnerable to resource gaps. Governed by the logic of shared or concentrated power distribution, some networks tend towards inclusivity over efficiency, also affecting actors' commitments to the project. In the next chapter, I show how the outcomes of the micro-processes

that occurred in the Inception Phase of networked civic innovation continued to influence the trajectory of the remaining projects.

Chapter 4: Community Engagement, Adoption, and Enactments of Technology during the Integration Phase of Networked Civic Innovation

Introduction

In the previous chapter I argued and demonstrated that the interactions of values, resources, and power affect the ability of the network of innovation to organize effectively and complete tasks necessary to successfully design and develop civic technology. Of the four projects examined in this study, only Living Voters Guide (LVG) and Occupy TempCheck (OTC) were able to successfully achieve the implicit and explicit goals of the Inception Phase. However, the success of civic innovation is defined not by the design and development of tools but in the *use* of such tools by the intended user community. In this chapter, focus shifts to examining the continued influence of values, resources, and power on adoption outcomes, bringing into the analysis not only the actions and activities of the network of innovation but also the intended user community. Through analysis of the LVG and Occupy cases, I argue that the conditions of value cohesion, resource capacity, and power sharing established in previous stages shape the interactions between network of innovation and the intended user community, and ultimately shapes adoption decisions.

Adoption, adaptation, and resistance to technology are common responses of intended user communities when new technology is implemented into a given context (DeSanctis & Poole, 1994; LaPointe & Rivard, 2005; Lin, 2005; Rogers, 2003). The response to technology by different user communities is the focus of a large body of research, with scholars across fields examining characteristics of the user community (Pinch & Bijker, 1987; Rogers, 2003), characteristics of the technology (DeSanctis & Poole, 1994; Leonardi, 2013; Markus & Silver, 2008; Rogers, 2003; Venkatesh et. al., 2000), and social contexts (see Klein & Kleinman, 2002).

To build upon these studies and to further our understanding of adoption outcomes within civic communities, this study examines values, resources, and power interactions that occur across time in the process of networked civic innovation. Process analysis reveals how decisions made in prior stages continue to affect innovation outcomes during deployment of technology in the community after implementation. In doing so, it bridges the activities and actions related to design and development of technology to the responses and adoption decisions of the community during and after implementation.

The focus of this chapter is the *Integration Phase,* during which the developed technology is introduced to the broader community with the objective of changing existing communication practices through use. There are two stages in particular that are analyzed, the *implementation stage* and *the post-implementation stage*. The former is focused on the activities during which technology is initially launched and deployed into the community. The latter focuses on actions and activities that occur after deployment.

In the previous chapter, the importance of micro-processes was highlighted to understand organizing outcomes within the network of innovation. In this chapter, analysis focuses on how the network of innovation as a unit engages with the intended user community to deploy the Living Voters Guide and TempCheck tools. Findings from analysis of the implementation stage show how community responses to deployment are reflective of the ability and effort of the network of innovation to translate the benefits, purpose, and intention of the tool to the community. Again, resource capacity, value conflicts, and technological frames surface as relevant to understanding community responses in light of how representatives of the community are engaged in the deployment process and how the network of innovation enrolls them in supporting the implementation effort. Additionally, I demonstrate how resistance to technology

implementation increases when power holders within the community are challenged by the incorporation of the tool, as well as how resistance can be more difficult to overcome when group level adoption is required as opposed to individual level adoption. These findings suggest that the success of civic innovation efforts is not dependent on simply the availability of technology but also on creating and leveraging connections within the community to support translation of the benefits and intention of the technology. Deployment and communication strategies that engage and enlist members of the intended user population in the implementation effort prove to be more successful than strategies that fail to do so.

In analysis of the post-implementation stage, I first examine how the network of innovations responded to community feedback and consider redesign efforts that may support more successful outcomes. Ultimately, findings show, resources play a major role in shaping the post-implementation path. As the goal of every project in this study was to transform some of the communication practices of the community through implementation of technology, understanding the level of transformation within any successful cases is important. By adopting a practice-based lens of technology, I examine the transformational effects of the LVG platform (the only tool that succeeded in generating activity) on the communication practices of users. By examining how the technology is actually put into practice, the findings in this study show that transformation, though possible, is difficult to achieve in even those projects that were able to sustain favorable conditions of values, resources, and power sharing.

To contextualize adoption outcomes, this chapter begins by first providing analysis and discussion of the deployment and communication strategies that each network of innovation adopted for the implementation of the technology into the community. I then provide a brief explanation of the actual outcomes of the launch of each tool. The launch outcomes are then

evaluated in light of the role of resources, technological frames and value conflicts, innovation-decisions, and power dynamics. A discussion of the distribution of values, resources, and power follows. Analysis and discussion then focuses on the responses of each network of innovation to adoption outcomes. The chapter closes with an analysis of the transformational effects of the LVG platform on user communication practices.

Implementation: Community Engagement, Response, and Resistance

Examining the implementation stage of networked civic innovation reveals the importance of community connections to supporting successful outcomes. In the following pages I discuss how the LVG and Occupy networks of innovation involve community members in the deployment and implementation process. The analysis shows that the level of community engagement affects how community members respond to the tool upon deployment. Findings also show that resistance to technology within the community is affected by how the voice and values of community were incorporated across previous stages of the process of networked civic innovation.

Deployment and Communication Strategy

In addition to the processes identified in the previous chapter, development of deployment strategy and communication strategy by the network of innovation emerged as relevant to understanding the process of networked civic innovation. *Deployment strategy* refers to the plan of action developed by the network of innovation to introduce and put technology into use in the intended user community. *Communication strategy*, one component of the deployment strategy, focuses solely on how information about the tool (e.g., its purpose and intention) is communicated to the intended user community. As is demonstrated in the coming pages, deployment and communication strategy can shape technological frames of users.

Developing a deployment strategy that accounts for how users are prepared for the introduction of a new technology is necessary for successful implementation of technology (Dodgson, Gann & Salter, 2008). In organizational settings, leadership often manages both the introduction of new technology and resources. Resources are generally devoted to strategically aligning relevant stakeholders to supporting the goals of the implementation efforts through training, launch events, meetings, and discussions with relevant and influential stakeholders (Swan, Newell, Scarbrough, & Hislop, 1997; Van de Ven, Angle, and Poole, 2000). Such efforts require resources and, importantly, take advantage of networked relationships in implementation strategy.

The ability to develop such strategies in civic innovation contexts is dependent on both the availability of resources and the commitment of the network of innovation to allocating resources towards the activity. The resource conditions established during previous stages informed the deployment strategies adopted by LVG and OTC. The comparative analysis between LVG's and OTC's approach to deployment and the differing outcomes shows that the most relevant resources during this stage included material and human resources, and especially network connections. The deployment and communication strategies also revealed the level of community engagement each network of innovation incorporated to support the implementation effort. Community engagement proved to be important to supporting successful outcomes. In the following section I discuss how the LVG and OTC networks of innovation utilized different resources in the deployment and communication strategies that shaped community responses to the implementation effort.

Deployment Strategy and Community Engagement

Participants in both the LVG and Occupy projects elected to implement the technology in connection to events occurring in the intended community. For LVG, launch was targeted for the

2010 mid-term election season when Washington state voters would receive ballots in the mail. The LVG platform would, if used in the intended manner, be a voting resource for citizens to participate in and use to inform his/her voting decisions. In the state of Washington voters vote by mail only, meaning the timeliness of the launch was important.[8] The network of innovation made sure to address the deployment strategy well in advance of the identified launch date, which they aimed at late September. Diane explained the level of importance the team gave to developing a strategy for launching the tool.

> "… (W)e spent quite a bit of our time during the summer leading up to the launch identifying and discussing how we wanted to actually introduce the platform to the community. It was necessary to have that in place early on so we could frame our discussions with different allies throughout."

Diane's mention of allies was an important indicator of the LVG network of innovation's approach to deploying the tool. By working with community partners, or allies, in advance, the network of innovation hoped to involve members of the intended community in sharing the tool. This approach required engagement and connection with the community prior to the launch event. The LVG network of innovation agreed on devoting resources to engaging with the community including building out an official launch event. The network of innovation engaged "co-promoters" in their deployment strategy by inviting influential community members to a launch event and providing information, media material, and website badges to anyone interested in sharing the tool online. During the event, the tool would go live and CityClub would show attendees how to use the tool, which research has shown is an effective means of supporting successful implementation of technology (Orlikowski, 2000; Lin & Silva, 2005). The intent was

[8] Voters are sent ballot at least 18 days before the each election (Secretary of State website). Thus, for the tool to be useful, it should be available to the community during that period between receiving the ballot and Election Day.

for such community champions to learn about the tool and then to share the tool with their own communities. This strategic approach acknowledged the value of network ties and the importance of champions who were embedded within the intended user community.

Connecting in advance with the intended user community was not a clearly defined component of the Occupy Project's deployment strategy. This was due, in part, to a shift from one deployment strategy to an alternative strategy that was developed relatively late in the process. The original deployment strategy was built around the re-launch of the Occupy.net website, which Dana explained as a "website where anyone can find a battery of tools that can help them in organizing activities, events, and coordinating people. These range from maps to communication tools like a place to take notes." The Occupy TempCheck tool would be one of many tools offered through the website.

However, when I reached out to Dana in mid-June to identify the official launch date of the Occupy.net website and the TempCheck tool, she suggested a slightly alternative strategy. "Our goal is to launch it all by National Gathering. Your app would be great to have for that, which is June 30th to July 4th. I think launching for June 25th would be awesome. Is that doable on your end?" (Email correspondence dated June 14, 2012). The targeted date of June 25th was just ten days away. The National Gathering meeting was expected to draw activists from around to country together to reconnect, organize, and coordinate activities to sustain the movement. One of the tech operations team members, who planned to attend the National Gathering meeting in person, suggested we offer the tool to guide the visioning process that was scheduled to take place during the event. The UW team readily agreed, recognizing the opportunity to have a purposeful process and a use-case scenario attached to the launch that had been absent from previous discussions.

As discussed in the previous chapter, a result of the adopted decision-making process (consensus-based in a large group) established in the OTC network of innovation during the Inception Phase, was that resources were limited at launch due to delays. Thus, the UW developer team focused their resources, primarily informational and human, on making sure the tool was ready for launch and left the communication strategy to Dana and her team in New York City. We learned that a group of individuals representing the Tech Operations team would be on the ground during the event. This group included Michael, an activist who had been peripherally involved with the design and development of the tool. The plan and intention, according to Michael, was to hold a series of workshops introducing many of the tools that were available on the Occupy.net website, including TempCheck. "We're going to be on the ground and [will] start spreading the message that this tool will be useful for the visioning process," he explained. No prior engagement with the on-the-ground activists attending the event was incorporated into this strategy.

Though each network of innovation linked deployment strategy to events, the strategy regarding community engagement prior to the event differed. Building awareness of the tool is identified as one important component to support successful innovation adoption (Rogers, 2003). The LVG network of innovation accounted for awareness building and community engagement through deliberate, advance planning and dedication of resources towards that effort. The abundance of resources available to support activities that connected and leveraged community members in the implementation process would prove to be invaluable to the effort. The more limited resource conditions, such as time as well as network connections, of the Occupy team would not support such efforts. Where LVG had time to plan strategy in advance, the Occupy team was limited in that capacity and had to devote resources such as time and human support to

making sure the tool was ready for launch instead of focusing on other factors such as building awareness, connecting to the community, and engaging and enlisting others to support the implementation at launch. The lack of network connections to the on-the-ground activist community, as a result of the decision to disconnect from the local activists during the ideation stage, also contributed to the lack of incorporation of the community into the OTC strategy. The communication strategy further reflected the distinct approaches the LVG and Occupy networks of innovation adopted to introduce the tools to intended users.

Communication Strategy and Community Engagement

In both networks of innovation, some discussion occurred regarding the development of specific communication strategy to support implementation efforts. According to Rogers (2003), the communication channels through which individuals learn about innovation influence adoption decisions. In particular, diffusion of innovations theory identifies mass communication, or media, and interpersonal networks, as influential communication channels affecting adoption behavior. Awareness of the innovation is built through exposure, but actual persuasion to use is often filtered through interpersonal communication within an individual's network. The integration of interpersonal communication channels and mass communication channels was addressed to varying degrees in the LVG and Occupy communication strategies.

Interpersonal Communication and Community Ties

In both cases, interpersonal channels of communication were recognized as important to communication efforts. However, where the LVG network of innovation gave due consideration in advance of the launch, leveraging Diane's network connections and choosing to expend resources on an extensive plan, the Occupy participants assumed such communication would be easy to facilitate at the time of the launch.

Prior to a launch event held at CityClub, the network of innovation communicated information through social media, the CityClub website, newsletters, and other informal means of communicating with existing members. "We got on the phone and called our partners. We told them to start spreading the news and encouraging their members to use the tool," explained Diane. Such contacts included not just citizens and CityClub members at large, but also other civic leaders who headed organizations such as the local chapter of the League of Women Voters.

This approach acknowledged that the influence of CityClub would only reach so far without the support of some key influential community members who could act as advocates for the tool within their own sub-communities. Reach to a broader community of potential users would expand if the network of innovation could enlist these individuals in championing the tool in their own communities, potentially extending the diffusion of the LVG platform. Engaging those influential advocates would require creating shared technological frames, which will be discussed in later sections of this chapter. For now, it is important to note the communication strategy employed by the LVG team accounted for the importance of interpersonal communication and influence in their outreach strategy. In the ten interviews I conducted, eight of the individuals said that they learned about the platform from someone they knew and looked to for civic and political information. Some of these individuals clicked on links that were included in Facebook posts, while others learned of the platform through conversation. One woman said she learned about it at a monthly meeting of a civic organization to which she belonged. The two other individuals learned about it from either the UW website, which had posted a news story after the launch, or through a talk that Travis gave at the UW about the tool. "I knew if Caroline [head of local civic organization] thought it was a useful tool then I wanted

to be sure to check it out. She is always in the know about these things," said one interviewee, perfectly capturing the value of the interpersonal communication strategy. Clearly, the community-based communication strategy had worked.

Occupy network of innovation members did not account for such communication in the deployment strategy, in part, due to the lack of network connections with the on-the-ground activists. The decision of the New York City-based team to wait until the event itself to do any kind of promotion or outreach within the community did not require advance communication to occur. The tech operations team, unbeknownst to the UW team at the time, was not well-embedded in the intended user community that would be attending the on-the-ground event. "Honestly, I'm not really involved with the local camp. The tech team pretty much focused on our project… we coordinate through small meetings with one another and then via email and listservs in general," explained Dana during a reflective interview. Engaging with the community in advance was not easy to accomplish given the peripheral position of the Occupy technologists in the broader Occupy network. Thus, community engagement through interpersonal ties was not a part of the Occupy team's communication strategy. The entire strategy would rely on what the team on the ground would be able to accomplish once in Philadelphia. As will be explained later in this chapter, the lack of network connections within the user community would become a major barrier to the implementation process. Whereas the role of interpersonal communication and networks was incorporated as a core component of the LVG strategy, it went unaddressed in the Occupy strategy.

Communicating Technological Frames through Mass Communication Channels

While building awareness through interpersonal channels is valuable, the use of mass communication channels can also be useful in innovation efforts (Rogers, 2003). Again, the

communication strategy regarding mass communication channels differed in the LVG and Occupy cases. Notably, the LVG network of innovation used media to help communicate the network of innovation's technological framing of the platform through which they wanted users to understand the tool.

The LVG network of innovation engaged in targeted media outreach prior to and after the launch of the platform. Lance, Alan, and Diane wrote an op-ed piece for the local newspaper, the *Seattle Times* that was published the week of the launch on September 27th, 2010. The op-ed addressed the current information and political environment that voters faced, drawing attention to the low levels of trust in the polarized information environment. Importantly, the article laid out a technological framing of the LVG platform:

> We have joined forces to develop a new technology that is inspired by three goals: Restoring trust in our neighbors, learning to trust our community's wisdom, and demonstrating trust in President Jefferson's claim that an informed citizenry is the bulwark of a democracy. … [t]he internet and technologies that connect people through it can provide access to vast and immediate information resources, diverse perspectives, and person-to-person communication… We hope the Living Voters Guide will help build a connected and informed electorate. We hope it will inspire public trust in one another. We offer it as our own ballot initiative to reclaim citizens' power and shared responsibility for making our democracy work (Bennett, Borning & Douglas, 2010).

Press coverage extended beyond the *Seattle Times* and also included local television stations and local newspapers around the state, as well as coverage in blogs. The resource-intensive communication strategy was generally considered successful in achieving the goals of the network of innovation. "To do this well we knew we needed to get awareness built before the launch itself…We did use a diverse set of communication channels, including our interpersonal networks, social media, and newspapers," said Deen, acknowledging the intentional attention given to building awareness and a case for the tool through many different channels of

communication. Though the team did actively attempt to shape the technological framing for users, some incongruence persisted which will be discussed later in this chapter.

As is evident, the Occupy network of innovation had very limited outreach in advance of the launch of the tool. In fact, prior to the event there was no external communication at all regarding the Occupy TempCheck tool, its purpose, and how it could be used in the context of the visioning process at the National Gathering event. Instead, communication was limited to listservs and website postings that, rather than discussing specific tools such as Occupy TempCheck, explained to the reader that during the event the Tech Operations team would be on hand to provide workshops and tutorials on a variety of online tools. Despite the popularity of some social networking platforms such as Twitter, the network of innovation did not broadcast information about the tool to the Occupy activist community. Ultimately the very limited approach the Occupy network of innovation took to building awareness and engaging the community around the Occupy TempCheck platform would affect the adoption outcomes, as the on-the-ground team that would attend the event would have little more than their own credibility to establish interest in the project.

In the previous pages, I have discussed how each project addressed, or failed to address, community engagement through their deployment and communication strategies. Community engagement in implementation efforts would prove to be important to shaping the responses of the users. Research shows that resistance to technology can be mitigated by advance communication of the technology and integration of community members in diffusion processes (Lin & Silva 2005). In part, the deployment and communication strategies of the LVG and Occupy teams were reflective of the resource conditions of each network of innovation as they progressed through design and development into the implementation stage. These choices shaped

the level to which the user communities were aware and supportive of the tools, which reinforced adoption, adaptation, or resistance to the tools. Discussion of the deployment and communication strategies both contextualizes the findings that will be discussed in the following pages as well as reveals how resource capacity was important to developing those strategies. In the following section, I provide a brief account of the initial user responses upon launch of both platforms to further contextualize the impact of the implementation process in each project. This provides context that frames the section that follows, which examine the role of values, resources, and power dynamics in shaping adoption outcomes for both tools.

Launch Outcomes of LVG and Occupy

The combined use of network connections and media appeared to be somewhat successful for the LVG project. Nearly 9,000 unique visitors checked out the website between September 22nd and November 2nd (Election Day). While that number may seem somewhat limited when considering the intended user community was broadly defined as "the voters of Washington State," the members involved in the project considered it generally successful given a list of caveats. First, the platform was launched during a mid-year election, which every member in the network of innovation mentioned meant that in general the number of voters would be reduced from presidential election years. Secondly, as Deen explained, "Creating an entire new community was not going to happen overnight or over one month." Despite these limitations, network of innovation members considered the initial launch successful.

However, one important value emerged during implementation that some users said contributed to limited engagement: trust. According to Jonathan, through user interviews conducted during the implementation stage, the network of innovation learned that the value of trust went unaccounted for in the design and development stages (see Kriplean et al., 2012). In particular, the issue was about users questioning the trustworthiness of information and facts

posted by other users. “People asked us to verify information that was posted in pro and cons meant to persuade others. Often they also wanted a way to verify who it was that was posting,” explained Jonathan. A large component of Lance, Alan, and Diane’s op-ed, intended to frame the technology for users, focused on increasing public trust. To some level the fact that users were questioning the veracity of claims and authors suggests that though the network of innovation had hopes to support increased public trust through use of LVG they fell short in realizing that goal. In the next section, I will further discuss this value conflict as well as discuss incongruence in technological frames of users and the network of innovation that affected adoption outcomes of the LVG platform.

In contrast, the Occupy Project failed to generate activity on the tool, and, in fact, faced strong resistance to implementation from the activists intended to use the tool. The UW team eagerly watched the Occupy TempCheck site starting on June 30th, prepared to handle any issues that came up. We were surprised to find that there was no activity to monitor. “We expected a deluge of activity and instead there isn’t even a trickle,” said Lance, capturing the disappointment of the team’s experience. In an attempt to understand what was going on, I reached out to Michael on day three of the National Gathering event. What I learned from Michael via phone call was that the tool was not being used by any of the activists at the event. As is discussed below, persistent value conflicts, resource deficiencies, and the presence of an alternative tool all contributed to a condition in which the platform failed to generate interest or activity.

Explaining Adoption Outcomes in LVG and Occupy

A series of outcomes can result when technologies are deployed in a given community. Adoption, adaptation, and resistance are three common categories of responses identified in literature (DeSanctis & Poole, 1994; Lin, 2005; Rogers, 1995; Scarbrough & Corbett, 2013).

Adoption outcomes in LVG and Occupy varied. Where in LVG some adoption occurred, there was strong resistance and even rejection of the Occupy TempCheck tool. What explains these different outcomes? Previous research has identified different factors that affect adoption outcomes ranging from characteristics of individuals, to organizational dynamics, to societal-level influences (see Scarbrough & Corbett, 2013). In the following pages, I provide meso-level analysis to identify why these differing adoption outcomes occurred based on analysis of values, resources, and power conditions. Doing so reveals connections between the choices and decisions made in previous stages of the innovation effort to the outcomes in the implementation and post-implementation stages. This evaluation connects to existing literature by identifying the relationship of values, resources, and power to several key concepts that others have identified to explain the success and failure of technology implementation: network connections (Robertson, Swan, and Newell, 1996), technological frames (Orlikowski and Gash, 1994), innovation-decision contexts (Rogers, 2003), and challenges to power holders (Markus and Robey, 1983). Additionally, the presence of alternative technology that surfaced in the Occupy case is discussed as a factor to explain adoption outcomes.

Network Connections and Community Champions

During the ideation, design, and development stages, the actors involved in the LVG and Occupy projects made certain decisions regarding which groups' values and voices were represented. Those choices resulted in some actors leaving or remaining in the network, shaping resource conditions that would inform the communication and deployment strategy in each case. For LVG, resources were well within the network of innovation, but Diane's network connections became vital to the launch strategy. The goal of the LVG network of innovation was to deploy the tool amongst a broad and diverse set of voters. Given the influence of interpersonal communication in diffusing innovations (Rogers, 2003), it was important to enroll others in

supporting the network of innovation's goal. Previous examination of the role of network connections in diffusion of technology suggests that users often turn to network connections to learn about and create frames of new technologies (Robertson, et al., 1996). Thus, network connections between the members within the network of innovation and influential actors within the community were a powerful resource.

Diane's access to a diverse network of influential civic leaders who led organizations, held political leadership positions, or generally shared similar goals to increase civic participation in the community was beneficial in helping to diffuse the technology to the community. Those connections who were willing to adopt both the framing of the LVG platform and the tool itself acted as *community technology champions* and facilitated adoption by promoting the tool within their own networks, spreading awareness of the tool, and shaping the frames of new users. Integrating these community technology champions was imperative as they had already established trust within the community and thus gave the tool a level of credibility that an outsider, such as Diane or other network of innovation members, may not have. This trust and credibility could also counteract potential resistance from within the community (Lin & Silva, 2005). The strategic approach to bringing these influencers into the implementation strategy leveraged the network ties in a manner that supported the network of innovation's goal of deploying technology into the community.

In contrast, the Technology Operations team that attended the event had few network connections on the ground. As a result of the distance between the Tech Operations team and the on-the-ground activists prior to the event, identifying supporters was difficult. Community champions were non-existent at the event. The choice to disconnect with the local activists in the first stages of the project was far more meaningful to the project than we understood at the time.

Not only had we lost the voice of the user community as a result of the split from Steve and the other Seattle activists, but we also lost our ability to have someone from within the on-the-ground activist community act as a technology champion for our tool. We required community ties to enlist and enroll others in supporting our goals for implementation. When the team went to deploy the tool, they lacked the resources and trust necessary to get community members to start sharing the tool with one another. "I'm just trying to talk to anybody at this point, but it may already be moot…" said Michael during our phone call. Activists appeared wary and to some degree suspicious of the Tech Operations team, according to Michael. We would later learn that this was the result of value conflicts and an important power dynamic within the activist community that we had overlooked.

In evaluating how the launch outcomes of the LVG and OTC platforms unfolded, network connections surfaced as a prominent resource. Diane's connections to the community and community leaders allowed for the flow of communication surrounding the launch and framing of Living Voters Guide to expand beyond her own circle. The engagement of those influencers becomes a powerful means to diffuse the project to users beyond the reach of the LVG network of innovation. The credibility of those individuals who acted as community technology champions on behalf of the LVG network of innovation turned into a valuable resource for the project.

In examining the lack of network connections available in the Occupy Project, the role of that resource is further illuminated. Without network connections within the community, the ability to spread the word about the tool was severely limited. The lack of trust built between the on-the-ground activists and the tech operations team proved a barrier to engaging individuals to use, much less champion, the tool as a viable platform for the visioning discussions. The lack of

necessary resources limited the success of the team in implementing the tool in the intended manner.

These findings suggest that in the context of civic technology projects, the role of network connections cannot be overlooked as important resources, especially during implementation. Network connections are important to diffusion of information and technology (Barley, 1990; Robertson et. al., 1996). In the context of diffusion of civic technology, this is true, but perhaps even more so than in organizational contexts. Engagement with the community and the ability to enlist and enroll influential community members in diffusing knowledge, awareness, and understanding of the tool was invaluable to the LVG effort. The trust that these individuals carried within the community was important because individuals often make adoption decisions based on what influential peers decide (Lewis, Agarwal & Sambamurthy, 2003). If a community technology champion shares the LVG tool with their membership, a member may be more likely to try the tool than if they learned about it through other means. The absence of these connections severely limited the ability of the Occupy network of innovation to gain traction within the intended user community. While beyond of the scope of this study, further examination of how knowledge and information about technology diffused through civic communities is warranted.

Analysis in the last chapter revealed the value of network connections during the ideation stage in recruiting other resources to the project. In this chapter, we see how network connections resurface as important to implementation efforts and diffusion strategies. The loss of network ties (the result of value conflicts in the Occupy case) can limit the transformational impact of a civic technology by restricting its diffusion within the community.

Incongruence and Congruence of Technological Frames during Implementation

In the previous chapter, I identified the different technological frames advanced by relevant groups within each project. In doing so, I revealed the political process by which some frames were advanced over others, giving particular shapes to the developed technologies. A second, more common examination of technological frames is conducted at the time of implementation through analysis of designer versus intended user frames (Orlikowski & Gash, 1994; Leonardi & Barley, 2010). Technological frame congruence (or incongruence) is a second factor that affected adoption outcomes in the LVG and Occupy projects. The difference in frames of the on-the-ground activists and the designers of Occupy TempCheck reflected the persistent value conflict of online versus offline participation that first emerged during the ideation stage of the project. The ability of LVG to address or actively shape the intended user communities' framing of the platform through targeted communication efforts was valuable in creating congruence between the designer and user frames. Trust, as a value, however, was not well supported in the original design of the LVG tool, as during testing Jonathan and Travis learned the concern of users regarding veracity of information and authorship of claims. Users wanted to be able to verify information and authorship, which existing features did not support. This value conflict, network of innovation members learned affected user acceptance of the technology during deployment.

Incongruence in technological frames between the designers of the Occupy TempCheck tool and the activists was in part the result of the limited communication strategy. The network of innovation was unable to inform the activists' framing of the technology, and the framing adopted by activists was largely reflective of the value conflict between online and offline participation. During my phone conversation with Michael, I learned that one of the primary factors standing in the way of implementing Occupy TempCheck in the visioning process was

that the activists on the ground were wary of bringing in online participation. “The thing is, they aren’t really interested in bringing in outside voices to the visioning… showing up here is what they care most about.”

The choice of the network of innovation to adopt the framing of the technologically minded actors over the local activists during the ideation stage resulted in the loss of the voice of on-the-ground activists. By losing that voice early on, we developed a tool that was not reflective of the values of the community we intended to use our platform. The tool we developed was one that directly conflicted with the values of intended users. Gaining interest and support for such a tool would require effort and resources that were not readily available at the time of implementation.

As Michael and his team attempted to describe the platform to activists, they framed it as an opportunity to invite the voice of people unable to attend the event into the decision-making process. Where the designers of the tool imagined the tool being used to bring in input from those unable to attend, and moving the process of deliberation online to introduce efficiency, the activists framing was that of a tool undermining the value of on-the-ground participation. “Some people here are really not interested in changing the current decision-making process… they are questioning if people who aren’t here at the event have the right to shape the vision.” This difference in interpretation supports the notion that technology can mean different things to different actors (Pinch & Bijker, 1987; Law & Callon, 1992). The different interpretations in this case were closely tied to the existing power dynamics within the community and the challenge the Occupy TempCheck platform posed to power holders.

I had the opportunity to speak to a few activists who attended the National Gathering event, and while these interviewees had not directly engaged with the Tech Operations team nor

heard about the TempCheck tool specifically, hesitancy to involve technology in the debate process was brought up several times. One woman said,

> "The whole point is that we're here to 'occupy' space, and there is a physical element to our protest. This is counter to what we're seeing with Facebook revolutions…we're trying to go back to a time where you can't just click away from something you don't want to see. You can't just ignore my body and my presence here. Technology gets in the way of that."

The existence of diverse frames in a given community is not unexpected, nor is it counterproductive necessarily; however, accounting for and acknowledging diverse frames during design is important (Leonardi & Barley, 2010; Orlikowksi & Gash, 1994). The network of innovation was unable to account for this incongruence however, creating a barrier to adoption that was difficult to overcome.

The technological framing of the Living Voters Guide platform was more successful, in part due to the resources deployed by the network of innovation to create shared framing of the tool. Through different communication channels including the op-ed, newsletters, emails, and during the launch event, the LVG network of innovation expressed the intent and purpose of the technology both prior to and after launch. The Occupy strategy did not account for this pre-work. Where the LVG network provided their partners with language to distribute when sharing the tool, the Occupy network of innovation assumed explanation of the tool through workshops would be enough. The LVG partners framed the use and intent of the technology that reflected alignment between designers and users. This facilitated adoption of the tool, to some degree, in a manner resonant with desired use imagined by the network of innovation.

One area where incongruence emerged was around the importance of trusting sources of voting information. The network of innovation conducted interviews with eight users during the first month of the launch. Through these interviews, one key value emerged that had gone

unaccounted for in design of the tool: trust. Users expected that the tool would replace the voting guides that are delivered by institutions such as the Secretary of State's office, political parties, or media. Credibility or verifiability in alternative voting guides was either based on trust in the source itself or by means of allowing the reader to check the information on his/her own. In one of my interviews, the user explained her use of a local weekly newspaper's voting guide. "You know you'll see a citation for a report or a link to a news article if the material is online."

The features of the Living Voters Guide platform did not actively support this value of trust. "We assumed a level of trust existed between citizens that it turned out we were wrong about… The user study showed that everyone was skeptical of whether people are who they say they are and whether the 'facts' they offer are legitimately factual claims," Jonathan explained (see Kriplean et al., 2012 for further discussion). Though the LVG network of innovation did attempt to incorporate the voice of the community throughout the process, in hindsight, members admit that the decision to conduct user testing after launch may have contributed to the oversight of this issue. "I'm glad we learned of it early on, though. It gave us a chance to start to think about how we could build trust in later iterations…like what kind of features would support that… We definitely had discussions about it right away," said Jonathan. This value conflict was something that the team recognized needed to be addressed in the near future.

Congruency in technological frames between users and designers had a clear effect on the willingness of users to use the two tools. The intention of the Occupy network of innovation to have users incorporate the tool in their decision-making processes was challenged by the on-the-ground activists' frames that saw no role for technology in group processes. Resistance to adopting the tool was indicative of the fundamental value conflict of online versus offline participation. The findings in this study demonstrate the connection between communication

strategy and developing congruency in technological frames. The strategic integration of community champions and active attempts by the LVG network of innovation to communicate the framing of the technology was largely successful. Previous studies have shown that providing training and language to explain the intention, use, and application of technology in the intended user community can lead to more successful outcomes (Orlikowski, 2000). The findings here suggest this is true in civic innovation contexts and that effort spent creating congruence in technological frames through targeted outreach can support more successful adoption outcomes.

Innovation-Decisions and Challenges to Power Holders

Another factor that reflected the influence of values, resources, and power on the adoption outcomes of the LVG and Occupy projects was the type of buy-in required for the technology to be adopted, or what is called the "innovation-decision." Whereas the LVG tool required individual-level adoption, the Occupy TempCheck tool required group-level adoption for it to be useful. Previous research (see Larsen & MacGuire, 1998; Rogers, 2003) has identified distinct types of innovation-decisions that occur: optional, collective, and authority. In this study, the two relevant types of innovation-decision are optional and collective. *Optional innovation-decisions* are choices made by an individual to use or not use a technology. *Collective innovation-decisions* are choices made by consensus among members to use or not use technology, and are most relevant. Resistance in either case is of concern to the network of innovation, but even minor resistance in collective innovation-decision contexts can be more difficult to overcome.

The Living Voters Guide tool required individual level adoption as opposed to collective buy-in that was necessary for the Occupy platform. While it is true that the value of the Living Voters Guide platform increases as more users contribute points to the system, the decision to

use the tool is an individual user's to make and did not require collective buy-in. To some degree, this type of decision is easier to implement in a community, as it does not require building group consensus across a large set of actors such as the Washington State voters targeted in the LVG project.

While community-wide adoption was not necessary for LVG to be successful, it was somewhat hindered in diffusing more broadly in particular communities. "The one place we still don't have buy in is with the more conservative groups in Washington. We can't get their buy-in…maybe in part due to the fact that we are potentially challenging their own voters' guides," reflected Diane.[9] This challenge to power has been identified as a potential barrier to adoption of technology (Markus and Robey, 1983; Lin & Silva, 2005). The resistance Diane reflected on was due to the fact that if organizations, such as the Republican Party of Washington, suggested that their members use the Living Voters Guide to gather and share voting information, then they may undermine their own interests that are met when membership uses their own voter guides. The disruption that the LVG designers intended to introduce to the existing voting communication environment challenged the power of such organizations, creating a barrier to enlisting them to use the tool and help diffuse it to their broader community. Enrolling individuals or groups whose power is challenged by the introduction of the technology into community practices is an important concern for civic innovation leaders to consider. In optional innovation-decisions, the resistance of some groups may be mitigated by the ability of individual

[9] In 2011, building from our first experience we actively targeted both Democratic and Republican district leaders in advance of the second launch of LVG. Democrats, we noted, were far more likely to take interest in LVG and were more willing to distribute it to their constituents than their Republican counterparts. Several Democratic leaders shared links to the LVG homepage in their monthly newsletters. Very few of our discussions with Republican leaders led to agreement to share the website, however, indicating this issue was ongoing throughout different iterations of the project.

users to make his/her own decision regarding use of the tool. As this analysis shows, that is not so easily addressed with technology that requires group adoption.

This issue of resistance became prominent in the Occupy case. In contrast to the LVG adoption requirement, the Occupy model required collective adoption decisions for the tool to have any utility in the community. If one user posted proposals on the platform, it was not meaningful unless others also engaged by reading it, voting on it, and then bringing the results into face-to-face meetings for incorporation into the decision-making process. For implementation to be successful in the visioning process, a collective decision by participants to use the tool and integrate it into the existing process was necessary.

Michael and I talked at length about the active resistance of on-the-ground activists at the National Gathering meeting. "The thing is, they are loud and they are prominent in the community. They have their own ideas about what we should be doing with the visioning process and don't see this [Occupy TempCheck] as a part of the process." Addressing the vocal resistors would be necessary. To understand more fully what the resistance to the technology was about I probed Michael to explain what he meant. To some degree, it was about the tension between online and offline participation. However, what Michael explained also suggested that those resistant to the technology felt the tool could undermine the power held by activists on the ground. "The sentiment here is people who show up deserve to have a little more say than those still sitting at home." In observing the resistance of activists to using the tool, it became clear that collective innovation-decisions required more of designers during the implementation stage. Achieving group adoption requires overcoming resistance that may exist within the group. Overcoming that resistance would require resources that Michael and his team did not have, such as network connections and community champions. Without our framing of the technology being

communicated to the community already, the framing advanced by the on-the-ground activists faced little resistance.

Displacement of power has been identified as a factor contributing to user resistance to technology in organizations (Markus & Robey, 1983). As was evident in this case, the on-the-ground activists who held decision-making power in the current set-up for the visioning process would have that power threatened if the process expanded to allow for online participants to have equal opportunity to participate. Though I do not generalize that all attendees at the event felt the same way, I do note that in several interviews I conducted with other Occupy activists, this sentiment was mirrored. There was a common notion that people on-the-ground, staying at camps, should have more say than others. Ultimately, the vocal resistors were able to interfere with the attempts of the Tech Operations group to implement our tool in the visioning process.

The findings here suggest that power displacement in collective innovation-decision contexts is important to acknowledge, especially in civic contexts. Community buy-in is necessary for many types of civic technology tools to be effective. Without the resources required to counter the vocal resistors, namely network connections, community champions, and trust built between the Tech Ops team and the activists at the event, there was little Michael and his team could do to implement the tool in the visioning process. Ultimately, what these findings suggest is that civic innovation projects need to account for resistors of technology, creating strategies to address potential naysayers. This may be even more challenging to overcome when collective buy-in is required for successful implementation. As both these cases show, non-users of technology matter (Wyatt, 2005) and they can, and do, have the ability to provide valuable insight into understanding adoption outcomes.

One contribution of Value Sensitive Design that may have been beneficial to employ in the Occupy project is the Value Dams and Flows method (Miller, Friedman, Jancke, and Gill, 2007). "Value dams" refers to the technical features or policies that even a small set of stakeholders are opposed to in a given system. "Value flows" are technical features or policies that a large percentage of stakeholders are supportive of and would like to see encoded into a given system. Identifying value dams and value flows during design employing this method, the authors contend, leads to creating a tool that is more likely to be adopted as it: a) avoids features that some stakeholders are resistant to, (b) incorporates into design values supported by many stakeholders, and (c) systematically addresses design tradeoffs (p. 4).

The remote participation features of the Occupy TempCheck tool were a clear value dam for the project. Engagement with more stakeholders beyond just the technologists during both the implementation stage as well as design stages may have revealed this value dam earlier in the process. Had we implemented the value dams and flows method during design, we would have considered this value dam in light of other features that may have gained wider support. For example, efficiency was important to many Occupy activists (Agarwal et. al., 2014) and perhaps considering and framing features in light of efficiency rather than remote participation may have better supported intended outcomes. Though the value dam and value flow methodology has been primarily organizational contexts (Miller et. al., 2007; Denning et. al., 2014) the findings support the inclusion of VSD methods into civic innovation contexts as well.

The previous section has discussed the influence of values, resources, and power on the LVG and Occupy projects in light of network connections, technological frames, value conflicts, and innovation-decisions. One more factor affecting the Occupy Project's success that was reflective of these facets of networked civic innovation was the presence of an alternative

technology. No such alternatives existed in the communication ecosystem of Washington voters when LVG launched. A brief discussion of the alternative technology and the impact it had on the Occupy Project outcome is provided below.

Alternative Technology in Civic Contexts

To further the challenges facing the Occupy network of innovation, we also learned of an alternative technology that had been built by activists well-known within the community. The tool, Open Assembly, appeared to be built to support the visioning processes in ways that we had imagined Occupy TempCheck would be used. According to Mike, Open Assembly was a tool that individuals who were participants in the National Gathering were already aware of before the event. These individuals also appeared to be actively advocating for use of the technology. Unaware of the alternative technology, we were surprised to learn of it during the launch effort.

The developers of Open Assembly appeared to be well embedded in the activist community already. "Everyone seems to know them already. I mean, they are doing a good job of getting out there. They have shirts even. And one of the main developers has been really vocal at the national level since the early days so they have a pretty strong presence," Mike explained. The Open Assembly tool was, in many ways, resonant of the same values found in Occupy TempCheck. On July 2nd, a post explaining Open Assembly and the Visioning Process was shared across several Occupy camps' websites and Facebook pages, including Occupy Seattle. The post explained:

> "We cannot let democracy be decided by only those with the luxury to travel to Philadelphia for the National Gathering. The Occupy Philly Visioning Working group, in conjunction with Open Assembly and InterOccupy, has developed an online component to allow anyone with access to a computer to take part in the visioning process. The online platform features chat, voice-over internet protocol (VOIP), proposals with collaborative document editing, and real-time straw-polling." (Occupy Seattle Facebook Page, July 2nd, 2012).

The values of inclusivity and broad input and consensus building were all communicated through the lengthy post. The invitation to "anyone with access to a computer" to participate was similar to the Occupy TempCheck framing of technology. What differed was the level of buy-in that the Open Assembly project had in advance of the event. When we lost our connection to local activists, we lost both sight of their values and access to their network connections. Where the Open Assembly group was able to have their post shared on the website, our requests to do the same were left unanswered.

However, though there was some activity on the Open Assembly tool, the community was still resistant based on the same value conflict we encountered in our process: using technology to invite outside participation was in opposition to a vocal contingent of the participants at the event. "…They are putting up a barrier to that [Open Assembly] tool too. I'm not sure why there is so much resistance, but we feel it," said Mike.

The Open Assembly project further illustrated how valuable the network connections were to the implementation process. Had we been embedded in the community, it is likely we would have learned of the project earlier, potentially changing the trajectory of the project entirely. The ultimate result of our efforts on the project was a sense of frustration at the amount of resources expended on a project that was not successfully implemented. The fact that even Open Assembly failed to generate interest amongst the community, however, showed how much adoption outcomes can be and are influenced by value conflicts.

Conditions of Values, Resource and Power in LVG and Occupy during Implementation

The goal of implementation was to deploy a technology for use in the intended community. Table 4.1 and 4.2 below reflect the distribution of value cohesion, resource capacity, and power sharing during the implementation stage in both the LVG and OTC projects, revealing

the conditions that supported or undermined that goal. Shifting to the meso-level of analysis, the tables reflect the distribution across both the network of innovation and the intended user community.

The conditions of values, resources, and power-sharing during the implementation stage in Occupy and LVG were heavily influenced by the interactions of the three facets in previous stages. The low level of value cohesion in Occupy TempCheck (see table 4.2) was reflective of the choices made by the network of innovation to address value conflicts that surfaced during ideation by eliminating the conflict and removing the voice of on-the-ground activists. The technologists who continued working together did not adequately address the online versus offline value conflict, thus they produced a tool that was not reflective of the values of the user community. Previous research shows cognitive proximity can be detrimental to innovation efforts, creating lock-in which can shut down consideration of alternative perspectives (Boschma, 2005). It is clear that to some degree the Occupy network of innovation developed a sort of lock-in when it reconfigured to include technologists and not on-the-ground activists. The distance between the users and the designers increased as a result of that decision. That distance created a context in which we were not close to the behaviors of the intended users. Thus, when we went through the processes of translating and encoding values into the design of the tool we accounted for values that were not only unimportant to the intended users, but actually in conflict with their values. We did not adequately address the online and offline tensions while designing the tool and instead, assumed acceptance of online modes of participation. Without input from actual on-the-ground activists that would use the tool, we created a tool that unintentionally underscored the value conflict, which contributed to non-use of the platform. The activists' interpretations of the technology were starkly different than those of the designers in the network

of innovation. If the goal is to create a shared interpretation, distance from the users proved to be a barrier in doing so.

Similarly, the resource conditions were affected by the same choice to disconnect with local activists during ideation. When we disconnected from local activists, we lost valuable network connections that may have proven useful when it came time to engage with the on-the-ground activists during and prior to deployment. As was evidenced in the LVG case, trust through ongoing interaction was important to enlist influential community technology champions to support implementation of the tool. With limited interactions with on-the-ground activists prior to the National Gathering meeting, Michael and his team found it hard to gather community support for implementation of Occupy TempCheck. Since group-level buy-in was required for the tool to be useful, the lack of connections was especially detrimental for the project outcomes.

The lack of support from intended users, due to the value conflicts and incongruent technological frames, resulted in the loss of access to community resources as well. Occupy was unable to leverage access to community resources, where LVG was able to recruit community members to support innovation and implementation goals. Thus, looking across the groups of relevant actors – the network of innovation and the intended user community – only a minority of actors leveraged resources to support the goal of implementing Occupy TempCheck into the community. Thus, resource capacity was low.

The distribution of power-sharing remained high in this case. The ability of the Occupy network of innovation, a minority of relevant actors involved in this stage, to influence the implementation outcomes was limited. Instead, a majority of actors – the intended user community – were able to influence outcomes. This group was resistant to our technology and on-the-ground activists were successful in keeping it out of the National Gathering visioning

process. The ability of a minority of actors to impose use of a technology is not uncommon in formal organizational settings. One can imagine leadership at a hospital implementing a new electronic records system and to some degree forcing staff, nurses, and doctors to use the system. While user resistance is always a possibility, a minority of actors can in some circumstances influence outcomes more so than a majority. However, in civic innovation contexts this may be more difficult to achieve. A minority of actors imposing technology against the will of the majority is unlikely. In fact, Keli Carender of the Tea Party explained as much in voicing the frustrations she and the leadership faced in implementing new tools for the membership. "We decide to revamp things like our website and Steve will devote resources to it, and then no one uses it. We can't keep spending the resources if our members are not going to use it..." She further explained that getting member buy-in was necessary for any tool to be worth the effort of building it.

As is shown in Table 4.2, value cohesion was generally high in LVG. The shared technological framing and efforts made by the network of innovation to create the aligned frames was generally successful in the implementation stage, with the exception of the public trust frame that was discussed earlier. The ability of the network of innovation to enlist and engage other community members and influencers in devoting their own resources to sharing the tool demonstrates that resource capacity was both distributed and was leveraged to support the goal of the implementation stage. In regards to power-sharing, the ability of users and the community to affect the goal of the implementation stage was high, as is always the case during implementation. Users can opt for using technology, or can always "choose to do otherwise" (Orlikowski, 2000). However, in this case the network of innovation was also able to affect outcomes by enrolling community members in their goal and leveraging community resources to

support diffusion of the technology into groups that the network of innovation may not have been able to reach otherwise. The findings here suggest that enrolling community members becomes necessary to increase support and use of the platform. Having trusted sources embedded within the community to advocate for and support implementation may mitigate resistance to tools and increase likelihood of others to also use the tool.

The analysis of the process of implementation in community-based networked civic innovation suggests that groups that seek to implement technology in community contexts must take into account whether the innovation decision is made at the collective or individual level. If group buy-in is required, adequate resources should be available and leveraged to build shared framings to counter resistance and generally create awareness of the tool in advance of deployment in the community. This finding supports what previous studies have noted in organizational contexts (Lin & Silva, 2005). Additionally, this study shows addressing value conflicts by removing the voice or representation of certain perspectives does not solve civic innovation problems. Voice and representation of the community in innovation processes continues to matter across the trajectory of the project and especially in later stages. Where the processes involved during design and development of Occupy TempCheck may have been smoother as a result of cleaving from the local activists, ultimately the need to address the conflict through design choices proved necessary. Translation of activists' values was overlooked as a result of our decision to break away from Steven and his fellow activists, which further contributed to the failure to implement the tool in the intended community.

Table 4.1: Distribution of Values, Resources, and Power Across all Stages of Innovation in the Occupy TempCheck Project (OTC)

	Ideation	Design	Development	Implementation	Outcome
High	◆ ●	■ ◆ ●	● ■	●	Network dissolves; Project ends
Medium	■		◆		
Low				■ ◆	

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

Table 4.2: Distribution of Values, Resources, and Power Across all Stages of Innovation in the Living Voters Guide Project (LVG)

	Ideation	Design	Development	Implementation	Outcome
High	■ ◆ ●	■ ◆ ●	● ■	■ ◆ ●	Network continues to evolve; Project continues iterative adaptation
Medium			◆		
Low					

■ = Value Cohesion ◆ = Resource Capacity ● = Power Sharing

In assessing the outcomes, the goal of implementation was fulfilled in LVG, though to a limited degree. The implementation goal was left unfulfilled in the Occupy Project. However, after the networks of innovation received feedback from the community, they had opportunity to address the resistance, value conflicts, and incongruent frames. Analysis of the post-implementation stage focuses first on how each network of innovation approached that opportunity. Then, as the goal of each project in this study was transformation of existing communication practices within the community, a discussion follows that is focused on how

successful LVG was in actually transforming practices of voters, since they were the only project able to successfully achieve the goals of each stage.

Post-Implementation: Designer Responses and Community Enactments of Transformation

Evaluation of the post-implementation stage of networked civic innovation focuses on what occurs after technology is deployed into a community. Unlike other stages, there are no common goals to fulfill during this stage, as the outcomes are largely contingent on how the network of innovation elects to proceed with the project. The adoption, adaptation, or rejection of the tool by the community provides the network of innovation a line of sight into what is working, what is not working, and what may need to be changed in order for the developed technology to be useful. In both cases, the network of innovation had the opportunity to consider feedback from the community and make decisions about how to proceed. In the LVG case, the network of innovation elected to continue to evolve the project to address differences through redesign. The Occupy network of innovation elected not to redesign the tool, but instead tried to re-implement it into another context. A brief discussion of these decisions is provided below.

The section following provides a closer analysis on understanding the transformative capability of the Living Voters Guide platform on the communication practices of voters in Washington State. By examining how the community actually uses the tool in intended and unintended ways, we gain insight into how transformational a tool actually is in changing existing communication practices within a community. Examining this through the technologies-in-practice lens (Orlikowski, 2000) revealed three ways users enacted particular communication practices through use of the LVG platform: information gathering, deliberation, and expression of political voice. Findings demonstrate that the tool in some ways transformed practices, but

through other enactments users also only slightly augmented or retained their current voting communication practices.

Addressing or Resisting Interpretive Flexibility

Artifacts can mean different things to different actors (Pinch & Bijker, 1987; Law and Callon, 1992). Interpretive flexibility, "the capacity of a specific technology to sustain the divergent interpretations of multiple groups" (Sahay & Robey, 1996, p. 260), is a term first offered by Pinch & Bijker (1987) to account for how different stakeholders can associate different meanings to the same artifact. Identifying different interpretations of an innovation provides insight into why a technology fails to achieve adoption in a community or leads to different unintended appropriations by users than those the designers imagined (Doherty, Coombs & Loan-Clarke, 2006). In examining the unintended use or rejection of a tool, designers can, and do, modify the artifact over time, translating and encoding different values and inscriptions that create more proximity in interpretations. Ultimately and ideally, this leads to a stabilized state of "closure" where interpretations are mostly aligned.[10]

The responses to the interpretive flexibility of the Occupy TempCheck and Living Voters Guide tools by participants in the network of innovation were divergent. The LVG network of innovation reacted to the alternative framings, interpretations, and concerns of users by returning to the design stage, redesigning the tool to account for some of the gaps in values. In contrast, the Occupy network of innovation did not try to redesign or address changes in the features of the

[10]Application of this concept of closure to ICT and information systems has lent to a slightly different approach to closure than adopted by those examining technologies such as bicycles, due to the more flexible nature of software which can and is modified regularly (Doherty et. al., 2006). Secondly, scholars demonstrate interpretive flexibility is not necessarily "infinite" due to the affordances and constraints of the artifact (Akrich, 1992; Orlikowski, 2000).

tool, but instead decided to take the tool as it was and re-implement it into a different context. These decisions in part were reflective of the resource conditions.

The LVG network of innovation actively attempted to account for the interpretive flexibility of the platform. The project members continued to devote resources to updating and addressing value conflicts over time. The iterative redesign process has been ongoing since 2010. Incrementally, the redesign efforts have introduced new features to support the value of trust, some successful and some less so. These efforts have involved encouraging members to include pictures and use real names, giving options to include hyperlinks to online materials, and most significantly in the 2012 deployment, the inclusion of a fact-checking capability (see also Kriplean, Bonnar, Borning, Kinney, and Gill, 2014).

To support the value of trust, the 2012, 2013, and 2014 deployments of Living Voters Guide introduced a new process with which users could engage. If an LVG user felt a particular fact provided by another user needed verification, he or she could flag it. Then, librarians from Seattle Public Libraries operate a fact-checking process where the librarian conducts non-partisan research on the claim to ultimately deem one of four judgments to the claim. The process of fact-checking was developed in meetings between CityClub, Diane, Travis, Alan, and librarians, and incorporated in later versions of the project. The process was intended to provide "a fair, balanced, and complete response," to user requests. Upon completion of the fact-checking process, librarians provide users with one of four responses that indicate the level of consistency the librarian found when evaluating sources to confirm the veracity of information presented: "consistent with sources found," "inconclusive given sources found," "inconsistent with sources found," or "outside the scope of services."

The inclusion of this fact-checking process shows how technology is shaped by, but also, shapes the interactions of social actors. Demonstrating the mutual shaping process that occurs in sociotechnical systems like the process of civic innovation, the LVG platform was redesigned to include features that responded to how users interacted with the tool. New features, built in response to the issue of trust discussed earlier in this chapter, allowed for flagging a point, as well as development of a background interface for librarians to interact with the fact-checking process. Examination of both the technology and social groups and interactions that informed the LVG redesign process suggests that in fact a "middle-ground" approach to examining not only the social but also the technical features and their ongoing evolution provides more meaningful understanding of the relationship between technology and society (see DeSanctis & Poole, 1994; Doherty et. al., 2006; Lievrouw, 2014; Orlikowski, 1992).

In contrast to the LVG team, going into the post-implementation stage, the Occupy network of innovation members had few resources left to address such changes. Due in part to resource constraints, especially material and human, updating and addressing value conflicts within the existing system was not possible. The decision instead, was to take the tool in its existing form, and integrate it into another feature on the Interoccupy.net website, called Occupy Hubs (see Figure 4.1). In an email sent around the time of the initial deployment, Michael suggested the issue-based hubs provided an alternative way for groups to work on proposal online. Though we worked on integrating the tool into the Hubs space, the tool was still never actually used. "Honestly, we never saw a demand for this within the community. It isn't surprising to see that it didn't gain traction," said Travis in reflection. Attempting to redesign the tool would have required more effort and given the amount of resources already expended on the project with little return on investment, it was difficult for the UW developer team to justify

more allocation of scarce resources. As a result, the network of innovation simply stopped work on the project.

The decision to not redesign in light of value conflicts, and to choose instead to implement the tool in a different context reveals some of the difficult conditions of community-led civic innovation efforts. Without adequate resources to address disconnects with the intended user community, the only option was to try to take what already existed and re-introduce it in a different way. In some ways, the Hubs space may have been more ideal than the National Gathering meeting because activists who were using the Hubs were already willing to use online tools to support their organizing efforts. However, again the network of innovation did not engage in a targeted or direct deployment or communication strategy to introduce the tool to users of the Hub space. Users were unlikely to fully understand the functions, uses, and purposes of the TempCheck tool as a result, reducing the likelihood of use (Orlikowski, 2000). It is also possible the non-use was reflective of the waning activism in the movement that by late August 2012 was markedly less vigorous. However, the late release of the Occupy TempCheck tool due to delays caused by decision-making processes during design and development contributed to the postponed release, which occurred during a time when activity was low.

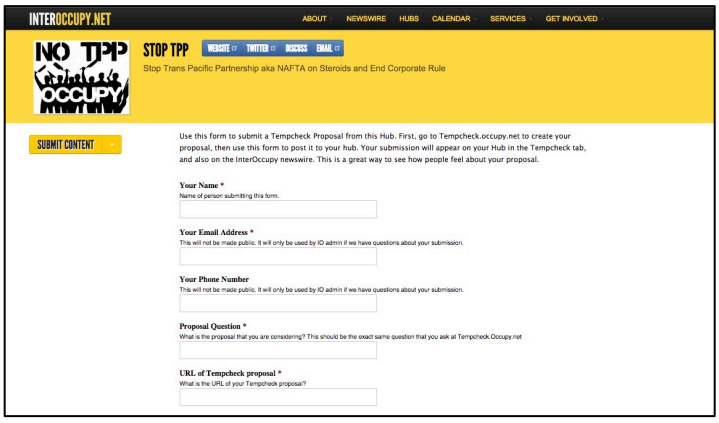

Figure 4.1: Example of Integration of Occupy TempCheck into Occupy Hubs

Transformation and Technologies-in-Practice

Transformation of existing communication practices was the underlying motivation for every project in this study. The ability to create new, or alter existing, communication practices within a group of individuals through the implementation of technology is not simple, as the results of this study show. The findings demonstrate that at least for the cases in this study, failure is more likely than success. It is likely this is true more broadly in the context of civic innovation and in other similar contexts of citizen-oriented innovation, such as e-government projects research failure is likely (Heeks & Bailur, 2007). LVG was the only project that was able to overcome barriers across all stages of networked civic innovation and engage the user population in implementing the tool into their voting communication practices. Through recursive design, the network of innovation has been able to sustain a small but stable community who actively use the platform every year. General use of a technology is an important indicator of the success of a given project; however, to understand the transformative success of such an effort requires understanding *how* the technology is used. By examining how the community actually uses the tool in intended and unintended ways, we gain insight into how transformational a tool actually is in changing existing communication practices within a community. Examining the ongoing technology use by the community reveals which structures, or rules and resources, are reproduced that maintain, augment, or transform existing practices (Orlikowski, 2000). By evaluating how users actually use (or do not use) the LVG platform and particular features of it through a practice-based lens, we more clearly understand which existing voting communication habits are changed within the user community. In LVG, I discovered three distinct technologies-in-practice enacted by users. Some of these enactments challenged existing practices, indicating some level of transformation was achieved in the communication

patterns of users within the community. In the following section, I briefly describe the three enactments: information gathering, deliberation, and expression of political voice.

Information Gathering Technology- in-Practice

According to Orlikowski (2000), users enact particular structures, through recurrent use of technology. This view of structure as enacted through human practice challenges perspectives that assume structures are embodied within technology. Until a structure is actually enacted through use, Orlikowski argues, it does not exist. The practice-based view on enacted structures cues researchers to focus on observing what people actually do with technology to understand how transformation of existing and targeted communication practices does or does not occur. The question is whether users enact technology to transform, augment, or retain their way of doing things through use or non-use.

Analysis of both Google analytics data provided by Travis, as well as the interviews I conducted, showed that the most common technology-in-practice observed by citizens was minimalistic interaction with the tool where information was gathered through passive scanning. In this enactment, there was little interaction with the different features such as the slider, creation of pro/con points, or even adding existing points to the list. Instead, users spent time reading short descriptions of the measures and scanning the pro and cons contributed by others. Often, after doing so, they left the website. "I use the internet to gather information before voting…now I've added Living Voters Guide to my list of websites to visit when I'm trying to learn about how to vote," explained one interviewee. This enactment was limited in that it did not appear that users necessarily transformed behaviors. Instead, they merely appropriated the tool to fit their ongoing practices, suggesting this enactment failed to produce change in the processes of voters who enacted this technology-in-practice. Where the network of innovation

hoped to increase participation and engagement between voters, users who enacted the information gathering technology-in-practice did not engage in those activities.

Deliberative Communication Technology-in-practice

Some users also enacted the deliberative communication technology-in-practice. "I spent a lot of time reading through the cons on this one measure. I couldn't understand how people were against it, so I tried to learn. I wasn't convinced of their position in the end but at least I spent some time trying to understand," said one interviewee. In this way, there was enactment of the deliberative communication technology-in-practice. The fact that in the first year, users identified their stance using the slider function, and, according to Jonathan and Travis, that over 40% of users included both pro and con points in their list, suggests this enactment was valuable to a broader range of users (also see Kriplean et al., 2012). The use of the points, the list, and the slider were important indicators that individuals were engaging in deliberative communication practices. Interviewees said they did not necessarily participate in such deliberation regularly. As was explained earlier, many interviewees said that though they "knew deliberation is important," they did not often go out seeking alternative points of views. Through enactment of the deliberative communication technology-in-practice, some change in voting communication practices was occurring within the intended user community.

Expression of Political Voice Technology-in-practice

The enactment of Expression of Political Voice technology-in-practice was perhaps the one enactment of technology most closely tied to the network of innovations' intended use, but it was also the one least commonly enacted. The number of visitors who engaged with the features that supported this enactment was far fewer than those who used it to gather information. In my interviews with users, I learned that expressing political voice was not a common behavior or practice for many of the interviewees. One interviewee said she felt more comfortable adding

points over time though, but initially wanted to understand the tool more before agreeing to add her comments to other points or post her own pro or con points. The type of participation that the LVG network of innovation hoped for required deep investment on behalf of the user. The level of attention, time, and skill required to create a pro or con point was much higher than scanning the platform for information.

Still, some users did enact this technology-in-practice. One user explained his process for creating a pro and con point,

> "I used the guide to give my opinion… at the beginning I felt strongly about the liquor measure and wanted others to know why… So I set aside time one day to think through my position and then write a short explanation. I did that just once, other than that I would just go on to see what other people were posting."

Several of the other interviewees also indicated he/she was motivated to write pros or cons. When individuals felt strongly about an initiative, they felt the need to enact that particular technology-in-practice. However, as Alan pointed out "We didn't really have many engaging measures to vote on initially," that may have contributed to the lack of enactment of LVG features that supported expression of political voice.

The Living Voters Guide was implemented with hopes of engaging citizenry in information exchange, deliberation, and expression of political voice. Through my interviews with users and designers, I confirmed that each of these technologies-in-practice was enacted to some extent. Different types of users enacted different technologies-in-practice. Those who enacted the information gathering technology-in-practice appeared to experience limited change in their voting process. On the other hand, users who enacted both the deliberative communication and expression of political voice technologies-in-practice indicated more transformation in existing communication practices as a result of using the tool. Transformation of voting communication practices did occur within the intended community, although to a

limited degree. “We’ll keep working every year,” said Diane in a closing interview. “…small and incremental change may be the way this needs to happen. The fact that other states are interested in this tool makes me think we may just be too early in the process, in the middle of it really, to be able to really see what will come of all of this.”

Conclusion

By examining the entire trajectory of innovation across four cases of community-based networked civic innovation, this study has demonstrated how values, resources, and power continuously influence the processes and outcomes of innovation efforts. Previous studies have tended to focus on either design or development stages of innovation, or on implementation and post-implementation processes. In this chapter, I build upon these studies by providing process analysis that extends across both the interactions *within* the network of innovation, as well as the interactions *between* the network of innovation, the intended user community, and the technology itself. In doing so, I show how choices and decisions made in the earlier stages shape and affect outcomes in later stages. Findings also shows how technological artifacts can evolve, when resource conditions are favorable, to reflect the social interactions of the intended user community and the network of innovation. In ideal situations, the evolution creates stronger value cohesion that supports increased use of the technology.

The findings in this chapter demonstrate the value of communication strategy to civic innovation projects. Strategies that incorporate community technology champions provide easily translated technological frames that speak to the values of the intended user community. When such frames are deployed in advance of launch they build awareness and are powerful means of engaging support for the implementation process. In the context of civic technology implementation, the role of the network connections to members within the community is shown

to be a powerful resource during implementation. Leveraging network connections within the community in advance of deployment increases the reach of the network of innovation and extends the diffusion of the technology. These connections can be useful to counter resistance within the community that may emerge as a result of value conflicts or if the implementation process challenges power holders' position in the community. The findings here highlight how engaging with the intended user community is especially valuable in civic innovation contexts.

The transformation of community communication practices through the implementation of technology is a lofty goal and the outcomes of the four cases in this study resulted more often in failure than success. If a network of innovation succeeds in designing and developing a tool they still must overcome many barriers to adoption that include resistance from power holders, alternative technology, or failure to translate the framing of the technology to the users (either through the inadequate communication strategy or incongruence in frames). If the network of innovation is able to overcome those issues, then it ultimately falls upon the user to adopt or adapt the technology in a way that actually supports the intended transformation. Only when users enact technology through ongoing practices that support new behaviors is the goal of transformation fully realized. In civic contexts, the ability of the network of innovation to influence those uses lies in the ability to translate and create congruent frames through targeted communication strategy. In the next and final chapter, I provide final conclusions and identify the implications and future directions for research built upon the findings in this study. Additionally, I provide insights and recommendations for community-based civic innovation projects that draw upon what this study has revealed regarding the role of values, resources, and power in networked civic innovation.

Chapter 5: Transforming Communities: The Advantages and Challenges of Configuring Networked Civic Innovation

Communities seeking to organize, activate, and engage in today's information environment have a host of off-the-shelf technologies to choose from to support their activities and processes. However, these off-the-shelf technologies are not ideal for all communities. Tools like Facebook or Twitter provide limited choices in how users can participate and, for some communities, actively challenge the values that matter most to a group of citizens, such as privacy, security of information, or lack of corporate control of information (Agarwal et. al., 2014). However, ongoing narratives insist that the promise of the internet and the technologies it enables counter such issues, advocating an "if you build it they will come," philosophy. The cases in this study demonstrate how flawed that perspective may be in light of the real challenges and barriers that face civic actors aiming to create change in the community through technology implementation.

Transformation is not an easily accomplished feat. As was demonstrated in the previous chapters, more often than not, failure, rather than success, was the outcome of the civic technology implementation projects examined in this study. Successful design, development, and implementation of a civic technology within a community require a constant flow of relevant resources. Also necessary is the ability to account for and address technology-related values and value conflicts in a manner that retains the voice of the community, simultaneously balancing the need to progress through necessary tasks required to create a material artifact. The processes involved with each stage of civic technology innovation is infused with politics, as different stakeholder groups attempt to influence the path of innovation and try to shape the artifact itself.

Navigating through the social dynamics to produce a tool that is reflective of the goals and values of the community in a manner that leads to adoption and transformation of said community is no small achievement.

This dissertation shows that the process of networked civic innovation is ongoing, dynamic, and interconnected as relevant actors weave in and out during different stages. By applying the network lens to the process of innovation in four civic networks, this study demonstrates how civic actors organize to design and develop technology. The network orientation of such groups becomes important as actors bring or take away resources from the project as a result of joining or leaving. Findings also show how, once technology is introduced to the community, the ability to leverage the network orientation of a community can serve to support or undermine the implementation of a given technology. Additionally, in showing how the social processes shaped the technological artifacts developed in two of the projects, and then examining how the tools shaped user practices, this study confirms the interaction of the social and technical worlds throughout the innovation process. In linking together the design and development stages of technology innovation to implementation outcomes and use of the technology, this study builds support for the mutual shaping perspective of the relationship between technology and society.

Through tracing of the actors across all stages of networked civic innovation, this dissertation demonstrates how values, resources, and power continuously interact with one another, creating and setting conditions that either support or undermine the innovation effort. This study builds upon existing literature about technology and civic life by moving away from an effects-centric lens which overlooks the social processes and political construction of technology that inform adoption and innovation outcomes. In applying the lens of values,

resources, and power and conducting process analysis, it shows how interactions between social actors that occur in the earliest stages have a continued effect on project outcomes in later stages. These interactions bridge together, and demonstrate the relationship between the Inception phase (design) and the Integration phase (use) of innovation.

As was demonstrated in the case of LVG, the goal of transforming community communication practices through technology implementation, though lofty, is attainable in the most favorable circumstances. Developing the right conditions to support transformation requires adequate resources, consistent representation of users in micro-processes, and communication strategy. Additionally, power sharing arrangements that fit the size and communication norms of the network of innovation and the community are necessary to support effective coordination. What this dissertation further demonstrates is that no single facet of networked civic innovation examined in this study is enough to support the process alone. For example, in Tea Party, the abundance of resources available within the network of innovation were irrelevant as a result of the value conflicts and the concentration of power within a small group of actors. In the Civic Commons project, the voluntary choice of giving power to a small group of actors had unintended consequences of the network contracting in size. When those with decision-making power supported the values of just one stakeholder group, ignoring the interests and values of others represented in the project, the rest were isolated from the project. The result was that these important actors, who had access to relevant resources, left the project. This contraction of the network resulted in resource gaps that could not be overcome.

This study contributes to our understanding of implementation of technology in civic contexts and demonstrates how the process of networked civic innovation may not prove to have a "one-size-fits-all" formula. Where consensus-based approaches to decision making in LVG

worked within a small network of actors, the same model of power-sharing created delays in the Occupy project, since building consensus in a large group of actors took away time and resources. Rather, it appears that networked civic innovation requires diligent effort on behalf of the actors involved to consistently consider and take into account the particular conditions of the project. It is critical to consider how value cohesion, resource capacity, and power sharing is distributed across relevant stakeholders. Networked civic innovation projects especially require attention be paid to the values of the intended users across all stages of innovation. It also requires mindfulness of the norms and practices of the intended community. These should be taken into consideration not only in light of the design of the artifact, but also in regards to the processes the technology is intended to transform.

In this chapter, I discuss the implications of this project, first by reviewing the contributions of applying the analytical and conceptual lenses of process analysis and values, resources, and power to each case. Here, I also reflect on my fieldwork and positionality as a researcher and participant in each project, drawing attention to the value and challenges of embedded research. Additionally, I discuss the trans-disciplinary nature of this study and highlight the contributions it makes to communication theory in particular. I then discuss how this project invites researchers to reconsider the framing of innovation outcomes as "success" and "failure," which this study suggests are limiting and overlook important facets of the network orientation of such projects. I then discuss the relevance of community engagement and trust, pointing researchers and practitioners to consider the role of community technology champions as important to explaining civic innovation outcomes. I then provide suggested directions for future research followed by a short practitioners guide developed as a result of working with the various community groups in each project.

Implications of this Study

The aim of this study was to examine how actors organize in informal civic networks to design, develop, and implement communication technology to transform existing communication practices within a community. By tracing the actions, choices, and processes of actors across all stages of innovation, this dissertation provides a conceptual framework that bridges the activities of design and development to adoption outcomes once technology is introduced to the community. Here I discuss the broad implications of this study.

Conducting Longitudinal, Qualitative and Process Analysis of Civic Innovation

This study employed an analytical framework that is both longitudinal and qualitative, providing a perspective on the process of innovation that is frequently overlooked in traditional innovation studies that often use cross-sectional data and employ quantitative methods such as surveys. Organizational communication studies have adopted more qualitative approaches (Leonardi & Barley, 2010), however few have linked the processes that occur during the Inception Phase (chapter 3) to the outcomes of the Integration Phase (chapter 4) as a result of following actors, actions, and activities across the entire trajectory. In following actors, assemblages, and activities across the whole trajectory of innovation, analysis conducted through this framework showed how actors moved into and out of the projects and created new assemblages that revealed the networked nature of civic innovation efforts. It also surfaced two types of goals at the heart of civic innovation processes—*implicit goals* focused on organizing actors to achieve tasks and *explicit goals* of implementing technology into a community for adoption. Additionally, by applying process analysis to examining the four cases, I identified important micro-processes and actions that occurred in each project. This approach demonstrated how the choices made in each network of innovation influenced the outcomes of those micro-

processes and created unique conditions that affected and shaped the innovation paths of the LVG, PSCCC, Occupy, and Tea Party projects.

In using this analytical framework, a new set of questions were addressed, which current approaches that focus on either the design and development stage, or implementation and use outcomes, are unable to answer. For example, Leonardi and Barley (2008) ask, do designers intend to shape the communication practices of users in particular ways, and if so, once put into practice, are those intentions enacted? Analysis of the design phase across all four projects shows that it is clear that in these cases designers had intentions to shape the communication practices of the user community as they developed the tool, and those intentions are integrated into the design through the processes of translation and encoding. By examining actual use of the LVG platform by users through a practice-based lens (Orlikowski, 2000), this study found that some of those intentions, such as increasing information exchange were successfully translated and enacted. Yet, other enactments, such as expression of political voice, were less likely to be put into practice by users. In examining why some enactments translated successfully while others did not, values as well as technological frames surfaced as relevant indicators. The findings in this dissertation suggest that applying new analytical frameworks that extend across innovation trajectories are important. Equally important, is the ability to closely follow the actors to understand and identify the mechanisms that inform the choices and decisions they make regarding the process of innovation.

Reflections on Role Duality in Process Research

Networked civic innovation is a dynamic and interactional process ripe with complexities that have been discussed throughout this dissertation. Process analysis was conducted to observe the socio-technical interactions, assemblages, actions, and outcomes that occur during, and as a result of, networked civic innovation. Conducting participant observation was a valuable means

to examine the social and political communicative interactions between relevant actors across all stages of innovation in each case. It was also necessary to situate practices in the organizational contexts that informed them. Even though participant observation can be complicated, I believe my approach as an engaged, full participant in the projects deeply benefitted my knowledge-building process. In this section, I reflect on my positionality in the different projects and discuss how it informed my analysis.

Role duality refers to my position both as a researcher as well as a node in each of the networks of innovation, or my organizational role in each project. In each project, I was diligent to be clear of my position as both a participant in the project and committed to group innovation goals, as well as an observer who was interested in sensemaking of the processes that unfold throughout civic innovation efforts. I kept a research journal during my participant observation data collection and reflected on role duality throughout. This revealed some insights that I share here with hope to contribute to future research on networks, organizational process analysis, and civic innovation studies.

Role as Participant

Throughout my fieldwork, I attended and participated in meetings, organized and facilitated discussions via email and phone calls, and when in a position to do so, participated in decision-making activity. I acted as a full participant in the Occupy, Tea Party, and Civic Commons innovation processes. As I discuss in the section below, my participation in the LVG project was limited during the initial stages of innovation. In my fieldwork, I fully engaged with each project with intent to build and develop technology alongside other network of innovation members. In this capacity, I took on various roles to support that process in each case. Through this level of engagement, I believe my analysis was better informed as I was able to gather an insider perspective of micro-processes, gained close access to relevant actors, developed first-

hand knowledge and understanding of stakeholder values, and was privy to interactions between stakeholders that may otherwise have been invisible. Additionally, through participation in decision-making processes, I understood the communicative practices adopted within each project firsthand, which better informed my understanding of project outcomes in each case. Maintaining distance would have limited my sense-making ability of the processes at the heart of networked civic innovation.

Role as Researcher

LVG was the case in which my role was most tilted towards the researcher-orientation. Much of the analysis presented in this study is based on the processes that occurred prior to my joining the project. I relied on both interviews and document-analysis to inform much of my understanding of the earliest stages of the processes that occurred within this case. However, my engagement with the project as a member, attending meetings, providing input on technical features, and especially my involvement with community outreach efforts for subsequent launches, provided opportunity to gather insider understanding of the inner working and logic of the LVG network of innovation and the community it intended to reach. The result was that my access to relevant groups, actors, documents, and artifacts in LVG was similar to the access I had to actors in the other cases.

For each case, I began my research without preconceived notions of what dynamics to examine and I let my initial forays into the processes unfold to reveal initial research directions to pursue. Many times, I attended different types of meetings beyond those of the network of innovation, such as local Occupy and local Tea Party meetings, either through invitation or of my own volition. This gave me deeper understanding of existing communication practices within each community and helped to contextualize the purpose of each project. I was also invited to participate in other projects that people were involved with and I always pursued such

opportunities to attend at least one or two meetings or events. In doing so, I saw how participants' civic networks overlapped and was able to situate into a broader context the processes, decisions, and outcomes in the projects as reflective of broader community practices, norms, and rules. This contributed significantly to my sense-making process as a researcher.

Reflections on Role Duality

Role duality can cause complexity for researchers as they navigate their position in projects. Thus, self-reflection throughout the process is necessary (Bourdieu, 2003). To address these concerns, I kept a researcher's journal throughout my fieldwork, writing memos to capture some of these issues and using it to reflect on how and when to engage with each project with the knowledge I was developing as a researcher. I often considered when and how insights gathered through my role as a researcher was useful to or should inform my position as a participant. Ultimately, I came to the conclusion, through a self-reflective practice, that as a participant in each project, I was committed to supporting innovation outcomes. Thus, when it was useful to supporting innovation goals, I often contributed contextual knowledge. Given that my intent was to make sense and find meaning through analysis of these observations, it was clear that I needed to engage fully with the projects, moving beyond observer and researcher. In doing so, I was better able to make sense of and properly account for complexities, which is most clearly revealed in the analysis provided in chapters 3 and 4.

In reflecting on the duality of the positions I held, I did note that in two of the cases I had to address the seemingly contradictory motivations of the researcher and the participant: first, in recognizing my position in the Tea Party and Occupy networks of innovation, and second, in considering and accounting for my own values in both projects.

At times, I became acutely aware of how important my role became in the progress of both the Occupy and Tea Party projects. I was uniquely positioned as a bridging link in the

network between the UW developer team and the Tea Party leadership. Similarly, I acted as the primary contact point in the Occupy case, connecting often and directly with Dana and her counterparts before bringing together the whole network for meetings. My organizational role in each project was to facilitate communication between relevant actors, trying to coordinate and organize meetings and relaying relevant information between different actors. My centrality in the networks of innovation gradually increased as a result. Acknowledging my position was important and, in conducting my analysis and presenting it in this dissertation, I tried to bring transparency by noting the roles that I filled and the resultant outcomes as and when it was relevant.

Given the political nature of some of the groups involved in the cases evaluated in this study, namely Occupy and Tea Party, I also had to acknowledge my own values in light of my participant-observer role. During one meeting in which we discussed both projects, Alan brought up the point that we would need to consider our own individual political values as we proceeded. He suggested during that meeting and elsewhere (Borning & Mueller, 2012), that researchers should acknowledge and account for their own values and consider their influence on analysis. Given the importance of values in this study, this point resonated deeply with me. At that point, I made a decision to try to actively remove my political values from the actions and decisions related to the innovation processes in both projects. Thus, in my engagements with the two projects, I consistently checked my motivations for actions or decisions and acted in a manner that focused on supporting innovation goals, neutralizing politically-oriented values. That was an active choice I made, and one which researchers involved with civic and political innovation projects will likely be confronted with again.

Borning and Mueller (2012) suggest this type of awareness be more transparently expressed and accounted for in design research. However, they do not offer methods to do so. In my own experience, I found that using the researcher's journal as a place to identify and acknowledge my own values was valuable to bring transparency to my analysis process. Consistently checking myself with the list of my own values that I created, was both useful in building self-awareness and also acted as method to bring transparency to and validate my analysis as a researcher and participant. Consideration of other such methods to account for individual researcher values or group values, as many of these projects occur with research teams, will be fruitful.

Applying the Lens of Values, Resources, and Power to Understanding Innovation Outcomes

Applying a distinct, conceptual framework using the lens of values, resources, and power also provided new insight. This study set out to examine the role and interactions of values, resources, and power in the context of civic innovation. In applying this framework, it becomes evident that the political construction of civic technology occurs as a result of actions, activities, and choices of actors involved with both the design and development of technology as well as those who are involved with the implementation efforts. The interactive relationship between values, resources, and power were also revealed in examining the four cases and suggest that scrutinizing such facets of the innovation process independent of one another hides the entangled interactions of the three facets that together shape innovation outcomes.

In examining these four cases of networked civic innovation, the important role that values plays across all stages of the innovation process becomes clear. Findings show that values are deeply implicated in the political construction of artifacts. During early stages, stakeholders choose to participate based on the identification of shared technology related values, and in

doing so, provide access to relevant resources to support the project. However, as was seen in PSCCC, Occupy, and Tea Party, visioning conversations reveal the value conflicts between stakeholders and those conversations become sites of political activity as groups attempt to advance particular technological frames that support their own values.

The interactions of values and power surfaces in examining the decision-making process adopted within the network of innovation, which then influences how such value conflicts are ultimately addressed. The governing logic of the networks in this study was either based on group consensus or a small group of actors making decisions for the whole group. The outcomes for both PSCCC and Tea Party, which adopted the former logic, resulted in the exclusion of voices and contributed to the ultimate dissolution of the networks of innovation and the projects' end. Exclusion of voices was also the result of the Occupy Project's approach, though in this case, all parties involved agreed it made sense to break into two different projects. The result was that though the Occupy network of innovation, newly fractured, was able to increase value cohesion through design and development stages and ultimately create a tool, it did so without representation of the voice of on-the-ground activists. This resulted in creation of a tool that did not reflect the values of the intended user community, which contributed to the resistance the intended user community showed to adopting the tool.

The shift into or away from the project by different relevant stakeholder groups ultimately also affected the resource capacity of each network of innovation. When a group or individual did not see representation of their values, they tended to disengage from the project, taking with them access to important resources. The loss of particular resources provided by non-journalists who left the Civic Commons project included material, informational, and human resources necessary to complete design and development stages. Network connections were the

primary lost resource when on-the-ground activists disconnected from the Occupy Project. The importance of network connections was only fully understood during the implementation stage, where it surfaced as especially valuable to deployment efforts. This dissertation, by tracing the ongoing interactions between actors across all four cases, revealed the continued effect of values, resources, and power conditions across every stage of innovation.

This study also contributes to design studies by surfacing the role of power in design processes. So far, very little VSD literature has addressed the role of power in co-design processes (Borning & Mueller, 2012). By examining the governing logic that defined the distribution of power between stakeholders, such as designers and community members, findings show that power dynamics are important to account for during such projects. In identifying different types of power-sharing models, this study provides some foundations for VSD literature to build upon and begin to incorporate and account for through design processes. The inclusion and exclusion of voice is a central concern of VSD and identifying the processes, choices, and governing logics that inform why and how groups are invited or not is important to examine in such studies.

In applying alternative analytical and conceptual frameworks to the process of civic innovation, this dissertation contributes new knowledge to our understanding of why and how informal civic networks organize to design and develop technology. It provides new conceptual understandings of why some groups are able to create transformation within communities as a result of technology implementation efforts. It also provides new theoretical directions to pursue in examining factors that can contribute to civic innovation failure, building on the conceptual framework of values, resources, and power dynamics. The findings from this study also suggest the need to reevaluate current analytical approaches to examining innovation that follows

processes rather than captures data at one moment in time. This study revealed the interconnected and dynamic nature of innovation that is hidden by cross-sectional analysis.

Additionally, this study contributes to existing literature on innovation by focusing on civic innovation. The context of civic innovation is especially under-theorized in existing innovation literature. The nature of civic innovation is complex and exists in conditions distinct from those of organizations and industries within which formalized structures support the innovation process. Borrowing our understanding from other fields lends limited insights, as the process of transformation in a community is a different animal than the process of transformation within an organization. This project contributes new theoretical framings to examine the unique conditions and challenges facing civic innovators, an area of study that will continue to expand and grow as the role of civic innovation continues to gain prominence.

Theoretical Contributions: Implications for Trans-disciplinary Research and Communication Theory

In writing this dissertation and developing the analytical and conceptual frameworks discussed above, I drew from a wide body of scholarship including communication and technology studies, organizational communication, political communication, science and technology studies, design studies, innovation studies, and management studies. Studying the process of design, development, and implementation of civic technology within community networks through the lens of values, resources, and power necessitated a trans-disciplinary approach. Applying and drawing from a diverse range of theories and concepts provided opportunity to engage theoretically with interactions, outcomes, and processes that occur in community-based civic innovation efforts in meaningful ways. Drawing from studies across disciplines, I found connective threads that allowed for deeper theoretical and methodological insights into the interactions of values, resources, and power across the trajectory of networked

civic innovation. The contributions of science and technology studies, management studies, and innovation studies to informing and building constructs for the theoretical framework of this study cannot be overstated.

In particular, the framing of the process of networked civic innovation as a socio-technical system, built from science and technology studies and communication and technology studies, was invaluable. This allowed me to interrogate not only the social or the technical interactions but to especially highlight their intertwined nature across the process of networked civic innovation. In particular, the mutual shaping perspective of technology and society revealed the influence of the activities of relevant actors in each project on the shape of technology and the reciprocal shaping of user actions. Activities and interactions between social actors influenced how the tools developed and ultimately the design of the technologies. The tool, through the affordances and constraints of the system then shaped how users engaged in communicative practices, as was demonstrated in the LVG case. By accounting for the entanglement of the social and technical worlds, the mutual shaping lens in this study revealed more than diffusion of innovations theory or social shaping theory alone may have revealed.

Approaching this study with a trans-disciplinary lens, I was able to interrogate important complexities that may have otherwise been overlooked. For example, drawing from design studies and incorporating the Value Sensitive Design lens, provided meaningful ways to classify the types of value tensions and conflicts within the networks of innovation, which has not yet been well-accounted for in existing communication and technology literature. Reciprocally, by studying value tensions from a communication perspective, I was able to identify the importance of technological frames in communicating the values and intent of technology across innovation contexts. This revealed the role of communication both within interactions of actors participating

in the network of innovation and between actors in the network of innovation and the broader community. In transcending the boundaries of either discipline, a more robust framework for understanding how values are communicated and eventually enacted in civic innovation contexts was revealed.

Though trans-disciplinary, this project contributes significantly to communication theory and particularly, to the fields of communication and technology studies and organizational communication studies. Understanding human processes in light of information and communication technology is a central concern of communication and technology scholars. The process of adoption of ICTs within political, civic, health, and organizational contexts has become of particular interest to communication and technology researchers (e.g., Bimber, 2014; Fiore-Silfvast, 2014; Freelon, Wells, & Bennett, 2013; Kreiss, 2012; Kwon, Nam, & Lackaff, 2011; Zorn, Flanagin, & Shoham, 2011). This study highlights the relevance of communication and technology theories by situating the process of technology innovation as embedded in, and resultant of, the social interactions of networks of actors. It reveals the role of communication networks in organizing throughout the innovation process. Analysis provided in this study shows the effects of communication flows or breakdowns across diverse actors on the configuration of the networks at the heart of the innovation process, contributing to our understanding of innovation outcomes as the result of social interactions.

Furthermore, this study contributes significantly to the field of communication and technology studies by shifting focus from an effects-centric perspective of technology adoption and demonstrates the relevance of process analysis to examine communication technology implementation outcomes. In doing so, deeper understanding of the communicative practices of communities that shape and inform the design, development, and adoption of technology are

revealed. This study suggests that effects of communication technology are better understood when we examine the processes that informed the shape of the technology.

This study also contributes significantly to organizational communication studies in multiple ways. Organizational communication is concerned with studying the practices, processes, and technologies within and between organizations. First, this study contributes to this field by expanding application of theories and constructs developed within the field and applying them to new contexts. It builds a bridge that connects theory that has been largely developed within the contexts of bureaucratic and traditional organizational settings and applies them to informal, networked, and civic communication settings. In doing so, this study expands the realms in which organizational communication theory is applied. Kreiss' study on the innovation process of the Dean and Obama campaigns also moved in this direction. However, the campaigns still operate with formal organizational rules to govern processes. This study contributes to our understanding of political and civic technology innovation by accounting for informal organizational contexts.

Additionally, this study expands upon communication technology and organizational communication theories and constructs, such as technological frames. It does so by first applying it to new contexts, civic and community-based innovation, and showing how technological frames is a portable concept that translates to different contexts as it can be meaningful beyond technology implementation in traditional organizations. Second, it shows that the role of technological frames begins prior to implementation, where most studies apply the concept to post-implementation contexts. Findings in this study demonstrate technological frames influence innovation outcomes from as early on as the ideation stage. A diverse range of scholarship

informs the frameworks, concepts, and constructs in this study, which contributes significantly to our understanding of communication and technology in non-traditional, organizational contexts.

Adoption Outcomes and the "Long-Nose" of Civic Innovation

Findings from this study suggest that to support successful innovation, it is necessary to create favorable conditions to support both the implicit and explicit goals of innovation. This is a wieldy and at times burdensome task that is not always possible to fulfill. To create these favorable conditions, stakeholders are required to be both strategic and consistent in paying attention to value-cohesion between relevant groups. They are also tasked with keeping aware of the resource needs of the project. In many ways, these tasks are relegated to "management" of the innovation project, but are, in fact, necessary to complete the project and produce the intended outcomes. Maintenance work is required for the project, yet literature tends to overlook this type of work in explaining adoption outcomes. Success and failure are not examined as the result of the work of the actors who negotiate network interactions between actors, monitor resource needs, and conduct the labor required to support these projects. Instead, literature tends to focus more on the use stage and points to characteristics of users, of technology, or the context in which technology is deployed as explanatory factors for success and failure. In overlooking the "work" of maintaining, repairing, and sustaining the networks of innovation as factors to explaining innovation outcomes, we risk to oversimplify and undervalue this important organizational component of innovation processes. Given the voluntary nature of civic innovation projects, the network maintenance work is especially valuable. Future research should continue exploring and expanding our understanding of how such networks are built, repaired, and sustained.

Literature also tends to point towards a dichotomous approach to understanding innovation outcomes that focus on "failure" and "success." However, the outcomes of several of the projects in this study suggest that defining adoption outcomes so narrowly potentially hides unintended consequences and unforeseen activities that occur as a result of the networked composition of the groups of actors involved in these projects. To contextualize this, I will first briefly discuss what occurred in the Civic Commons and Occupy projects after the initial projects ended. I will then discuss what these cases may suggest about the process of networked civic innovation that goes unaccounted for in narratives based on failure and success alone.

Civic Commons

After Anne sent the final email declaring the Civic Commons project closed, I continued to work with actors on other civic projects and observed as they continued to participate in these new endeavors. Rick and I discussed his role in the Next Fifty project, an effort undertaken by the Seattle Center to celebrate 50 years since the 1962 World Fair was held in Seattle. The project involved civic organizations such as CityClub, as well as local corporations like Microsoft, as well as civic leaders and citizens. Rick saw the opportunity to take some of the ideas he heard through the visioning conversations with the PSCCC group and apply them to the Next 50 project.

> "I had this idea back then that it would be great to create a kind of feature of the Commons that let people upload videos and share their stories, tell the community about who they are and what matters to them. We didn't do that with the Civic Commons… we didn't have the technical capabilities to build that. But in the Next 50 group I saw that we had plenty of technical guys, we had support from different organizations, and this was an idea that others [also involved in the project] thought made sense for the goals of Next 50."

What Rick did was to take the ideas generated through the conversations with participants in the Civic Commons project and carry them forward to a new context, a space that had conditions of

values, resources, and power that supported the idea. Though the Civic Commons project "failed" in achieving the goals of designing and developing a technology, it provided conditions for ideas to generate and opportunities for civic actors to imagine new and different ways of engaging in the community. Anne Balsamo (2011) speaks of the "technological imagination," a quality of mind that enables people to think with technology and to transform what is known into what is possible. This technological imagination is the "wellspring" of innovation. The Civic Commons project created a space where stakeholders tapped into the technological imagination. Though the conditions in the Civic Commons project were not right to support the ideas that Rick and others had, it did create space to imagine possibilities. Despite the idea "failing" to translate in the Civic Commons tool, Rick's idea traveled via Rick into a new network of innovation involved where it could materialize given more supportive conditions. Ideas bubbled up through one project and materialized in the context of another.

Occupy

During my final interview with Dana she shared that something similar happened with the Occupy case. As we learned, the integration of an online component of decision-making did not make sense for the context of the National Gathering meeting that was focused on on-the-ground activities. However, as the movement evolved through the fall of 2012, it began to take on a slightly different quality or characteristic. As much of the on-the-ground activity was waning with the removal of camps, the localized and geography-based nature of organizing was less relevant. But, a new form of activism was emerging within the movement. What grew from the interactions at the camps was a form of issue-based activism. The local geography became less important than particular causes, such as prison reform or women's rights. These sub-groups had emerged at camps but soon became the most prominent residual type of activism from the original protest activities. "We're kind of like the Children of Occupy," one activist said during

an interview in the summer of 2012. “I really care about prison reform and the fact that not everyone in my local Occupy community does, doesn’t matter as much…I can find others through the websites that are working on prison reform…” Online tools were more useful for this type of organizing.

One prominent issue-based group that emerged in the fall of 2012 was the Occupy Sandy group. This group created a Hub on the Interoccupy.net website. Individuals involved with Occupy Sandy, organized to create a “disaster relief network” dedicated to providing aid to communities affected by Hurricane Sandy, which hit the east coast in late October of 2012. Dana explained that some of the people who had been involved in the Technology Operations team, and our TempCheck project specifically, had become active members of the Occupy Sandy group. She explained that the network had adopted a participatory budgeting process for handling funds and that as they developed the process, the ideas that informed the TempCheck tool were brought into the discussion. “They didn’t use the tool but what we created motivated their thinking and it’s kind of working there.” To some extent, the project involved online submission of proposals that were then voted on to indicate support or opposition. Once again, though the technology itself did not become meaningful in the original context, the ideas that were generated through the process were powerful and, indeed, proved valuable in slightly different contexts.

The outcomes of the Civic Commons and Occupy projects suggest that creating narrow boundaries around what we define as success and failure can limit our understanding of how innovation works in civic networks. Ideas traveled through network ties into new contexts in both cases. As communities are considered “networks of networks,” the flow of ideas from one context to another via the civic actors who are members of multiple groups is important to

acknowledge. This presents a type of "network advantage," of community-based networked civic innovation. By this I mean, that ideas that are developed in such community contexts appears to have more opportunity to succeed than they do in traditional organizational contexts, where once the project has failed it is unlikely to revive without buy-in from management. This transfer of ideas to new contexts suggests that the network composition of such community-based civic innovation projects is important to account for in our research.

The individuals involved in such efforts are likely well-embedded in broader civic networks and communities. Many of the people I worked with in this study indicated the project we were working on was just one of several they were involved with at any given time. When ideas don't materialize in one context, there is opportunity to transfer ideas to new contexts. Given the difficulty of achieving success, as is demonstrated in this analysis, accounting for the transfer of such ideas is valuable. This notion of ideas and innovations traveling through different networks suggests that there is a "long-nose" to the civic innovation process. Many ideas may surface through projects like those evaluated in this study, and they may continue to travel until there exists a context in which the conditions of values, resources, and power are optimal for the idea to materialize into an actual artifact that is used by the community. Future research can and should continue to explore the mechanisms by which civic innovation ideas, visions, and frames travel through civic networks.

Community Engagement and Civic Innovation Success

This study also demonstrates the importance of engaging with the intended user community throughout the innovation process. In the early stages of the process of networked civic innovation, representation of the users' voice increased the likelihood of translation and encoding of their values into the artifact. As is evident in contrasting the outcomes of the LVG

and Occupy projects, reflection of user values in the features and the framing of the artifact are important to support intended adoption outcomes in later stages. To enroll and enlist the community in supporting the innovation effort, networks of innovation could not simply drop into the community and expect widespread acceptance and adoption. Instead, engaging the community both in advance of deployment and working with individuals who are already embedded within the community was critical.

The nature of these projects required individuals to change their existing patterns of community communication practices. Change processes that are not mandated but must instead be willingly adopted, require maintenance work on behalf of the individuals attempting to implement the technology. The LVG network of innovation actively incorporated this work in their communication strategy. By spending time training, providing frames for, and enrolling the community technology champions in using the tool, the LVG network of innovation was able to spread their influence into the broader community network. Leveraging the existing trust of those champions within the community created credibility that supported the implementation effort.

The engagement of the community plays a unique role in the context of civic innovation efforts. Community buy-in is necessary for successful implementation and there are few means to mandate adoption. Thus, the relationship between the network of innovation and the community, based on ties, trust, and representation of voice is important to continue examining in communication and civic innovation research.

Typologies of Civic Innovation Networks

This study focused on the process of innovation within informal civic networks that were primarily led by the community. However, one can imagine that there are different compositions of civic innovation networks that involve different types of civic actors such local government

bodies, public sector organizations, or private organizations, as well as citizens and civic leaders. As the composition of the actors involved changes so, too, do the conditions of values, resources, and power sharing.

For example, let's take an existing project such as the Smart Chicago Collaborative, which is funded by the Knight Foundation in collaboration with the Chicago Community Trust (a community foundation). The project sets out to create a new technology (an app) to support bus riders confined to wheelchairs. Examining this project compared to the case of the Civic Commons project, we can already begin to imagine how differences in resources and power dynamics may create very different conditions for organizing. By understanding the different types of network compositions based on the types of actors involved and their governing logic, future research may identify the ideal types of network arrangements. Or research may identify the unique strengths and challenges faced by different types of civic innovation networks that may support more successful innovation outcomes.

In addition to community-based civic innovation networks, I have identified three types of civic innovation networks based on the different actors involved. Future research may not only build upon these by identifying new types of networks but also by examining the differences within and across each type.

- *Government-Led Civic Innovation Networks*: Includes projects that are primarily led by government at the local, state, or federal level. These projects may incorporate citizens but are ultimately classified as government-based projects.
    - Exemplar: InnovateSF, an initiative of the San Francisco Mayor's Office to provide open access of city data to the broader public. Led by the mayoral

department, the primary partnerships to support the project extend to other city-operated departments and city residents.

- *Public-Private Hybrid Innovation Networks*: Includes projects led by government, non-profit, and/or private sector partnerships.
    - Exemplar: The Boston Foundation leads The Boston Indicators Project in partnership with the City of Boston and the Metropolitan Area Planning Council. The project integrates online technology to provide citizens, organizations, and government leaders access to information relevant to the Boston community, a means to engage in public discussion around issues that affect the community, and provides tracking and reports on identified civic goals.
- *Private Sector-led Civic Innovation Networks*: Includes projects led primarily by private companies or private citizens, especially including start-ups. These projects may or may not be part of the social good arm of major corporations. Often, but not always, the technology provides some financial support for the company.
    - Exemplar: PopVox, a platform that integrates real-time legislative data with users' personal stories by aggregating, verifying, and delivering citizen input to lawmakers. The platform intends to amplify the voice of citizens, connecting them to lawmakers, and creating transparent records, which are intended to inform actionable policy decisions.

The distribution of values, resources, and power in each type of the civic innovation networks defined above likely differ from one another and especially from community-based civic innovation networks such as those examined in this dissertation. Understanding how each civic

innovation network negotiates the micro-processes that occur during ideation, design, and development also likely differs as a result of the values, resources, and power conditions. Comparing and examining across the different types may lend insight into whether some compositions of civic innovation networks are more likely to achieve success than others.

Practitioner Guidance

As I conducted my final interviews with actors in each case, I had the opportunity to reflect with them on the lessons learned from the individual projects. It seems both necessary and right to take what was learned through examining these different cases to provide guidance for others taking on the monumental task of creating community transformation through technology design, development, and implementation. In this vein, I have identified some takeaways that I believe can support future innovation efforts at the practitioner level. I share them here with hopes of giving back to the communities and many of the individuals with whom I worked who showed deep commitment, care, and interest in the well-being, growth, and betterment of their community.

- Build a process of values assessment into each stage of the project. The importance of values cannot be understated, as it shows continuous effects across every stage of innovation. From the initial formation of the networks of innovation, to the moment of truth when technology was introduced to the community, values mattered. In such efforts, values become the ties that bind and draw actors and their resources to the project. When community values, in particular, are not represented or accounted for during design, the likelihood of successful adoption outcomes are threatened, either as a result of losing resources or the result of creating a tool that does not reflect what matters most to the community.

- Obtain and spend resources relevant to community engagement: A constant flow of resources is necessary for success. Some resources, such as technical skills and expertise, are a must in any innovation project. With civic innovation, network connections to the community are essential. Develop strategies to draw and leverage resources towards community engagement efforts.
- Build communication strategy around supporting interactions with community members in advance of deployment. The ability to shape and provide a frame for the purpose and intention of a given technology is especially important to supporting intended adoption outcomes. Building awareness of the tool and communicating the frames that you want the community to understand your artifact through, are invaluable. A communication strategy that does not engage with the community, and simply drops the technology into a given context, provides limited opportunity to counter alternative framings offered by resistors, which can undermine implementation efforts.
- Engage community technology champions in deployment and communication strategy. Network connections matter and building connections with leaders within the community is necessary to support adoption by the community. The role of the community technology champions should not be overlooked. As information and innovations flow through community networks, the acceptance and adoption of new tools by influential members can increase the likelihood of adoption by more members. In engaging these champions in your efforts, you can extend your network reach, which is important to diffusing the technology to groups and individuals that are not otherwise within your sphere of influence.

- Spend the necessary time at the beginning of the project to consider what power-sharing and governance model is right for your project. Power-sharing rules tend to remain constant so it is worth spending time and energy identifying the "right" model for the given project during the earliest stages.

Conclusion

The process of networked civic innovation is not easy and at times it is simply the sheer will, determination, and perseverance of some community members to keep trying despite the many challenges that stand in the way. What surprised me the most was that even when confronted with the fact that a project was failing, I heard repeatedly from actors involved in these projects that they knew it was worth trying anyway. Transformation is no small feat at any level, but to attempt to create change across entire communities through coordination of volunteers is especially daunting.

The civic actors who participated in the LVG, Occupy, Civic Commons, and Tea Party projects are important indicators of what lies at the heart of civic life: dedication, determination, and commitment to imagining new and better ways to participate in, engage with, and grow our communities. Technology often offers the promise of supporting such efforts. However, realizing that promise was difficult in most of the projects. Even though most projects "failed" to achieve intended innovation outcomes, there was something built and left behind in each case. A kind of shared experience that we all acknowledged shifted our thinking for future projects. Jeff sent an email to the Civic Commons group in response to Anne's declaration of the end of the project that speaks to the nature of the residue of the process of networked civic innovation: "The magic happens when we come together. We've all learned a lot in the process of coming together over the course of two years, and that's a positive outcome. Perhaps flowers will yet grow out of the

soil that has been so well tended." In this statement lies the beauty of the process of community-based networked civic innovation. Civic innovation rarely results in complete failure, but rather, generates ideas, spaces, and room for new ideas that may travel in ways we cannot yet imagine.

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