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# Network Hopes

## Municipalities Deploying Wireless Internet to Increase Civic Engagement

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In this work, the authors examine four cases of municipalities that have attempted to create municipal-sponsored wireless broadband networks. In each of these cases, one of the reasons given for establishing the network was to engage the citizens in their community and government. In each of these cases, the efforts have failed in some way. This problem rests on several assumptions. First, these municipalities believe in the importance and need to increase civic engagement, public participation in local government. They also believe that one way to do this is through increasing access to broadband Internet. In this article, we argue against a simplistic, deterministic, utopian view of information and communication technologies. We argue that in the case of local governments, choices made by government officials to solve social problems with technology are often made out of hope, frustration, inadequate funding, and inadequate knowledge. These public technology projects are often met with failure and often lead to further distance and mistrust between local governments, public officials, and citizens.

**Keywords:** *civic engagement; social capital; wireless broadband Internet; municipalities*

The purpose of this article is to illustrate the potential hazards of failed technology-driven efforts to increase civic engagement. In this work, we examine four cases of municipalities that have attempted to create municipal-sponsored wireless broadband networks. In each of these cases, one of the reasons given for establishing the network was to engage the citizens in their community and government. In each of these cases, the efforts have failed in some way. This problem rests on several assumptions. First, these municipalities believe in the importance and need to increase civic engagement, public participation in local government. They also believe that one way to do this is through increasing access to broadband Internet. This leads us to our central question, what do these very public failures mean for public technological projects and public support for increasing civic engagement and public participation in local government via technology?

In this article, we argue against a simplistic, deterministic, utopian view of information and communication technologies. We argue that in the case of local governments, choices made by government officials to solve social problems with technology are often made out

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of hope, frustration, inadequate funding, and inadequate knowledge. These public technology projects are often met with failure and often lead to further distance and mistrust between local governments, public officials, and citizens. If the original social problem was a poorly engaged public in local and community affairs, then these projects have the potential to backfire, causing more damage than preventing or solving.

This argument is built on the belief that the Internet is becoming a cornerstone of modern life, as much of public, private, educational, and economic life have both online and off-line components. It has been argued that as full participation in civic, commercial, and social life is tied to Internet and computer literacy and access, high-speed access is becoming a necessity rather than a luxury (Tapia & Ortiz, 2006; Tapia, Stone & Maitland, 2005). To support this, there have been several studies that claim people who have access to and the skills to use the Internet (a) are more successful economically, with respect to education, jobs, earnings; (b) socially participate more in terms of political and civic engagement; and (c) receive more government services and other public goods than those who do not (Katz & Rice, 2002; Kennard, 2001; Oden, 2004; Tufekcioglu, 2003).

Based on this argument, information technology skills and access are beginning to be seen as public goods because, like education and libraries, they are capable of providing positive externalities associated with economic growth and democratic governance; (Tolbert & McNeal, 2003). Because computer and information technologies are framed as tools for participation in the economy and the political arena (Westen, 2000), this provides a strong case for government intervention to provide access to all citizens. In this context, broadband Internet access is seen by many governments as a public utility, similar to that of water, gas, electricity, and waste, rather than a luxury.

The Federal government of the United States has followed this trend and recognized the importance of broadband and has adopted a variety of measures to promote broadband. In the United States, policies concerned with universal access to telecommunication services exist at the federal, state, and local levels. Such efforts follow a long tradition of “universal service” programs that attempt to provide low-cost telecommunication services both to low-income persons and those living in areas where it is costly to provide such services (i.e., rural areas). At the federal level, Internet access is subsidized to certain schools, classrooms, health care providers, and libraries through the universal service fund, which is administered by the Federal-State Universal Service Joint Board (Prieger, 1998). Additional efforts at the state levels include programs to improve the benefits of Internet access (see Strover, Chapman, & Waters, 2004) and tax incentives for fixed line operators to deploy broadband “last mile” networks. However, together these efforts have been insufficient to guarantee ubiquitous low-cost broadband access. Most of these measures rely on the marketplace to address the nation’s need for broadband connectivity. Unfortunately, the micro-economic motivations of the private industry do not take into account the macroeconomic and social welfare needs of the nation (Windhausen, 2008). The private sector is primarily motivated by short-term profits and cannot take into account the positive externalities of widely available broadband networks.

Local governments in the United States have also followed this trend in that since 2004, more than 400 cities in the United States have announced plans to deploy wireless broadband networks. Municipal wireless broadband networks can be defined as a government and community effort with the goal of designing, developing, implementing, and using

wireless broadband for a specific coverage area, for specific users at a particular moment in time. Municipal governments have a responsibility for stimulating local economic growth and promoting the welfare of their residents. They have become increasingly frustrated by the comparatively slow pace of broadband Internet build-out, and a considerable number have recently begun seizing on the new technologies to supply Internet access themselves. Recent initiatives underscore an intense focus by municipalities to use wireless broadband to strengthen economic development, promote digital inclusion, or improve the efficiency of government services. Wireless broadband, with its use of free airwaves and unlicensed spectrum, is substantially less expensive to deploy than other broadband solutions. In general, municipalities become Internet service providers (ISPs) to decrease telecommunications expenses by lowering the cost of broadband Internet access for government institutions and citizen users.

Municipalities have fundamentally different goals in providing broadband Internet access than private industry. Municipalities are interested in promoting civic engagement, social inclusion, and economic development across all neighborhoods and communities through the deployment of their wireless network. Private industry must be concerned with the bottom-line and provides service with a mind toward profits rather than social welfare. Traditionally, the United States has relied on private industry and competition to achieve greater quality and efficiency in the provision of Internet services. However, this approach is not working in that the United States is falling behind the rest of the world in terms of their broadband rollouts and average speed and quality of service.

This article is organized as follows: first, we present several sources of literature that have informed our work including that of civic engagement in the setting of the United States, the concept of broadband optimism, the connections between civic engagement and information and communication technologies and with social capital. In the following section, we will discuss on research design and then present our findings. Lastly, we will discuss our findings and present some implications for the intersection of civic engagement and municipal broadband systems.

## **Crisis in American Civic Engagement**

Compounding this is the fact that in the past two decades, the number and quality of social ties held by Americans have declined dramatically. Since 1985, we have moved from about one quarter of the American population being considered isolated from others to approximately one half. The number of people who have someone to talk to about matters that are important to them has declined dramatically, and the number of alternative discussion partners has shrunk. Although Americans have lost connections with friends and family, the most significant changes have happened locally at the neighborhood level (McPherson, Smith-Lovin, & Brashears, 2006). According to McPherson, Smith-Lovin, and Brashears, "The general image is one of an already densely connected, close, homogeneous set of ties slowly closing in on itself, becoming smaller, more tightly interconnected, more focused on the very strong bonds of the nuclear family (spouses, partners, and parents)." Perhaps more disturbing is the continued stratification of Americans by education

and race in these networks. Education and Whiteness are still strongly correlated to larger, more connected networks.

These isolation trends are corroborated by Putnam (1993, 2000) in his work with declining civic and public embeddedness. He reports a decline in socializing among neighbors and general participation in social life beyond the level of the nuclear family. In addition, this same trend is supported by Sampson, McAdam, MacIndoe, and Weffer-Elizondo (2005) who identified a downward shift in the type of civic participation in which Americans engaged.

Additionally, research on youth attitudes reveals that, compared to prior generations, today's youth are less interested in politics (Bennett & Xenos, 2005; Galston, 2004), less likely to express trust in their fellow citizens (Keeter, Zukin, Andolina, & Jenkins, 2002), and less inclined to perceive citizenship as involving duties and not simply rights (Kurtz, Rosenthal, & Zukin, 2003). Although youth are more likely than their elders to serve as community volunteers (Lopez, 2004), young people often characterize volunteering as an alternative, rather than a gateway, to participation in electoral politics (Galston, 2004).

## **Broadband Optimism**

Technological determinism depicts technology as an exogenous developmental idea that coerces and determines social relationships and organizations (Williams & Edge, 1996). Technology is treated as given, and it is believed that it provides an effective vehicle for societal change. The lack of complication provided by such a view fails to recognize the complexities in design, development and use, and recurring failures to deliver desired outcomes (Dutton & Peltu, 1996; Dutton, 1999). Technological utopianists, the positive form of technological determinism, argue that technology will improve our quality of life, which places the use of some particular technology; computers, Wi-Fi access, or the Internet, as the central enabling element of a utopian vision.

These utopian technological visions have also carried over into forging a link between civic engagement and communication technologies. In his visit to United States in the 1830s, Alexis de Tocqueville voiced eager optimism for the newest communication tool of the time, mass-circulation newspapers, as a means to promote community connectedness (Ray, 1999). Likewise, Claude Fischer's (1992) historical analysis of the telephone reaffirms information technology's role in building social bonds (also see Marvin, 1988).

Modern policy makers have followed this trend and assumed that rapid diffusion of broadband would bring numerous benefits to society, including, but not limited to, development of e-commerce, e-health, and e-government, among others (see Lee, O'Keefe, & Yun, 2003, for the case of South Korea). Strover et al. (2004) state that these diverse, but mostly enthusiastic, perspectives on broadband and its benefits can be summarized under the overarching concept of broadband optimism. Broadband optimism is part of a larger, overall technological utopian trend that has been a part of many electronic communication technologies. However, this optimism has frequently been applied to technologies that have failed to live up to expectations. Various authors, from academics to business writers, gave optimistic reports about the futures of technologies such as videotext (Fedida & Malik, 1979), local access cable (Dizard, 1997), and interactive television (Rigdon, 1996). Clearly,

there is much misguided optimism, and future reports regarding electronic communication technologies, therefore, must be tempered by reality (DiMaggio, Hargittai, Neuman, & Robinson, 2001).

Broadband movements in the United States are characterized generally by technological optimism: the belief that computer/Internet access and expertise can provide transformative powers to the individual as well as for the community. Strover et al. (2004) state that community technology efforts easily fell into a relatively uncritical equation of community technology with local power and local autonomy equaled improved democracy and empowerment.

The literature concerning the Internet's effects on social and political life has been described as passing through three stages: "unjustifiable euphoria, abrupt and equally unjustifiable skepticism, and gradual realization that web-based human interaction really does have unique and politically significant properties" (DiMaggio et al., 2001, p. 319). Scholars have categorized most research on new media effects on civic and political life as optimistic or pessimistic (Norris, 2001; Xenos & Moy, 2007). Optimists believe that new media promote democracy in a variety of ways, typically by lowering the costs of communication, association, and participation (e.g., Rheingold, 2000). In contrast, pessimists caution that new media will likely not lead to significant changes in political behavior and may even harm public life in a variety of ways (e.g., Margolis & Resnick, 2000; Sunstein, 2001).

At the base of this is fear, fear of a uniformed, disassociated public. The increasing technical complexity of contemporary policy issues and growing reliance on policy experts to resolve them have raised fears that an uninformed public is incapable of holding technical decision makers accountable (Collingridge & Reeve, 1986; Stanley, 1978).

## **Information and Communication Technologies and Civic Engagement**

Several authors have agreed that differentiated Internet activities produce differentiated effects on social ties and networks. Internet activities used for interpersonal contact (e.g., e-mail and chat) are likely to have more social connections than those who use it for solitary activities (e.g., web surfing). These findings suggest media multiplexity. The Internet is used for both social and nonsocial purposes (Kraut et al., 1998; Weiser, 2001). Nonsocial use of the Internet involves solitary online activities, such as web surfing, news reading, and person-versus-computer gaming. Such asocial activities can detract from time spent with others. In contrast, social use of the Internet involves direct contact with other people. Those using the Internet for interpersonal contact (e.g., e-mail and chat) are likely to have more social connections than those who use it for solitary activities (e.g., web surfing), and there is indication, albeit not statistically significant, that solitary web users are likely to have fewer social ties than nonusers.

Adding support to the multiplexity argument is that Internet effects are contingent on media preferences and social context. For example, Shah, Kwak, and Holbert (2001) found increased social capital among those using the Internet for informational purposes and the reverse for those oriented toward social-recreational use. Similarly, Prior (2005) found differential effects based on media preferences for political information versus entertainment. Examining a range of media, he argued that differential effects grow as media choice and

variability grow. Not only are there differential Internet effects' patterns based on differences in user preferences but also that these differences may surpass those found for television, owing to the unprecedented flexibility of the Internet as a medium. With respect to the social context of users, Nisbet and Scheufele (2004) found that Internet effects on efficacy, political knowledge, and electoral participation were moderated by levels of interpersonal discussion.

For some, there is growing evidence that the Internet has proved to be more fertile ground for building young people's knowledge of and engagement in public affairs than many traditional media (Anderson, 2003; Andrews, 2009; Bachen, Raphael, Lynn, McKee, & Philippi, 2008; Jennings & Zeitner, 2003; Lenhart, Madden, & Hitlin, 2005; Levine & Lopez, 2004; Pasek, Kenski, Romer, & Jamieson, 2006). For others, online political communication has generated greater political engagement and participation. For example, in their study of politically interested Internet users during the 1996 elections, Johnson and Kaye (2003) found Internet use substantially related to political engagement. More recently, Drew and Weaver (2006) identified exposure and attention to online political information as positively related to campaign knowledge and interest. Analyzing 1996–2000 NES data, Tolbert and McNeal (2003) found access to the Internet and online election news positively associated with voting and other forms of political participation. Finally, in explaining the positive relationships between Internet use and membership in civic or political organizations, Weber, Loumakis, and Bergman (2003) cite the Internet's ability to "make it easier for citizens to obtain political information through mediating political organizations, direct government web sites, and information sharing, vis-a-vis email, listservs and chat rooms" (p. 39).

However, in opposition to those findings mentioned above, studies of civic sites aimed at all ages have found little opportunity for interpersonal interactivity. Studies of newspaper and television news sites (Bucy, 2004; Oblak, 2005) have found that few offer opportunities for discussion among readers and between readers and journalists, which might democratize the news agenda. Government sites, despite some experiments in citizen participation such as online public consultations that allow citizens to suggest or comment on policy issues, have been more likely to provide a one-way flow of information than to offer opportunities for substantive interaction between citizens and government or to elicit citizens' participation in political processes (Coleman & Gotz, 2001; Musso, Weare, & Hale, 2000).

## **Civic Engagement and Social Capital**

Civic engagement has been defined as "individual and collective actions designed to identify and address issues of public concern." Throughout U.S. history, all of the universal services promoted by American governments—from the Erie Canal and railroad networks, through public libraries and the radio, to telephone and the Internet—represent attempts to bring the vision of the Constitution to fruition by enabling its citizens to be engaged in the political, economic, and social process. As a key component in what Putnam calls social capital (Putnam, 1993, 2002), civic engagement enables good governance by making democratic governments function effectively. To Norris (2001), civic engagement refers to citizens' individual and collective involvement in public affairs (e.g., voluntary voting and attending public meetings).



Most authors agree that civic engagement in the political sphere is at the center of every democracy. It can be argued that civic engagement *is* the backbone of modern democracy. It facilitates good governance and makes all levels of government more efficient and accountable (Putnam, 2002; Shah et al., 2001). Therefore, “while the democratic principle for participation is inclusion, the economic principle is contribution; that is, to maximize the potential of each individual is also to maximize a community’s wealth” (Kvasny, Kranich, Schement, 2006). In other words, lack of participation in the community (or lack of access to information) hinders the potential of that community in the public sphere; and, if continually ignored, enforces isolation and possibly alienation. In this light, the costs and benefits of inclusion by way of access may be measured in terms of a community’s progress toward maximizing the contributions of each member and of the entire community as a whole (Kvasny et al., 2006).

For urban planners, policy makers, and academics alike, the benefits of political participation and associational activity for the development of norms of trust, respect, and reciprocity within local communities justify the implementation of initiatives that can enable citizens to become more active in public affairs (Lelieveldt, 2004; Organisation for Economic Cooperation and Development, 2001). In particular, policies to promote and support social and political participation are thought to play a crucial role in building social capital in ethnically heterogeneous areas (Cheong, Edwards, Goulbourne, & Solomos, 2007). A growing body of evidence suggests that there are likely to be important links between political participation and positive externalities associated with the attitudinal features of bridging social capital in urban areas (see Putnam, 2002). In particular, voting in democratic elections may make citizens more considerate and respectful of each others’ rights (Smith, 2002; Wuthnow, 1999).

Civic engagement is widely recognized to be integral to the growth of positive externalities associated with social capital (see Putnam, 2002, 2007). Civil society is “the networks of ties and groups through which people connect to one another and get drawn into community and political affairs” (Skocpol & Fiorini, 1999, p. 2). Social capital can be understood as the collective capacity arising from “connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them” (Putnam, 2000, p. 19). Social capital is characterized by distinctive bonding (exclusive) and bridging (inclusive) aspects, which reinforce exclusive identities or encompass myriad diverse ones (Putnam, 2000).

Research suggests that an engaged, active citizenry committed to participating in democratic elections views itself as a collection of political equals and is typically more likely to feel an obligation to promote the public good (Hays & Kogl, 2007; Rice and Feldman, 1997). In addition, where levels of political engagement are greater, levels of social disaffection tend to be lower (Boeckmann & Tyler, 2002). Positive social norms, such as trust and mutual respect, contribute to the “bridging” social capital (Putnam, 2002, 2007) that characterizes diverse but cohesive communities, and which may be enhanced by a variety of modes of civic engagement, such as voting in democratic elections and association electivity. This may bolster a “virtuous circle” of civic engagement and community cohesion, as “stocks of social capital, such as trust, norms, and net-works, tend to be self-reinforcing and cumulative” (1993, p. 177).

From the perspective of broadening civic engagement, citizen empowerment and service-driven government are the main drivers of participatory government. Some scholars



examine the general relationship between civic engagement and communication (Carey, 1989). Others explore civic engagement and IT more specifically, and how its design and use affects government reform, public service delivery, and civic engagement, while others examine their effects on social capital and communities, digital inequality, and organizational transformations (Kvasny et al., 2006; Putnam, 2000, 2007; Shah et al., 2001)

## Research Design

This research is a subsection of a much larger research effort. The overall project examined the impact of 10 municipal wireless projects on the digital divide, both quantitatively and qualitatively. The focus of this research is on a subset of that data, the qualitative data from four cities that espoused a connection between their broadband project and civic engagement.

Our approach to this research was fundamentally qualitative and interpretive following the constructivist ontological tradition, whereby findings were interpreted within their contexts, instead of generalizing across all possible contexts. Interpretive research is based on the basic assumption that human knowledge is obtained through social constructions (Klein & Myers, 2001). The goal of interpretive research, thus, is to understand the contextual complexities involved in these interactions (Trauth, 2001).

The selection of case study as a methodology for conducting this research is appropriate for three reasons. First, case studies have been identified as an appropriate and important tool for the study of information and communications technologies in organizational contexts (Darke, Shanks, & Broadbent, 1998). Second, the case study is viable method for studying areas that are underdeveloped in the literature (Benbasat et al., 1987). Third, the case study method is particularly well suited for studying phenomena that cannot easily be distinguished from its context.

The conducting and comparing of multiple case studies is also a preferred technique for increasing the validity and generalizability of the findings as well as theory development and testing (Benbasat et al., 1987; Yin, 2003c, p. 46). Inductively generalizing from a single case study is epistemologically problematic and runs the risk of being easily falsified by a single counterexample (Benbasat et al., 1987). However, this risk can be partially overcome by conducting multiple case studies of similar (by definition, it is impossible to conduct identical case studies because case studies are contextual); one can identify recurring patterns and make general propositions.

For each case study, we have collected multiple forms of evidence from multiple sources. These sources included city documentation, archival records, and interviews. Documentation included items such as policy handbooks, usage statistics, design documents, data schemas. Documentary data serve to build the “picture” of the state of the city network under observation, the changes it has gone through, and provide possible pointers to other sources of evidence and questions to ask. Archival records such as meeting minutes, contracts, and change-logs were collected for tracking the evolution of the system. Changes to the network were catalogued and tracked for follow-up. Interviewing was used to follow-up on questions arising from the archival, documentary, and observational data.

We chose four cities as case studies for this work, Tempe, Arizona, Portland, Oregon, Corpus Christi, Texas, and Madison, Wisconsin.

Municipalities were included in this study if they met the following criteria: must be located in the United States; must have already deployed a wireless broadband system that uses a Wi-Fi or Wi-Fi mesh technological infrastructure; must have launched the Mu-Fi project network by December 31, 2006; must be in operation for public access and municipal use, not just municipal use; must be a government-led, citywide wireless broadband network initiative and not a countywide, statewide, or city hot spot; and must geographically cover at least 50% of the city by December 31, 2007.

Interviews were structured and semiformal; almost like conversations, using a broad interview guide. Interviews were conducted during the calendar year 2007. Each interview was conducted over the phone and lasted about 1 hr. The sample consists of approximately 75 interviews. The types of individuals interviewed were public officials from the Government Project Administration Office, the Broadband Provider, the Chamber of Commerce, the Public Safety Department, the Employment Services Department, the Economic/Community Development Department, the Public School District Office, the Public Health Center, the Public Library, the Parks & Recreation Cultural Center, and Community Center and the Tourism Office.

For this study, we used a form of analytic induction, a mixture of deductive and inductive approaches to our analysis (Epstein & Martin, 2004). First, we developed a set of codes based on insight we had gained from the larger research, previous studies on civic engagement, public technologies and social capital, and the interview core questions. We used these codes deductively. During the coding process, we also let some codes emerge from the data. The inductive approach reflects frequently reported patterns used in qualitative data analysis. The process of coding was iterative and cyclical based on the framework developed by Seidel (1998). This work also took instruction from the grounded theory method (Glaser, 1992; Strauss, 1990), a “qualitative research method that uses a systematic set of procedures to develop an inductively derived theory about a phenomenon” (Strauss, 1990, p. 24). The benefit of the grounded theory approach is that the resulting theory is intimately tied to the evidence (Eisenhardt, 1989).

## Case Study Data

### Introduction: Case Study 1—Tempe, Arizona

Tempe identified a list of objectives for its wireless network venture. Some of the overarching goals included to provide ubiquitous wireless broadband coverage to their city, provide an alternative to DSL and cable modem for Tempe residents, promote usage of the Tempe City web site and e-government applications by offering free “anywhere” access to Tempe.gov, among other goals. Tempe was so proud of its initiative that a large framed display of a wireless kickoff ceremony adorned the entrance to the mayor’s office for several years. Today, a piece of wire from a wire-cutting ceremony has become detached and is falling off the famous display. It is symbolic of how the city’s highly touted wireless network itself has fallen into disrepair. This is surprising given the fact that Tempe was one of

the first midsize cities to go live. The city declared the provider in default of the contract and declares the network abandoned to this date. As expounded below, Tempe failed to enhance public participation via its network because of their overwhelming emphasis on the network's town-gown role and not necessarily finding ways of improving civic engagement. It lends support to the argument advanced by a number of deterministic writers that the technology itself determines social change.

### **Introduction: Case Study 2—Portland, Oregon**

The Portland wireless network went live in early December 2006, with more than 70 access points covering much of the downtown area. Since then, the network expanded with network reach at about 95% of the city. Portland's previous provider, MetroFi, provided wireless access to Portland residents in two ways. For US\$19.95 per month, users received speeds of 1 Mbps with a 256 Kbps upload channel without advertising. Others could get a free version of the service by accepting advertising. Since its launch, MetroFi announced that its network had 19,900 registered users. In the summer of 2008, MetroFi told the city it was turning off the system because the city (or a private company) failed to step in to buy the network. This led to what many considered an end to the troubled, city-backed experiment in providing universal access to its citizenry. Despite aiming to increase public participation, Portland failed to achieve its goal. Compared to the general population, only a small fraction of citizens were connecting to the citywide Wi-Fi grid, and those who were connected were mainly students, knowledge workers, and downtown residents who are already experienced in the use of Internet access and computer usage.

### **Introduction: Case Study 3—Corpus Christi, Texas**

Corpus Christi was one of the first cities to create a citywide Wi-Fi network. Corpus Christi officially launched its US\$7 million city-owned wireless broadband network in December of 2006 during a ribbon cutting ceremony. Tropos teamed with prime contractor Northrop Grumman to build the city's Wi-Fi networking system. Corpus Christi's metro-scale Wi-Fi network provided coverage to 90% of the city's 277,000 residents across more than 100 square miles of the city. Until very recently, Corpus Christi, in cooperation with MetroFi, used its wireless network for intragovernment and intergovernment services. Although the city had reached an initial agreement with MetroFi, the city decided to buy back the network from the provider in 2008. This was due, in part, to MetroFi's staggering losses and project abandonment. Currently, the network is owned and operated by the city and uses "ConnectCC" as a tool connecting all 147 square miles of Corpus Christi wirelessly. Despite the fact that Corpus Christi bought back the network, the city still has not made an impact in terms of enhancing public participation via their network. The interview data indicate a significant difference between what the city intended for the network and what the city is currently offering, with the former being a mere splash page.

### **Introduction: Case Study 4—Madison, Wisconsin**

Madison's 10-square mile, indoor and outdoor broadband network is like Tempe's in many ways in that it also passed through several network operators (AOL, CellNet, and

Mad City Broadband [MCB]). MCB had no contract with the city, except for the rental of five or six traffic signal light poles, where it installed radio transmitters. The remaining signals were all in contract with the local electric utility company. MCB installed several access points on its utility poles. However, its network was not seamless nor were they advertising as such. Wired areas of Madison included the capital, the section leading to the local university area, most of the community centers, and particular streets where MCB had equipment installed on telephone polls. In late 2008, Xicom Wireless, a global provider of wireless broadband services, announced its acquisition of MCB. Xicom continues to provide wireless broadband to Madison and expects to rollout the next phase of the project in the coming months. At the time of collecting the data and writing this analysis, Madison failed in its goal-enhancing civic engagement. As explained below, the success of the Madison wireless project lies in improving service delivery, crafting clear and sound civic engagement policies, aligning the community's goals with the overall Wi-Fi mission, and integrating e-government services to the initiative.

### **Civic Engagement Through Wireless Broadband in Tempe**

In Tempe, it was clear that the wireless network brought many people a new convenience, which is the ability to remotely access information and services. For many local citizens looking to get involved, this was a tangible benefit. However, this appeared to have been a dream rather than a reality. Tempe envisioned people using this new high-tech infrastructure, but ordinary citizens, other than students, were not using this technology.

Primary users of the network seemed to have been university students, because a local state university is located in their downtown corridor. However, the coverage area was not significantly expanded to include other segments of the city. Subject # TE-5146 said

I don't have data to show you that it's made a difference in other neighborhoods outside the downtown area. I don't have any data to share with you that says these people are not using it or how it's affected them. It's my gut to say yes it has made a difference, at the college level specifically. But, I can tell you having a student that's getting ready to graduate with a degree. . . . It's been very convenient for my kid in terms of flexibility and where she can do her work and where she can meet with her groups and I think that flexibility is good. Will it motivate her to interact with it on a more permanent basis? I seriously doubt it.

Another top government official, Subject # TE-5143, mirrored the same sentiment:

Currently, I haven't heard anything, I don't know that it has been discussed in meetings that I was involved in, as far as quantifying things that we can look at, by having this network availability and the type of workers we're looking to attract. The network doesn't really seem to be working in terms of getting the public involved the way we wanted. But, we have been able to measure other types of services with it. We will continue to explore all areas.

Because Tempe focused their network in the downtown core, college students became their primary target. However, it is important to mention that Tempe's cultural services department did envision using the Wi-Fi grid to alert citizens of their 100 special events a year held in the main city park. One respondent did say he knew some promoters of those

events who intended to use the wireless network to accomplish a host of different things. Although he did not know the extent to which it was successful or not, he heard anecdotal evidence of long-term plans to investigate whether citizens were really using the network to attend any of these events.

Public officials certainly touted the Tempe wireless project as an endeavor that would eventually enhance the image of their city; however, many interview participants thought the contrary. They believed it would take a long time to collect data that proved the network was getting the public involved or making any sort of discernible impact in terms of civic engagement. Because Tempe is a college town, the city used the university to its advantage and vice versa. It is no surprise that those affected by the network tended to be college students. City officials were optimistic and hoped this impact would trickle down to other segments of their population.

The interviews showed that Tempe, with its provision of wireless broadband access, largely failed to meet its goals in terms of lessening the digital divide. Those who were connected to the computer network were predominantly residents who were already employed—groups generally described as traditional Internet users (i.e., college students). Respondents indicated that those residents who were connected were also significantly more experienced in the use of Internet than the nonconnected. The project failed to extend access to the excluded. As Tempe's municipal Wi-Fi was hardly used by the excluded, because of a lack of effective marketing strategy, it can be argued that the effects on quality of life for the excluded were also minimal.

Despite its failure to make gains in public participation, the expectations of Tempe's wireless network remained high. Both government officials and local stakeholders interviewed continued to believe that information technology had the potential to be a powerful weapon in enhancing civic engagement and increasing access to local information, the basis for the development of community identity and participation.

## **Civic Engagement Through Wireless Broadband in Portland**

Several respondents felt that the city had placed less of an emphasis on increasing public participation and more emphasis on the hype surrounding the network. One senior executive from a local economic development agency, Subject # PO-6021, said

It's a fad in government because it's something to check off its list. I think people are fundamentally opportunists. The reality and the problem that I see from rural to inner city communities is that those kids who qualify for free or reduced lunch are those kids who are least likely to have a computer or Internet access at home. Our economy is hemorrhaging manufacturing jobs. Eight out of 10 jobs require technology skills. I don't think the city has failed; I don't think it has tried.

Participants echoed the sentiment that citizens were either having trouble accessing the network and/or did not have the necessary applications to get it in their home. As a result, most felt the Unwired Portland initiative was great for mobility and city tourists but not necessarily local residents. Because the city revealed that there was not one dollar of public subsidy going into the project, many felt that public officials had been absolved from any

responsibility of the project. They do not believe this constitutes good sound policy in terms of achieving civic engagement in the new information society.

Interestingly, the city was unsure about who was taking advantage of the network. The registration process did not require people to indicate their income level, occupation, or gender. It was completely anonymous to the broadband provider. Although city officials argued that the wireless service was opening new doors for communicating with their citizens and particularly disparaged communities, for countless citizens the Wi-Fi cloud has yet to prove it has contributed something positive to their communities.

The Unwire Portland project failed to connect all groups of their society to the wireless cloud. As a result, the city also failed to achieve civic engagement by way of their network. Compared to the general population, only a small fraction of citizens were connecting to the citywide Wi-Fi grid and those who were connected were mainly students, knowledge workers, and downtown residents who were already experienced in the use of Internet access and computer usage. Sadly, the city failed to develop metrics to track whether the few that were logged in into their network were using it to learn something about their city government, their voting process, and so on. The general lack of user and usage information by the government and their broadband provider means that researchers have little to no information about how the network was used to achieve civic engagement.

Despite the network connection issues and relative lack of use by all groups, to city officials, the overall perceptions of the potential of Unwire Portland remained extremely positive. The general belief was that the Wi-Fi grid was an emerging technological phenomenon with the potential to affect socioeconomic structures. The expectation of its impact remained high and expected in the longer term. Not only were city officials and broadband provider somewhat content with the service, but community groups and residents thought that wireless projects such as Unwire Portland were to be common place in most areas in the near future, and the expectations of its impacts on community identity were high. Unfortunately, proving citizens with only a splash page, the lack of content and services posed a serious threat to the survival of the network. This suggests that a strategy that included specific civic engagement goals in relation to the wireless project was not examined.

## **Civic Engagement Through Wireless Broadband in Corpus Christi**

Access to the Internet was very important for a city like Corpus Christi. However, the original model adopted by Corpus Christi was for predominantly government services like e-meter reading. By adding a digital divide component to their government service agenda, the city took a crucial step to increase public participation in public and community life.

Despite the fact that Corpus Christi has not made a huge impact on increasing public participation, subjects thought that it had the potential to do so. In agreement with the views expressed by some of its proponents, the city was seen as a vehicle for increasing Internet access through the provision of municipal broadband access. The importance of being included in the new digital global economy was emphasized by most interviewees, who praised the step-by-step strategy used by the city, the partnerships established with key institutions, and the positive feedback received from the community.



It can also be argued that Corpus Christi had the potential to reach a wider audience and perhaps truly achieve civic engagement. The interview data indicate a significant difference between what the city intended for the network and what the city is currently offering, with the former being a mere splash page. This difference has not been further examined, but it can be speculated that affording a splash page allowed the city a sense of acquittal because of the service it provided in the otherwise rather Wi-Fi deprived community and because of the high expectations they had of the network. One public official mentioned the following:

One of our initial goals was, for example, to have the independent school district link their information to the city's Wi-Fi portal so if parents wanted to know their child's grades they could go in through the portal and get that information. We were going to provide all sorts of public information about city services and really have citizens involve in this process; there was also some interest in doing e-business training. Again, those were very early discussions and lots of issues and questions about how do we go about getting this done and so on, and then when the decision was made to go live with the actual provider, I think most of the time and energy was redirected toward evaluating the system and tweaking it and making changes to it for their models. Most of us have a lot on our plates. . . . (Subject # CC-8001)

Again, the expectations were especially high in relation to the potential impact of Corpus Christi's wireless system on improving civic engagement, such as access to online services, but expectations were also high in relation to how they would actually go about rolling out their network or how they intended to measure the impact it was having in their community. Additionally, some residents worried that the service was no longer free. Respondents argued that free access was key to successfully engaging its citizenry to use the Internet in their city. The bottom-line is that free is always free and when it is no longer free there is a cost and sometimes that cost can be a barrier to some people. There is not only the access charge but the larger charge on the front end of just having the equipment to access the platform. Several participants expressed the fact that every city's model is different, and there are different things that must be explored in-depth. Most participants felt this was a multifaceted, iterative process and that the city did have some hurdles to overcome if it wanted its technology venture to succeed in increasing public participation.

Some support was given to the views expressed by a number of dystopian proponents that the Internet would lead to the creation of "mouse potatoes" who neglect participation in society. In general, however, the majority of respondents believed that Corpus Christi still had the potential to enhance public participation and improve the community's identity.

Like other cities, Corpus Christi's biggest obstacle to increasing Internet access was access to low-cost computers for those who need them. Some respondents also expressed skepticism and hostility regarding taxpayer dollars going toward paying for a wireless network. Opinions varied widely about paying for access—several would rather have paid for access than having to wade through a litany of pop-up ads, while others demanded free access in any form, especially because it was initially free during the testing phase. This fact underscored a central issue to the city's implementation of its wireless network—the money had to come from somewhere to finance it. Corpus Christi realized the value of having a viable wireless network, and two of the biggest benefits were the enhancement of civic engagement by way of dissemination of information through a city portal.



## Civic Engagement Through Wireless Broadband in Madison

Despite the general enthusiasm with which Madison's wireless project was launched, it was clear that there were many problems with the project. In contrast to Corpus Christi, Portland, and Tempe, the Wi-Fi project in Madison did not work out as anticipated, because of state legislative prohibitions, managerial issues, and its failure to attract and involve residents. For example, the MCB (or the wireless provider) failed to live up to their promises of providing ubiquitous Wi-Fi coverage. There were problems with the MCB, few access points were live and available, and the project failed to extend its membership beyond the downtown core. Some respondents thought that the latter was the biggest barrier to the project's success.

Madison's wireless initiative was promoted by city officials but ultimately built by MCB. It can be argued that this strategy will ultimately hurt the overall goal of the network in terms of achieving public participation. As a result of the experiences gained from the project's lack of service delivery, clear civic engagement strategy, community support, and technical glitches. Considerable amounts of time, money, and effort were needed with an emphasis on service and support; this is something the Madison has yet to manage well. One respondent said

Madison is looking at itself as a technology leader, especially in the mid-west region and eventually having a robust citywide Wi-Fi network. This would certainly contribute to that and again make Internet access more affordable to achieve things like closing the digital divide, increase public participation and bringing more government information to all neighborhoods throughout the city; that would be a huge benefit. (Subject # MA-9710)

This said, however, Madison failed in its goal of involving community members in the design, development, and deployment phases of the network. It was mainly the MCB group and a city liaison, which were in charge of the whole project and made all the decisions. Madison's broadband project seemed to have been perceived as belonging to MCB and not the community. For citizens to feel a part of the community and engage in discussions about city life and city issues via the Wi-Fi network with their government, it is critical for residents to have a stake in the decision-making process.

Madison failed to include the excluded and ultimately enhance civic engagement, even though some residents thought that it had the potential to do so. In agreement with the views expressed by utopianists, it was believed that Madison's Wi-Fi technology would usher in an era of increased public participation. For instance, one interview participant added

Internet access is something that should be provided and supported at least by governments. The UN Declaration on Human Rights says communication is a human right. Article 19 of the 1948 U.S. declaration of human rights, says that communication is a human right. I think that access to the Internet and the means of communication and participation in our global society, is something that should be provided to all people as a right and as a service of government. By doing so, we will be able to achieve public participation the way we'd like to achieve it. Otherwise, it is just hearsay and innuendo. (Subject # MA-9703)

A representative from a local grassroots organization, Subject # MA-9743, said

I would say very little to no impact to the city in terms of engaging the public's interest due to the network at any level. Most of the people who used the service like me noted bad service.

Some of them came to the realization that if they had DSL at home, they might as well keep it because it works. So, it's not successful by my stretch of our imagination.

From a library's perspective, one respondent argued that offering access is not enough; cities need to offer more creative means of hardware transfer mechanisms as well as technical and literacy training portals to get people truly involved. This is particularly true for e-government services, where participation often requires Internet access. For example, taxpayers flood libraries in the spring to access the Internet and download tax forms as well as to obtain valuable advice. As Nancy Kranich explicated in her paper, "seniors seek information and register online to receive mandatory federal Medicare prescription drug coverage. Immigrants communicate with and complete forms for government agencies documenting their work status. Farmers register electronically for federal water rights payments. And displaced hurricane victims used libraries to find housing, jobs and fill out FEMA forms" (Kranich, 2006). As municipal broadband service providers expand, governments will continue to shift these services to libraries as well as grassroots organizations to reduce operating costs.

Several respondents sagely stated that Madison's network only appealed to people who already had computers—the network served no purpose for people without them. Thus, some believed Madison's network was doing little to enhance civic engagement for all residents.

## Discussion

Our findings across all four of our case studies can be distilled into the following seven points.

1. Cities identified a pattern of decreasing civic engagement, public participation, and social inclusion as a problem in their municipality.
2. Connection to the Internet was framed as a solution to this social problem.
3. Because incumbent telecom providers were not able to provide broadband services to the entire city population at the speed, quality, and cost demanded by the municipality, the city stepped in to offer the service itself.
4. Using promises of increased civic engagement, public participation, and social inclusion, among more materials things like increased socioeconomic status, taxpayers were convinced to support the municipal projects, often with tax dollars.
5. The municipalities initiated the project and universally encountered problems with deployment and implementation along the way.
6. Most projects ended in failure.
7. Most citizens who supported the project were left confused, disgruntled, and mistrustful in response to past, current, and future municipal technology projects.

We found several critical points in this pattern in which these municipalities made choices that created a greater likelihood for failure. The first critical point was found in Numbers 2 and 4 above, when these municipalities framed their broadband project as a solution to the problem of civic engagement and public participation. Current evidence seems to say that

access to broadband Internet may be necessary but not sufficient to alleviate social problems. Offering simple technological solutions to complex social problems is naïve. There can be a dangerous tendency by government officials to “play down,” oversimplify, and polarize issues in the short term. This might result in wasted resources and false expectations, and may be due, in part, to politicians’ short-term tenure in office. Technological solutions, such as building a municipal broadband network, may be seen as far easier and simpler to implement than improving the educational system, redistributing wealth, restructuring the health care system, and changing the economic system underlying society, which may be the actual solutions to poverty, civic disengagement, and a loss of social cohesion. This technological solution was sold to the taxpayers who then supported the program, throwing in their hopes with their money.

Through these four case studies, we find that delivering broadband Internet access to citizens does not, in fact, solve problems with civic engagement, public participation, and social exclusion. In other words, merely adding low-cost broadband Internet access to impoverished neighborhoods, without additional educational programs and low-cost devices, may exacerbate these problems. Recent research (see Kvasny and Payton, 2005; Kvasny, 2006; Kvasny and Keil, 2006; DiMaggio et al., 2001; Kling and Lamb, 2000) suggest that the success of engaging the public projects depends on a variety of factors such as training, education, user perceptions of IT, and the organization’s past experience with using IT. In cities in which municipalities offer wireless broadband, access may be interpreted as just another “out of reach” commodity. Without low-cost devices, appropriate cultural content, and significant training and support, access may be simultaneously interpreted as useless and yet another thing made for the rich, the White, and the elite.

In terms of the perceptions of the impact of city-sponsored municipal wireless network in our four case studies, there is a perceived disconnect between the rhetoric used by the cities and the experience and expectations of those living and working within the city. These cities have made public claims that their networks will improve the quality of the lives of its citizens, either through the act of directly providing access or through using that access to attract business and jobs to the community. In all cases, the experience of those concerned with each project, including city employees, technical managers, community representatives, among others, found that while access was provided, it did little to improve the lives of the most disenfranchised citizens or better connect citizens with their government or each other.

The second critical point was in Numbers 3 and 5 above, when each of these cities believed that the solution to providing low-cost, high-speed Internet access was in becoming a telecom provider. Although a few of these cities had some experience in providing utilities such as water, sewer, and even electricity, none had experience as an ISP. None possessed the core competencies necessary to build and manage their own network or partner with other entities that could provide the service. Often in these partnerships, the goals of the city and the private ISP were fundamentally at odds with one another.

When these projects did, indeed, end in failure, the implications were varied. First, municipalities were often seen by citizen as having mismanaged tax dollars and the broadband projects. Second, municipalities were seen as having misrepresented their intentions to address social problems such as civic engagement. Lastly, because of these perceptions, the citizens further distanced themselves from the municipalities and public technologies. This

actually has the potential to further exacerbate the problems with civic engagement and public participation that started the entire process.

This study has several practical implications for a variety of users (local governments, policy makers, technologists, incumbents, and so on). Public elites have framed their technological Wi-Fi venture as a tool that can improve the social fabric of their communities by enhancing civic engagement. Thus, the issues of good policies that improve civic engagement and a progressive process for evolving policy are therefore of utmost importance. It is important to go beyond the hype and political correctness and tackle the issue head-on. This process should (a) build awareness and understanding of the potential impact of information and communication technologies (ICT) for development; (b) take ownership of the policy reform process at the local level; (c) have political determination; (d) include multistakeholder collaboration; (e) seek active participation of at-risk communications; and (f) be flexible to adapt to local needs and wants. The importance of the evolving policy process is precisely that, *inter alia*, flexible policies promote public participation in the new information economy. Unfortunately, there can be a dangerous tendency by public officials to oversimplify and polarize issues in the short term. This is due, in part, to politicians' short-term tenure in office. This can be problematic as most science and technology programs require a long-term and systematic approach (Putnam, 2000, 2002; Rogers, 1995). Government policy rhetoric anchored in the value of wireless broadband needs to be met with significant funding, resources, and community support. As this study showed, there are dangers that a superficial investment will lead to surface change that does little to improve the reality of municipal broadband communities. Below are just a few public policy questions worth considering:

- If municipal broadband is not the solution, what is?
- What are the acceptable limits to government intervention to facilitate broadband public participation activities in the United States?
- What are the future scenarios of civic engagement in the digital global economy?

This study does not reveal a panacea as to how policy makers could help ensure municipal networks succeed. However, it points to the importance of factors that are often overlooked in municipal broadband policy, namely the general understanding of the multifaceted nature of civic engagement programs. As previously mentioned, the relationship between civic engagement and municipal wireless projects is an aspect requiring further study. Moreover, for municipal broadband proponents who view these systems as a gateway leading to a more equitable society, the stark reality in 2009 is that more and more cities are not taking the high road of successfully enhancing civic engagement. Beyond a splash page and loosely formed partnerships, there were no substantial elements that allowed for a public participation strategy for these five cities. This raises a broad range of issues, which should constitute the platform for future municipal deployments:

- If local governments are not the right leaders of telecommunications change, who is?
- What will the future of communities be in the information society?
- What role will libraries, governments, and network connectedness play in promoting democracy and ICT?

## Conclusion and Implications

Rhetoric that promises solutions to communities and does not deliver can actually cause additional problems. Most directly, cities waste money, time, and effort on failed initiatives. More importantly, the gap between the digital haves and have-nots continues and grows. Additionally, community groups, partners, and the public grow disillusioned with an associated increase in the distrust of public officials and government. Lastly, the belief that technology directly solves social problems continues uncontested, even though it is so evidently failing again and again.

For some municipalities in which the promises of bridging the engaging the public were especially clear and strong and in which taxpayer dollars were used to fund the project, disconnects such as these can lead to a further mistrust of authority and technology, worsening the sociocultural problems at the root of the engaging the public. In other words, it will entrench existing exclusion, and educational and social inequality may increase. From our data, we do not conclude that these municipal community projects are a failure and should not be attempted. We conclude rather that they have great potential but that the plans and actions taken by the government should match the rhetoric used by the public leaders. Plans should include the community and provide the auxiliary training and support necessary to build users instead of networks. Mismatched plans and rhetorical promises may do more harm than good.

This article has focused on four cities, which initiated municipal wireless projects and failed to some degree. This pattern is not unique. The number of new U.S. municipalities who are entering as telecommunications providers is dropping and many more municipal projects have been abandoned or failed. However, as municipal-sponsored broadband projects have lost their position in the U.S. telecommunications scene, community wireless networks have gained prominence.

Community wireless networks originate in the hands of interested, concerned, and technologically able citizen and community groups (Auray, Charbit, & Fernandez, 2003; Sandvig, 2004; Meinrath, 2001, 2005; Bar & Park, 2006). These community networks have conventionally been opposed to municipally sponsored or owned wireless networks, in which the city acts a convener, leader, provider, and designer of the network (Tapia & Ortiz, 2006; Ortiz & Tapia, 2008; Gillett, 2006). Community networks have typically been characterized as bottom-up or grassroots (Gurstein, 2000, 2003) while municipal projects are framed as being as top-down. Although the number of community broadband networks grows, they are often plagued by issues of funding, leadership, and maintenance.

As municipal projects fail and community networks grow in number, but suffer, we see some hope in something called public broadband. Public broadband is a network in which partnerships between local governments, industry, and community groups define the ownership, management, maintenance, and use of these networks (see Tapia & Ortiz, 2006, 2007). They are not purely municipal, community, or private. Clement and Bryne-Potter call this hybrid public broadband or broadband in the public interest. They define it as broadband networks that serve the public interest, regardless of the ideology on which they were founded and the means by which they are provided (Clement & Bryne-Potter, 2007).

We believe that these public broadband networks offer some solutions to the problems that have come out of our study of municipal networks. First, we see public networks as

having potential as both sites of civic participation and as enablers of civic participation. Public networks as a site of civic engagement may act as a means for community members to engage in the development, management, and maintenance of the network through essential volunteer activities such as serving on committees, providing technical support and training, or engaging in content development (Cukier, Bauer, Ngwenyama, & Middleton, 2006). As mentioned above, access to broadband Internet alone was never enough to affect issues of social exclusion. However, when the community participates in building the network and offering the technical support, instruction, and training that would accompany the network, this may have more potential for impact. Public networks also may have the potential to further act as enablers of civic participation by providing services and support, including access to and training on ICT equipment and software, and offering local community content and service such as community directories and electronic discussion forums. Public wireless networks might also be used to better inform and engage citizens about local politics and community issues, through the use of a community portal, location-based information and event alerts, online forums, and online polling. By taking the ownership, development, design, and deployment of the broadband network out of the hands of the government officials, the network will have to be designed and built by citizens for citizen needs. This public network may also have no need for selling itself as a solution to social problems in that it would not require taxpayer dollars or support and would sell itself to its direct participants.

Finally, in support of a more hybrid approach to public networks, municipalities and communities have different goals than those of private telecom providers. Although many municipalities pursuing Wi-Fi envisioned access for every citizen as a means of fostering social inclusion, the focus has shifted from social justice to profit sharing. This shift is the result of an inherent tension that exists between the municipality, which is motivated to provide the service at a low cost so that disadvantaged citizens can benefit, and the service provider which is motivated to price the service as high as possible so as to maximize their profit. Although smaller municipalities have developed their own Wi-Fi initiatives with seed funding through community development grants obtained from state and federal government and have been able to focus on social inclusion, larger municipalities have generally opted to outsource development to telecoms and ISPs who operate from a profit making business model (Jain, Mandviwalla, & Banker, 2007). The United States has taken a deregulatory approach under the assumption that the market will build enough capacity to meet the demand for broadband Internet. However, the market may do a good job of providing reliable infrastructure with reasonable quality of service, but it has no incentive to provide universal, ubiquitous coverage if it cannot generate sufficient profit doing so (Middleton, 2007; Clement and Bryne-Potter, 2007). The business pressures of providing connectivity do not ensure that networks will be built with the standards deemed important by communities.

We are concerned about this tension between the civic engagement and public participation programs that might have motivated the city officials and the profit motive that motivated the private companies that developed the network. This disconnect may lead to a host of other problems in which public policy, local government, and wireless broadband technologies and local governments are seen by underserved, disconnected, and disenfranchised communities as untrustworthy.



## References

- Anderson, D. M. (2003). Cautious optimism about online politics and citizenship. In D. M. Anderson & M. Cornfield (Eds.), *The civic web: Online politics and democratic values* (pp. 19-34). Lanham, MD: Rowman & Littlefield.
- Andrews, R. (2009). Civic engagement, ethnic heterogeneity, and social capital in urban areas: Evidence from England. *Urban Affairs Review, 44*, 428-440.
- Auray, N., Charbit, C., & Fernandez, V. (2003). *WiFi: An emerging information society infrastructure, socio-economic trends assessment for the digital revolution (Vol. Issue Report no. 40)*. Milan, Italy: STAR project, IST Programme, European Commission.
- Bachen, C., Raphael, C., Lynn, K., McKee, K., & Philippi, J. (2008). Civic engagement, pedagogy, and information technology on web sites for youth. *Political Communication, 25*, 290-310.
- Bar, F., & Park, N. (2006). Municipal Wi-Fi networks: The goals, practices, and policy implications of the U.S. case. *Communication & Strategies, 61*, 107-125.
- Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*, 368-386.
- Bennett, L., & Xenos, M. (2005). *Young voters and the web of politics 2004: The youth political web sphere comes of age*. Paper presented at the annual meeting of the International Communication Association, New York, NY.
- Boeckmann, R. J., & Tyler, T. R. (2002). Trust, respect and the psychology of political engagement. *Journal of Applied Social Psychology, 32*(10), 2067-2088.
- Bucy, E. (2004). Second generation net news: Interactivity and information accessibility in the online environment. *International Journal on Media Management, 6*, 102-113.
- Carey, J. W. (1989). *Communication as culture: Essays on media and society*. London: Unwin Hyman.
- Cheong, P., Edwards, R., Goulbourne, H., & Solomos, J. (2007). Immigration, social cohesion and social capital: A critical review. *Critical Social Policy, 27*, 24-49.
- Clement, A., & Bryne-Potter, A. (2007). Saving Toronto hydro telecom's one zone project from itself: Alternative models for urban public wireless infrastructure. *Journal of Community Informatics, 4*.
- Coleman, S., & Gotz, J. (2001). *Bowling together: Online public engagement in policy deliberation*. Retrieved March 1, 2009, from <http://bowlingtogether.net>
- Collingridge, D., & Reeve, C. (1986). *Science speaks to power: The role of experts in policy making*. New York: St. Martin's Press.
- Cukier, W., Bauer, R., Ngwenyama, O., & Middleton, C. A. (2006). A critical analysis of media discourse on information technology. *Information Systems Journal, 8*, 273-289.
- Darke, P., Shanks, G., & Broadbent, M. (1998). Successfully completing case study research: Combining rigour, relevance and pragmatism. *Information Systems Journal, 8*, 273-289.
- DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, P. (2001). Social implications of the Internet. *Annual Review of Sociology, 27*, 307-336.
- Dizard, W. (1997). *Old media, new media: Mass communications in the information age*. New York: Longman.
- Drew, D., & Weaver, D. (2006). Voter learning in the 2004 presidential election: Did the media matter? *Journalism & Mass Communication Quarterly, 83*, 25-42.
- Dutton, W. H. (1999). *Society on the line: Information politics in the digital age*. Oxford and New York: Oxford University Press.
- Dutton, W., & Peltu, M. (1996). *Information and communication technologies: Visions and realities*. UK: Oxford University Press.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*, 57-74.
- Epstein, L., & Martin, A. (2004). Coding variables. In K. Kempf-Leonard (Ed.), *The encyclopedia of social measurement v. 1* (pp. 321-327). New York: Elsevier Academic Press.
- Fedida, S., & Malik, R. (1979). To broadband or not to broadband: The relationship between high-speed Internet and knowledge and participation. In *Viewdata revolution*. New York: Wiley.
- Fischer, C. L. (1992). *America calling: A social history of the telephone to 1940*. Berkeley: University of California Press.



- Galston, W. A. (2004). Civic education and political participation. *PS: Political Science & Politics*, 37, 253-266.
- Gillett, S. E. (2006). Municipal wireless broadband: Hype or Harbinger? *Southern California Law Review*, 79, 561-594.
- Glaser, B. G. (1992). *Basics of grounded theory: Emergence v forcing mill valley*. CA: Sociology Press.
- Gurstein, M. (2000). *Community informatics: Enabling communities with information and communications technologies*. Hershey, PA: Idea Group Publishers.
- Gurstein, M. (2003). Effective use: A community informatics strategy beyond the digital divide. *First Monday*, 8.
- Hays, R. A., & Kogl, A. M. (2007). Neighborhood attachment, social capital building, and political participation: A case study of low-and moderate-income residents of Waterloo, Iowa. *Journal of Urban Affairs*, 29, 181-205.
- Jain, A., Mandviwalla, M., & Banker, R. D. (2007). Can governments create universal internet access? The Philadelphia municipal wireless network story. E-Government Series, IBM Center for the Business of Government. Retrieved May 4, 2008, from [www.businessofgovernment.org/pdfs/JainBankerReport.pdf](http://www.businessofgovernment.org/pdfs/JainBankerReport.pdf)
- Jennings, M. K., & Zeitner, V. (2003). Internet use and civic engagement: A longitudinal analysis. *Public Opinion Quarterly*, 67, 311-334.
- Johnson, T. J., & Kaye, B. K. (2003). A boost or bust for democracy? How the web influenced political attitudes and behaviors in the 1996 and 2000 presidential elections. *Harvard International Journal of Press-Politics*, 8, 9-34.
- Katz, J., & Rice, R. (2002). *Social consequences of Internet use: Access, involvement, and interaction*. Cambridge, MA: MIT Press.
- Keeter, S., Zukin, C., Andolina, M., & Jenkins, K. (2002). *The civic and political health of the nation: A generational portrait*. Retrieved March 1, 2009, from [http://www.civicyouth.org/research/products/Civic\\_Political\\_Health.pdf](http://www.civicyouth.org/research/products/Civic_Political_Health.pdf) on
- Kennard, W. (2001). Equality in the information age. In B. Compaine (Ed.), *The digital divide: Facing a crisis or creating a myth*. Cambridge, MA: The MIT Press.
- Klein, H. K., & Myers, M. D. (2001). A classification scheme for interpretive research in information systems. In E. Trauth (Ed.), *Qualitative research in IS: Issues and trends* (pp. 218-239). Hershey: Idea Group Publishing.
- Kling, R., & Lamb, R. (2000). IT and organizational change in digital economies: A sociotechnical approach. In E. Brynjolfsson, & B. Kahin (Eds.), *Understanding the digital economy* (pp. 295-324). Cambridge, MA: The MIT Press.
- Kranich, N. (2006). The civic mission of school libraries. *Knowledge Quest*, 34, 10-17.
- Kraut, R. E., Patterson, M., Lundmark, V., Kiesler, S., Mukhopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychology*, 53, 1017-1032.
- Kurtz, K. T., Rosenthal, A., & Zukin, C. (2003). *Citizenship: A challenge for all generations*. Retrieved March 1, 2009, from <http://www.ncsl.org/public/trust/citizenship.pdf> on
- Kvasny, L. (2006, April). Information technology, forms of capital, and economic development, School of Information Studies, University of Michigan, Ann Arbor, MI [photos].
- Kvasny, L., and Keil, M. (2006, December). *The challenges in redressing the digital divide: A tale of two cities*. Paper presented at the International Conference on Information Systems (ICIS), Barcelona, Spain.
- Kvasny, L., and Payton, F. (2005, May). *IT perspectives: The case of women in Sub-Saharan Africa*. Paper presented at the International Conference on Information Processing, Working Group 9.4 (IFIP 9.4) Conference, Abuja, Kenya.
- Kvasny, L., Kranich, N., & Schement, J. (2006). Communities, learning and democracy in the digital age. *Journal of Community Informatics*, 2.
- Lee, H., O'Keefe, R. M., & Yun, K. (2003). The growth of broadband and electronic commerce in South Korea: Contributing factors. *The Information Society*, 19, 81-83.
- Lelieveldt, H. (2004). Helping citizens help themselves—Neighborhood improvement programs and the impact of social networks, trust, and norms on neighborhood-oriented forms of participation. *Urban Affairs Review*, 39, 531-551.

- Lenhart, A., Madden, M., & Hitlin, P. (2005). Teens and technology: Youth are leading the transition to a fully wired and mobile nation. Retrieved December 10, 2005, from [http://www.pewinternet.org/pdfs/PIP\\_Teens\\_Tech\\_July2005web.pdf](http://www.pewinternet.org/pdfs/PIP_Teens_Tech_July2005web.pdf)
- Levine, P., & Lopez, M. H. (2004). Young people and political campaigning on the Internet. Retrieved March 1, 2009, from [http://www.civicyouth.org/research/products/fact\\_sheets.htm](http://www.civicyouth.org/research/products/fact_sheets.htm)
- Lopez, M. (2004). *Volunteering among young people*. Retrieved March 1, 2009, from [http://civicyouth.org/PopUps/FactSheets/FS\\_Volunteering2.pdf](http://civicyouth.org/PopUps/FactSheets/FS_Volunteering2.pdf) on
- Marvin, C. (1988). *When old technologies were new: Thinking about electric communication in the late nineteenth century*. New York: Oxford University Press.
- McPherson, M., Smith-Lovin, L., & Brashears, M. E. (2006). Social isolation in America: Changes in core discussion networks over two decades. *American Sociological Review*, *71*, 353-375.
- Meinrath, S. (2001). *Wirelessing the world: Socio-historical and technological factors affecting the battle over (community) wireless networks*. Institute of Communications Research—University of Illinois, Urbana-Champaign: The Champaign-Urbana Community Wireless Network (CUWiN).
- Meinrath, S. (2005). Social benefits of community wireless networks. Retrieved March 3, 2006, from <http://www.saschameinrath.com/writings/CommunityWirelessNetworks%20--%20Intro%20To%20Mesh.ppt>
- Margolis, M., & Resnick, D. (2000). *Politics as usual: The "Cyberspace Revolution."*. Thousand Oaks, CA: SAGE.
- Middleton, C. A. (2007). Understanding the BlackBerry as an instrument of organizational culture. *Continuum: Journal of Media and Cultural Studies*, *21*, 165-178 [Preprint].
- Musso, J., Weare, C., & Hale, M. (2000). Designing web technologies for local governance reform: Good management or good democracy? *Political Communication*, *17*, 1-19.
- Nisbet, M. C., & Scheufele, D. A. (2004). Political talk as a catalyst for online citizenship. *Journalism & Mass Communication Quarterly*, *81*, 877-896.
- Norris, P. (2001). *Digital divide? Civic engagement, information poverty and the Internet in democratic societies*. New York: Cambridge Univ. Press.
- Oblak, T. (2005). The lack of interactivity and hypertextuality in online media. *Gazette: International Journal for Communication Studies*, *67*, 87-106.
- Oden, M. (2004). *Beyond the digital access divide, developing meaningful measures of information and communications technology gaps*. Austin: The University of Texas at Austin Press.
- Organisation for Economic Cooperation and Development. (2001). *The well-being of nations: The role of human and social capital*. Paris, France: Centre for Educational Research and Innovation.
- Ortiz, J. A., & Tapia, A. H. (2008) Keeping promises: Municipal communities struggle to fulfill promises to narrow the digital divide with municipal-community wireless network. *The Journal of Community Informatics: Special Issue on Wireless Networking for Communities, Citizens and the Public Interest*, *4*.
- Pasek, J., Kenski, K., Romer, D., & Jamieson, K. H. (2006). America's youth and community engagement: How use of mass media is related to civic activity and political awareness in 14- to 22-year olds. *Communication Research*, *33*, 115-135.
- Prieger, J. (1998). Universal service and the Telecommunications Act of 1996. *Telecommunications Policy*, *22*, 1.
- Prior, M. (2005). News v. entertainment: How Increasing media choice widens gaps in political knowledge and turnout. *American Journal of Political Science*, *49*(3), 577-592.
- Putnam, R. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.
- Putnam, R. (Ed.). (2002). *Democracies in flux: The evolution of social capital in contemporary society*. New York: Oxford Univ. Press.
- Putnam, R. (2007). E pluribus unum: Diversity and community in the twenty-first century. *Scandinavian Political Studies*, *30*(2), 137-174.
- Ray, M. R. (1999). Technological change and associational life. In T. Skocpol, & M. Fiorina (Eds.), *Civic engagement in modern democracy* (pp. 297-330). Washington, DC: Brookings Institution Press.

- Rheingold, H. (2000). *The virtual community*. Boston: MIT Press.
- Rice, T., & Feldman, J. (1997). Civic culture and democracy from Europe to America. *Journal of Politics*, 59, 1143-1172.
- Rigdon, J. (1996, March 28). Blurring the line: New technology aims to make the web look and act more like television. *The Wall Street Journal*, p. R20.
- Rogers, E. M. (1995). *Diffusion of innovations*. New York: Free Press.
- Sampson, R. J., McAdam, D., MacIndoe, H., & Weffer-Elizondo, S. (2005). Civil society reconsidered: The durable nature and community structure of collective civic action. *American Journal of Sociology*, 111(3), 673-714.
- Sandvig, C. (2004). An initial assessment of cooperative action in Wi-Fi networking. *Telecommunications Policy*, 28, 579-602.
- Seidel, J. (1998). Qualitative data analysis. The Ethnograph v5 Manual, Retrieved February 15, 2009, from <http://www.qualisresearch.com>
- Shah, D. V., Kwak, N., & Holbert, R. L. (2001). "Connecting" and "disconnecting" with civic life: Patterns of Internet use and the production of social capital. *Political Communication*, 18, 141-162.
- Skocpol, T., & Fiorini, M. P. (1999). Making sense of the civic engagement debate. In T. Skocpol, & M. P. Fiorini (Eds.), *Civic engagement in American democracy* (pp. 1-23). Washington, DC: Brookings Institution Press.
- Smith, M. A. (2002). Ballot initiatives and the democratic citizen. *Journal of Politics*, 64, 892-903.
- Stanley, M. (1978). *The technological conscience: Survival and dignity in an age of expertise*. New York: Free Press.
- Strauss, A. L. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. London, SAGE.
- Strover, S., Chapman, G., & Waters, J. (2004). Beyond community networking and CTCs: Access, development, and public policy. *Telecommunications policy*, 28, 465-485.
- Sunstein, C. (2001). *republic.com*. Princeton: Princeton University Press.
- Tapia, A., & Ortiz, J. (2006). *Municipal responses to state-level broadband Internet policy*. Paper presented at the 34th Research Conference on Communication, Information and Internet Policy Telecommunications Policy Research Conference (TPRC), Alexandria, VA.
- Tapia, A. and Ortiz, J. (2007, September). *Policy and plan convergence for municipal broadband networks*. The 35th research conference on communication, information and Internet policy. Washington, DC.
- Tapia, A., Stone, M., & Maitland, C. (2005). *Public-private partnerships and the role of state and federal legislation in wireless municipal networks*. Paper presented at the 33rd Research Conference on Communication, Information and Internet Policy, Washington, DC.
- Tolbert, C. J., & McNeal, R. S. (2003). Unraveling the effects of the Internet on political participation? *Political Research Quarterly*, 56, 175-185.
- Trauth, E. M. (2001). *Qualitative research in IS: Issues and trends*. Hershey, PA: Idea Publishing.
- Tufekcioglu, Z. (2003). *In search of lost jobs: The rhetoric and practice of computer skills training*. Unpublished doctoral dissertation, University of Texas, Austin.
- Weber, L. M., Loumakis, A., & Bergman, J. (2003). Who participates and why? An analysis of citizens on the Internet and the mass public. *Social Science Computer Review*, 21, 26-42.
- Weiser, E. B. (2001). The functions of Internet use and their social and psychological consequences. *CyberPsychology & Behavior*, 4(6), 723-743.
- Westen, T. (2000). e-Democracy: Ready or not, here it comes. *National Civic Review*, 89, 217-227.
- Windhausen, J. (2008). "A blueprint for big broadband." An educause white paper. Retrieved January 29, 2009, from <http://www.educause.edu/Resources/ABlueprintforBigBroadband/162506>
- Williams, R., & Edge, D. (1996). The social shaping of technology. *Research Policy*, 25, 856-899.
- Wuthnow, R. (1999). Mobilizing civic engagement: The changing impact of religious involvement. In T. Skocpol, & M. P. Fiorini (Eds.), *Civic engagement in American democracy* (pp. 331-363). Washington, DC: Brookings Institution Press.
- Xenos, M., & Moy, P. (2007). Direct and differential effects of the Internet on political and civic engagement. *Journal of Communication*, 57, 704-718.
- Yin, R. K. (2003). *Case study research: Design and methods*. Thousand Oaks, CA: SAGE.

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