

TOWARD A GROUNDED THEORY OF COMMUNITY NETWORKING

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Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May 2014

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Masten-Cain, Kathryn. *Toward a Grounded Theory of Community Networking*. Doctor of Philosophy (Information Science), May 2014, 252 pp., 16 tables, 2 figures, references, 224 titles.

This dissertation presents a preliminary grounded theory of community networking based on 63 evaluations of community networking projects funded by the National Telecommunications and Information Administration's Technology Opportunities Program (TOP) between 1994 and 2007. The substantive grounded theory developed is that TOP projects differed in their contribution to positive outcomes for intended disadvantaged community beneficiaries based on the extent and manner in which they involved the disadvantaged community during four grant process phases: partnership building, project execution, evaluation, and close-out. Positive outcomes for the community were facilitated by using existing communication channels, such as schools, to connect with intended beneficiaries; local financial institutions to provide infrastructure to support local trade; and training to connect community members to jobs. Theoretical contributions include situating outcomes for disadvantaged communities within the context of the grant process; introducing the "vulnerable community" concept; and identifying other concepts and properties that may be useful in further theoretical explorations. Methodological contributions include demonstrating grounded theory as a viable method for exploring large text-based datasets; paving the way for machine learning approaches to analyzing qualitative data; and illustrating how project evaluations can be used in a similar fashion as interview data. Practical contributions include providing information to guide community networking-related policies and initiatives from the perspectives of stakeholders at all levels, including establishing funded projects as local employment opportunities and re-conceptualizing sustainability in terms of human networks rather than technological networks.

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ACKNOWLEDGEMENTS

I would like to dedicate this dissertation to my grandson, Airic, who has always known me to be “working on a paper” and to my husband, Randy Cain, who has inspired and supported me in so many ways. I am also grateful to Kate Williams, who curated and made available the Technology Opportunities Program (TOP) project evaluations that served as my dataset; my committee chair, Linda Schamber, who encouraged me to keep pursuing my degree even when the going got really tough; Howard Rosenbaum, who knew me as a community networking champion before I dared dream of getting a Ph.D.; committee member Ruth West, who helped me follow my heart and obtain the data to finish the dissertation story I really wanted to write; and committee member Cornelia Caragea, who has inspired me to pursue the power of computing to analyze language in new ways. I would also like to extend a big thank you to Alice Robbin, who helped me learn to be “playful” with developing theory, exposed me to the vast literature relevant to community networking, and engaged me as the graduate student assistant for the Rob Kling Center for Social Informatics; Harmeet Sawhney, who helped me see big trends and included me on his team at *The Information Society* journal; my ex-husband who supported me for a big portion of my Ph.D. journey even when he didn’t understand it; Bill Moen, my boss at TxCDK of over five years, who brought me to Texas when I needed a major life change; Herman Totten, Dean of UNT’s College of Information, who never failed to ask about my dissertation progress; and many other friends, community and family members, colleagues, and acquaintances, who have inspired me in different ways and encouraged me to complete this degree. Finally, I’m grateful for my faith, which has sustained me throughout.

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LIST OF DEFINITIONS AND ACRONYMS

To improve the readability of this review, several terms that emerge throughout the paper are briefly defined in advance, with references to examples of their use in the relevant literature.

- **Category:** An abstraction representing a set of concepts (Corbin & Strauss, 2008, p. 159). Often used synonymously with theme.
- **Community informatics:** “A multidisciplinary field for the investigation and development of the social and cultural factors shaping the development and diffusion of new ICTs and its effects upon community development, regeneration and sustainability” (Keeble & Loader, 2001, p. 3).
- **Community network (CN):** Locally developed and operated nonprofit organizations that use information and communication technologies (ICTs) to enhance geographically-based communities (Beamish, 1995, p. 3; Rosenbaum & Gregson, 1998, p. 3; Schuler, 1996, p. x).
- **Community networking project:** A project that incorporates ICT for the purpose of enhancing communities.
- **Concepts:** “Words that stand for ideas contained in data.” (Corbin & Strauss, 2008, p. 150).
- **Conceptual coding:** “Deriving and developing concepts from the data” along with their properties and dimensions (Corbin & Strauss, 2008, p. 65).
- **Constant comparison:** “The analytic process of comparing different pieces of data for similarities and differences” (Corbin & Strauss, 2008, p. 65).
- **Digital divide:** The lack of information technology access for certain segments of the population, which served as a key problem underlying many community networking initiatives (Servon, 2002, p.1).

- Dimensions: Possible values for conceptual properties. (Corbin & Strauss, 2008, p. 159).
- Disadvantaged community: For purposes of this study, a community or population that has challenges accessing or effectively using technology due to conditions relating to geography, socioeconomics, limited mobility, or a service need.
 - Funding initiative: A set of funded projects that resulted from a call for proposals from a funding agency; an example is the Technology Opportunities Program (TOP).
 - Grant process: For purposes of this study, the process of an organization applying for and receiving a grant in order to accomplish some purpose; this involves four phases: partnership building, project execution, evaluation, and close-out.
 - Grounded theory (GT): “[T]he discovery of theory from data—systematically obtained and analyzed in social research...[that] provides...relevant predictions, explanations, interpretations and applications” that are understandable to both researchers and practitioners (Glaser & Strauss, 1967, p. 1).
 - Information and communication technology (ICT): Technologies that provide access to information through telecommunications, such as the Internet, wireless networks, cell phones, and other communication media.
 - Memos: “Written records of analysis” (Corbin & Strauss, 2008, p. 117).
 - National Telecommunications and Information Administration (NTIA): Located within the Department of Commerce, the NTIA is the Executive Branch agency that is principally responsible by law for advising the President on telecommunications and information policy issues. It was the agency responsible for the Technology Opportunities Program (TOP).

- Positive outcomes: The direct impact on a targeted beneficiary community or population due to a funded project, commonly considered to be beneficial. “Positive outcomes” for the community are not always the same as the “desired outcomes” as stated by the project team. Instead, positive outcomes are often ascertained indirectly, based on a commonly held view of what would benefit the target community population. An example of a positive outcome is the creation of volunteer opportunities for local community residents to work on a community networking project. While volunteering may not have been explicitly expressed as a desired outcome by either the project team or the community, it can be seen to benefit the local community – especially the individual volunteers. In contrast, an example of a desired outcome for the project might be the completion of a project on time and within budget, which may or may not directly benefit the targeted beneficiary community.

- Properties: Aspects of concepts (Corbin & Strauss, 2008, p. 159). For example, the concept “method of impact” in this study has two properties, direct and indirect.

- Saturation: The full development of concepts in terms of their properties and dimensions, as well as the relationships between concepts for theory construction (Corbin & Strauss, 2008).

- Social capital: Social capital has at least three different conceptualizations. According to Bourdieu (1983), social capital is “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (Social Capital section, ¶ 1). Coleman (1988) describes social capital as resources inherent in relationships that actors can use to achieve their objectives. These resources can take three forms: “obligations and expectations, information channels, and social

norms” (p. S95). Putnam (1995) defines social capital as “networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (p. 66).

- Social exclusion: “A process by which certain groups are systematically disadvantaged because they are discriminated against on the basis of their ethnicity, race, religion, sexual orientation, caste, descent, gender, age, disability, HIV status, migrant status or where they live” (Department for International Development, 2005, p. 3).

- Social inclusion: “[T]he extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement” (Warschauer, 2003, p. 8).

- Sustainability: The form in which a project or collaboration continues to exist beyond the grant period.

- Technology Opportunities Program (TOP): An NTIA initiative started in 1994 during the Clinton presidential administration that funded the community networking projects examined in this study until termination in 2005 by the Bush presidential administration.

- Theme: A grouping of lower-level concepts under a more conceptual label (Corbin & Strauss, 2008, p. 159). Often used synonymously with category.

- Theoretical integration: “Linking categories around a central or core category and refining the resulting theoretical formulation” (Corbin & Strauss, 2008, p. 65).

- Theoretical sampling: Continued data gathering based on evolving concepts...to look for situations that would bring out the varying properties and dimensions of a concept” (Corbin & Strauss, 2008, p. 117).

- Theory: An ever-developing explanation or prediction of some phenomenon (adapted from Glaser & Strauss, 1967, pp. 31-32). Two types of middle range theories discussed in Glaser & Strauss (1967) are substantive (empirical) and formal (conceptual).

- Universal access: A belief that everyone is entitled to a basic level of access to the information and communications infrastructure (Clement & Shade, 2000, p. 32).

- Vulnerable community: A disadvantaged community that is identified as the intended beneficiary of a grant, but is at high risk for being exploited in order to attract grant funding while the community itself gains no lasting benefit from the infusion of funding.

CHAPTER 1

INTRODUCTION

1.1 Prologue

In 1995, I was fortunate enough to live in one of three communities in my state that decided to try an experiment by giving citizens free access to this new thing called the “World Wide Web.” Working closely with my stepson’s school system, I joined an exciting community-wide collaboration involving businesses, non-profits, government and others to help write a successful grant to start up a local community network. About a year later, when I moved to a rural, impoverished community in a remote location of the state, I pulled together a new collaboration and founded my second community network – funded through a second round of the same state grant funding initiative. Having become an activist community network champion, I was elected to serve on a statewide community network association board where I worked as a volunteer, tirelessly advocating for community networks in my state—especially those in remote, rural, and/or economically disadvantaged communities. I believed in the vision of the Internet as a way to level the playing field between rural and urban, rich and poor, and the educated elite and the common person.

A decade later, frustrated and puzzled by political and economic situations encountered, I became a Ph.D. student with the aim of making the world a better place by advancing the community networking movement. What I found, however, was that the scholarly literature did not seem to represent the situation “on the ground” for community networking activists or “champions” like me. Several of us had dedicated a significant portion of our lives to promote the cause of community networking, particularly in disadvantaged communities – often only to see the community networks we championed struggle for existence and eventually die. The

literature seemed to start with a priori assumptions about what “should be” rather than what “is”; or the literature focused on criticizing rather than building up community networking efforts. It just “seemed like” there ought to be ways to leverage information and communication technology (ICT) to truly transform the lives of individuals within disadvantaged communities. I suspected that perhaps there were some findings that had simply been overlooked, or just not brought together in such a way as to make it so. So that’s what I set out to do in my dissertation.

1.2 Overview

In this dissertation project, I examined the literature on community networks to identify research questions to guide an empirical analysis of evaluations of community networking projects funded by the Technology Opportunities Program (TOP). Formerly called the Telecommunications and Information Infrastructure Assistance Program (TIIAP), TOP was a federal program launched in the mid-1990s during the same period when I was heavily involved in the community networking movement. The aim of this dissertation was to develop a grounded theory of community networking that would help inform efforts designed to use ICT to enhance or even transform the lives of individuals from disadvantaged communities or populations.

1.3 Background for the Research

The National Telecommunications and Information Administration’s (NTIA) Technology Opportunities Program (TOP) – formerly called the Telecommunications and Information Infrastructure Assistance Program (TIIAP) – was launched as part of the Clinton presidential administration’s effort to build out a National Information Infrastructure (NII). TOP was created as a vehicle for funding community information and communication technology (ICT) initiatives to help overcome the digital divide, defined as the gap between the “technology haves and have nots” (Hundt, 1996). Between 1994 and 2007, TOP provided about \$230 million in matching

funds for 606 projects to nearly 300 grantees, with many of these projects classified as “community networking” (Williams, 2007). In 2005, the Bush Administration defunded TOP, with the last approved projects running until 2007 (Williams, 2007). Kate Williams, then a Ph.D. student at the University of Michigan and now an assistant professor at the University of Illinois at Urbana-Champaign, received permission to archive materials from the program. As a result, an archived website (<http://www.ntia.doc.gov/legacy/otiahome/top/index.html>) was set up, and the University of Michigan placed, in its Special Collections Library, seventeen boxes of physical materials from the TOP initiative (<http://quod.lib.umich.edu/s/sclead/umich-scl-top?byte=5285081;focusrgn=contentslist;subview=standard;view=reslist>). Williams (2007) describes the TOP Data Archive project in detail, along with her hopes for researchers to access the materials and share findings. That is one of the primary hopes of this dissertation.

Some of the individual projects and the TOP initiative as a whole were evaluated from time to time (see Frechtling, J., Lockwood, J., Silverstein, G., Somers, L., & Tuss, P., 1999; Frechtling, J., Silverstein, G., Snow, K., & Somers, L., 2000; Johnson & Johnson Associates, Inc., 2001). However, to date, there has been no attempt to develop an overarching theory of community networking from the large cache of data that has been archived from this initiative. Such a study can help guide policy, standardize case study approaches, improve methods for collecting and analyzing larger datasets, and “allow us to generalize and confirm trends in communities” (Williams & Durrance, 2010, p. 5). A theory of community networking may help inform other community technology initiatives, resulting in improved project success and avoiding taxpayer waste.

1.4 Research Questions

The purpose of this dissertation project was to develop a grounded theory of community

networking, drawn from a limited “cache of material” (Glaser & Strauss, 1967, p. 167): evaluations conducted of sixty-three (63) TOP-funded community networking projects, curated as part of the TOP Data Archive Project (Williams, 2007). These evaluations were retrieved from two sources: electronic documents available via an archived copy of the TOP website accessed via The Wayback Machine (<http://archive.org>) and physical documents available as part of the TOP Dataset archived at the University of Michigan’s Special Collections Library in Ann Arbor, Michigan. See Appendix A for the complete list of project evaluations that served as data for the study.

A grounded theory approach, described further in the chapter on methodology, was used to develop a theory about community networking that emerges from the data. The overarching research question in this study is: How can community networking initiatives be structured to maximize positive outcomes for individuals from disadvantaged communities? The following questions, drawn from the literature, were used to direct data collection and analysis of TOP project evaluations, and selected concepts emerged and were elaborated upon from the data. The guiding questions for data collection included:

- What opportunities for collaboration were enabled by the community networking projects between previously unconnected individuals and organizations with differing levels of resources and/or status?
- To what extent did conditions prior to TOP grant funding appear to have affected project outcomes?

1.5 Significance of the Study

Federal efforts to build out the National Information Infrastructure (NII) continue to this day, with a considerable amount of taxpayer support funneled toward such efforts. Over \$4 billion has already spent on the Broadband Technology Opportunities Program (BTOP), the NTIA’s successor to TOP (<http://www.ntia.doc.gov/other-publication/2013/btop-fact-sheet>). As

reported in the 19th quarterly report to Congress on BTOP in January 2014: “In 2009 and 2010, NTIA invested approximately \$4 billion in 233 BTOP projects benefitting every state, as well as five territories and the District of Columbia. The portfolio of projects initially included:

- 123 infrastructure projects totaling \$3.5 billion in federal grant funds to construct broadband networks
- 66 Public Computer Center (PCC) projects totaling \$201 million in federal grant funds to provide access to broadband, computer equipment, computer training, job training, and educational resources to the public and vulnerable populations
- 44 Sustainable Broadband Adoption (SBA) projects totaling nearly \$251 million in federal grant funds to support innovative projects that promote broadband adoption, especially among vulnerable population groups where broadband technology traditionally has been underutilized” (National Telecommunications and Information Administration, 2014, p. 1)

The allocation of federal funding in BTOP shows that funding for “vulnerable populations” represents only a small fraction of the total, resulting in political criticism of the initiative for failing to improve the lives of disadvantaged populations, as well as charges of interfering with the operation of the free market. As stated by the president of the “nonpartisan, nonprofit organization,” Citizens Against Government Waste, in response to congressional hearings about BTOP in 2013 (see <http://cagw.org/media/press-releases/house-holds-hearing-stimulus-expansion-broadband>): “[I]f federally-financed broadband expansion cannot even stick to its goal of providing access to unserved and underserved communities, it is engaging in the destruction of private-sector jobs as well as wasting taxpayer dollars. Both offenses are aggravating; combined, they are inexcusable.”

This study of BTOP’s predecessor, the TOP initiative, may help explain why efforts to enhance disadvantaged communities appear to have become minimized today – and, more importantly, what elements are necessary, although perhaps not sufficient, for leading to positive outcomes for disadvantaged communities. This study is therefore significant for its implications

for those who continue to find themselves on the wrong side of the digital divide, for taxpayers, and for society as a whole in our quest to level the playing field through the use of ICT.

1.6 Expected Contributions

This study is expected to make the following contributions to the body of knowledge:

- *Theoretical*: The study develops a preliminary theory that situates community networking within a specific historical context, providing a deeper understanding of the relationship between communities, ICT, and policy initiatives. This appears to be one of the first formal theories of community networking presented.

- *Methodological*: The study describes how a grounded theory approach, which is seldom used in information science research, was employed to examine existing caches of material. This study shows the value of a qualitative grounded theory approach in tackling some of the “big data” challenges of today.

- *Practical*: The study provides valuable information to guide community networking-related policies and initiatives, which continue to this day.

1.7 Scope of the Study

As a qualitative study, the intention was to be exploratory and to develop a theory of community networking intended to spark the generation of hypotheses for further examination. It was not expected that all relevant concepts would be identified up front or would be developed throughout the course of this study. As stated in Glaser and Strauss (1967), “accurate description and verification are not so crucial when one’s purpose is to generate theory” (p. 28). Therefore, a precise codebook designed for inter-rater reliability was never the aim of this study, nor is one produced. As stated in Corbin and Strauss (2008), “when constructing a dissertation based on the findings from a qualitative research study, the researcher should rely on...(a) developing a clear

analytic story by sorting through the diagrams and memos, then (b) working out a main outline that will fully incorporate all important components of that story” (p. 280). The analytic story describes the points at which a specific federal grant initiative, the Technology Opportunities Program, could have done better in achieving positive outcomes for disadvantaged communities. The story begins with an understanding of community networking, one of the means through which the TOP initiative engaged with communities.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This section provides an overview of the literature to be examined, a working definition of community networks, and a description of the scope of the literature review.

2.1.1 Literature Reviewed

Community networks (CNs) are locally-developed and operated non-profit organizations that use information and communication technologies (ICTs) to enhance geographically-based communities. This literature review examines CN research in the U.S. from 1993 to 2008, during the William Clinton and George W. Bush presidential administrations. It examines underlying theoretical assumptions, the empirical evidence, and methodologies employed in nearly ninety (90) scholarly works on community networks. This research bridges the fields of library science and information science as community networks were envisioned as a promising way for libraries to remain “relevant” in the information society by helping communities leverage information and communication technologies (ICT) in the information age.

2.1.2 Community Network Definition

Community networks “connect, via electronic communications or virtual space, people who also share a common geographic space such as city or neighborhood” (Virnoche & Marx, 1997, p. 88) in order to facilitate local information exchange and to increase communication on an ongoing basis (Beamish, 1995; Virnoche & Marx, 1997). Organizationally, CNs “are usually nonprofit, volunteer-based organizations which are based in a particular geographic area...[and] usually provide a basic level of access to the Internet” (Keenan & Trotter, 1999, Introduction section, ¶ 4). Potentially, community networks facilitate civic participation (Gregson, 1997;

Schuler, 1994, 1996, 2004), address the informational needs of a community (Durrance & Pettigrew, 2002), and revitalize, strengthen, and expand existing geographically-based human networks (Venkatesh, 2003). One of their most visible features is a community website (Rosenbaum & Gregson, 1998). Most CNs have the common features described by the Association for Community Networking (AFCN) in 1997 (Kubicek & Wagner, 2002):

- Grassroots operation: operated by and for local community
- Universal access mission: promote equal access to the media
- Low cost: services provided at little or no cost
- Information and communication: address everyday information and communication needs
- Community building: strengthen local community cohesion
- Geographically-based: community served is based on geographical proximity

Arriving at a precise, universally agreed upon definition of a community network has proven challenging because CNs can serve many different purposes and have different characteristics. Community networks are sometimes referred to as community information networks (Grigsby, Shuffstall, & Goetz, 2002), community information systems (Unrah, Pettigrew, & Durrance, 2002), or community electronic networks (Sullivan, Borgida, Jackson, Riedel, Oxendine, & Gangl, 2002). For this paper, a CN is defined as a locally developed and locally operated non-profit organization that uses information and communication technologies (ICTs) to enhance a geographically-based community. Thus, a CN has several distinct features: a physical sense of place, represented by a virtual space (usually a website), with a local nonprofit organizational structure.

2.1.3 Scope of this Review

This review includes the empirical research literature on community networks that were

established in the United States following the National Information Infrastructure initiative begun by the Clinton-Gore Administration in the United States (Gore, 1993). Although the history of community networking begins earlier (Kubicek & Wagner, 2002; Servon, 2002), peer-reviewed scholarly literature from 1993-2008 forms the main corpus of work reviewed. The review also draws on relevant non-peer reviewed popular and scholarly literature from outside the United States because several influential concepts relevant to the development and research of CNs in the United States originated from this literature. Since government and the nonprofit sectors in the United States also played important roles in CN development, relevant literature from these sectors is also occasionally referred to.

Empirical research conducted on CNs located outside the United States is outside the scope of this analysis because the social, political, and cultural contexts of other societies are deemed significantly different from the American context. Also outside the scope of this analysis is research on CNs that (1) were established prior to 1993; (2) are considered to be “virtual only” (based on non-place-based criteria, such as interest or group membership); (3) are managed by a single or a few individuals; (4) are managed by non-community members; or (5) operate primarily for commercial or government purposes. Research on other forms of community ICTs such as community technology centers and cybercafes is also outside the scope of this analysis.

2.2 A Brief History of Community Networks

This section describes the historical context in which community networking emerged. It chronicles community, government, and academic involvement with community networking and describes efforts to institutionalize community networks, as well as their ultimate decline.

2.2.1 Community Initiatives

The community networking concept appealed to proponents of democracy who viewed

the virtual world as an opportunity to enhance political participation and civic engagement. Howard Rheingold's 1993 populist book *The Virtual Community* helped launch this "democratic technology movement" (Agre, 1997, p. 242). Drawing from his personal experience with the Well, an early online community, and from observations of the Usenet and Bulletin Board System (BBS) culture, Rheingold (1993) contended that "the same many-to-many communications capabilities of CMC [computer mediated communication] formerly reserved for the elites could catalyze the emergence of a formidable, far more populist kind of social organization" (p. 111).

Doug Schuler, founder of the Seattle Community Network (SCN) and former chair of Computer Professionals for Social Responsibility (CPSR), positioned community networks as a "participatory medium" for increasing civic engagement (Schuler, 1994). Civic engagement is defined as the "development of social trust that facilitates collective social action toward achieving common social goals" (Kavanaugh & Patterson, 2002, p. 327). Schuler provided the manifesto and how-to manual for community networks in his 1996 book *New Community Networks: Wired for Change* (Carroll, 2005). Drawing on his experience with the Seattle Community Network (SCN), Schuler (1996) outlined the social and technological architectures for community networks and provided guidance for developing, sustaining, and evaluating community networks (p. 381). He explicitly called for CN advocates to build an "infrastructure for democracy" (p. 381) as part of the NII. Contending that "government support and protection for an infrastructure for democracy is the most critical, basic, and pressing role of government in a democratic society" (p. 381), Schuler suggested that universities and libraries partner with communities to use the new technologies to promote civic engagement and to build a global network for all.

Involvement of libraries in community networking as part of community building was championed by Bajjaly, a faculty member of the University of South Carolina's College of Library and Information Science and founder of the MidNet community network (Bajjaly, 1999). Bajjaly touted the potential of community networks to "reignite a spirit of cooperation and belonging that we thought was lost forever" (p. 6) by providing opportunities for individuals to develop friendships and trade ideas and for institutions to establish joint efforts and to share resources (Bajjaly, 1999, p. 9). With libraries seldom part of community building proposals and missing from vision statements of other organizations serving the community (de la Pena McCook, 2000), community networking was seen as an opportunity for libraries to become an active part of community building efforts.

2.2.2 Government Initiatives

The Santa Monica Public Electronic Network (PEN) was an early attempt by government to leverage ICTs to support sociopolitical goals in a particular community (Servon, 2002). PEN was created by the Santa Monica, California city government in 1989 (Rogers, Collins-Jarvis, & Schmitz, 1994). The free service, which operated on public access terminals, aimed to improve information access, city service delivery, resident communication, and sense of community; to diffuse a new communication technology; and to equitably distribute communication among all residents (van Tassel, 1996). One of PEN's most celebrated achievements was the success of Santa Monica's homeless population's using PEN to lobby for access to showers and lockers prior to job interviews (Rogers et al., 1994). "PEN provided an opportunity to establish information-exchange relationships with higher status ['homed'] individuals" (Rogers et al., 1994, p. 406) and helped abolish the stereotype that the homeless did not want to find jobs. Rogers et al. (1994) conclude that PEN encouraged diverse opinions on contentious issues and

partially overcame barriers of distance, socioeconomic status, physical appearance, gender, and “social network distance” (p. 409). PEN helped pave the way for the idea that community networks might be useful in achieving public policy goals.

Although electronically-based community networks had existed in some form since the 1970s, significant events in the 1990s greatly contributed to their development and growth (Kubicek & Wagner, 2002). In 1990, Tim Berners-Lee of the European Organization for Nuclear Research (CERN) created the hypertext-based World Wide Web (European Organization for Nuclear Research, 2008). In 1991, then-Senator Al Gore sponsored and shepherded the passage of the High Performance Computing and Communication Act (Library of Congress, 2008). The Act led to the funding and release in 1993 of Mosaic, the first graphical user interface to the World Wide Web (European Organization for Nuclear Research, 2008).

The technological advancements of the Internet, coupled with the earlier success of PEN, enabled the Clinton-Gore administration to introduce community networks as an instrument of public policy as part of their National Information Infrastructure (NII) agenda, which was launched in 1993 (Gore, 1993; Servon, 2002; Virnoche & Marx, 1997). The main purpose of the NII, informally referred to as the “Information Superhighway,” was to increase American competitiveness in the global economy, but it was also widely expected to yield “unprecedented opportunities to advance our social progress and improve the living standards and quality of life for all Americans” (National Information Infrastructure Advisory Council, 1996, Benefits of the Information Superhighway section, ¶ 4). A central concern of the administration was to ensure that all Americans could access the NII (Gore, 1993).

Principles underlying the development of the NII included private investment, protection of competition, open network access, flexibility, and ensuring universal service to prevent a

society of haves and have nots (Gore, 1993). The Clinton-Gore administration charged the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) with addressing the issue of the digital divide, the gap between those connected to the NII and those who were not (Servon, 2002; Wresch, 1996). The NTIA's first step to combat the digital divide was to obtain data on the extent of the digital divide. The Census Bureau's Current Population Survey (CPS) was expanded to include questions about computer and modem ownership and usage, in addition to existing questions about telephone ownership and usage. The Census Bureau was asked "to cross-tabulate the information gathered according to several specific variables (*i.e.*, income, race, age, educational attainment, and region) and three geographic categories -- rural, urban, and central city" (National Telecommunications and Information Administration, 1995, Background section, ¶ 4). A series of written reports entitled *Falling through the Net* examined the nature and extent of the digital divide, including the characteristics of and risks for those who remained unconnected (National Telecommunications and Information Administration, 1995, 1998, 1999, 2000).

The Telecommunications and Information Infrastructure Assistance Program (TIIAP), later renamed the Technology Opportunities Program (TOP), was created as a vehicle for funding community ICT initiatives to help overcome the digital divide. Between 1994 and 2004, TOP provided matching funds for 606 projects to nearly 300 grantees, with one-third of these projects classified as "community networking" (National Telecommunications and Information Administration, 2008). Adhering to similar principles, state and local initiatives were undertaken throughout the United States (Strover, Chapman, & Waters, 2004).

2.2.3 University Initiatives

University scholars often joined with community practitioners and leveraged government

funding to support community networking. The Blacksburg Electronic Village (BEV) was established in 1993 as a collaboration between Virginia Tech, the city of Blacksburg, and the telecommunications firm Bell Atlantic (Cohill & Kavanaugh, 2000). Much of the research on CNs involves BEV initiatives, which included innovative applications designed to enhance learning, civic participation, socialization, economic development, entertainment, consumer information, and medical service (Carroll, Rosson, Cohill, & Schorger, 1995; Carroll & Rosson, 1996; Carroll & Rosson, 1998; Carroll & Rosson, 2001; Carroll, Rosson, Isenhour, Van Metre, Schafer, & Ganoe, 2001; Cohill & Kavanaugh, 2000). Some researchers were from Virginia Tech, while others, like Cohill and Kavanaugh, were staff of the community network. BEV researchers fueled enthusiasm for CNs by widely touting BEV's successes in connecting most of Blacksburg's residents to the Internet and facilitating online participation by various user groups, most notably senior citizens. BEV served as a demonstration project of community networks under the Clinton-Gore administration (Carroll, 2005).

Recognizing early on the potential of CNs to expand the role of the library in the information age, Joan Durrance of the University of Michigan's School of Information and Library Science spearheaded the Community Networking Initiative (Bajjaly, 1999). Drawing from her experience working with information and referral (I&R) databases, Durrance viewed CNs and libraries as natural partners based on their shared interest in providing community information (CI), which "helps people cope with problems of daily living and facilitates community participation by bringing people and organizations together" (Durrance & Pettigrew, 2002, p. v). As early as 1994, Durrance was teaching community networking classes at the University of Michigan. CNs were well positioned to capitalize on "what librarians do so well-- identifying, organizing, and providing access to information needed by citizens" (Durrance,

Hansen, & Knox, 1995, Developing Community Networking Experiences at UM-SILS in research section, ¶ 5) and could transform “physical communities into information communities” (Pettigrew, Durrance, & Unruh, 2002, p. 900). Libraries were encouraged to participate in community networking efforts to make community information available online which would also help justify their continued public funding (Bishop, Tidline, Shoemaker, & Salela, 1999; Pettigrew, Durrance, & Vakkari, 1999).

In her master’s thesis at the Massachusetts Institute of Technology, Beamish (1995) examined the status of community networking initiatives in the United States. She called for further research to identify better ways to design CNs, leverage volunteer energy, and achieve sustainability toward reaching goals of ensuring access to the “information highway,” enhancing democratic participation, and strengthening communities.

2.2.4 Efforts to Institutionalize Community Networks

By 2000, several organizations had been created to serve the interests of community networks. The Organization for Community Networks (OFCN) was created circa 1997 as a central repository for community network information and resources (Organization for Community Networks, 2013). Created in 1997 primarily as an advocacy organization, the Association for Community Networking, summarizes the state of affairs of community networks in the following paragraph:

Over the past two decades a wide variety of projects have been launched to bring the benefits of electronic networks to citizens, students, government agencies, small businesses, libraries, schools, and non-profit groups. There are currently more than 150 active, identified community or civic networks, and they have taken many forms and offer a wide variety of services. The result has been the beginning of a new grassroots movement in the United States. (Association for Community Networking, 2008, Community Networks section, ¶ 1)

This flurry of grassroots community technology activity was not limited to the United States. Community networking initiatives were launched across the globe, including Canada (Clement, Gurstein, Longford, Luke, Moll, Shade, et al., 2004; Graham & Shade, 1996; Keenan & Trotter, 1999), the United Kingdom (Day, 1999; Myles, 2004), Italy (De Cindio, 2004; De Cindio, Gentile, Grew, & Redolfi, 2003), and Australia (Schauder, Stillman, & Johanson, 2005; Stillman & Stoecker, 2005). To unify these global efforts, Gurstein (2000, 2007) launched a new field called “Community Informatics,” defined as “a technology strategy or discipline which links economic and social development efforts at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks and telecentres, electronic democracy and on-line participation, self-help and virtual health communities, advocacy, cultural enhancement, and others” (p. 1). CI includes activists, scholars, policy-makers, digital artists, and media commentators who combine “an interest in the potentially transforming qualities of the new media with an analysis of the importance of community social relations for human interaction” (Keeble & Loader, 2001, p. 3). The Community Informatics Research Network (CIRN) was formed in 2003; annual meetings of CI adherents have been held in Prato, Italy since 2003; and the *Journal of Community Informatics* (JCI) was launched in 2004. In addition, several community informatics programs have been instituted at American universities (Bishop & Bruce, 2005), with “7 of the 57 library and information science programs in the United States and Canada” offering CI courses (Williams & Durrance, 2010, p. 5).

2.2.5 Decline of Community Networks

At their peak in the late-1990s, there were estimated to be 250-300 CNs in North America (Kwon, 2005). However, Kubicek and Wagner (2002) report that there had been no

significant increase in the numbers of CNs and that few of those that were established early on still existed. Schweitzer (2003) notes that over 50% of the community network websites identified at the Organization for Community Networks (OFCN) website (<http://www.ofcn.org>) were either no longer active or had not been updated in over a year. It appears that the OFCN community network list has not been updated since 2001 (Organization for Community Networks, 2013). Sites, such as the University of Michigan's "Community Connector" site, which provided links to the various community network websites around the world, and the Association for Community Networking (AFCN) appear to be defunct.

A common reason attributed to the decline of community networks was the assessment of the Bush-Cheney administration that continued funding of CNs was no longer necessary given the evidence provided by the NTIA studies. NTIA reports had been renamed from *Falling through the Net* to *A Nation Online* indicating a shift in policy from focusing on those left behind to an assumption that everyone was already connected in some manner (National Telecommunications and Information Administration, 2002, 2004). This reflected the Bush administration's "sustained faith in market imperatives to address the digital divide" (Warf, 2013, p. 4). Data showed increasing Internet access and computer ownership across all demographic groups, thus allowing the administration to proclaim that the digital divide problem has been solved (National Telecommunications and Information Administration, 2002). In line with this philosophy, the Technology Opportunities Program (TOP) was ended despite objections from advocacy organizations such as the Benton Foundation (Leslie Harris & Associates, 2002).

Compounding this trend was that empirical evidence indicated that computers and Internet access could not ameliorate the causes of the digital divide or help disadvantaged

communities realize their economic development goals (Strover et al., 2004). There was little evidence to support the hopes that CNs could ensure digital equality, increase civic engagement, and develop an informed citizenry. There seemed to be a widening gap between the visions of the proponents and advocates of CNs, on the one hand, and the practical reality on the ground. To help understand this gap, it is useful to examine some of the key concepts underlying community networks.

2.3 Key Concepts

This section presents a review of some of the key concepts underlying the community networking literature – communities and networks, place and space, and consumer and civic models.

2.3.1 Communities and Networks

Although the term “community” is intended to engender positive connotations, the term is quite complex and often contested. In sociology, Tonnies and Durkheim formulated the most developed views of the community concept (Brint, 2001).

Tonnies describes a dichotomy between “real and organic” *Gemeinschaft* (community) and “imaginary and mechanical” *Gesellschaft* (society) (Tonnies, 1988, p. 33). *Gemeinschaft* presumes low numbers of people located far from centers of power who share common beliefs and ways of life. Frequent social interaction occurs continuously between concentrated, trusted ties held together through strong emotional bonds. In contrast, *Gesellschaft* presumes high numbers of people located near centers of power who have little in common. Infrequent social interaction occurs intermittently and only temporarily between dispersed ties that are held together through rules and regulated competition (Brint, 2001). Tonnies perceived an evolutionary transition underway from *Gemeinschaft* to *Gesellschaft*.

In contrast, the well-known early sociologist Durkheim conceives of community as a set of “variable properties of human interaction” rather than as a physical entity or social structure (Brint, 2001, p. 3). This approach allows for a finer distinction of the different structural and cultural aspects of community and a recognition that “community-like relations can be found in all sizes of physical places” (Brint, 2001, p. 6). These relations are characterized by dense and demanding ties; social attachments to and involvement in institutions; ritual occasions; small group size; perceptions of similarity with physical characteristics, expressive style, way of life, or historical experience of others; and common beliefs in an idea system, a moral order, an institution, or a group.

The community studies tradition, which includes the study of “physical places,” “elective communities,” and community “structural characteristics” (Brint, 2001, p. 5), has remained at the descriptive level, failing to produce useful generalizations. Key findings are that “communities are not very community-like” (Brint, 2001, p. 6), that physical locale is no guarantee of sociality, and that hidden power structures reinforce social inequities. Thanks to the work of Barry Wellman¹ and others who “brought enclave communities into touch with the dispersive possibilities of modern transportation and communication systems,” sociologists now tend to study social networks and relationships rather than community structures (Brint, 2001, p. 6). Social network analysis reveals that, in reality, communities consist of “loosely bounded, sparsely knit networks of specialized ties” more indicative of *Gesellschaft* instead of the

¹ Wellman is one of the main social network researchers in the community ICT area. He contends that through the Internet, people can link to the people they choose, no matter where they are, resulting in “networked individualism” as the primary mode of social organization (Wellman, Quan-Haase, Boase, Chen, Hampton, de Diaz, et al., 2003). Wellman’s work is focused on Canada and is thus out of scope for this paper. However, interesting research has been generated by the “Netville” studies in Toronto, conducted from 1997-1999 (Hampton, 2003) and by the multi-year Canadian Research Alliance for Community Innovation and Networking (CRACIN) project (Clement, Gurstein, Longford, et al., 2004).

idealized “tightly bounded, densely knit groups of broadly based ties” of *Gemeinschaft* (Wellman, 1999, p. xiii).

Drawing from science and technology studies (STS) and social network theory, Arnold (2007) conceptualizes community networks as “a-modern hybrids” (Abstract section, ¶ 1). The innovative feature of the community network sociotechnical assemblage is that it “brings together ‘community’ and ‘network’ as both ontological concepts and as empirically observable phenomenon” (Arnold, 2007, Abstract section, ¶ 1). Instead of asking how CNs can maximize what is good in a community, an a-modern question asks how CNs change what is seen as good (Arnold, 2007). Instead of theorizing a CN “as a public good infrastructure supporting *Gemeinschaft* community” (Arnold, 2007, Conclusion section, ¶ 2), [a CN should be seen as] “a resource for building private assets” (Arnold, 2007, Conclusion section, ¶ 2).

Evidence supporting Arnold’s “a-modern hybrid” conception can be seen in Srinivasan’s (2007) Tribal Peace project, which was designed in conjunction with members of 19 Native American Indian reservations in California. Srinivasan’s participatory design approach allows tribe members to build “ethnomethodological information architectures” (p. 725), private cultural assets of their own choosing in cyberspace that help reconnect these disparate “villages.” The result is an a-modern hybrid “conflation of binaries” (Arnold, 2007, Abstract section, ¶ 2) of social/technical, community/network, and hierarchy/heterarchy.

2.3.2 Place and Space

Some see geographically-bounded physical “place” as increasingly irrelevant or a barrier to overcome in favor of becoming part of a virtual “space” within the broader world community. Others see place as fundamentally relevant and as an asset to strengthen. Community networks

value both the “proximate” and the “virtual” (Baker, 2000, p.104); they attempt to strengthen place by becoming part of virtual space (Howley, 1998).

Many writings tout the increasing irrelevance of place and the ability to transcend it in the information age. For example, de Sola Pool (1990) predicts that distance will cease “to be a barrier to communication” (p. vii), while Cairncross (2001) writes of freedom from the “fate of location” with regard to communication and provision of business services (p. xiii). Schuler (2000) states that traditional communities are “exclusive, inflexible, isolated, immutable, monolithic, and homogeneous” and can now be replaced, thanks to increased mobility and communications that de-emphasize geography, by new communities that are “inclusive, fundamentally devoted to democratic problem solving, outer-directed as well as inner-directed” (p. 175).

Gieryn (2000) rejects the notion of place as irrelevant, abstract, or virtual, or as merely context. "Place," a physical, named, unique spot in the universe, is, according to Gieryn, the "interpretive frame" for any serious sociological examination. Place serves to reinforce differences and hierarchy, to dominate over nature, to facilitate collective action, to either engage or estrange, to instill social norms, and to evoke a sense of identity and memory. For example, Bohland, Puckett, and Plymale (2005) illustrate how place matters in the life of communities in Appalachia; not only is Internet access limited due to geography, but non-technological issues play a significant role as well. These include local political power bases; discomfort with public access sites like libraries and schools; gender roles; language differences; and the oral tradition. Williams (2005) points out that jurisdictions drawn along geographical boundary lines commonly serve as the basis for political representation, planning, and resource allocation. “[P]lanning and funds flows are channeled according to those boundaries and political battles are

often fought within these jurisdictions” (Williams & Durrance, 2010, p. 1). Measures of the digital divide, for example, are based on geographically-oriented census data (National Telecommunications and Information Administration, 1995, 1998, 1999, 2000, 2002, and 2004). Such data help prioritize funding for various government-funded initiatives, including community networks. Virnoche and Marx (1997) contend that “since the focus of computer community networking is at the county, city, town, or neighborhood, we use the local level as a defining analytical characteristic of geographic space” (pp. 86-87).

Community networks provide a hybrid between place and space. Participants of a community network are joined together via the common bonds of a geographically-defined “place” as a starting point, with ICTs extending this physical place into virtual “cyberspace.” Thus, CNs rearticulate “local identity through a global information infrastructure” (Howley, 1998, p. 405) by making local information and resources available on-line while using “the global medium of the Internet to accomplish their goals” (Longan, 2005, p. 849). Thus, CNs simultaneously serve local needs of communities while incorporating these same communities into the broader global information society.

Baker (2000) notes that in Washington, DC, for CNs where a strong geographical sense of community exists, ICTs enhance the flow of social, political and educational information. Efforts “to establish a virtual regional community without an underlying recognized geographical component” failed (p. 130). Baker concludes that CNs will only be successful if “a core concept of community” (p. 130) already exists that can be augmented by the CN. CNs cannot create community, but communities can create CNs.

2.3.3 Consumer and Civic Models

Virnoche (1998) observes two divergent models of CNs: consumer and civic. Consumer

models tend to be top-down, government-led approaches that emphasize job creation and computer literacy, whereas civic approaches tend to be bottom up, grassroots initiatives that emphasize democratic participation and civic engagement (Virnoche, 1998). Loader and Keeble (2004) suggest there is a mismatch in both vision and language between consumer and civic approaches. Self-interest prevails in the consumer model, with individuals-as-consumers engaging in mutually beneficial exchanges and competing with others for scarce resources. Public interest prevails in the civic model, with individuals-as-citizens weighing the pursuit of their own self-interest against that of the greater good. Under the consumer model, championed by a “fast moving capitalistic computer industry” (Virnoche, 1998, p. 202), the Internet may be used for private profit generation, with one-way broadcast information as the norm. Under the civic model championed by a “technointellectual liberal computer culture” (Virnoche, 1998, p. 202), the Internet is viewed as a public preserve dedicated to promoting the values of equal access and democratic participation facilitated by two-way interactivity.

The contrast between the Seattle Community Network (SCN) and Blacksburg Electronic Village (BEV) illustrates the differences between the citizen and consumer models in a concrete fashion. SCN is an example of a CN explicitly based on the citizen model (Schuler, 2005; Silver, 2004). Run by volunteers, without funding from the Technology Opportunities Program (TOP), the primary emphasis of SCN has long been on community activism (Schuler, 2005). While BEV’s chief advocates point out that BEV includes several opportunities for interactive citizen involvement (Carroll & Rosson, 1996; Kavanaugh, 2002; Kavanaugh, Carroll, Rosson, Zin, & Reese, 2005; Kavanaugh & Patterson, 2002), Silver (2004) contends that BEV adheres to the consumer model. BEV has placed a strong emphasis on providing quality broadcast content and has received considerable government and corporate funding. Silver contrasts BEV directly with

SCN. The conceptualization of SCN as an exemplary citizen model of a CN in contrast with BEV as an example of the consumer model provides a useful illustration of the tension between the two models. It also suggests that CN advocates are guided by different theoretical assumptions about the relationship between communities and ICTs.

2.4 Theoretical Frameworks of Community Networks

In this section, theoretical frameworks of community networks in the scholarly literature are conceptualized along two dimensions: view of technology and underlying values. There are three main views of technology: technological determinism, social constructivism, and sociotechnical interaction. Three underlying values dominate the CN literature: grassroots development, social capital building, and community information. However, it is important to note that there is considerable overlap in the CN literature of these concepts.

2.4.1 Views of Technology

2.4.1.1 Technological Determinism

Technological determinism is at the heart of the community network concept. Technological determinism assumes an ICT will cause “direct effects” through adoption and use (Kling, Rosenbaum, & Sawyer, 2005, p. 13). Three perspectives on technological determinism have been offered. Technological utopianism contends ICTs will result in positive social change and that new technologies will eventually be accepted and seen as indispensable. Technological dystopianism or anti-utopianism contends that ICTs will result in social change that is harmful to society (Bellamy & Taylor, 1998; Kling, 1996). Technological skepticism emphasizes the uncertainty and unpredictability of technologically-driven outcomes. Technological utopianism underlies most of the CN research, with community networks widely viewed as agents of positive social change.

However, there are some skeptics. Schuler (1996) contends that CNs are vehicles for resisting informational capitalistic attempts to transform public service institutions into market-oriented operations and to commodify information to trade for profit. Schuler (1996) expresses concern that the NTIA's requiring matching funds for the TIIAP grants will inevitably favor the interests of corporate partners who provide the matching funds and who have ICT products to sell, which may or may not reflect what users really want or need. Hearn, Kimber, Lennie, and Simpson (2005) posit that community technology initiatives are often a response to the supply of ICTs, which favor industry-led approaches.

2.4.1.2 Social Constructivism

In contrast to technological determinism, social constructivism privileges the role that social forces play in societal outcomes. Social shaping of technology (SST) contends that technology is not an external, independent force that changes society from the outside. Instead, SST positions technology as inextricably shaped by social forces, such as science, technology, economics, and the state (MacKenzie & Wajkman, 1999). Rather than assuming that intrinsically superior technologies will prevail, SST contends that technological change is subject to path-dependency, where early actions can have long-lasting impacts. Another social constructivist approach, social construction of technology (SCOT), analyzes both technological change and continuity; recognizes that technology results from socio-technical development rather than causes it; analyzes actors as well as structures; and conceives of technological development as occurring within a seamless web of social, technical, scientific, and political factors (Pinch & Bijker, 1984; Bijker, 1995).

In line with social constructivist approaches, Venkatesh (2003) asserts the need for “robust, theoretically informed accounts of community network development as socially

embedded and socially constructed artifacts” (p. 345). He contends that community networks are "molded, intentionally or otherwise, by social processes" (Venkatesh, 2003, p. 340); power interests coalesce "to secure particular technological outcomes" (Venkatesh, 2003, p. 340); some community constituents may be more influential than others; actors often have vested interests and motives for behaving in certain ways; and a community's social needs are prioritized in accordance with the community's values (its policy agenda).

Historical narratives describing community network development indicate the implicit, if not explicit, employment of social constructivist approaches. For example, Bowden, Blythe, and Cohill (2000) and Carroll and Rosson (2003) recount the history of the Blacksburg Electronic Village, Schuler (2005) describes the history of the Seattle Community Network, and Silver (2004) contrasts the histories of BEV and SCN. The trajectories of both BEV and SCN are similar, with a burst of local content creation and enthusiastic users early on, tapering off to out-of-date content, mostly external links, and inactive users. Patterson (2000) proposes that the Blacksburg Electronic Village be evaluated from a social constructivist perspective by exploring how people came to use BEV, rather than its competitors, for meeting their needs.

2.4.1.3 Sociotechnical Interaction

Socio-technical perspectives are premised on the belief that “social systems and technical systems are open, integrated, and interdependent” (Howley, 1998, p. 407). Technical system changes affect the surrounding social system and social system changes affect the technical system. Venkatesh and Shin (2002) examine Urban-Net, an advanced (“fourth generation”) community network in New York, as an interorganizational sociotechnical network. They portray Urban-Net’s development as a dialectic between dominant economic interests of the resource rich who wish to exploit technology and social goals of serving the resource poor who

cannot afford the technology. The dialectical view analyzes how a social system “develops along certain lines, how this trajectory is maintained or reproduced, and how its character changes over time” (p. 180).

2.4.2 Underlying Values

2.4.2.1 Grassroots Development

One of the identifying features of community networks is their grassroots development. Community networks are built and managed by members of the local community. Thus, theories of human-computer interaction and participatory design underlie the technological design of community networks by placing an emphasis on the community network user (Carroll, 1991; Howley, 1998). Howley (1998) notes that both human-computer interaction and the CN movement share goals of creating functioning and relevant systems for diverse users. Howley contends that incorporating HCI approaches can enhance equity, access, and participation in CNs. HCI helps overcome the techno-elite bias that favors an emphasis on technical “efficiency and elegance,” (p. 404) which overwhelms and alienates novice users by putting the emphasis on system-centered, as opposed to user-centered, design. A user-centered perspective, by contrast, promotes collaboration and negotiation among various, often competing, stakeholders, such as community residents, local government, businesses, schools, social service and community-based organizations. The goal is to encourage active involvement in CN development, rather than passive reception. This serves to safeguard against “hollowing out” local content and communication in favor of instantaneous access to the global Internet.

Participatory design involves users as part of the CN design team. Participatory design is “an approach to the assessment, design, and development of technological and organizational systems that places a premium on the active involvement of workplace practitioners (usually

potential or current users of the system) in design and decision-making processes” (Computer Professionals for Social Responsibility, 2009). Gurstein (2003) suggests that participatory action research involving full participation of end users alongside the designer would be more likely to yield true “effective use,” where the local community determines the "uses" to which ICTs should be directed. The main reasons touted for participatory design include improving system knowledge, reducing resistance, and establishing realistic expectations (Bjerknes & Bratteteig, 1995). The Scandinavian approach emphasizes a more politically-oriented perspective – to increase “democracy by giving the members of an organization the right to participate in decisions that are likely to affect their [lives]” (Bjerknes & Bratteteig, 1995, p. 74).

Based on an “institutionalist approach to artifact design,” Venkatesh and Chango (2007, p. 469) propose that stakeholders, such as community-based organizations who advocate for the disadvantaged, can better ensure that a CN will result in reconfiguring the prevailing social order by “designing the conditions of design” (p. 467). They contend that without a more activist approach from the point of design, it is likely that the community network will merely reinforce existing power structures.

2.4.2.2 Social Capital Building

The term “social capital” is used throughout the community networking literature as a way to explain and measure the value of community networks in community life. “Social capital refers to all the social links that people have, their social networks, and the tendency within those networks for people to do things for each other” (Ellis, Oldridge, & Vasconcelos, 2004, p. 168). However, social capital has multiple meanings deriving from different conceptions. Bourdieu’s (1983) conception underlies much of the discourse on the digital divide and social exclusion, where CNs are positioned as instruments for addressing the inequality evidenced by a lack of

ICTs and Internet access. Coleman's (1988) conception underlies discourse involving community building and social inclusion, where CNs are viewed as instruments for connecting people to needed resources. Putnam's (1995) conception underlies the discourse involving CNs as tools for promoting civic engagement and democracy.

2.4.2.2.1 Bourdieu: Empowerment and Social Exclusion

There is a common belief that having access to the Internet can translate into an improved quality of life, including "valued goods, services, and life outcomes" (Dimaggio, Hargittai, Neuman, & Robinson, 2001, p. 312). Therefore, not having ICTs and Internet access represents a new form of social inequality. This dichotomy between the "technology haves and have nots" (Hundt, 1996) has been widely labeled the "digital divide" (Norris, 2001; van Dijk & Hacker, 2003; Wresch, 1996). However, it is increasingly recognized that the digital divide problem is more complex than simply one of infrastructure and access (Selwyn, 2004; Van Dijk, 2006). Thus, the more comprehensive term, social exclusion, is increasingly being used along with the term digital divide.

Originating in France, "social exclusion" refers to a rupture in the social bond between society and its citizens, where society provides a livelihood and citizens fulfill certain obligations toward society (Silver & Miller, 2003). The concept was recast by the European Union (EU) to mean the inability of citizens to enjoy a basic standard of living, which then prevents participation in society's major social and occupational opportunities. In Britain, the emphasis on reducing social exclusion led to attempts to measure poverty in relative terms, specifically as "deprivation from goods, services and activities which the majority of the population defines as being the necessities of modern life" (Gordon, Levitas, Pantazis, Patsio, Payne, Townsend, et al., 2000, p. 5). Individuals can be excluded from income and resources, labor market, services, and

social relations (Gordon et al., 2000). The international development community recast social exclusion as systematic group-based discrimination, asserting it as the major cause of poverty and a major impediment to “the efficient operation of market forces” throughout the world (Department for International Development, 2005, p. 5). Social exclusion has its roots in neoliberalism, which privileges privatization, deregulation, and downscaling social programs except for those most needy (Portes, 1998).

A classic Marxist, Bourdieu presents social capital as largely negative (Everingham, 2003). It is a benefit of exclusive group membership, a “credential” entitling a member to credit and excluding those who do not belong to the social network. Bourdieu’s (1983) conception of social capital, with social class as the unit of analysis and its emphasis on exclusion, is useful in explaining structural inequalities, such as those observed in digital divide and social exclusion research (Everingham, 2003, p. 112). Social capital “is the product of investment strategies, individual or collective, consciously or unconsciously aimed at establishing or reproducing social relationships that are directly usable in the short or long term” (Bourdieu, 1983, Social Capital section, ¶ 4). Thus, like other forms of capital, social capital is an investment, eventually expected to yield a future return (Everingham, 2003) and it has two elements: the social relationship enabling resource entitlement and the quality and amount of resources (Portes, 1998). The proposed remedy to the exclusion described in digital divide research often involves government intervention to ensure “digital equality” or “universal access” by all individual citizens to the Internet (Sawhney & Jayakar, 2007), thus moving them from the “have nots” to the “haves.”

The term “empowerment” is closely related to the concept of social capital in Bourdieu’s conception. Mehra, Merkel, and Bishop (2004) contend that “the internet has tremendous

potential to achieve greater social equity and empowerment and improve everyday life for those on the margins of society” (p. 781). One hope of proponents of community networks is to demonstrate that “the right mix of information technologies [will] help level the playing field and bring everyone into the Information Age” (Virnoche & Marx, 1997, p. 94). Even evaluations are intended “to empower the target of the evaluation” (Patterson, 2000, p. 73).

Williams and Alkalimat (2004) use the term “cyberpower” to refer to the extent to which individuals, groups, or institutions use ICTs to wield power. However, as Mehra et al. (2004) caution, “if we continue to regard the use of the internet as separate from the social realities of disadvantaged user communities, then true empowerment of individuals in such groups via the use of the internet will never be gained” (p. 799).

2.4.2.2.2 Coleman: Community Building and Social Inclusion

In contrast with Bourdieu’s emphasis on social capital as a means of exclusion, Coleman views social capital as largely positive, because it advances both self-interest of individuals and the organizations to which individuals belong (Everingham, 2003). For Schuler (1996), community networks can advance social goals, such as building community, stimulating economic development, and enhancing local decision-making, with “their immense potential for increasing participation in community affairs” (p. 25) as their most important aspect. These concepts of community building and social inclusion align most closely with Coleman’s conception of social capital, defined as the resources that accrue to individuals as a result of their relationships in networks. By acting as part of a collective with some degree of closure, individuals are able to achieve their own self-interests that they would not be able to attain on their own, while also benefiting the group. Coleman identified three forms of social capital: those based on expectations of reciprocity, those based on norms and sanctions, and those based on

information provision. In contrast with other forms of capital, such as physical, financial, and human capital, social capital is an inherently public good, as the individual who generates it does not necessarily receive its benefits. This results in underinvestment of social capital, which may explain declines in other types of capital (Coleman, 1988).

The term “community building” is often used as a synonym for social capital (in Coleman’s sense) in the CN literature. Virnoche and Marx (1997) defines community building as “involving residents with community issues and events, as well as with one another...[based on] a belief in the importance of social cohesion obtained through involvement and communication about shared interests or concerns” (p. 92). Community building is strategic, comprehensive, community-driven, asset-based, and customized to neighborhood; it reinforces values, builds social capital, and is linked to the broader society (de la Pena McCook, 2000, p. 10). The assumption is that the Internet will strengthen a sense of community via connecting virtually (Virnoche & Marx, 1997). Grigsby et al. (2002) contend that “grassroots planning, training and community participation are critical for helping people not only access or use IT, but for using it to build community capital and *improve the quality of their lives*” (p. 2). Several researchers point to the opportunity for community building via stronger collaborations between community networks and community-based organizations, such as libraries (Bajjaly, 1999; Bishop, Bruce, Lunsford, Jones, Nazarova, Linderman, et al., 2004; de la Pena McCook, 2000; Kranich, 2001), rural development organizations (Grigsby et al., 2002; Shuffstall, Alter, Bridger, & Sager, 2007), and social service organizations (Bishop et al., 2004; Rideout & Reddick, 2005) – particularly with regard to reaching underprivileged populations.

Warschauer (2003) defines social inclusion as “the extent that individuals, families, and communities are able to fully participate in society and control their own destinies” (p. 8). This

view assumes that we are in a new networked information economy where ICT access determines who is marginalized and who can participate in information era imperatives of “identity, language, social participation, community, and civil society” (p. 9). To facilitate the use of ICTs for positive social change and social inclusion, rather than focusing on access to equipment and facilities, it is critical to look at “effective use,” what people do or can do with ICTs (Gurstein, 2003).

In his concept of “networked individualism,” Wellman (2001) extends the concept of social capital to the network level, contending that “network capital” “makes resources available through interpersonal ties” (p. 27) and that “social capital [is] a product of personal community networks as well as of formally institutionalized groups” (p. 28). Foth and Brereton (2004) contend that community networks can serve as potential bridges between virtual and physical public spaces, thereby fostering “network social capital” and neighborhood identity. Acevedo (2007) contends that network capital serves “as a measure of the differentiated value in the Information Age that communities structured as social networks generate on the basis of electronic (digital) networks for themselves, for others and for society as a whole” (p. 2).

Jankowski, Van Selm, and Hollander (2001) caution that community networks will most likely be found to enhance social capital in communities already high in social capital without improving communities that are poor in social capital. Similarly, Foth and Brereton (2004) predict that community networks are more likely to succeed in well-established communities that are already rich in social capital. Simpson (2004) refers to this phenomenon as the “self-reinforcing virtuous cycle” of high social capital communities in contrast with the “vicious cycle” of “uncivic communities” with diminishing social capital (p. 14). Cordell and Romanow (2005) go even further, suggesting that social capital should be a prerequisite to community ICT

investment. They argue that scarce public funds should be “directed to those place-based communities that already show evidence of strong positive social capital” or to virtual, rather than place-based, communities “where the pay-offs are greatest” (p 17).

2.4.2.2.3 Putnam: Civic Engagement and Democracy

Putnam’s conception of social capital as key to a functioning democracy is widely referenced in the community networking literature, as it is in the development literature (Everingham, 2003). Putnam (1993) extends the benefits of social capital from individuals and groups to the level of society. Key features of social capital in Putnam’s (1995) view include “networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit,” such as civic associations and civil society (p. 66). “A dense network of secondary associations located in civil society” is necessary for an effective democracy (Everingham, 2003, p. 112).

The term “civic engagement” is often used as a synonym for social capital (in Putnam’s sense) in the CN literature. The assumption is that “as civic engagement increases, so does quality of life in the community” (Kavanaugh & Patterson, 2002, p. 327). Carroll & Rosson (2003) assert that community networks can contribute to social capital by providing opportunities for personal growth and development, externalizing community self-perceptions and values, attracting attention and participation from beyond the geographic community, and attracting new residents. Kranich (2001) compares CNs to libraries in their capacity to “create channels of communication for public dialogue” (p. 88). Oxendine, Borgida, Sullivan, & Jackson (2003) suggest that “community electronic networks may represent a potentially significant technologically based approach to the problems of civic and political non-involvement” (p. 693).

However, Putnam (1995) himself doubts that electronic forums will be able to serve as effective substitutes for traditional civic associations, like bowling leagues.

Originally, the Blacksburg Electronic Village (BEV) was formed to bridge the rural isolation digital divide, but now that nearly everyone in Blacksburg is online, the focus has shifted to building community social capital by supplementing community communication (Kavanaugh & Patterson, 2002). Schuler (2005) encourages community networks to facilitate information exchange between individuals to create “bonding social capital” and among communities to create “bridging social capital,” terms coined by Putnam (2000). Bonding social capital brings like people together, whereas bridging social capital brings together people who are dissimilar. While often necessary, enhancing bonding social capital can be negative due to the closing off of new ideas, while the enhancement of bridging social capital leads to more positive outcomes (Putnam, 2002).

Related to the concept of civic engagement is that of democracy. Agre (1997) views community networking as a “democratic technology movement” consisting of grassroots activists who support a number of democracy-related projects while contesting development of the global information infrastructure. Promoting public discussion and debate is one of the main aims of community networking (Beamish, 1995). A fundamental value of American democracy is that everyone be given equality of opportunity (Riedel, Dresel, Wagoner, Sullivan, & Borgida, 1998). CNs accomplish equality of opportunity to the Internet by ensuring universal low-cost access to publicly provided information, developing a virtual public space, enabling open communication and interaction, and promoting a high degree of political participation (Bellamy & Taylor, 1998). CNs ideally further enhance democracy by making it possible for all citizens to use the Internet to interactively communicate rather than to passively receive information,

drawing on the special interactive properties of the Internet, including: permitting individuals to initiate communication and be selective and autonomous information users; supporting intuition-rich, personal, and immediate connectivity that encourages matter-of-fact, conversational virtual communities that cannot be controlled by politicians, media tycoons, and bureaucrats; and providing unlimited access to global information resources (Bellamy & Taylor, 1998).

2.4.2.3 Community Information

Community networks and libraries share an emphasis on providing information of value to local communities. Open information access is highly valued by libraries, as articulated in the American Library Association's mission "to enhance learning and ensure access to information for all" (American Library Association, 2008). Durrance and Pettigrew (2001) trace the provision of community information as a key library service to the 1970s. They contend that, in the 1980s, libraries helped develop "community networks that provide citizens with equitable access to the Internet for obtaining [community information] and communicating with others" (Durrance & Pettigrew, 2001, p. v), including making library databases available on the Internet.

Bajjal's (1999) "The Community Networking Handbook," an American Library Association publication, describes how libraries can develop synergies with community networks, with CNs viewed as separate entities from the library. Public library community network initiatives focus on community information, but may involve interactive online discussion opportunities as well (Durrance, Pettigrew, Jourdan, & Scheuerer, 2001). There are several models of public library community network initiatives, including: library as primary stakeholder, library as web host, library as information architect, and library as gateway (Durrance et al., 2001).

Researchers in library and information science have been primary champions of

promoting community networks as vehicles for linking people and organizations with information. Durrance and Pettigrew (2002) describe the complementary roles of libraries and CNs in providing community information, which is defined as information that “helps people cope with problems of daily living and facilitates community participation by bringing people and organizations together” (p. v). They explain that some individuals have problems expressing their information needs and “navigating the local human services web” (Durrance & Pettigrew, 2002, p. 140). Dervin’s (1999) sense-making theory helps identify the barriers that people face when seeking information. Sense-making contends that, throughout their lives, individuals encounter knowledge gaps that can only be bridged by “making new sense of their situation” (Pettigrew, Durrance, & Vakkari, 1999, p. 396) through information seeking. Wilson’s (1997) revised information behavior model posits that this information gap is due to intervening variables (demographic, psychological, role-related, environmental, and source-related) between the context of an information need and successful information seeking.

In common among all these conceptions of community networks is that they can be effective in filling gaps between citizens and a better way of life. The next section examines the empirical evidence available to support or refute these claims.

2.5 Empirical Research

This section synthesizes findings and conclusions from books and research papers on community networks in the United States. This section is organized to reflect some of the goals of community networking: grassroots design, empowerment, political participation and civic engagement, community building, and community information, recognizing that these categories are not mutually exclusive. The section concludes with a section on evaluation studies.

2.5.1 Community Networks and the Grassroots

This section investigates the claim that community networking represents a grassroots effort to integrate ICTs into communities. Community networks “offer a unique vision of grassroots technology development” (Carroll & Rosson, 1996, p. 69).

2.5.1.1 The Techno-Elite

The conception of CNs as being built by the grassroots has its skeptics. Vaughan and Schwartz (1999) note "paradoxically, in designing a community information network the person who is intended to benefit most from the system, the average citizen, is least involved in the process" (p. 588). Similarly, Merkel, Xiao, Farooq, Ganoë, Lee, Carroll, et al. (2004) note there are few studies where community members actively contribute or drive community ICT design. Instead, CN development is typically undertaken by those who are already "ICT-literate" and that, more often than not, the user is not meaningfully included (Vaughan & Schwartz, 1999). To combat this, drawing on Rogers' (2003) diffusion of innovation theory, Vaughan and Schwartz (1999) identify target users for two focus groups to help optimize the website design of HoosierNet, an Indiana CN. One group included innovators, skilled computer users who had volunteered for HoosierNet. The other group included early adopters, individuals who were active in the local community and who also volunteered for HoosierNet. The authors found that their assumptions about user website navigation and content needs were often incorrect and that meaningful category names were essential.

The Blacksburg Electronic Village (BEV) illustrates various technological innovations, including incorporation of MOOs (multi-user domains object-oriented) (Carroll & Rosson, 1998; Carroll et al., 2001), applications for senior citizens and schools (Cohill & Kavanaugh, 2000), and history databases (Carroll et al., 1995; Cohill & Kavanaugh, 2000). By 1996, BEV was

touted as “one of the most advanced community network projects in the U.S.” (Carroll & Rosson, 1996). Silver (2004) chronicles how BEV and the Seattle Community Network (SCN) were developed, along with motivations and rewards of the developers. However, he also notes that most of Blacksburg’s residents were already connected to the university in some way (85%, according to Cohill & Kavanaugh, 2000), making them among the techno-elite. Carroll and Rosson (2003) acknowledge that design trade-offs in community network features cause “both desirable and undesirable consequences for members, groups of members, and other community institutions” (p. 384). Such trade-offs include designing interfaces that cannot be maintained by host organizations, excluding non-participants, undermining face-to-face meetings, promoting the passive and asocial activity of web browsing, reducing proportion of local content, increasing Internet-related health risks of depression and obsession, and altering existing communication patterns and power relationships that can lead to conflict (p. 386).

2.5.1.2 Disadvantaged Individuals

There are specific problems with increased user involvement in systems design particularly for those who are disadvantaged. Kavanaugh, Reese, Carroll, and Rosson (2005) point out that “participatory design is rarely used for people with disadvantages in education, such as below poverty line groups, or others who typically have low computer literacy” (Socio-technical implications section, ¶ 4) because, for them, learning to use ICTs “is still a daunting task” (Socio-technical implications section, ¶ 5). Also, they tend to use the Internet for seeking and purchasing consumer products, as backed up by Mehra et al.’s (2004) study, which describes how low-income individuals use the Internet for buying or selling things needed in daily life such as cars, houses, and computers. Shiffer (1999) laments the difficulty in attaining a critical mass of users for CNs in Milwaukee and Buffalo despite the potential of CNs for enhancing

distressed urban communities. He suspects the lack of critical mass is due to a dearth of relevant content, one of the design trade-offs mentioned by Carroll and Rosson (2003).

2.5.1.3 Non-Profit Organizations

There are problems with involving non-profit organizations who serve the disadvantaged in CN design as well. Based on their participatory work with non-profit organizations, Merkel, Clitherow, Farooq, Xiao, Ganoe, Carroll, and Rosson (2005) contend that community ICT initiatives, such as Pennsylvania's Civic Nexus project, usually lack resources like time and money to develop and sustain robust applications. Community groups often fail to see the centrality of information technology (IT) to their missions, fail to engage in long-term IT planning, rely too much on volunteers instead of paid IT staff, and are resistant to changes in their practices (Merkel et al., 2005). Based on their work with a community network in rural Potter County, Pennsylvania, Grigsby et al. (2002) conclude that the development of organizational capacity and human capital is more important than money in using ICTs to address community problems. They identify local extension agents as key "change agents" for diffusion, working in conjunction with local community leaders, government and technology partners, and local residents.

Based on their longitudinal work with Urban-Net in New York, Venkatesh and Chango (2007) note that community-based organizations (CBOs) are less resourced and less tech-savvy than public (government) organizations. When CBOs and public organizations come together in civic networking initiatives, the natural tendency is for the more powerful public organizations to try to maneuver community networking goals to suit their own interests, rather than the interests of the disadvantaged who are represented by the CBOs.

2.5.1.4 Summary

To summarize, despite the best intentions of CN designers, in reality, there are several issues involved with grassroots CN design:

- Underprivileged individuals often lack even basic skills in ICT usage, and their Internet use tends to be for consumer-related purposes
- Since organizations involved in CN initiatives have limited resources, they are not able to easily attract technologically-savvy individuals to design and maintain the applications and infrastructure
- The amount of relevant local content correlates with the level of grassroots development
- Ensuring effective community network design will likely involve building coalitions between the techno-elite and those who are less techno-savvy to improve local capacity
- Even if such coalitions come to pass, there will likely be a need for safeguards to ensure desired outcomes for those who are most disadvantaged

2.5.2 Community Networks and Empowerment

This section investigates the claim that community networks can help overcome the digital divide, thereby contributing to community empowerment and an improved quality of life. This claim is related to the form of social capital described by Bourdieu (1983). “In casting the digital divide as an important national problem, scholars, policymakers and the public recognize the tremendous potential of the internet to improve everyday life for those on the margins of society, and to achieve greater social equity and empowerment” (Mehra et al., 2004, p. 782).

2.5.2.1 A More Equitable Social Order

Schuler (1996) places community networks as a cornerstone of his theory of civic intelligence, “the capacity of society to consciously adapt to its environment and shape a future environment that is healthy, equitable and sustainable” (Schuler, 1994, Abstract section, ¶ 2).

Bajjalay (1999) defines community networking as “a process designed to achieve the necessary

electronic information access objectives in order to improve the quality of life and the economic development of a community” (p. 6). However, in a review of a number of CN initiatives, Beamish (1999) notes that while CN projects assume that “technology will automatically improve the lives of low-income residents and their neighborhood” (p. 364), it is often unclear what residents will use the CN for, and there is an “alarming” lack of evaluation data supporting these utopian claims (p. 364). Carroll and Rosson (2001) acknowledge that even the impact of the Blacksburg Electronic Village on the economy of Blacksburg is unknown.

In their field research with Boulder Community Network (BCN), Virnoche and Marx (1997) note that CN advocates cling to the utopian idea that the right mix of technologies will level the playing field, despite findings from the social movement literature that “it is very difficult to mobilize people who lack general resources and whose energies are channeled into meeting day-to-day sustenance needs” (p. 94). As a Boulder (Colorado) Community Network staff member shared, low-income single working parents “did not ‘choose’ this form of empowerment and [it is] presumptuous to assume that they even wanted the technology” (Virnoche & Marx, 1997, p. 93). Bishop et al. (1999) attribute this to “more immediate and grave survival needs” (p. 365) facing this population.

In an analysis of the existing literature that deconstructs the concept of social capital, Pigg and Crank (2004) suggest that ICTs have “the capability to contribute to enhancing and extending social networks, providing access to resources that can be mobilized for action, enhancing solidarity in social groups, and supporting mechanisms of enforceable trust and reciprocity in transactions” (p. 69). They make an analytical distinction between communication (affective) and information (cognitive) aspects, concluding that there is evidence that some components of social capital are created via the Internet’s communicative functions. However,

there is little empirical evidence to show that the Internet's information functions are creating social capital. "It is likely that content, per se, is not the driving force" (p. 66).

Mehra, Merkel, and Bishop (2004) examine the every day computer and Internet usage of low income, mostly African-American, participants engaged in the Community Networking Initiative, a partnership between Prairienet, the University of Illinois at Urbana-Champaign, and the Urban League, to provide computer training and distribution. They note that the "have not" category of the digital divide rhetoric is an inadequate representation of how people use technology. "[P]eople adopt technology in a series of stops and starts, often dictated by events and changes in their lives" (p. 786), with networks of family and friends heavily influencing adoption and technical problem resolution. Usage depends on the extent to which individuals understand what ICTs can do for them. And even when communities articulate specific goals, these are often not considered in digital divide initiatives (Srinivasan, 2007).

Looking back on the Seattle Community Network, which he founded, Schuler (2005) concludes that the lack of agreement on shared goals has likely doomed the movement. Yet, he still holds out the belief that "civil society – through democratic discussion and action – must ultimately transform...the dominant forces in our society" (p. 40).

2.5.2.2 Public Access Sites

One of the methods used by CNs to level the playing field is to make public access terminals available for Internet access by all citizens. Based on their census of public access sites in Toledo, Ohio, Williams and Alkalimat (2004) examine four different types of public computing sites: government, commercial, university, and community. As a result of public spending, government sites, including public schools, libraries, and government offices, are randomly located "in the same proximity to rich and poor" (p. 108). Market demand drives

location of commercial and university sites, with their being closer to upper-income groups and students. Community sites, which include churches, private schools, civic organizations, and hospitals, follow a U-shaped pattern, located near high- and low-income areas, but not the middle.

Pigg (2001) finds that only three of the 22 CNs in the Missouri Express community networking initiative had public access terminals. And when they do exist, there are still many barriers to their use. Based on surveys, interviews, and focus groups from residents of a low-income neighborhood in the Urbana-Champaign area served by Prairienet, Bishop et al. (1999) find that, despite an expressed enthusiasm for the idea of using CNs, the ability of residents to take advantage of public access terminals is limited by transportation, safety concerns, child care, access hours, and need for technical support. Through survey, field visits, document analysis, observations, and interviews, Strover et al. (2004) find similar barriers in 36 Texas CNs, including location, hours of operation, transportation, childcare, support staff, language, connectivity and technical problems. In their review of community informatics projects worldwide, Loader and Keeble (2004) find that the socially excluded make little use of public access sites.

Marks (2005) describes the importance of libraries and the potential for community networks to improve the quality of life for deaf people living in rural areas. However, inaccessible websites, language and cultural differences, and historically lower income and education levels among the deaf are formidable barriers. Another barrier is that, due to their lower numbers, disabled individuals are often the last user groups whose needs are built into library budgets.

2.5.2.3 Funding Requirements

Venkatesh and Shin (2002) describe the social shaping of Urban-net (a pseudonym), an inter-organizational network designed to connect non-profit organizations in economically distressed communities to a central advanced telecommunications “backbone.” Because of an “implied threat” from the funders to pull funding if an insufficient number of organizations signed on, the CN developers employed a “mall model” of diffusion that relied on enlisting powerful “anchor tenants” first. In the absence of “provisions...requiring the resource rich to assist the resource poor to get connected” (p. 182), applications to serve the needs of the poor, the elderly, the disabled, and ethnic groups were not developed.

In an examination of five rural broadband projects in New York, Venkatesh, Nosovitch, and Miner (2004) note that system planners suffered from a lack of technical expertise and useful prototypes; experienced considerable project delays, scope changes, staff turnover, and ambiguous costs; and did not understand their political role between the telecommunications company and targeted beneficiaries. With resource-poor community-based organizations and small businesses failing to unite, the end result was that the CN merely reinforced existing power structures. Venkatesh and Owens (2006) suggest that educational institutions produce a “reflexive designer” who employs social learning and uses solidarity with others to achieve social equity goals.

Based on interviews, archival data, surveys, content analyses, and participant observation, Shin (2007) chronicles how A-Net, a network set up to provide broadband and video to 80 institutions serving low income and underserved communities in New York, shifted away completely from public benefit goals to private for-profit goals that were oriented almost exclusively toward telemedicine. The telemedicine focus came from the influence of the CN’s

founder, whereas the self-sufficiency requirement in the grant funding led to the focus on the CN's making money.

The Texas state agency that funded CNs, the Telecommunications Infrastructure Fund (TIF), also had a requirement for CNs to achieve self-sustainability (Strover et al., 2004). The result was that the most successful CNs were those with the partnerships with the strongest school systems, which also received significant funding from TIF. Texas' grant guidelines limited CNs in several other ways. These included requiring partnership with and location of equipment only at certain sites, such as educational institutions and libraries, that may not be willing to reach out to or are not frequented by targeted beneficiaries and that may not buy-in to the CN mission; difficulty explaining bureaucratic and accounting requirements for pursuing and administering the projects; political pressure to spend grant funds on non-community-defined goals; and disallowing use of funds for marketing. Other impediments to success include problems with the technology; failure to collect usage and demographic data; and CNs' focusing on direct-to-individual instead of indirect-to-individual programs (via community-based organizations). The most popular public access programs were in community centers, libraries, and schools that had ongoing social programs and available support staff; laptop and digital camera personal loan programs; and computers located for agency staff use (Strover et al., 2004).

2.5.2.4 Summary

To summarize, the evidence identifies several issues with CNs serving to empower disadvantaged communities:

- ICT adoption and usage changes over time in response to everyday needs and social network pressures
- The connection between how a CN will help one achieve a better quality of life remains unclear

- Public access sites are underutilized by intended disadvantaged users due to numerous barriers which are not addressed by CNs
- Requirements imposed by funders often constrain, rather than enhance, the effectiveness of CNs
- Ensuring that community networks will reach targeted beneficiaries will likely involve some sort of enforcement mechanisms between the resource rich and the resource poor

2.5.3 Community Networks and Community Building

This section investigates the claim that community networks can enhance community building, the form of social capital described by Coleman (1988). Community networks “offer opportunities for community institutions to collaborate and build partnerships...that might be overlooked by the commercial sector” (Kranich, 2004, p. 292).

2.5.3.1 Social Relations

Contractor and Bishop (1999) describe three stages of how ICTs impact social relations: substitution, enlargement, and reconfiguration. Substitution involves using the new ICT to accomplish more efficiently the same communication tasks done previously. Enlargement involves using ICTs to sustain or deepen ongoing relationships. Contractor and Bishop contend that most ICT effects have involved substitution and enlargement, which only serve to deepen “the digital divide between those who have social and knowledge capital and those who don’t” (p. 151). To effect positive social change, CNs must reconfigure relationships by establishing new positive connections and weakening negative relations.

There is evidence that CNs can facilitate interpersonal network reconfiguration by fostering and supporting new positive connections within geographical communities and promoting community information sharing through these new relationships. The MUSIC project in Newark that spanned several low-income housing developments fostered several new “on-the-ground” relationships (Shaw & Shaw, 1999). These included bonding between older women and

younger girls when braiding hair, ride-alongs to the airport between university researchers and low-income residents, putting on a talent show, and the formation of a boy scout organization (Shaw & Shaw, 1999). The MUSIC project also appears to have also led to some social mobilization. For example, an annual parade was rescheduled because it conflicted with the funeral for a murdered local girl who had been memorialized online (Shaw & Shaw, 1999).

To facilitate network reconfiguration at community level, Contractor, Zink, and Chan (1998) describe their planned piloting of a “communityware” tool called PrairieKNOW (Prairie Knowledge Networks On the Web), which is designed to identify who knows or has certain resources within a community. The tool is based on asset mapping (Kretzman & McKnight, 1993). Community asset mapping has also been used in working with community technology centers (CTCs), another community ICT intervention launched during the Clinton-Gore era (Pinkett, 2003; Servon, 2002).

2.5.3.2 Community Network Building

The evidence suggests that activities involved in creating and operating community networks themselves may foster network reconfiguration and thus constitute a form of community building. Longan (2005) observes that community building tends to revolve around building the CN, instead of building the community itself, with technological aspects of CNs obscuring the needs of the community. However, Bishop, Bruce, Lunsford, Jones, Nazarova, Linderman, et al. (2004) turn the act of community network building into a positive. They describe the Inquiry Page project, a web-based tool aimed at fostering collaboration for the purpose of mutual learning and inquiry, a concept that is rooted in the works of Dewey. The collaboratively-developed Inquiry Page consists of digital curricula and action plans, discussion forums, workshops, partnerships, and ideas. The researchers report that the collaborative Inquiry

Page project “makes more productive use of the diverse and sometimes conflicting knowledge held by the teachers, students, university researchers, librarians, parents, and community activists who are both creators and users of Inquiry Page infrastructure and resources” (Bishop et al., 2004, 4 Open process for ICT capacity development section, ¶ 2).

Drawing from his examination of three Washington, DC, area CNs, Baker (2000) notes that planning CNs by communicating only virtually is easy, but keeping up the motivation and commitment necessary to implement CNs is much harder and requires face-to-face interaction to build relationships that will endure. Kavanaugh et al. (2005) describe that in their work with senior citizens in Blacksburg, the most tangible benefits were the relationships that developed between senior citizens and younger people who worked together on participatory design projects.

Schuler (2005) contends that “a community network in and of itself can provide an occasion for shared work and, hence, help build community” (p. 34). He suggests that since computer use is individual, rather than community-oriented, perhaps a useful measure of a CN’s value is by having its volunteers go on to serve their communities in other ways as many volunteers at the Seattle Community Network have.

2.5.3.3 Interorganizational Relations

Ohio’s Trumbull County Community Network project (Watson, 2001) maintains inter-organizational linkages among schools industry, and government rather than individuals. In their study of three public library-community networks, not-for-profit organizations report that CNs helped them provide their services more efficiently and effectively, improved staff computer knowledge and skill, and enhanced organizational visibility (Durrance & Pettigrew, 2002; Pettigrew et al., 2002).

Venkatesh, Nosovitch, and Khan (1999) survey nonprofit participants in New York's effort to link community non-profit institutions (e.g., libraries, schools, government, and social services) via high-speed community network backbones. The surveys identify gaps in knowledge between the expertise needed and that available. The researchers suggest that university-based technology transfer programs can play a leading role in reducing knowledge barriers and diffusing the technology so as not to exacerbate technology gaps.

Kubicek and Wagner (2002) suggest that CNs would do well to develop new community applications that enhance the effectiveness and efficiency of civic groups and non-profit organizations. Shuffstall et al. (2007) suggest the use of community development techniques to engage local leaders and organizations to create new linkages that connect rural communities.

2.5.3.4 Summary

Overall, there is evidence to suggest that CNs do contribute to community building. To summarize, the evidence shows that:

- Face-to-face interaction is important when implementing CNs
- CN building itself provides opportunities to supplement and reconfigure social relationships through skill building and working with new people
- Concentrating on reconfiguring social relations, particularly at the inter-organizational level with nonprofits, is a promising direction for CNs

2.5.4 Community Networks and Civic Engagement

This section investigates the claim that community networks can enhance civic engagement, related to the form of social capital described by Putnam (1995). "Comparable to libraries, community networks...create channels of communication for public dialogue" (Kranich, 2004, p. 292).

2.5.4.1 Blacksburg

Residents in the Blacksburg, Virginia area served by the Blacksburg Electronic Village

(BEV) were subjects for a number of empirical studies that assess the extent to which the CN increases civic engagement. Based on surveys administered in 1996 and again in 1999 of randomly selected, non-student, households in the Blacksburg area, Kavanaugh and Patterson (2002) find 1) No change in community attachment and involvement even though BEV access increased (there was near universal Internet access by Blacksburg area residents in 1999); 2) Increased use of the Internet to communicate with family members, informal social groups and, to a lesser extent, with members of formal social groups and local friends; and 3) A subset of the population are early adopters who tend to use the Internet more for civic engagement and social capital building activities than later adopters. Kavanaugh and Patterson (2002) provide two explanations for their findings: 1) that Putnam (2000) was correct in his contention that successful CNs like BEV are outcomes of, rather than catalysts for, “communities with already high levels of social capital, community involvement, and community attachment,” or 2) that social capital erosion can be restored through CNs awakening “a latent capacity for civic engagement” among “individuals of higher social and economic status, with high demands for their time and attention” (Kavanaugh & Patterson, 2002, p. 341). The authors hope for the latter, reasserting that an important role that CNs can play is helping Americans transfer “social capital building communication behaviors” (p. 342) learned online to offline activities.

Based on one-on-one interviews and online surveys conducted in 1997 and 1999 of community leaders and senior citizens actively engaged in social networks with an online presence, Kavanaugh (2002) finds that the Internet strengthens existing social networks and information exchanges, facilitates development of weak ties across groups, and increases community involvement for those who are already active in their communities and who also score higher in education and newspaper readership.

Based on surveys of Blacksburg residents in 2001 and 2002, Kavanaugh et al. (2005) find that the Internet strengthens social involvement for those with high levels of education and community involvement. They also find that being members of each other's social networks provides built-in norms of reciprocity, rules, and roles that carry over into the online community” (Discussion section, ¶ 1). Community social relationships “are reinforced and strengthened not only by more face-to-face interaction but also by more online interaction” (Discussion section, ¶ 2). Based on surveys, questionnaires, and interviews of Blacksburg area residents, Carroll (2005) finds that existing community activism in Blacksburg is the best predictor of Internet use for civic activity, whereas non-community activists use the Internet for other goals.

2.5.4.2 Minnesota

Riedel et al. (1998) conducted a mail survey of residents of Grand Rapids, Minnesota, to generate baseline data for the community in the early stages of introducing the GrandNet community network, a cooperative effort between the local school district, an area community college, county human services, a development corporation, and the public library. The results show that, despite residing in a small rural community, Grand Rapids residents are highly educated, tend to be “ahead of the technology curve” (p. 380), and are dedicated to the democratic ideal that computer resources should be available to everyone. The best predictors of likely use of GrandNet are prior GrandNet use, positive attitude toward computers, and involvement in local community activities and politics. After controlling for political, social, and technical capital, socioeconomic status differences disappear entirely.

Sullivan et al. (2002) administered mail surveys in 1997 and again in 1999 to residents of two rural communities: Grand Rapids, a community served by GrandNet, by then a TIIAP-funded CN; and Detroit Lakes, a community whose Internet access was supplied by the

competitive marketplace. Sullivan et al. find that “political capital,” a measure of “the political intensity of one’s social network” (p. 873), is linked to computer use and attitudes in Grand Rapids but not in Detroit Lakes. Thus they conclude that extant “political capital” may be critical to CN development and growth and therefore CNs are likely to succeed only in a community with actively engaged citizens.

Borgida, Sullivan, Oxendine, Jackson, and Riedel (2002) use a historical analysis along with focus group results from these same two Minnesota communities to assess whether each community views Internet access as a public or private good. They conclude that Grand Rapids residents take the perspective that the digital divide is a communal problem requiring a public response, whereas Detroit Lakes residents believe that Internet access should be addressed by the private sector.

2.5.4.3 Other Sites

A number of other studies challenge the contention that CNs are effective tools for generating new political participation and civic engagement and building social capital in the sense of Putnam (1995). Based on surveys following training sessions with 24 individuals who volunteered to create political projects for a local community network, Gregson (1997) finds that political interest and prior Internet experience are the best predictors of willingness and ability to use the community network to promote political participation. Individuals with high political interest appear to benefit the most from training, whereas those with both high political interest and Internet experience are ready to go. However, “People [with] no interest in either the Internet or political participation will not suddenly become politically active merely because a community network begins offering training” (Conclusions and Suggestions for Further Study section, ¶ 6).

It has been disheartening for community networking advocates to find that those who access networks for information do not necessarily wish to participate in civic affairs (Bellamy & Taylor, 1998). However, this is consistent with extensive literature review findings of Robbin, Courtright, and Davis (2004) that ICTs appear to reinforce, rather than reinvent, political behavior, with elites and organizations gaining the most benefit (p. 463). Exacerbating this problem is the fact that it has been much easier to secure funding for economic or workforce development-related applications than it has been for social or political applications, resulting in the marginalization or exclusion of democratic applications (Bellamy & Taylor, 1998). Bellamy and Taylor suggest that instead of trying to replace representative democracy with direct democracy, community networking advocates could promote using ICTs for enabling "new forms of popular deliberation and direct participation" (p. 115) that can provide strategic guidance to elected officials.

Rosenbaum and Gregson (1998) note that board members representing 24 of 28 Indiana CNs made little mention during their interviews of plans for interactive features to facilitate political and civic engagement. A website content analysis conducted on Indiana's CN websites revealed that only a few CNs had developed local discussion forums (Rosenbaum, 1998). This is consistent with Beamish's (1995) findings that, despite their purported goal of enhancing democratic participation, community networks failed to provide opportunities for public discussion and debate or opportunities to interact with government officials.

Pigg's (2001) website content analysis of 22 Missouri CNs showed very little evidence of attempts to create a public sphere. In a website content analysis of 40 CNs, Tonn, Zambrano, and Moore (2001) find little evidence to support CNs building social capital. In a website analysis of six CNs, using their own social capital model, Chewar, McCrickard, and Carroll (2005) conclude

that CNs provide weak support in building social capital. In interviews with 70 CN activists from five CNs, Longan (2005) finds that CNs do not generate communicative mobility capable of bringing about social change. In a review of 75 CN websites, Horning (2007) finds that CNs do not promote strong democracy, however, CNs do have useful, local content conducive to social capital generation.

2.5.4.4 Summary

Overall, there is little evidence to support the contention that CNs transform non-civically engaged community residents into active community participants. To summarize, the evidence shows that:

- CNs are more likely to be established and used in communities where civically-engaged early adopters can champion them
- Early CN adopters and the most enthusiastic CN users are more likely to already be civically engaged, and they view CNs serve as an additional outlet for civic engagement
- CN websites show little evidence of promoting civic engagement or strong democracy
- For those not inclined to be civically engaged, CNs and the Internet are used to reinforce existing social relationships and for purposes other than civic engagement

2.5.5 Community Networks and Community Information

This section investigates the claim that community networks provide useful information about and for communities. “Community networks can be the local entrance to the Internet as well as to [local] information and communication services” (Cisler, 1994, p. 24).

2.5.5.1 Information Content

Based on a website content analysis of 24 CN websites in Indiana, Rosenbaum (1998) finds that while the websites have useful and usable technical infrastructures, they lack deep local content and services (Rosenbaum, 1998). This aligns with findings about BEV and SCN

which show active local content creation early on, tapering off to outdated content, mostly external links, and inactive users (Bowden et al., 2000; Carroll & Rosson, 2003; Patterson, 2000; Schuler, 2005; Silver, 2004). Additional barriers to the usefulness of CN websites include poor retrieval, poor interface design, poor organization, out-of-date or inaccurate information, questionable authority, missing information, dead links, language, security, specificity, and nonanticipatory systems (Durrance & Pettigrew, 2002).

Through a series of studies, Kwon and her colleagues systematically assess the assumption that users understand the community information goals of CNs (Kwon, 2005; Kwon & Onwuegbuzie, 2005; Kwon & Toms, 2002; Kwon & Zweizig, 2006). Using questionnaires and surveys from current and former users of an unspecified CN in the Midwest, they show that the CN is used mainly as an affordable means of accessing the Internet rather than for accessing community information. This is particularly true among those with no alternative means of access, who also happen to be of lower socioeconomic status (Kwon, 2005; Kwon & Onwuegbuzie, 2005; Kwon & Toms; Kwon & Zweizig, 2006). However, consistent with Riedel et al. (1998), favorable attitude toward the CN was a significant predictor of CN use by individuals with alternative means of accessing the Internet. This suggests that users who support the local community information goal of CNs are those more likely to use the CN, even when they can access the Internet through other means (Kwon & Zweizig, 2006).

2.5.5.2 Information Use

In a series of works, Durrance and Pettigrew chronicle the history of community information, going back to the 1970s, and summarize results of their 1998-2000 study of how the public uses networking community information (Durrance & Pettigrew, 2001; Durrance & Pettigrew, 2002; Pettigrew et al., 1999). They find that community networks can 1) overcome

geographical and digital divide barriers involved in asking for information, 2) increase non-profit effectiveness and responsiveness, 3) improve searching, 4) enhance respect for librarians' skills, and 5) "contribute to community building, foster civic engagement, create a sense of community" (Durrance & Pettigrew, 2001, Benefits of Community Networks section, ¶ 5). Four community networks are highlighted as exemplars of successful CN-library partnerships: Tallahassee FreeNet, Darien (Conn.) Community Information Network, Three Rivers Free-Net, and NorthStarNet in Chicago (Durrance et al., 2001).

Durrance and Pettigrew (2002) use Dervin's sense-making methodology (1999) to determine how individuals use community information systems and how barriers often get in the way within the context of the situation at-hand. When people are blocked from accessing useful community information, they experience a reduced quality of life. Barriers to accessing community information within low-income communities, for example, include fragmented social service information, uncoordinated service delivery, and uncoordinated resource sharing (Contractor & Bishop, 1999).

Baker (2000) concludes that, in light of increased competition from commercial Internet service providers, community networks can no longer be simple information and connection portals targeted at individuals to remain viable. Instead, CNs should focus on their ability to enhance political, education, and social information flows in geographic communities. Community networks, working in close conjunction with public libraries, can and already have helped citizens access community information (Durrance & Pettigrew, 2002).

2.5.5.3 Summary

Overall, there is evidence that CNs are helpful in connecting citizens to information, but there are some challenges. The evidence shows that:

- Community networks begin by providing good local content, but over time fail to keep the links and content updated on their websites
- There is a lack of recognition that a primary CN aim is to provide local content; Most users use CNs as an inexpensive Internet access point rather than for the local content on their websites
- A promising niche for CNs appears to be in improving information flows between community organizations and institutions, particularly in partnership with libraries

2.5.6 Meta-Level Evaluation of Community Network Initiatives

The empirical evidence examined for this literature review includes four evaluations of the community network literature, some of which extend beyond the United States. The evaluations organize the literature based upon CN goals, provide recommendations for future evaluation, and offer interpretations of what is happening with CNs.

Based on a review of 14 published CN evaluations and 84 CN websites, Gregson and Ford (1998) find that it is difficult to evaluate CNs because they all have different goals. Providing information and access are top goals for CNs, followed by technical literacy, community building, communication, economic development, and education/lifelong learning. Civic participation is further down the list, with social services provision identified as a goal only by three CNs. The authors recommend further exploratory studies, involving more stakeholders in evaluation, triangulation of data, goals-based evaluations, actionable evaluations, coordination of evaluations, and built-in assessment tools.

O'Neil (2002) examines 30 community ICT evaluations conducted between 1994 and 2001 and finds they fall into five major theoretical areas: strong democracy, social capital, individual empowerment, sense of community, and economic development opportunities. O'Neil presents a table listing different indicators identified in her review and calls for researchers to be explicit in what they are evaluating, since specific factors contributing to the effectiveness of community ICT initiatives are still unclear. Recommendations for evaluation include

determining the evaluation's purpose and research questions up front, making explicit one's assumptions and underlying theoretical framework, involving stakeholders in evaluation design and implementation, obtaining quantitative data, triangulation, and compliance with human subjects regulations.

Loader and Keeble (2004) evaluate a broad array of community informatics initiatives around the world, including community networks in the U.S. They organize the literature based on the typical components of community informatics projects: access, computer skills, economic opportunity, civic participation, and diversity. In the course of the review, they identify "five thematic ambiguities" in the literature:

- Communities can engender social control as much as social capital
- Despite the aim of social inclusion, the articulate middle-class tends to more effectively use ICTs
- There is a mismatch between top-down techno-enthusiasts and grassroots community advocates
- Technology alone will not bridge the digital divide because it also requires self-confidence in technological ability and perceived relevance
- It is difficult for community ICT projects to be both innovative and sustainable over the long-term

Barriers to the underserved identified by Loader and Keeble (2004) include:

- Locating public access sites in libraries and schools
- Emphasizing ICTs for education and literacy
- Failing to demonstrate relevance of ICTs for disadvantaged groups

Borgstrom, Drucker, and Sparrow (2005) present a meta-analysis of the three formal evaluations conducted of the NTIA's TOP initiative by Frechtling, Lockwood, Silverstein, Somers, and Tuss (1999); Frechtling, Silverstein, Snow, and Somers, (2000); Johnson and Johnson Associates, Inc. (2001). Borgstrom et al. (2005) specifically focus on projects that fall

into the categories of community economic development, urban asset mapping, and rural resource management, while acknowledging the other project categories of arts and culture, education, human services, lifelong learning, public safety, social services, telemedicine and health, and workforce development. The formal TOP evaluations recommended that future projects include requiring comprehensive community needs assessments, technical feasibility studies, stakeholder involvement in planning and operations, integration of technology into existing activities, and collection of outcome data. From “the full spectrum of TOP projects” (p. 107), Borgstrom et al. (2005) identified two key elements for success: 1) building strong social networks, as well as technical and 2) being realistic about the time needed to assemble, implement, and evaluate the effort.

Meta-level evaluations of community networks show that:

- Community networks have different goals, which makes evaluation challenging
- Stakeholders are not sufficiently involved in CN development, operations, or evaluation
- Innovative technological aspects of CNs may not be addressing locally-driven needs “on-the-ground”

2.6 Methodologies

This section describes the main methodologies employed in the scholarly literature on community networks in the United States where data collection occurred. Scholarly works that do not include empirical evidence, such as those that are mainly conceptual in nature or that proposed evaluation frameworks without supplying evaluation results, have been excluded from discussion in this section.

Of the community networking studies that involve empirical evidence, the most common modes of observation are qualitative field research (which includes focus groups, participant observation, and action research), survey research (which includes surveys and interviews), and

unobtrusive research (which includes document review, website content analysis, and historical/comparative review).

Combining qualitative and quantitative measures is common and desirable in community networking research (Beamish, 1995; O’Neil, 2002). Qualitative research is good for exploratory studies of new phenomena, such as community networks, since it provides a holistic and naturalistic view of a dynamic situation. And it is a good complement to quantitative measures, which produce numbers that may be more reflective of an entire community, rather than just individuals impacted by the community networking initiative. Quantitative methods are useful in giving a sense of expected outcomes, but they offer “few benchmarks for interpreting measures” (O’Neil, 2002, p. 91). Quantitative measures may show how many people are using a community network, but not for what purpose or to what effect (Beamish, 1995).

2.6.1 Survey Research

Survey research, including interviews and surveys, is useful for collecting data about a population that is too large to observe directly (Babbie, 2004). Research on individuals in Blacksburg and surrounding Montgomery County, Virginia, was gleaned from several surveys and interview instruments administered at different points in time, with age and income among the demographic variables captured. Between 1996 and 1999, Kavanaugh (2002) conducted one-on-one interviews with community leaders and senior citizens who belonged to groups with an online presence. Online questionnaires were distributed in 1996 and again in 1999 to members of a local school board mailing list, yielding a 20% and 7% response rate, respectively (Kavanaugh, 2002). Kavanaugh and Patterson (2002) compared results from a telephone survey of Montgomery County residents in 1996 with the same survey of non-student Blacksburg city residents in 1999.

Several studies of the Blacksburg Electronic Village (BEV) relied on data supplied by a single questionnaire, entitled Experiences of People, Internet and Community (EPIC), that had been distributed to a stratified sample of 100 households drawn from an initial pool of 1250 households (Carroll, 2005; Kavanaugh, Carroll, et al., 2005; Kavanaugh, Reese, Carroll, & Rosson, 2005). The survey instrument was adapted from previous BEV research group instruments as well as the HomeNet study (Kraut, Lundmark, Patterson, Kiesler, Mukopadhyay, & Scherlis, 1998). Half of the sample were from Blacksburg; half from elsewhere in Montgomery County, Virginia. Education and Internet use were also variables considered in the stratification. Surveys were hand-delivered in Fall 2001 and \$25 was paid for each completed survey. Twenty households were selected for in-depth interviews. The survey was administered to the same households a year later. In Round 1, there were 156 individual respondents, and in Round 2, there were 143 respondents (after replacing for dropouts). Key constructs in the survey included “collective efficacy” and the relationships between Internet use and community involvement in terms of membership, belonging, activism, and social Internet use.

Forty percent of 1000 Grand Rapids residents who were randomly selected from the voter registration rolls and the local phone book responded to a 15-page questionnaire sent out by Riedel et al. (1998), along with a cover letter from the mayor. These results established the baseline data for further research in Minnesota. Borgida et al. (2002) and Sullivan et al. (2002) relied on the same survey results for their studies in Minnesota. A mail survey, focusing on various measures of social capital, was conducted in 1996 of 2000 randomly selected households in Grand Rapids and Detroit Lakes, Minnesota, yielding a 40% response rate in each community. A followup in late 1999 was expanded to include residents of Itasca and Becker counties, yielding a response rate of 64% from 2791 households. Elements of Kraut et al.'s (1998)

HomeNet survey and the UCLA Loneliness Scale were added to the followup survey.

Kwon and her colleagues examined survey results from users of a CN that had been launched as “a community service of a Graduate School of Library and Information Science at a large Midwestern university” (Kwon & Zweizig, 2006, p. 87). A questionnaire was mailed in March 2001 to a random sample of 1000 adult current and former users. Just over 400 responses were used from surveys returned in the first round (Kwon & Onwuegbuzie, 2005; Kwon & Toms, 2002; Kwon & Zweizig, 2006). A second round of surveys sent to these users, resulted in just over 200 responses, which were used in Kwon’s (2005) study. Kwon and her colleagues used these results to develop a community network use model (CNUM). A variety of quantitative approaches were used to analyze the survey results, including multiple regression (Kwon, 2005; Kwon & Toms, 2002; Kwon & Zweizig, 2006) and structured equation modeling (Kwon & Onwuegbuzie, 2005). Demographic variables captured included gender, age, education, and income.

Venkatesh et al. (1999) received 85 completed surveys from a sample of 150 non-profit organizations to be served by the Syracuse MetroNet, one of New York’s Diffusion Program-funded community networks. One survey elicited user needs; while the other elicited information about the supporting human and technology infrastructure. Venkatesh et al. also interviewed leaders of eight Diffusion Program networks. Shin (2007) conducted in-depth interview with project team members and community development representatives involved with A-Net, a broadband community network in New York.

To determine the usefulness of community information provided at public library-community network sites, Pettigrew et al. (2002) conducted an on-line survey with 197 adult community network users and 87 staff members of three CNs: Three Rivers Free-Net in

Pittsburgh, PA, NorthStarNet in Chicago, and CascadeLink in Portland. Durrance and Pettigrew (2001) interviewed citizens, local organizational representatives, and public library staff in the communities of these same three public library-community networks.

Longan (2005) conducted face-to-face interviews in 1998 with seventy (70) community networking activists from five community networks about what they thought was driving the community networking movement. The five CNs were Austin Free-Net, Blacksburg Electronic Village, Charlotte's Web, Metropolitan Austin Interactive Network, and Seattle Community Network.

2.6.2 Field Research

Field research, including focus groups, participant observation, and action research, allows for a richer understanding of behaviors and attitudes best observed in their natural setting (Babbie, 2004). Community networking activities provide a good opportunity for field research.

Vaughan and Schwartz (1999) conducted two focus groups: one "innovator" group consisting of five volunteers (of 14 named) with HoosierNet and one "early adopter" group consisting of seven officers of local associations (of 15 invited). They had focus group participants develop prototypes and participate in usability studies as well. Using a participatory design approach, Gregson (1997) trained 24 volunteers (17 from a high school American History course) how to use the Web for political purposes.

Two studies involved participants of Prairienet's Community Networking Initiative (CNI), which provided computers, training, and Internet access to over 700 predominantly African-American, low-income families. Over the course of a year, Merkel used an ethnographic approach to interview and observe 11 participants (Mehra et al., 2004). They used the constant comparative method (Glaser & Strauss, 1967) to analyze the data. Over the course of six months

in 1998, Bishop et al., (1999) conducted 26 interviews (with a total of 34 CNI participants). They also conducted focus groups with 116 adults and 48 teenagers who participated in a two-day CNI training and received a computer upon completion, and conducted a followup phone interview with 35 of those participants (40 could not be reached because of disconnected phones or having moved).

Action research is a favored approach for examining community networks. In action research the researcher studies a system while collaborating with system members to change it in a positive direction. O'Brien (1998) provides a useful summary of the history and principles of action research. Many community networking researchers have been actively involved in developing the community networks they study.

Carroll (2001) explains that the Blacksburg Electronic Village provides an example of how diverse community settings are helpful for incubating human-computer interaction technologies via rapid prototyping and formative evaluation. BEV researchers describe various efforts to develop BEV systems, including capturing BEV's history (Carroll et al., 1995); MOOsburg, a multi-user domains object-oriented system representing Blacksburg; and the community network website in general (Carroll & Rosson, 1996, 2003).

Action research has also been employed with the Seattle Community Network (Schuler, 2005); in rural Centre (Merkel et al., 2004; Merkel et al., 2005) and Potter counties (Grigsby et al., 2002; Shuffstall et al., 2007) of Pennsylvania; in east central Illinois' Prairienet, with the PrairieKNOW communityware (Contractor & Bishop, 1999) and Inquiry Page projects (Bishop et al., 2004); in Trumbull County, Ohio (Watson, 2001); and in San Diego County's Tribal Peace initiative among Native American communities (Srinivasan, 2007).

Participant observation was the primary method employed with Boulder Community Network (Virnoche & Marx, 1997; Virnoche, 1998). Virnoche embedded herself as an unknown participant observer who became very active within the organization.

2.6.3 Unobtrusive Research

Unobtrusive research methods, such as document review, website content analysis, and historical/comparative review, involve “studying social behavior without affecting it” (Babbie, 2004, p. 313). Much of the evidence supporting CN studies comes from examining data available from CN websites or from other historical evidence. Schuler’s (1994) sampling of earlier generation community networks, such as Berkeley Community Memory, Cleveland Free-Net, Big Sky Telegraph, and Santa Monica Public Electronic Network (PEN), provides an example of this approach. Beamish’s (1995) master’s thesis from M.I.T. is another and involves describing some of these earlier CNs as well, including the Cleveland Free-Net, Heartland Regional Network, Buffalo Free-Net, Hawaii FYI, and Santa Monica PEN.

Beamish (1999) and Shiffer (1999) highlight projects that emphasize technology use among low-income groups. Based on historical evidence available from websites, Baker (2000) analyzes and compares three Washington DC area community networks based on their key actors, innovation factor, opportunities and barriers, and policy outcomes/assessment. Venkatesh and Shin (2002) examine a number of public documents to describe the development of Urban-Net in New York from a dialectal perspective.

Using more formalized data collection instruments, Horning (2007), Tonn et al. (2001) and Chewar et al. (2005) conduct website content analyses of 75, 40, and 6 websites respectfully. These analyses are specifically aimed at identifying elements conducive to social capital building.

Silver (2004) uses a “constructivist studies of technology” (p. 301) approach to compare the development of Blacksburg Electronic Village and the Seattle Community Network. He draws from three various historical sources: online archives of the CN development teams; popular accounts in the news media and magazines; and three written works: Schuler (1996), Cohill and Kavanaugh (1996), and Schorger’s (1995) Ph.D. dissertation, *A Qualitative Study of the Development and First Year of Implementation of the Blacksburg Electronic Village*. A fourth source of material is from oral histories with key players.

In Missouri, Pigg (2001) examines the websites of the 22 Missouri Express community networks along several dimensions, including communication structures, local content, database usage, and public sphere functions.

2.6.4 Multiple Methods

Many community networking studies involve the use of multiple research methods, particularly those involving regional community networking initiatives.

Beginning in June 2002, Strover et al. (2004) compiled a database of Texas’ 36 Telecommunications Infrastructure Fund (TIF)-funded community network leaders and participants, analyzed 200 responses to a mail survey, and conducted multiple field visits to the 36 communities to conduct 210 interviews, observe operations, and gather documents.

In Indiana, data collection involved site visits to eight CNs, surveys of CN board members, and a website content analysis of 24 of 28 Access Indiana-funded community networks (Rosenbaum, 1998; Rosenbaum & Gregson, 1998).

In New York, five of the state’s 22 funded community networking projects (one urban/suburban and four rural) were part of a two-phase study of Next Generation Community Network design that began in June 1996 and concluded in 2000 (Venkatesh & Shin, 2002;

Venkatesh, Nosovitch, & Miner, 2004). Phase 1 involved interviews with planners from the communities. Phase 2 involved collecting data from engineering, marketing, sales staff as well as program selection committee members (Venkatesh & Shin, 2002; Venkatesh et al., 2004).

2.7 Theoretical and Methodological Critique

This section summarizes the critique of community networking scholarly research with regard to theory and method.

2.7.1 Theory

2.7.1.1 Hidden Assumptions and Varying Goals

One of the biggest problems with community networking research is that rarely are the theories and assumptions of the researcher made explicit (O’Neil, 2002). Yet the goals of community networking vary, often as a reflection of these implicit theories, values, political interests, and ideologies (Gygi, 1996; O’Neil, 2002; Schuler, 2004). In many cases, community networking goals are not explicitly articulated at all (Beamish, 1995, 1999), and when they are articulated, they are not readily converted into quantifiable, measurable objectives (Gregson & Ford, 1998). Compounding this is the fact that the literature about communities and ICTs generally is fragmented across disciplines (Kling, 2000; Pigg & Crank, 2004). Lack of clarity of theoretical underpinnings and community networking vision makes it difficult to evaluate the extent to which community networks have achieved their aims.

2.7.1.2 Poor Definitions

Community networking research tends to treat “community” too simplistically, glossing over differences within communities (Howley, 1998). “Community has been a kind of question in the United States, as well as an answer...[with] discussions of community...marked with unacknowledged tensions” (Kling, 1996, p. 436). Postill (2008) contends that community

informatics research, as well as Wellman's "networked individualism," has overly depended on the troubling concepts of "community" and "network." "Community" is a term that plays well in the public rhetoric, but "its empirical referent is seldom specified or, indeed, specifiable" (Postill, 2008, p. 415). Use of the term community often results in conflating "cultural categories with actual social groups" (p. 415).

Social network analysts invoke the term "whole network" that requires identifying the boundaries of a network in order to research (Wasserman & Faust, 1994). However, the network idea was fundamentally meant to connote unboundedness, cutting across enduring groups and organizations (Postill, 2008). The danger is that drawing boundaries first instills assumptions that limit one's thinking.

The term "community network" is often not well-defined either (Schuler, 2004). Community networks are sometimes included with the term "online community," leading to contradiction and confusion (Dimaggio et al., 2001). The key distinction is that community networks aim to strengthen ties within an existing local community by creating a web presence rather than to create an entirely new virtual community in cyberspace (Sawhney & Jayakar, 2007).

2.7.1.3 Technological Utopianism

The community networking literature is predicated on the normative assumption that community networks and the Internet will make a positive difference in people's lives (Dimaggio et al., 2001; O'Neil, 2002). However, it is unclear especially what low-income communities would use Internet access for (Beamish, 1999). Community network writings have a "celebratory tinge" and the community networking concept is rarely challenged (Sawhney & Jayakar, 2007, p. 187). Instead, the literature focuses on how to overcome implementation

challenges (Sawhney & Jayakar, 2007), while potential consequences of CN use are not addressed – even in evaluations (Carroll & Rosson, 2001).

Often ignored are the broader social, cultural, and political issues embedded within the “web of computing” (Kling & Scacchi, 1982). For example, the cultural issues of “place,” such as those facing Appalachia described by Bohland, Puckett, and Playmale (2005), are usually glossed over in U.S. community networking literature. Such issues include local power structures controlling the allocation of computers and Internet access, traditional gender roles being challenged since the Internet plays more to the literacy strengths of women, religion possibly portraying technology as demonic, and even the influence of local language. Schuler (1996) suggests the development of local social and political models for community networking in addition to existing technological models.

Community networking assumes that the “new” features of the Internet can only help to create a vibrant public sphere for promoting democracy. However, “the public sphere is, and always will be, a much larger phenomenon than an Internet discussion forum” (Agre, 2002, p. 311). Community networking research ignores longstanding knowledge about electronic citizen democratic participation, including that the government provides the information it chooses at the price it chooses, with limited or no influence by citizens, and with ICTs merely providing more sophisticated market research capabilities and opinion shaping techniques (Bellamy & Taylor, 1998).

2.7.1.4 Lack of Critical and Contextual Perspectives

It is widely assumed in community networking that “universal access” to the Internet, providing equal opportunity across all social strata and geographical regions, is a positive (Sawhney & Jayakar, 2007). This is predicated on the assumptions of a “technological

imperative” (Chapman, 2004) that “technology and its architecture are givens” (Agre, 1997, p. 242), that access is scarce, and that equitable distribution is the answer (Agre, 1997). Rarely does anyone question whether disadvantaged social groups will have “equal opportunity to escape these technologies” (Virnoche, 1998, p. 217).

In their evaluation of the literature, Loader and Keeble (2004) conclude that community informatics needs to incorporate “a more critical evidence based perspective” (p. 36) that recognizes that the ambiguous relationship between ICTs and communities “is shaped primarily through a complex interaction of social, political, commercial and political factors...[producing] both intended and unintended outcomes” (p. 36). This complex interaction necessarily involves different stakeholders. In a content analysis of 269 articles, Houston and Erdelez (2002) examine the interests of the various stakeholders involved in digital divide research, concluding that:

- Those who are already connected (the “haves”) tend to marginalize the existence of a digital divide and advocate for market-based solutions
- Those in the digital industry, assisted by government, promote digital goods and services in order to maximize profit
- “Educators and others who wish to change Internet content, interfaces, and uses to reflect the needs and wants of the ‘unconnected’ appear at this time to have no ulterior motives beyond a genuine desire to improve the human condition” (p. 105)

However, Stoecker (2005) challenges this latter point. He suggests that academics, including himself, may have the most to gain by community informatics initiatives, such as community networks, as entire careers can be made by designing and studying them. He asks whether community informatics initiatives actually detract from their stated goal of building communities and suggests that rather than creating new ICT-based initiatives, it might be more appropriate to integrate with ongoing community efforts not centered around technology. “It may be that our fascination with the technology is distracting us from our concern for the community”

(p. 16); “technology is too often the place where we start, when it should be where we end up” (p. 18).

The concept of social capital, which underpins much of the CN research, also has a celebratory tinge. For example, Woolcock and Narayan (2000), in their report to the World Bank, convey their enthusiasm about using the concept of social capital to provide richer explanations of economic development from an interdisciplinary perspective. However, some writers are skeptical of how the social capital concept has been applied to communities and ICTs. Everingham (2003) contends that invoking Putnam’s notion of social capital relies on western values and allows international financial institutions like the World Bank to shift “responsibility for poverty onto the poor themselves” (p. 109). Similarly, Stoecker (2005) speculates that community informatics projects may be serving capitalist elites by encouraging communities to produce globally competitive homogenized goods, quieting discontent, integrating the poor into the system, and establishing the means to blame the poor for their own poverty if they fail to take advantage of new technologies. When community informatics researchers use the concept of social capital to refer to leveraging community social exchange relationships for purposes of economic development, this represents another example of how the capitalist economy directs community development instead of empowering the community to develop its own path to sustainability (Stoecker, 2005).

Dimaggio et al. (2001) contend that Internet research in general has focused too much on individuals, while ignoring how the Internet itself evolves as a result of struggle among powerful political and economic actors. Robbin and Courtright (2002) contend that “the digital divide is a potent resource whose symbolic properties and communicative power have activated a wide array of participants in the policy debates about how to create a more just society.” Stevenson

(2009) provides a detailed account of a struggle among powerful actors using language of the digital divide. Using critical discourse analysis to examine the NTIA's *Falling through the Net* reports, he carefully demonstrates how the digital divide rhetoric furthered the neoliberal agenda by framing the problem as one of technology access that can be blamed on individuals instead of on "new social relations of production" related to class (p. 11). Stevenson illustrates how this struggle further played out between the proprietary Gates Foundation Library program with its provision of nearly 50,000 PCs in 11,000 public libraries and the free and open source software (FLOSS) movement.

2.7.2 Method

This section summarizes the critique of community networking scholarly research with regard to methods.

2.7.2.1 Narrow Range of Methodologies

Riedel et al. (1998) contend that, with the exception of the research on the Blacksburg Electronic Village, community networking research suffers from applying too narrow a range of methodologies that fail to include baseline data and that "lack adequate controls, longitudinal data, or utilization of multiple methodologies" (p. 378). Wellman & Gulia (1999) note that anecdotal accounts of online communities far outweigh survey research about interpersonal connections, detailed ethnographic accounts, and time-budget studies of what people spend their time doing online. Longitudinal studies of changes in inequality need to be conducted, and research needs to move beyond single case studies toward more systematic studies of how the Internet is used collectively (Dimaggio et al., 2001).

2.7.2.2 Operationalization of Concepts

Some concepts in community networking research have not been adequately

operationalized. For example, Kwon & Onwuegbuzie (2005) operationalized CN “Use” as the total hours or frequency of use online. However, they suggest that more direct measures might be more useful, “such as the number of e-mails received or sent, the number of visits to affiliated local information provider sites, and the amount of information sought or found” (p. 1541).

2.7.2.3 The Scholar-Designer

Wellman and Gulia (1999) raise concern about the involvement of academics in systems design generally, as undoubtedly scholar-designers who have been heavily invested in action research want the community networks they’ve worked on to be successful.

2.7.2.4 Shortcomings in Evaluation

Community networking research has failed to identify meaningful outcomes for evaluation (Beamish, 1999; Gregson & Ford, 1998; O’Neil, 2002). Strover et al. (2004) suggest that such measurable outcomes of community networks could include computer literacy and job placement. For example, there are no studies that evaluate how many jobs were actually obtained through the provision of hundreds of public access sites throughout the country (Beamish, 1999).

In a two-year study of community information provision and use, Durrance and Pettigrew (2001, 2002) provide examples, best practices, and benefits of how CNs in partnership with libraries help with information dissemination, but they conclude that evaluating impact on users and communities is impossible because of a lack of “tools.” Durrance and Fisher (2005) follow up by providing a “guide to identifying user-centered outcomes” that includes a community network user survey based on Dervin’s sense-making methodology; however, they fail to share the results of their survey of 197 CN users to demonstrate the usefulness of their instrument.

2.7.2.5 Limitations in Generalizability

Kwon and Onwuegbuzie (2005) report that despite attempts to recruit all user groups for

their studies, most study respondents were registered community network users. By default, such users are already more likely to use the community network to access the Internet than unregistered users. Blacksburg Electronic Village researchers routinely note that individuals in their studies tend to be more affluent and educated due to the fact that roughly 85% of Blacksburg residents are affiliated with Virginia Tech (Kavanaugh & Patterson, 2002). Brown (2008) notes that household Internet diffusion studies may suffer from under-representing “a large segment of society, namely low income households” (p. 398).

Since community networks emphasize different aspects in different communities, generalizing findings from one study to another is difficult (Kwon & Onwuegbuzie, 2005). Replication of studies in different sites is suggested as a potential remedy for this (Kwon & Onwuegbuzie, 2005). Patterson (2000) calls for comparing data across communities and evaluating community network initiatives at the level of the community. “Not until evaluators are able to compare different cases are they truly able to create a general theory of community computer networking that can be generalized to all such initiatives” (p. 73).

2.8 Areas for Further Research

This literature review suggests that one of the most promising contributions of community networking, as distinct from the Internet generally, involves providing opportunities for collaboration between previously unconnected individuals and organizations with differing levels of resources and status. Examples include connections made between the techno-elite and the non-technologically-savvy with regard to grassroots design; between resource rich and resource poor organizations with regard to community empowerment; and between libraries and other organizations with regard to local content creation and maintenance.

One potential way to examine community networks is using a deductive, top-down approach. Social network theory provides one especially promising theoretical basis for such an examination. As Williams and Durrance (2008) contend, the roles of strong and weak ties (Granovetter, 1975) with regard to establishing and sustaining community technology are not well understood and present a particular policy challenge and opportunity. Structural hole theory (Burt, 1992) and betweenness centrality (Wasserman & Faust, 1998) are other potentially useful social network concepts for examining phenomena such as the cross-boundary collaboration that community networks appear to have fostered.

Another way to examine community networks is using an inductive, bottom-up approach. Since community networks started being “built” in 1993, a considerable treasure trove of data and case studies has built up as well. A grounded theory approach (Glaser & Strauss, 1967) would start with the data and work its way up to building theory. This literature review suggests that conditions that existed prior to receiving grant funding may impact success and also that transformation may occur when unequal partners connect. A grounded theory examination of the community networking projects that were funded through the Clinton era’s Technology Opportunities Program (TOP) may help discover concepts important in further developing theory around these observations.

Library and information science (LIS) has been and continues to be positioned at the intersection of information, technology, and communities. As Patterson (2000) suggests, future research should compare individual case studies that represent the considerable investments made in community networking on the part of LIS researchers and practitioners over the last 15+ years. Insights from such a study may transcend immediately-observable impacts, revealing unintended consequences (both positive and negative) that extend beyond the lifetimes and

boundaries of the community networks themselves. The goal of such a study will be to develop a generalizable theory of community computer networking initiatives aimed at answering the question: How can community networking initiatives be structured to maximize positive outcomes for individuals from disadvantaged communities?

In the next chapter, I describe the methodology employed for comparing community network evaluations from the NTIA's Technology Opportunities Program to create such a theory of community networking.

CHAPTER 3

METHODOLOGY

For this study, I employed a grounded theory approach to develop a theory of community networking. This section provides an overview of grounded theory and then describes the specific processes followed in the study.

3.1 Grounded Theory

3.1.1 An Inductive Research Approach

Grounded theory (GT) was presented in the well-known 1967 book by Glaser and Strauss entitled *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Spawned by their collaborative work on dying patients, Glaser and Strauss' (1967) grounded theory was a response to an “embarrassing gap between theory and empirical research” (p. vii). GT is defined as “the discovery of theory from data—systematically obtained and analyzed in social research...[that] provides...relevant predictions, explanations, interpretations and applications” that are understandable to both researchers and practitioners (Glaser & Strauss, 1967, p. 1). Thus GT's main purpose is to construct theory from any kind of data using an inductive, bottom-up, data-driven research approach rather than validating an existing theory using a “logico-deductive,” top-down, theory-driven research approach.

Employing GT can yield development of either substantive theory, developed for a specific, empirical subject, or formal theory, developed for a formal, conceptual area (Glaser & Strauss, 1967). GT provides guidelines for how to analyze piles of collected qualitative research data, rather than just how to collect it. It offers pragmatic middle-range theory building that falls between minor hypotheses of everyday life and all-inclusive grand theories that strive for “universal explanations of social behavior” (Suddaby, 2006, p. 633), and it yields research that

“fits, works, is relevant, and is readily modifiable” (Glaser, 2010). Table 3.1 summarizes the key differences between the more traditional logico-deductive research method and grounded theory, according to Glaser and Strauss (1967).

Table 3.1

Comparison of Logico-Deduction and Grounded Theory Research Approaches

Topic	Logico-Deduction	Grounded Theory
Purpose	Verification of existing theory and description	Generation of theory
Sampling objective	Data collection	Concept collection for theory
Data	Preplanned throughout	Only the initial set is preplanned
Research Design	Preplanned	Emergent/flexible
Sample	Established boundaries (exclusionary)	Ongoing inclusion of groups
Aim	Accurate evidence; requires controlling variability	Generation of theory by developing categories
Comparison Groups	Can only compare comparable groups	Can compare any groups
Note Taking	Whole group	Categories help guide
Process	Distinct phases: <ul style="list-style-type: none"> • Sampling • A Priori Coding • Analysis 	Simultaneous conduct of: <ul style="list-style-type: none"> • Theoretical sampling • Comparative Coding • Analysis

3.1.2 Core Techniques

Consistent across the various books about grounded theory are the following core techniques: 1) *constant comparison*, where data are simultaneously coded and analyzed for the purpose of generating theory, 2) *conceptual coding*, where concepts, along with their properties and dimensions, are identified from the data, 3) *theoretical sampling*, where the selection of data to analyze is based on the theory being constructed, and 4) *saturation*, when properties of concepts supporting the emerging theory have been fully developed (Corbin & Strauss, 2008; Glaser & Strauss, 1967; Suddaby, 2006).

Coding is the act of “deriving and developing concepts from data” (Corbin & Strauss, 2008, p. 65). Concepts are abstractions about what is going on. Concepts have one or more

properties or dimensions. Categories are ways of grouping concepts together. Available evidence, facts, or data fit different concepts. Theoretical sampling of material to be analyzed is based on “concepts derived from data” (Corbin & Strauss, 2008, p. 65) with the purpose of discovering all relevant categories and their properties in order to close gaps in the emergent theory (Glaser & Strauss, 1967). Theoretical sampling is to be done until *saturation* occurs – when “no additional data are being found whereby the [researcher] can develop properties of the category” (Glaser & Strauss, 1967, p. 61). The saturation point is determined by “a combination of the empirical limits of the data, the integration and density of the theory, and the analyst’s theoretical sensitivity” (Glaser & Strauss, 1967, p. 62). Unlike traditional sampling, which aims to identify the distribution of incidents across a set of concepts, theoretical sampling aims to identify the set of concepts themselves. Thus, after coding a number of times for the same concept, if an incident does not point to a new concept, then it does not need to be coded. Whereas in traditional sampling all identified incidents are to be coded. Throughout the research process, the analyst writes *theoretical memos* that create a record of data explored, properties and dimensions of concepts identified, comparisons made, questions asked, stories told, and paradigms about “the relationship between conditions, actions/interactions, and consequences” are elaborated (Corbin & Strauss, 2008, p. 118).

3.1.3 Misconceptions, Misuses, and Mistakes

Several misconceptions about GT, drawn from Glaser and Strauss (1967) and Suddaby (2006), are outlined in Table 3.2. These include the belief that GT takes too long for dissertation research. Glaser (2010) contends that GT is an excellent approach for dissertations since it “takes one from data collection through several stages to a theory and in a scheduled amount of time ensures a finished product that can comply with a deadline.” On July 27, 2013, I conducted a

search of the Proquest Theses and Dissertations Abstracts database to see how often GT has been employed in information science dissertations. Of the 2127 dissertations coded with a subject of “information science,” only 46 included the term “grounded theory” in the abstract, representing about 2% of all information science dissertations. This lends support to the notion that many doctoral students, at least in information science, avoid undertaking grounded theory studies.

Table 3.2

Misconceptions vs. Reality about Grounded Theory

Misconception	Reality
Any research grounded in data is GT.	Only research that follows the grounded theory methodological package is GT.
GT is better than other methods.	GT is no better or worse; it is just one of the many methods available to researchers.
Anyone can do GT.	Successful GT researchers must be able to conceptualize data, tolerate confusion and resulting set-backs, and wait for “conceptual sense making to emerge from the data” (Glaser & Strauss, 1967, p. 838).
GT takes too long for a dissertation or thesis.	GT provides a total package from data collection to theory in a set amount of time (scoped by structural conditions like theory type, material cache, geography, or kind of group), making it very desirable for dissertations and theses.
GT is exciting.	GT can produce highly motivating and relevant findings, which are made possible through often tedious constant comparisons.
Grounded theorists can just as easily conduct logico-deductive research.	Because of their natural inclinations, successful grounded theorists often do not easily conduct traditional hypothesis-testing research.
GT is specifically for symbolic interaction qualitative research.	GT is a general method for use with any data (quantitative or qualitative) or epistemology; however, all steps should be followed, with theory emerging rather than being forced.
Literature should not be read until AFTER data have been collected and analyzed.	Any reasonable research agenda requires a clear research question and awareness of existing literature – especially in well-trod areas.
GT involves presenting raw, undigested data, such as interview excerpts.	GT is not about the data <i>per se</i> ; it’s about abstracting subjective experiences represented in the data into theoretical statements about causal relations; interviews are rarely the only data.
GT can be used to test hypotheses.	Doing so represents “methodological slurring”: using GT’s interpretive ontology (that actors construct their own reality) to analyze realist assumptions (that variables are concrete, objective, and measurable).
Rigid formulaic coding rules or software alone can be used to analyze the data.	GT requires interpretation by the researchers, not just coding; while software can help organize and code data, it is not good at creative thinking or interpretation.

(table continues)

Table 3.2 (continued).

Misconception	Reality
It is important to conduct GT perfectly, identifying a clear saturation point.	GT is an inherently messy practical approach for understanding complex social processes; saturation depends on empirical context and researcher experience.
Grounded theory is easy.	GT requires an intimate, extensive, ongoing relationship between researcher and empirical site; it is not easy at all.

There have been numerous examples of the misuse of grounded theory. Table 3.3 lists these misuses, along with how my approach avoided these misuses.

Table 3.3

Typical Misuses of Grounded Theory and This Study's Approach

Typical Misuses	My Approach
Saying you are using GT when you have not even read the seminal text of Glaser and Strauss (1967).	In addition to Glaser and Strauss (1967), I have also read Strauss (1987), Charmaz (2006), and Corbin and Strauss (2008).
Saying you are using GT to develop theory, when all you are doing is describing.	The explicit aim of this study was to develop a theory of community networking that is grounded in the data, based on the understanding that “accurate description and verification are not so crucial when one’s purpose is to generate theory” (Glaser & Strauss, 1967, p. 28).
Failing to distinguish whether you’re using GT for coding or for theory generation.	While coding was employed, the aim of this study is to generate theory.
Using GT to justify failure to know the literature.	The questions guiding my research were drawn from a thorough literature review of community networking.
Using GT to disguise poor methodological skills.	This method supplemented my exposure to research methods used previously, such as interviews, surveys, and website content analysis.

Common mistakes made in using grounded theory include: 1) using theoretical sampling for the wrong reasons, such as articulating initial research questions, establishing population distributions, identifying negative cases, creating a complete dataset, and achieving generalizability and 2) conducting theoretical sampling too early may result in premature closure of analytical categories, redundant categories, over-reliance on overt statements to check categories, and unfocused or unspecific categories. For this study, the data available for theoretical sampling was limited to a finite “cache of archival material” (Corbin & Strauss, 2008,

p. 155) – specifically, all the project evaluations that I was able to procure from the NTIA’s Technology Opportunities Program. It was from this cache that theoretical sampling occurred. Admittedly, this did not represent the ideal situation for GT since theory generation was limited by the existence of a limited number of “comparative materials” (Glaser & Strauss, 1967, p. 168) available from this now-terminated federal initiative. But, as stated in Corbin and Strauss (2008), “a researcher can do a high-level analysis on whatever data he or she has” (p. 150). In my view, GT presents an exciting potential approach to analyzing the ever-growing existing caches of material in our digital age in the pursuit of “neglected discoveries” (Swanson, 2011).

Drawing from this cache of material, I applied theoretical sampling according to the GT principle of letting “questions about a concept serve as a guide for what incidents to look for in the next set of data” (p. 150). I did not hesitate to return to previously analyzed data when I thought I may have overlooked something or needed to look at data from a different concept-based perspective. However, because of the limited available data, it was expected that there would be gaps in the analysis. Even though I fell short of developing a complete theory, I concur with Corbin who says generating concepts alone “is a useful research endeavor...[as] concepts provide a language that can be used for discussion and debate leading to the development of shared understanding and meanings...to build a professional body of knowledge and enhance practice” (Corbin & Strauss, 2008, p. ix).

3.1.4 Best Practices

Glaser (2010) identifies three characteristics GT researchers need: “an ability to conceptualize data, an ability to tolerate some confusion, and an ability to tolerate confusion’s attendant regression” (Types of Grounded Theory section, para. 2). GT researchers eschew the irrelevance produced from following “approved formal methods” that rigidly dictate

“preconceived problems, concepts, and format methods of data collection and the processing of it” (Glaser, 2010, Types of Grounded Theory section, para. 5). Instead of striving for “objectivity,” the GT researcher strives for “sensitivity” – the “ability to pick up on subtle nuances and cues in the data that infer or point to meaning” (Corbin & Strauss, 2008, p. 19), which is often honed from accumulated experience.

In common among the various grounded theory books I’ve read are a set of best practices for GT, which I followed:

- Remain in close, ongoing interaction with your data
- Be creative, flexible, and open to twists and turns in your analysis
- Follow core GT techniques of theoretical sampling and constant comparison
- Describe your methodology and provide illustrations of your coding and category creation techniques
- Demonstrate theoretical sensitivity: openness to new data interpretations (emergence vs. forcing)
- Select appropriate methods for your research questions based on your epistemological assumptions

3.2 Process

Corbin and Strauss (2008) best describe how I employed grounded theory. Instead of presenting a step-by-step recipe, their book “presents a set of analytic techniques that can be used to make sense out of masses of qualitative data” (p. ix), with researchers selecting which techniques to use and in which ways. In the preface, Corbin acknowledges that “grounded theory has evolved into many different approaches to building theory grounded in data” (p. viii). She confesses to having become disillusioned with the idea that “theory construction is the only way to develop knowledge” (p. ix). She contends that doing qualitative research is something you just

have to feel your way through and that “multiple interpretations can be constructed from one set of data” (p. ix).

Figure 3.1 provides a graphical overview of the GT process employed in the course of this study. Rather than following a series of steps in rigid sequential order, grounded theory involves repeated and simultaneous iterations of the following activities, which are described next in more detail. As the figure illustrates, theory constructing (integration) is the main aim of the other activities:

- Data gathering (collection)
- Conceptual coding (comparison)
- Memo writing (elaboration)
- Theoretical sampling (saturation)
- Theory constructing (integration)

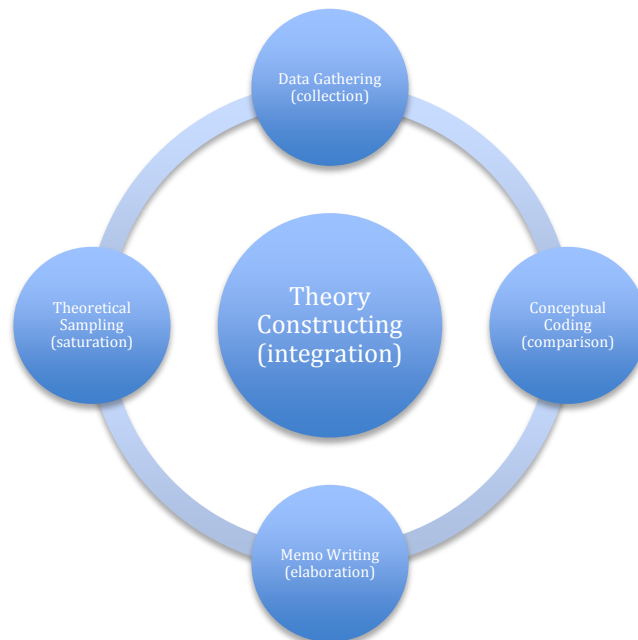


Figure 3.1. Grounded theory process for this study. Theory constructing (integration) is the main aim of the other activities: data gathering (collection), conceptual coding (comparison), memo writing (elaboration), and theoretical sampling (saturation).

3.2.1 Data Gathering (Collection)

Data used for GT analysis can be from a variety of sources in order to stimulate generation of categories. Analysts are encouraged to include any materials relevant to the subject since “all slices of data are relevant” (Glaser & Strauss, 1967, p. 75). Data may be collected yourself or by others (secondary data); may be of any type, including library documents, interviews, field notes, reports, etc.; and may be limited based on structural conditions, such as kinds of groups (but not number or to what extent), caches of material, or geographical region to study.

The data collected for this study are secondary data: a “cache of material” that includes all the evaluations I could locate from the Technology Opportunities Program (TOP) Data Archive project (Williams, 2007). The archive has both virtual (available through the Internet Archive) and physical (at the University of Michigan’s Special Collections Library) components. On June 27, 2013, I downloaded from archive.org 34 evaluations completed in 1998 and 1999 on TOP projects. On July 17 and 18, 2013, I visited the University of Michigan Special Collections Library and retrieved 23 project evaluations that were available in hard copy. Documents were removed, one at a time, from one of 17 boxes of material archived from the TOP initiative. Each page was individually photographed. And then the individual images were reassembled into complete evaluation documents and saved as Adobe Acrobat (.pdf) files. One of the boxes containing evaluations, Box 7, was not able to be retrieved from storage in time for my visit. I submitted a request to University of Michigan Special Collections Library staff to retrieve the remaining 6 project evaluations in Box 7 for me. On 10/31/13, the remaining evaluations were received. Appendix A provides a complete list of the 63 evaluations that make up the cache of material from which I sampled.

3.2.2 Conceptual Coding (Comparison)

The most well known method for coding concepts when following GT is the constant comparative method presented by Glaser and Strauss (1967). This involves comparing incidents for each concept with the aim of generating conceptual properties: dimensions, conditions, consequences, and their relationship to other concepts and properties. Charmaz (2006) describes initial and focused coding, which involves quickly coding word-by-word, line-by-line, incident-by-incident, comparing data with data. She suggests using gerunds to convey action, staying close to the data, keeping open to new concepts, and recoding using the most significant or frequent codes. Glaser (2005) proposes “theoretical coding” involving the use of any of 18+ “coding families” to relate substantive codes to each other as hypotheses (e.g., 6 Cs: causes, contexts, contingencies, consequences, covariations, and conditions). Strauss’s (1987) axial coding involves creating dense texture of relationships around a category axis to sort, synthesize, and organize.

According to Corbin and Strauss (2008), identifying the data’s meaning is more important than the process: “The best approach to coding is to relax and let your mind and intuition work for you” (p. 160). Rather than being two separate steps, as described in the second edition of Strauss and Corbin (1998), Corbin (Corbin & Strauss, 2008) contends that open and axial coding, described below, “go hand in hand” (p. 198):

- *Open coding* involves analyzing data for concepts: Use techniques, such as those outlined in Table 3.4, to start with freely brainstorming about concepts in the data, along with their properties and dimensions, remaining “open to all possible meanings in the data” (p. 52), without trying to group the codes.
- *Axial coding* involves analyzing data for context, process, and theoretical integration: Continue to ask questions and compare in order to group lower-level concepts under a more conceptual label – a category or theme; and then link categories together to construct the theory. Corbin and Strauss (2008) introduce an analytical tool called “the paradigm,” in which the analyst looks for key words that specify:

- Conditions: why, where, what happens, when, and how
- Inter/actions and emotion: individual or group responses to events
- Consequences: outcomes of inter/actions

Table 3.4

Techniques to Facilitate Open Coding

Analytic Tool	Description
Questioning	Some ideas for questions: <ul style="list-style-type: none"> • “W”s: who, what, when, where, how, and with what consequences • Temporal: duration, frequency, rate, timing • Spatial: where, how much space, closed or open, boundaries • Technological, informational, social • Sensitizing, theoretical, practical, and guiding
Comparisons	<ul style="list-style-type: none"> • Constant: literal description; incident with incident • Theoretical: abstract; identifying properties & dimensions from own experiences or using metaphors to understand underlying meaning
Word meanings	<ol style="list-style-type: none"> 1) scan the document to identify seemingly significant words or phrases 2) list all possible meanings of the word or phrase
Narrative structure	How narratives are organized suggest what is deemed most important
Time	Words like if, in case, before, after, when, or since can identify shifts in events or perceptions
Flip-flop technique	Look at opposites or extremes of a concept to identify its properties
Personal experience	Rely on personal experience to identify other possible meanings
Red flag	Terms like “never” or “always” may indicate personal assumptions or bias
Language	Understanding the meaning of words used, as reflected in “in vivo” codes
Emotions	Indicators of emotion often follow action or inaction
Metaphors	Metaphors and similes can help paint a better picture for understanding
Negative case	A case that doesn’t fit the picture can draw attention to alternatives
“So what?”	Asking questions such as “So what?” and “What if...?” can get at meaning

Source: Corbin & Strauss, 2008, p. 69

I started out by extensively coding four project evaluations as data memos using Microsoft Word tables (see Appendix B). The coding technique I used was to lift a quote from the evaluations, identify the “trigger words” that made me think the quote was significant, and describe conditions, interactions, and consequences in relation to what was described in the quote. Then I identified concept, properties, and dimensions embedded within the quote. I then assembled all the identified concepts, properties, and dimensions, along with identification of their source evaluation, into a single spreadsheet and sorted them by concept/property. From this

list of concepts and properties, along with my sensitivity to the four evaluations assessed, I came up with a list of themes. The aim of this exercise was to become familiar with the range of data contained in the evaluations, to narrow down the area for further exploration aimed at theory development, and to identify other evaluations to look at further for purposes of theoretical sampling. Again, since the aim of this dissertation was to develop theory, it was not necessary to look at ALL of the evaluations – only those that might illustrate new concepts or properties relevant to the emerging theory (Glaser & Strauss, 1967, p. 28).

When it came time to code more evaluations as a result of theoretical sampling, I began using Microsoft Excel instead of Word. I created a worksheet with a row for each of the available evaluations and columns listing the emerging concepts. In the cells, I typed or pasted in relevant quotes or notes. Using Excel made it possible for me to easily view all the evaluation data for a particular concept together in a single glance. As I continually went back to review my data, I organized the concepts and properties into categories to make them fit better within the context of my emerging theory and categories.

3.2.3 Memo Writing (Elaboration)

An important task in developing grounded theory is the writing of memos. Memos were first introduced in Glaser and Strauss (1967) as an attachment to field notes as a way to provide “an immediate illustration for an idea” (p. 108). Memos should be written regularly from the start of a project and should be written “in close conjunction with the data collecting and coding” (Strauss, 1987, p. 109). Memos are partial, preliminary, and provisional (Charmaz, 2006, p. 84). With memos “you stop and analyze your ideas about the codes in any – and every – way that occurs to you” (Charmaz, 2006, p. 72). Some guidelines from Strauss (1987) and Charmaz (2006) for writing memos include:

- Keep data and memos separate
- Do not hesitate to interrupt coding to write a memo, so you don't lose the idea
- Write spontaneously, in your own style
- Give specific titles to memos
- Bring raw data or quotes into memos
- Use to define codes/categories and properties, describe processes, identify gaps, ask questions, identify conjectures to check out
- Feel free to modify memos
- Make categories as conceptual as possible, as these will form basis of emerging theory
- Indicate category "saturation" in memos, when appropriate
- Use for self-reflection
- Be flexible in your memo writing style

In the process of elaboration "concepts must be linked and filled in with detail to construct theory out of data" (Corbin & Strauss, 2008, p. 103). Throughout the study, I wrote process memos to elaborate upon concepts, properties, and dimensions and to describe the process undertaken. I used memos to describe themes; present challenges and questions; expose my biases and assumptions; articulate my emerging theory; and suggest areas for future inquiry or even later research. In essence, memos served as field notes to record my grounded theory journey. I found it useful to track significant examples from the data that helped elaborate the emerging concepts and properties that I was coding in my Excel spreadsheet. In this way, memos served as a set of synthesized data and notes to myself upon which I built the emergent theory. Appendix C contains the process memos I wrote. I started out planning to write a new memo each day, but since my work on any particular topic was spread out over a period of days or weeks, I found it more useful to keep "running" memos to continually build upon. Thus, instead

of attaching specific dates to memos, I labeled them with the category being developed, along with the timeframe for the analysis. Thus, the memo titles changed as my categories became more focused toward the emerging theory, and I eventually dropped the timeframes since there was so much overlap during the analysis period. In the end, the 9 memos in Appendix C represented a fairly faithful record of my analytical journey – although you will see, at a certain point, I simply quit writing memos and turned to crafting the dissertation itself.

3.2.4 Theoretical Sampling (Saturation)

Theoretical sampling is driven by the concepts and gaps identified in memos. The aim is to seek and collect more pertinent data (statements, events, or cases) to elaborate and refine concepts and their relationships for the emerging theory. Ideally, this is done until saturation is achieved – when no new properties emerge. This will provide a sense of the range of variation. It is important to not make up hypothetical “what if” data; grounded theory is about staying close to real data. Saturation should not be confused with seeing the same patterns repeat. Instead, saturation occurs when comparing new data neither sparks new theoretical insights nor reveals new concept properties.

Since I worked from a limited cache of material that represents only some of the projects included in the TOP initiative under study, saturation occurred when comparisons among the available documents failed to reveal new concepts or properties relevant to my developing theory. I continually looked through the evaluations to see if any contained new concepts or properties, but I did not rigorously code each evaluation, since that is not required of using grounded theory for the purpose of theory development. Thus, theoretical sampling, for the concepts and properties of interest to my emerging theory, was reached in this study.

3.2.5 Theory Constructing (Integration)

In grounded theory, the discovered theory is not treated “as a byproduct of the ‘main work’ – making accurate descriptions and verification” (Glaser & Strauss, 1967, p. 185). The theory IS the main product. Theory is defined here as an ever-developing explanation or prediction of some phenomenon (Glaser & Strauss, 1967, pp. 31-32). Concepts and properties that emerge from the data, along with the general direction of relationships between them, drive the generation of theory. The resulting theory should be relevant and fit the data. However, it is not necessary to present and state all data in exact detail.

In the process of integration, the analyst links related concepts that make up a category or theme. Then the analyst links themes by identifying a core theme and linking other themes around it. In crafting the theory, the analyst works to reduce terminology and to generalize, resulting in parsimony and a clear scope. The theory itself is written using abstract themes to cover many concepts and properties or to write formal propositions. Grounded theory has both positivist (assumptions of an objective reality) and interpretive (assumptions of multiple socially constructed realities) aspects (Charmaz, 2006). The theory generated can also be either substantive or formal. A substantive theory is developed for a specific empirical area, whereas a formal theory is developed for a more conceptual area (Glaser & Strauss, 1967). For this study, I developed a substantive theory of the TOP initiative and disadvantaged community outcomes, and also a formal theory of any funding initiative and disadvantaged community outcomes.

Figure 3.2 shows the relationships between theory, themes, concepts, properties, and dimensions that evolved throughout the grounded theory process. I started in the middle by examining the evaluations to identify concepts, the properties of those concepts, and then different dimensions, or ranges of values, of the properties. Key concepts of interest were

identified and elaborated upon by identifying their properties until saturation occurred. Throughout the process, broader categories were developed to link concepts together, and categories were linked together to develop more coherent themes. Themes were linked together to generate theory. The key principle was to remain immersed in the data and to be open to twists and turns in the evolving theory. The Results section describes the final substantive theory that I developed, along with the concepts, properties, categories, and themes that were derived from the data along the way.

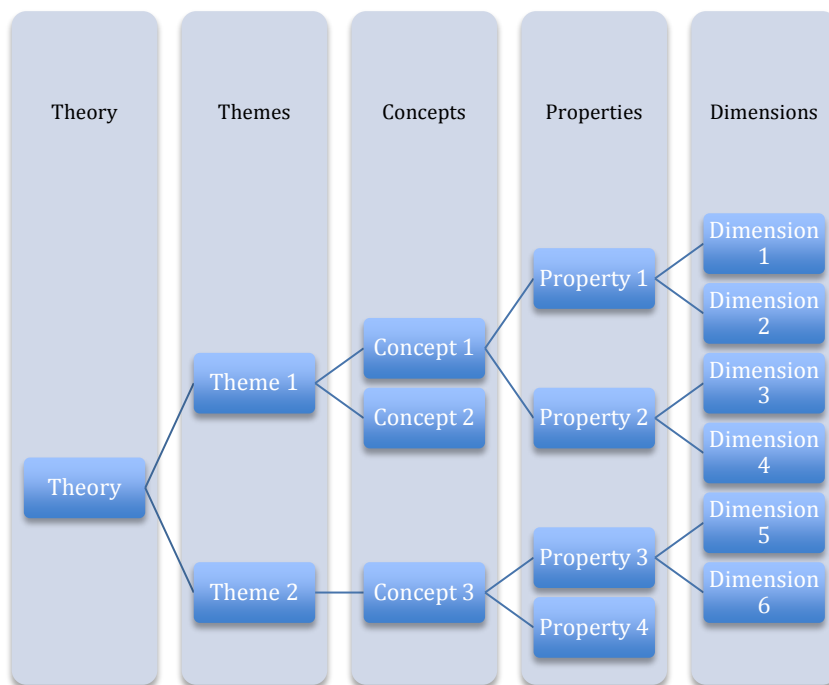


Figure 3.2. Relationship between theory, themes, concepts, properties, and dimensions.

3.3 Ensuring Quality of the Research

Corbin and Strauss (2008) outline the following conditions for ensuring high quality research: philosophical and methodological consistency, clarity of purpose, self-awareness, qualitative research training, sensitivity for the topic and participants, a willingness to work hard, an ability to relax and get creative, an awareness of the implications of methodological decisions, and “a desire to do research for its own sake” (p. 304). I believe that these conditions were met.

It is important to understand that the aim of this particular study was to generate theory – not to test it. “Integration is the final step for researchers whose research aim is theory building” (Corbin and Strauss, 2008, p. 274). This involves rereading memos to fit categories together, developing the story line, and “just plain thinking” (p. 274). Therefore, a codebook aimed at achieving generalizability and inter-rater reliability was not created as part of this study. Instead, the trustworthiness of the study’s results is based on the following criteria, as described by Edge and Richards (1998, p. 345):

- Credibility (internal validity): the provision of “a credible version of what happened, both in terms of description and interpretation”
- Transferability (external validity): the production of “understandings of one situation which someone with knowledge of another situation may well be able to make use of”
- Dependability (reliability): ensuring “that the inevitable changes in the situation being investigated, in the participants, and in the emergent design of the research itself are properly documented, so that the decisions made and the conclusions reached are justifiable in their own contexts”
- Confirmability (objectivity): “providing evidence which confirms the presence of the data according to the perspective, standpoint, or value-system espoused by the researcher.”

3.4 Summary

In this chapter, I described grounded theory, detailed the grounded theory process followed in this study, and outlined plans for ensuring quality of the research.

CHAPTER 4

RESULTS

This chapter presents the results of the grounded theory process described in Chapter 3. Sixty-three (63) project evaluations from the Technology Opportunities Program (TOP) served as the data for this study and are referred to as “TOP evaluations.” See Appendix A for information about each project, including the project name, project number, year of evaluation, full document title, and evaluation author(s). Throughout this section, direct quotes from the TOP evaluations are used whenever possible and are indicated inside quotes. All evaluations are referred to as TOP evaluations, even if they occurred when the program was officially called the Telecommunications and Information Infrastructure Assistance Program (TIIAP). While the presentation of results suggests a linear analytic process, it was actually quite iterative, allowing immersion in the data while remaining open to twists and turns in the evolving theory, as described in the Methodology chapter.

The overall research question was: How can community networking initiatives be structured to maximize positive outcomes for individuals from disadvantaged communities?

The following questions, drawn from the literature review, guided the initial examination of the data:

- What opportunities for collaboration were enabled by the community networking projects between previously unconnected individuals and organizations with differing levels of resources and/or status?
- To what extent do conditions prior to TOP grant funding appear to have affected project outcomes?

4.1 Coding and Categorization from Seed Evaluations

To initialize the research process and provide direction for the further collection of data, four Technology Opportunity Project (TOP) evaluations (described in Table 5) were examined closely with an eye toward providing insight into the guiding questions above. These four “seed” evaluations were selected because they represented several different aspects of the projects, such as: early/late timeframe during the TOP initiative, urban/rural population, new/enhanced infrastructure, and centralized/distributed population. Throughout the rest of this chapter, the seed projects are referred to by their acronyms, as shown in Table 4.1: LAFN, RUN, TSN, or TVN. Appendix B contains the detailed data memos I wrote up while coding each of the four seed evaluations.

Table 4.1

“Seed” Evaluations

Acronym	Project Title	Project #	Evaluation Year	Purpose
LAFN	Los Angeles Free-Net	06-40-94026	1997	<i>Expand existing interactive computer and telecommunications technology of the LAFN to all 19 million Los Angeles, California residents</i>
RUN	Project Rural Urban Network	21-40-95062	1999	<i>Install a fiber optic network to link the city government, public school system, library, and other institutions located in Louisville; to provide cable services to an inner-urban Enterprise Community in Louisville; and to set up teleconferencing in remote rural Pike County, Kentucky</i>
TSN	Tri-State Network Demonstration Project	28-40-94068	1999	<i>Expand an existing interactive framework and technological infrastructure developed by the Tri-State Education Initiative (an educational initiative established by NASA) to support economic development in select counties of Mississippi, Alabama, and Tennessee (550,000 residents)</i>
VTN	Virtual Tribal Network (VTN)	35-60-01068	2004	<i>Provide broadband Internet connectivity to five tribal museums and culture centers to enable development of web-based exhibitions and databases; cultural and arts education programs in traditional languages for the tribal members; and cultural education programs for the public</i>

The concepts and properties identified from these four evaluations helped shape subsequent data collection and theory formation. These concepts and properties are presented in this section,

organized into categories, to illustrate the analytical process undertaken during the course of this study.

The line-by-line reading and open coding of the four seed evaluations yielded a robust set of nearly 200 concepts and properties. Throughout the course of analysis, these concepts were organized into the following categories: project collaborations (history and stability, shared purpose, and investment), project design (intended beneficiaries and needed resources, barriers, and indicators), and transformative potential (outcomes, community involvement, and skill building opportunities). In the sections below, quotes from the seed evaluations that illustrate the categories are presented using quotes, and the concepts and properties, as originally coded from the seed evaluations, are presented in tables. Other than organizing the concepts and properties into the categories below, no further effort was made at refinement; they remain in their raw form as originally captured during analysis. The tables of concepts and properties are presented in this section to assist the reader in understanding how the grounded theory approach was employed in this study.

4.1.1 Project Collaborations

Each TOP project involved a collaboration of partners that were assembled as a project team in order to carry out the funded project. Collaboration project features included the relationship among partners before and during the grant, shared purpose established for the project, and investment in the project by collaborators. Table 4.2 lists the concepts and properties derived from the seed evaluations that relate to features about project collaboration.

Table 4.2:

Project Collaboration Concepts and Properties

Concepts	Properties
Champion Characteristics	Champion type Current relationship Timeframe started
Change	Change action Change timeframe Change type
Collaboration	Collaboration impact Collaboration partners Collaboration timeframe started
Collaboration Change	Change timeframe Change type
Cooperation	Cooperation mechanism
Entity Existence	Entity type Timeframe started
Existing collaboration	Collaboration purpose Collaboration type
Existing Resources (prior to grant)	Resources technology
Existing Status (momentum/inertia)	Physical networking of key entity Physical networking of partners
Existing Ties (prior to grant)	Connections economic Connections political Connections technological
Geography	Physical boundary changes
Investment Relationship	Funding type Investment direction Timeframe started
Legal	Legal action type
Marketing	Marketing timeframe
Network Composition	Existing constraints Quantity of players Variety of players
Partner	Partner type Partner willingness to get involved
Project	Official award administration Partners horizontal (level – eg, global, federal, regional, local) Partners vertical (sector) Project management Technical management
Project Origination	Driving need Model
Public relations strategy	Effectiveness/favorability Venue
Purpose	Economic incentive/orientation Purpose Motivation
Staff	Staff existing expertise Staff role

4.1.1.1 History and Stability

In some projects, the grantee organization assembled a project team consisting of organizations they had already collaborated with or were connected to in some way already – or at least the lead organization had a history of collaboration. In others, either the lead organization was new to collaborating and/or the collaboration itself was brand new, forged in order to pursue the TOP grant opportunity. Some collaborations remained solidly in place throughout the project evaluation period; others were less stable.

- LAFN: Founded in 1988 as a volunteer-run organization, the Los Angeles Free-Net (LAFN) had been in existence for several years by the time the TOP grant was awarded in 1994... “The LAFN President, a clinical professor of medicine at the University of Southern California and former Chief of Staff at both Encino Hospital and the Tarzana Regional Medical Center, was the founder of the LA Free-Net and remains a driving force behind its growth and its evolution.” This quote illustrates the existence of a “community network champion,” a single person who took an especially active role in promoting the community networking effort. Champions were often mentioned in the TOP evaluations, but were seldom explicitly named. However, their organizational affiliations usually were identified. In this project, “the grant recipient organization was the Los Angeles Free-Net Division of the H.O.P.E. Unit Foundation, an organization offering counseling and education for people with cancer housed at the Encino-Tarzana Regional Medical Center” Four new partners, with no explicitly-mentioned ties to the founder or to the Encino-Tarzana Regional Medical Center, also participated in the project. These health- and education-related organizations (El Camino Community College, California Lutheran University, South Coast Air Quality Measurement District Headquarters (in conjunction with the City of Hope National Comprehensive Cancer Center), and the USC-

Kenneth Norris Jr. Comprehensive Cancer Center) were selected based on a process of “graphical analysis,” to serve “as external nodes in the network by providing space for the frame-relay equipment.”

- RUN: The Jefferson County Public School system, the grant recipient for Project RUN, recognized early on “the need for overall community involvement in school improvement [with] more than \$41 million...contributed to the district through more than 1,100 partnerships over the past 10 years”... JCPS assigned paid staff to work on the project who “during the planning process... learned that other local organizations were in the process of developing their own networks.” JCPS brought in as partners the City of Louisville, the Louisville Free Public Library, the Louisville Science Center, Bellarmine College, and the remote rural Pike County School System. Interestingly, “Pike County was the home of the Kentucky Governor at the time the project began.” It is not clear from the data whether or not JCPS had ties to any of these specific organizations prior to the TOP grant. The collaboration appeared to be fairly stable throughout the project, while weathering some challenges: “There were delays in approval of various aspects of the project by the school system, which were related to an internal political situation. The city network also experienced delays at various times along the way. Typically, when one partner experienced problems, the others have taken responsibility to try to keep the project moving ahead.”

- TSN: The Tri-State Network experienced a dramatic change in collaborators from the very start – changing from being led by an educational consortium to an economic development organization that, in turn, handed over the reins to a university. This final partnership remained intact throughout the project period. The original proposal for the Tri-State Network was “developed and submitted by the Tri-State Education Initiative Consortium (TSEIC), a 501-C-3

not-for-profit organization of 30 school districts organized to work cooperatively to enhance and broaden the capabilities of their respective education systems” in the states of Alabama, Mississippi, and Tennessee. However:

After the grant was awarded, TSEIC decided against involvement and responsibility for the project and returned the award to the U.S. Department of Commerce because they had reservations about their capabilities for managing a complex project with such a large economic development component. Officials in the State of Mississippi Department of Economic and Community Development (MDECD) convinced Commerce to fund the project through them instead. Mississippi State University (MSU) was contracted to take over project operations with Johnson Controls World Services, Inc., as the onsite subcontractor. MDECD had little involvement in the project’s operations beyond garnering the support of the Yellow Creek site that housed the network hub.

- TVN: As one of the few “later era” TOP projects, the 2004 evaluation of the Tribal

Virtual Network (TVN) did not follow earlier evaluation formats for the TOP initiative.

Therefore, it was not clear from the evaluation just who the partners were in the project.

However, according to the original abstract:

The University of New Mexico's Arts of the Americas Institute will work with a consortium of Native American communities to provide broadband Internet connectivity to five tribal museums and culture centers...The tribal consortium involved in this project includes the Pueblos of Zuni, Jemez, and Pojoaque, the Indian Pueblo Culture Center of Albuquerque, and the Jicarilla Apache Nation.
(<http://ntiaotiant2.ntia.doc.gov/top/details.cfm?oeam=356001068>)

Based on information gleaned from reading the evaluation, the relationship between the University of New Mexico (UNM) TVN staff and the members of the consortium was not a close one “For each community, 2-3 persons were identified by the UNM Tribal Virtual Network staff to respond to the survey...Of the fourteen mailed surveys, ten were returned. Upon follow-up, it was determined that the four individuals who did not return the surveys were more administrative and had little involvement with the technical aspects of the TVN.”

4.1.1.2 Shared Purpose

For some projects, the foundational or uniting purpose is clear. For others, the sense of

shared purpose seemed weak – or even non-existent.

- LAFN: In the case of the Los Angeles Free-Net (LAFN) the original purpose was “to help him [the founder] set up an online resource to facilitate the exchange of medical information between physicians and the general public.” It did so by offering “special interest group bulletin boards, access to local, state, and federal legislative information, special K-12 interactive education programs, medical bulletin boards, electronic mail, and other services.” The TOP project represented a logical expansion of LAFN/s services by providing “a low-cost communications infrastructure that would allow toll-free access to the Los Angeles Free-Net (LAFN) and the Internet from most parts of Los Angeles County,” thereby making LAFN a general purpose access network for the Los Angeles region.

- RUN: The uniting purpose for one aspect of Project RUN was that “The school and the city realized that they could merge their efforts and thus avoid duplication of effort and cost” since both the City of Louisville and the Jefferson County Public School System were undertaking large infrastructure projects designed to benefit students and residents. As an additional part of the collaboration, “The Louisville Chamber of Commerce brought together representatives from the city, county, and state governments as well as local big business...[They] called their vision, ‘A Community of Access,’ and decided to focus on three service areas: health, distribution, and telecommunications.” Making this shared vision a reality involved negotiations among the key players. “For each section of the cable, the partners had to decide whose budget would be used to install and later maintain it. Working this out in advance took time and careful negotiation, but it was worth the effort in the end.”

- TSN: The Tri-State Network (TSN) represents a case where the project’s purpose of economic development and the focus of the original lead organization, the Tri-State Education

Initiative Consortium (TSEIC), were in such conflict that TSEIC withdrew from the project. “Conceived as an economic and community development project, the primary objective of the \$600,000 TIIAP demonstration project was to implement a community-based advanced telecommunications infrastructure that would support economic development efforts focusing upon Tishomingo County and impacting the surrounding region... After the grant was awarded, TSEIC had second thoughts about their capabilities to oversee a project with such a strong economic development focus.” The new grantee, the Mississippi Department of Economic and Community Development (MDECD) was more aligned with this goal as it was “interested in sponsoring the grant for the economic development gains it would bring to the region.”

- TVN: In the case of the Tribal Virtual Network (TVN), a shared common purpose among project collaborators did not appear to be established. The University of New Mexico (UNM) had a vision that was apparently not shared by its partner, a consortium of 5 tribal museums and cultural centers. The UNM’s vision stated in the project abstract was that “The Access Grid connecting the sites will allow the museums to develop web-based exhibitions and databases; cultural and arts education programs in traditional languages for the tribal members; and cultural education programs for the public.” However, a sense of disappointment was expressed in the evaluation that:

Consortium members are most frequently using the AG [the Access Grid] for the monthly meetings, however, some have used it to present health education to other members’ communities... UNM TVN staff expressed the opinion that it is likely that consortium members have not assimilated the technology into their typical duties...[and] some members may not have an adequate vision for the future use of the technology.

4.1.1.3 Investment

TOP grant funds required one-to-one matching contributions in order to show that the collaborations were invested in the effort. This means that for every dollar requested, the

collaboration had to put up a dollar – whether in cash or some other means. The seed evaluations demonstrated a range of investment strategies and corresponding levels of commitment.

- LAFN: Not only did Tarzana Regional Medical Center serve as “the original site and current home of the LAFN,” it also provided “a no-strings grant of \$50,000...room in the computer center...[and] 80+ phone lines.” Space for the frame-relay equipment was provided by the four other partners in the project: El Camino Community College, California Lutheran University, South Coast Air Quality Measurement District Headquarters (in conjunction with the City of Hope National Comprehensive Cancer Center), and the USC-Kenneth Norris Jr. Comprehensive Cancer Center – which also provided “15 free telephone lines.”

- RUN: “Most of the federal share went to the cost of the fiber; all the groups involved contributed staff time and in-kind contributions.” As the awardee, the Jefferson County Public Schools invested most heavily in the project by contributing a considerable amount of staff time. “The Executive Director of Educational Technology serves as the TIIAP project director...The Voice and Data Communications Specialist serves as the project coordinator...The 12 resource teachers of the Computer Education Support Unit provide training and ongoing daily support to users...A consultant with expertise in networking will serve as the project evaluator.”

- TSN. Mississippi State University managed the project and provided in-kind resources and staff time from seven university units. The National Aeronautics and Space Administration (NASA), through the Tri-State Education Initiative (TSEI) and the Tri-State Education Initiative Consortium (TSEIC) it had established in the region, provided funding, facilities to house the network hub and server, K-12 curriculum development materials, technical assistance, and the original technology infrastructure on which the project was expanded. Thus,

the TSN was able to leverage previous investments made in the region – particularly in the Yellow Creek site – by the federal government.

- TVN. It is not explicitly mentioned in either the abstract or the evaluation what the specific contributions were of the partners to the project. Therefore it is difficult to ascertain the perceived level of investment by partners in the project.

4.1.2 Community Networking Project Components

It was observed in the seed evaluations that while project collaborations served as one level of network, their purpose was to connect intended beneficiaries with needed resources using information and communication technologies (ICT). For analytical purposes, I will refer to these arrangements as “community networking projects.” Note that a “community networking project” is distinct from a community network (CN) as defined in the literature review. In the literature review, a CN is conceptualized as a formal “locally-developed and operated non-profit organization.” However, in the community networking projects included in this study, only a few, such as the Blacksburg Electronic Village (54-40-95052) and the LA Free-Net (06-40-94026), were formal CN organizations. Most of the TOP projects did not include, or intend to develop into, formal non-profit organizations. However, all projects involved the incorporation of ICT for the purpose of enhancing communities, or intended beneficiaries, in some fashion. Therefore, for purposes of this study, a “community networking project” is defined as a project that incorporates ICT for the purpose of enhancing communities.

This section provides examples from the seed evaluations of the various components of community networking: intended beneficiaries and connections, barriers encountered, and measurement indicators.

4.1.2.1 Intended Beneficiaries, Connections, and Resources

Viewed typically as lower-resourced actors in need of assistance, most TOP projects characterized intended beneficiaries in terms of disadvantage or things they lacked. Intended beneficiaries were expected to benefit from ICT-enabled interventions that connected them to resources such as information, plans, services, or solutions. Table 4.3 lists the concepts and properties extracted from the four seed evaluations that relate to intended beneficiaries and connections to needed resources that were expected to be made through ICT-enabled interventions.

Table 4.3

Intended Beneficiaries and Connections to Resources Concepts and Properties

Concepts	Properties
Beneficiary	Beneficiary demographics
Benefit	Benefit type Level of cognitive dissonance
Catalyst	Catalyst source
Choice	Who to serve for grant
Connection	Connection opportunity Connection status due to grant Connection status prior to grant Connection type Inequality (barrier) Inequality (between nodes that connect)
Higher-Resourced Actor (The “Haves”)	Engagement level in project (project at time of report) Engagement level in project (project start) Resource type
Information (content)	Information type Public access
Intended Beneficiary	Ownership Past history with other actors Project receptiveness
Linkage	Commonality Linkage mechanism Linkage type
Lower-Resourced Actor (The “Haves”)	Engagement level in project (project at time of report) Engagement level in project (project start) Need type
Members	Member responsibilities Membership status
Neediness	Population identified Population type

(table continues)

Table 4.3 (continued).

Concepts	Properties
Network Broker	Backup Criticality Level of service provided Network broker type Service provided
Plan	Plan component Planned solution
Problem	Problem source
Service Opportunity	Activation level (project of report) Activation level (project start) Connection cost Connection effort Connection quality Continuation plans Ongoing operations Self-supporting potential Service delivery method Service quality Service type
Services	Service level planned Service type
Solution	Solution description Solution type

- LAFN: In the LAFN project, the intended beneficiaries were all LA residents, who were deemed a disadvantaged population was based on the geographical boundaries of the local telecommunications system. “The majority of [19 million] Los Angeles residents were discouraged from using LAFN resources because the connection required a long distance telephone call.” This deprived them of LAFN’s “communication, education, and information services [offered] via interactive computer and telecommunications technology.” An example of how such ICT-enabled interactivity was envisioned to connect intended beneficiaries to needed resources was LAFN’s plan “to reinstate one of the original services offered through LAFN, Ask the Doctor, which allows users to anonymously receive answers to medical questions from experienced physicians. Ask the Doctor had been discontinued prior to the TIIAP award due to a lack of participation on the part of physicians. The network now has a large base of doctors who

use the system and LAFN administrators are in the process of resurrecting this service using an online chat forum.” The hope was that the ICT-enabled chat forum would create a direct connection between residents (lower-resourced actors) and doctors (higher-resourced actors). While the specific “Ask a Doctor” feature had not been implemented by the time of the evaluation, “LAFN has...facilitated a great deal of networking and communication among the local medical community...LAFN regularly hosts realtime online chats with experts in the health field. In the 3 years since the program began, 11 Nobel laureates have participated.” Thus, medical professionals (the higher-resourced actors) were benefiting from the connections fostered through the ICT intervention.

- RUN: In addition to its primary intended beneficiaries of the Jefferson County school system and Louisville municipal partners, Project RUN targeted two disadvantaged communities: an impoverished urban enterprise zone and a remote rural county. The primary aim of Project RUN was to link selected government, public, and private organizations in Jefferson County to “a 17-mile fiber optic network.” However, to demonstrate the ability to connect all area students and citizens to the new network, “the district decided to build a demonstration network in the Enterprise Community, which has a high level of poverty,” and they extended the project to “reach out to Pike County, a very rural area at the other end of the state...[by installing] teleconferencing classrooms.” While not much was written about the specific ICT-enabled interventions instituted to enhance the Enterprise Community, teleconferencing “gave the Louisville Zoo the opportunity to educate students who could not normally come to the zoo and built a much stronger link between the zoo and Pike County. Also, it gave the incentive to a few classes to visit the zoo.”

- TSN: The Tri State Network was primarily intended to benefit a remote region of a

tri-state area of Mississippi, Alabama, and Tennessee. “The grant was awarded to help alleviate rural isolation and a lack of telecommunications resources and infrastructure in the northeast corner of Mississippi. The primary objective of the project was to implement a community-based advanced telecommunications infrastructure that would support economic development efforts focusing upon Tishomingo County and impacting the surrounding region.” ICT-enabled cultural activities were established to help achieve TSN’s economic development aims of recruiting business and industry to the region. “A prototype for a comprehensive cultural/education network for schools and the community was initiated with a linkage to the Smithsonian Museum of Natural History in Washington, D.C...” The result was that “electronic communication and information technology...made possible the interaction between school children in Mississippi and museum scientists and curators at the National Museum of Natural History.”

- TVN: The Tribal Virtual Network targeted five Native American tribes, which are “grappling with a variety of issues having to do with maintenance of their cultural heritage” and sense of identity. The ICT intervention was the Access Grid (AG), Internet, and software to “enable museum officials to access professional training online.” However, the training needed in order to use the AG was not readily available, and the intended beneficiaries were not able to effectively use the ICT intervention. “While most of the responding members did not attend the first AG training, most attended the training in Chicago and found it beneficial...Members indicated a desire for more AG training. In particular, troubleshooting, designing and setting up an AG room...Community members lack sufficient knowledge to use the equipment and further community based training is needed.”

4.1.2.2 Barriers

The seed evaluations often described barriers getting in the way of the community networking project’s ability to achieve positive outcomes for the intended beneficiaries.

Concepts and properties related to barriers are shown in Table 4.4 and include issues relating to hardware, software, training, hours of operation, and trust.

Table 4.4

Barriers Concepts and Properties

Concepts	Properties
Barrier	Access to equipment Access to training Computer lab advertising Computer lab equipment Computer lab hours Computer lab location Computer lab software Equipment Frustration Geography Information sharing Perceived relevance of training Project coordination Software Time Time gap between training and getting equipment Training space Trust experience between beneficiaries and project awardee Trust level between beneficiaries and project awardee (legitimacy) Understanding Scheduling

- LAFN: The biggest barrier to success for LAFN involved challenges dealing with the existing telecommunications providers. “Project administrators had several problems working with local telephone companies, describing them as amorphous organizations in which it is hard to determine anyone’s responsibility.”

- RUN: In project RUN, it was noted that “The political and legal aspects of the project rather than the technical produce the main problems.” Specific barriers to use of the telecommunications equipment at Pike County included scheduling and usage challenges.

“Scheduling time for the necessary connections is very complex. Some classes had to be cancelled because of snow days during the winter months and then had to be rescheduled. On two occasions, the hookup was delayed...[It was] difficult to get students to use the teleconferencing equipment appropriately, such as speaking up, pushing the buttons to speak, and interacting with people at the other site.”

- TSN: TSN encountered significant project coordination and information sharing challenges. “The large number of components and players involved in the project created issues of coordination and organization...Changing key players midstream was a significant issue in both the organization and execution of the project goals...Furthermore, the broad scope and multifaceted organization of the project made it difficult for area residents to know whom to contact with which questions or concerns...” The project also encountered what appears to be outright obstruction. “To expedite the establishment of the TSRC, NASA offered temporary space for the hub at the Tishomingo County Educational Complex near Iuka. The hub and officers were set up there, with the hope and design that they would be moved to Building 1000 at the Yellow Creek site as soon as it became available. Unfortunately, this did not happen. Essentially, this involved building a system “from scratch,” which delayed the full operation... Project staff...had a difficult time accessing several federal databases containing information about the project site that was needed for the architectural survey...NASA was not the only organization unwilling to share data... MDECD directed the project staff to limit the GIS data available to the general public and economic developers from around the country.”

- TVN: The TVN was riddled with barriers, including infrastructure, equipment, training, staffing, and space. “Some members noted that not having the equipment in their communities when they attended training hampered the transfer of the knowledge and

skills...Over half of the members mentioned infrastructure barriers such as equipment problems, needing larger rooms for training and reliable internet connections...Also, the gap between attending training and obtaining the proper equipment served as a barrier...Lack of time and frustration were also noted as barriers...Two key positions for the TVN, the program coordinator and technical support, were vacated and not filled for several months.”

4.1.2.3 Indicators

The evaluations included several indicators for measuring project outcomes, as shown in Table 4.5. Project success can be based on such things as training attendance, ICT usage, assimilation, or sustainability, for example.

Table 4.5

Indicators Concepts and Properties

Concepts	Properties
Indicator	Assimilation Attendance Interest Expectations
Missing Data	Missing data type
Pre-existing conditions	# of computers Assessments in place Curriculum in place Length of time Ratio – users: computers
Success Contributor	Collaborations enabled
Success Factors	Time to completion
Success Indicator	Success indicator measure Success indicator result Success indicator type Success indicator verification
Sustainability	Projects
Sustainability Plans	Service to be sustained Who to take over service
Usage Indicator	Activity Activity status Customer Uptake

- LAFN: An indicator of success for LAFN was the legitimacy and traction it gained as a TOP-funded project. “TIIAP funding not only was critical for implementing the network, but

it validated the network in the eyes of the community. Universities and community organizations were found to be more willing to work with a network that has received a seal of approval from the Department of Commerce.”

- RUN: Project RUN used time to completion as a measurement indicator. “The project has received two extensions. At the time of the site visit, it was considering asking for a third... The project took longer than anticipated.”

- TSN: Sustainability of the telecommunications network beyond the grant period was a primary indicator for TSN. “Network operations were smoothly transitioned to the Tishomingo County school system.” Another important indicator was trust in the project leadership, given the region’s history. “The local economy had been devastated by a series of abandoned federal initiatives; the community was very reluctant to support the TIIAP initiative. However, once the communities came to understand that this project was being carried out by a local state university rather than a federal agency, the atmosphere changed. Project staff worked hard to reward the community’s trust by providing opportunities for citizens to improve their economic and educational opportunities.”

- TVN: Attendance at trainings and community and consortium use of the Access Grid was an indicator for TVN. “According to a 2003 NEH Project Performance Report, over 300 community members from each of the five tribal communities attended these workshops...[Yet,] community use of the new technology has been minimal...Consortium members have not assimilated the technology into their typical duties.”

4.1.3 Positive Outcomes

Often, a purported goal of community networking projects was the achieving of positive outcomes – particularly for individuals from disadvantaged communities or populations.

Concepts and properties from the seed evaluations related to positive outcomes are shown in Table 4.6. Reported outcomes from the evaluations are described in this section as well as two aspects of community networking projects that appear to be particularly important factors in contributing to positive outcomes: the direct involvement of community stakeholders and technology skills-building opportunities connected to employment.

Table 4.6

Potential Positive Outcomes Concepts and Properties

Concept	Properties
Brokering Outcome	Audience transformed/affected Benefit type Consequence effect Consequence type Legacy format Legacy type Network tie direction Pathway Prior connection Tipping point Transformation mechanism Transformation reason Transformation type User (stakeholder) details User details collection barriers User details collection techniques
Community	Community based Community use Connection to wider digital community Gap between perceived (by evaluator) vs. actual (expressed in results) interest Internet availability
Community Engagement	Participation level
Community Engagement Recommendations	Type to increase
Community Support	Evaluation timeframe level Startup support level
Development Opportunity (working on the project)	Development type
Employment Benefit	Co-location of staff Job pay On-the-job learning
Expected Transformation	Transformation area
Feedback opportunity	Feedback method Feedback type
Impact	Impact area Impacted population

(table continues)

Table 4.6 (continued).

Concept	Properties
Stakeholder Engagement	Timeframe started Volunteer involvement
Sympathetic Community	Victim quantity
Sympathetic Community	Victim timeframe
Training	Topic
Unplanned Benefits	For whom
Unplanned negative outcomes	Type
Vulnerability	Vulnerability area
Workforce	Workforce status

4.1.3.1 Reported Outcomes

The four seed projects resulted in varying types of success, ranging from very little evidence of positive outcomes to significant success of the project.

- LAFN: Project evaluators deem LAFN a huge success. “The most important outcome of the grant was that it enabled LAFN to become L.A.’s most significant presence on the Internet. LAFN has come to be viewed as a gateway to the larger ISPs, serving an important role in exposing people to the Internet [and] absorb[ing] some of the burden of training new users that is often faced by the larger ISPs...The LAFN project is clearly a success in that has managed to expand network access to a degree far beyond what the project planners anticipated.”
- RUN: RUN was successful in installing a considerable amount of fiber optic cable, but it was acknowledged that “more cable needs to be installed before the full benefits of the system can be realized.” However, the outcomes for “quality and effectiveness of new applications and services” were less clear. “It was expected that the ‘education process’ would be greatly transformed by the facilities and services provided by the project. No details about what would be evaluated were included.”
- TSN: Despite numerous obstacles, TSN was reported to have been a success as demonstrated by “the tremendous level of community support that was garnered in an initially reluctant population. Community members became involved in all aspects of the project. The

educational aspects of the project in particular should establish lasting impacts on the county's teachers and students. And the economic development supports and resources developed through the project have encouraged local industry to take advantage of worldwide commercial opportunities available via the World Wide Web and persuaded businesses and industries to locate in the area. An important factor in the project's success was the multi-discipline collaboration that occurred between campus groups that typically do not work with each other."

- TVN: Evaluators for TVN reported very limited positive results. "One community is using the video editing with youth, and there have been TVN sponsored diabetes education programs for the elders in the communities. One consortium member has plans to market the usage of the AG [Access Grid] to groups within the community for distance education and teleconferencing."

4.1.3.2 Community Involvement

A main form of engagement by the intended beneficiary communities in the four seed projects, when it occurred, came in the form of community volunteers.

- LAFN: Volunteer engagement presented a very direct way for the community to be engaged with LAFN. The network had volunteers serving in all areas – including as mentors, webmasters, content management, training, user registration, and technical support. "Much of the success of LAFN is directly attributable to the dedication and enthusiasm of its volunteers."

- RUN: Instead of bringing stakeholders onto the project, the RUN project director became involved in the community – at least for the project's primary goal. Louisville Chamber of Commerce brought together representatives from the city, county, and state governments as well as local big business to look for niches in which the city could stand out as a means of attracting further growth and development...The TIAP project director served on the

telecommunications committee of this endeavor...as a member of the planning committee that is implementing the statewide telecommunications system and electronic network.” However, for the project’s other two goals, it was not clear whether stakeholders from the targeted Enterprise Community or remote Pike County were involved in the effort.

- TSN: While community engagement in the project at first seemed non-existent, under the project leadership of Mississippi State University, community members became heavily involved as volunteers. “During its 3-year existence, the Tri State Initiative has also incorporated the efforts of over 150 professional facilitators and trainers and a volunteer work force that has donated more than 25,000 hours of their own personal time to its projects.”

- TVN: Based on the evaluation, members of the tribal consortium communities appears to be most involved in TVN as passive recipients of the Access Grid technology and associated training rather than as active participants.

4.1.3.3 Skills Building Opportunities

Staffing for TOP projects appeared to provide many opportunities for technology skills building. The four projects differed in the extent to which intended beneficiaries were encouraged to engage in these activities.

- LAFN: Volunteers gained valuable experience in helping LAFN. “Volunteers report that they are motivated to work with the network primarily by the intrinsic rewards their assistance offers. They feel that they are providing a worthwhile community service and they recognize that the assistance they provide is critical to the network’s success... [and] intrinsic rewards of their efforts have increased as the network expanded...”

- RUN: All the staff positions on project RUN appear to have been filled by staff of the Jefferson County Public School system. “The Executive Director of Educational Technology

serves as the TIIAP project director... The Voice and Data Communications Specialist serves as the project coordinator... The 12 resource teachers of the Computer Education Support Unit provide training and ongoing daily support to users.” There is no mention of volunteers.

- TSN: Project staff from Mississippi State University gained valuable skills from the TSN project. “The experience of generating high-quality, creative products and events under pressure, using leading-edge software and hardware was nevertheless considered beneficial by the project team because it increased their knowledge about technical systems and the time requirements necessary to produce quality results... Despite these difficulties [with understanding LATA lines], and despite the fact that the network nodes in Tennessee and Alabama ultimately received only minor use, the project director felt that the out-of-state nodes were worth installing because they provided an opportunity to learn about the issues involved in interstate telecommunications.” The evaluators also noted that “The evaluation detected a substantial amount of volunteerism among residents of the tri-state project area. This is an untapped resource that holds potential promise for not only expanding the program, but also entrenching the technology in the social fabric of the community.”

- TVN: A suggestion from one of the survey respondents suggests that an opportunity exists within TVN for paid staff to be trained from within the target community. “Need for basic backup training for assistants to the techies – at present if the one tech is unavailable AG system cannot function.” However, there was no indication that this suggestion was acted upon.

4.2 Identification of a Core Theme

From the original list of concepts and properties derived from the four seed evaluations, followed by reading additional evaluations to get a sense of breadth, a set of themes emerged. After reflecting and elaborating on the various concepts, properties, and themes through the

course of writing memos (included in Appendix C), the axis around which the themes seemed to organize was that of grants as the connecting thread – before, during, at the point of evaluation, and after TOP. What seemed most important was how the collaborations between grant partners evolved over time and the collaborations’ level of commitment toward addressing the needs of the intended beneficiaries. The sections that follow describe the phases in the TOP grant process and the related themes (without any further refinement) that emerged from the data. Analysis includes information from TOP evaluations beyond the seed evaluations, with direct quotes indicated in italics.

4.2.1 Prior to the TOP grant award: Collaboration features.

The evaluations pointed to the significance of aspects about project teams as they were forming prior to the awarding of the TOP grants, as described in Table 4.7. Such aspects include the strength and nature of prior relationships.

Table 4.7

Themes Related to the Proposal Phase

Theme
Acceleration of what was happening anyway
Collaboration challenges – agreements
Collaboration features – levels of partners, pre-existing
Existing vs. new
Extremes: e.g., Columbia & Harlem; Yale & New Haven – town vs. gown
Legitimization of partnership (especially when previous “bad blood”)

Several projects noted the importance of clear written agreements among partners no matter who the intended beneficiary was: students, families, service organizations, and/or businesses. In the Western Brokering Project (08-50-94067), “Staff found that legal contracts and other special arrangements with state agencies and local institutions would [help] ensure that all students had access to the equipment, library and computer resources, and the Internet that they needed to participate in distance learning programs... [and it was critical to] facilitate joint

agreements and contracts in writing between all parties.” This project, among many others, also noted that “it would have been useful...to conduct some sort of needs assessments...” The Middle Schools Online project (24-40-94063) noted that a key lesson learned was to “prepare formal agreements with participating schools and families...[to] insure that all stakeholders begin the process with common expectations.” Similarly, a key lesson learned for the Grace Hill Neighborhood Services project (29-40-94082) was to “Develop formal agreements with other agencies that will be using agency computers.” In Biz-Pathways Minnesota’s Virtual Entrepreneurs’ Network (27-60-01024) “there is a clear understanding that MRP [Minnesota Rural Partners, a rural development council] created this project, recruited partners to it and must continue to play the role of lead partner...”

An important feature of the collaboration was the underlying shared purpose with regard to why the particular set of partners chose to work together. Often it was not clear exactly how the collaboration would benefit the intended beneficiary community. Theoretical sampling to the point of saturation yielded five types of shared purposes: workforce, clients, consumers, personal connection, and topic of interest. Here are some examples:

- Workforce: In projects such as the City Heights Community Technology Center (06-60-01048), Biz-Pathways (27-60-01024), NebWorks (31-60-98021), and SmartCities (29-60-94059), the promise of ICT to cultivate a workforce was the binding thread between partners.
- Clients and/or K-12 students (recipients of non-profit services): In projects such as Plugged-In (06-60-95039), L.E.A.P. (09-40-94002), Grace Hill Neighborhood Services (29-40-94083), St. Louis WhizKids (29-60-03001), and Metro Chicago Information Center (17-60-01040), collaborating organizations not only served the same demographic population, they even shared many of the exact same people on their caseloads.
- Consumers (recipients of for-pay goods and services): A shared set of consumers, often based on a geographical region, formed the basis of partnerships centered around:
 - Education: Western Brokering Project (08-50-94067)

- Medicine: Mobile Community Health Information Network (01-60-95002) and NetWellness—Ohio Valley Community Health Information Network (39-40-94081)
- Telecommunications infrastructure: OneNet (40-40-95113), Project InterLine (31-60-95010), and TSN (28-40-94069)
- Personal connection: LAFN had partners who shared connections with its founder. In RUN, Pike County may have been included because it was the home community of the Kentucky governor.
- Topics of interest (objects of study or work): In the case of TVN (35-60-01068), Indian artifacts were the shared interest between the University of New Mexico’s Arts of the America’s Institute and the five tribal cultural organizations that made up the consortium. For the Coastal Monitoring Network (06-60-01015), the oceans were the shared topic.

4.2.2 During TOP Grant Period: Interaction Methods

As shown in Table 4.8, there were different underlying assumptions about and means of interacting between the project collaborators and the intended beneficiary community.

Table 4.8

Themes Related to the Active Grant Period

Theme
Assumption that connecting “disadvantaged” outliers to the “advantaged” center (bridging) is better than building on internal strengths (bonding)
Clients as indirect beneficiaries
Consumer/user involvement
Direct (people to tech) vs. indirect (people-serving organization to tech)

Theoretical sampling to the point of saturation on methods of interacting with intended beneficiaries revealed direct methods, indirect methods, and both direct and indirect methods. The Women’s Opportunities Resource Center Electronic Commerce Initiative (42-60-01053) was directly used by the women entrepreneurs it was intended to benefit; whereas the Providence Community Resource Network (44-60-99019) shared neighborhood level information to providers that then served the intended beneficiary, residents in the West End/Elmwood Opportunity Zone. The Choices Bank Project (30-60-01045) provided an advanced directives

portal that could be accessed either directly by severely ill or injured people and those who care for them or indirectly through institutional providers, such as hospitals, clinics, aging, hospice, and nursing programs. In some cases, projects changed from providing services and benefits directly to indirectly. For SmartCities (29-60-94059), “instead of recruiting and building a new organization, we chose to accomplish our mission by working with and through existing organizations.”

4.2.3 At Point of Evaluation: Impact on Intended Beneficiaries

The themes shown in Table 4.9 indicate significant problems in the effective evaluation of outcomes for disadvantaged communities.

Table 4.9

Themes Related to the Point of Evaluation

Theme
Existing community demographics – no attempt to measure change for participants
Impact/outcomes data not collected, no baseline data
Varying infrastructure needs & capabilities at start affected success
What does not get done – focus groups/assessment for low-income

There seemed to be a general lack of concrete outcome indicators at the community level – even when such indicators had explicitly been planned. For TSN’s remote communities, about 1500 baseline phone interviews were conducted in the region early in the project, but a planned follow-up survey of “about the project’s effects and impacts” was not done. And “there has been no attempt to document or evaluate project impacts on end users at the expansion sites in Alabama and Tennessee.” In Idaho Public Television’s DTV Datacast Planning Grant (16-60-99006), the goal “greater public awareness of public TV DTV possibilities and the issues involved in providing data services to those rural areas” was dropped. In Harlem’s LEAP project (09-40-94002), “there were plans to conduct two focus groups to assess the uses of technology in low-income communities and the accessibility of technology to low income clients. However,

these did not occur.” A quote from the Plugged In project (06-60-95039) sums up the challenges to evaluation at the community level, “Counting people who got jobs, improved test scores, or went to college as a result of involvement is not only difficult to do, but impossible to attribute to any one program. Staff are comfortable telling the stories of frequent users, how they use Plugged In’s services, and quoting the users’ views of impacts, but they are unwilling to boast of achievements and make claims of impact that are difficult to substantiate.”

4.2.4 Toward End of TOP Grant: Sustainability

Sustainability of the community networking efforts beyond the grant period were discussed in most of the project evaluations. The themes indicated in Table 4.10 suggest several possible sustainability outcomes: some project collaborations were likely to simply “end” when the grant funding ended; some showed a likelihood of continuing in either their current or a related form as “spinoffs”; other projects seemed to completely “morph,” continuing in new directions or with different partners.

Table 4.10

Themes Related to the End of the Grant Period

Theme
Abandoned efforts (competing, spinoffs)
Capacity building: strengthened ability for future collaborations & grants
Collaboration challenges – sustainability
Networking benefits: communication, information access, new lasting collaborations
Partners changed after project ended
Original plan changes: purpose, partners, funding, users

Three of the four seed collaborations seemed likely to continue in some capacity. The strongest continued collaborations were to build upon co-developed infrastructure, while explicit commitments to serve disadvantaged communities appeared to be weak.

LAFN seemed to be in a stable position, with plans to keep expanding. “Current projections show that user fees will fully cover all operational expenses associated with

maintaining the network and possibly expanding the user base and the range of services provided... LAFN management are also actively seeking grants to help underserved community segments utilize the network.

The partnership to build up Louisville's infrastructure in project RUN was continuing. "The school district and its partners will continue to install fiber optic cable. In 5 years, the district hopes to have a LAN in all local schools and about 100 of the 150 schools on fiber optic cable." More vague were "future ideas in which the zoo and Pike County may participate..." Conspicuously, the Enterprise Community was not mentioned in future plans.

Spinoff collaborations involving Mississippi State University boomed as a result of its success in the TSN project. "A beneficial part of the project was the establishment of ties by MSU to the Smithsonian, NASA, and the U.S. Department of Education. The continuation of these ties and the development of future projects with these agencies has been an added benefit from the project." The project also resulted in "strengthened ties between MSU and the Tishomingo County Special Municipal Separate School District." MSU became heavily involved in "educational and training activities outside the university using distance learning technologies...[and a] new Center for Education and Training [was established as] a mechanism for interdisciplinary ventures." MSU's relationship with the Smithsonian Institution National Museum of Natural History led to several spinoff ventures. The project "put MSU's School of Architecture on the map by securing their reputation with state agencies and within the architecture community." However, a key part of the TSN initiative was halted: "The Attorney General ruled to disallow the project to compete as an Internet service provider (ISP)." This signaled an awareness that taxpayer funding of infrastructure projects might unfairly compete with the private sector – a point of contention that continues in the current day with the

Broadband Technology Opportunities Program (BTOP), the NTIA's current program to build out the National Information Infrastructure (<http://cagw.org/media/press-releases/house-holds-hearing-stimulus-expansion-broadband>).

There was no indication that the TVN collaboration between University of New Mexico and the five tribes would continue since "use of the TVN technology in the community is minimal."

Several projects completely changed direction or morphed at or near the end of the TOP grant period – often leaving key collaborators out of future plans. In the case of the Mobile Community Health Information Network (01-60-95002), "Additional funding has been secured for the system, but it will not be administered under the same project director. Continued support for users outside of the USA Hospital System is questionable since there is currently no formal mechanism for it. The considerable effort invested in developing sound relationships between the USA hospitals and the individual community health centers may be lost unless the centers are kept alongside the hospitals in moving forward with the technology."

The Western Brokering Project started with a goal to provide distance education among existing educational institutions to underserved and placebound students throughout 15 western states. However, "just as Brokering Project staff were beginning to investigate strategies for long-term sustainability, the Western Brokering Project staff were given the opportunity to work on the development and implementation plans for the new Western Governors University (WGU), a virtual university operating entirely at a distance and offering other institutions' courses and programs as well as developing its own programs. Staff were able to transfer their experience and lessons learned through the Brokering Project to WGU... Had that opportunity not come along, staff speculate that the Brokering Project would have (1) become more closely

aligned with the WICHE [Western Interstate Commission for Higher Education] Student Exchange Programs (SEP), and (2) attempted to adapt distance education to existing exchange strategies.”

4.3 Theory Components

Weaving back and forth between coding and analyzing the data (the 63 TOP evaluations), a pattern emerged about how disadvantaged communities were treated throughout the grants process. The same types of populations were mentioned again and again as being the intended beneficiaries, but these communities were not always active participants in the community networking project collaborations designed to assist them, numerous barriers prevented the introduced information and communication technologies (ICT) from being effective, and evaluation data demonstrating project outcomes at the community level seemed scarce. In the final analysis, despite the ICT interventions, individuals from these populations or communities often showed little evidence of having their lives enhanced or transformed – despite a lot of grant money spent on these transformation efforts. Thus, there were four major components at play here: the grant process, community networking interventions, “vulnerable” communities, and evidence of positive outcomes.

4.3.1 The Grant Process

Partial funding for each of the Technology Opportunities Program projects occurred as the result of a *grant process*. The grant process can be defined as the process of an organization applying for and receiving a grant in order to accomplish some purpose. My understanding of the typical grant process is drawn from my experiences with grant writing, beginning with community networks in 1995 and continuing to this day in my university role in grant proposal

development. The typical grant process, from the perspective of the organization applying for and receiving the grant, involves the following four phases:

1. In the *partnership building* phase, the lead organization assembles a team of individuals and other organizations that can contribute knowledge, manpower, money, or other resources designed to achieve a specific goal. The primary outcome of this phase is *commitment to a shared purpose* among the partners and an action plan for carrying out the project.
2. During *project execution*, which occurs when the grant is awarded, the action plan is carried out. However, sometimes the scope of the project is revisited and possibly modified in order to maximize the possibility of “success.” The outcome of this phase may include *changes* to the project.
3. During *evaluation*, the overall success and impact of the project is assessed through the development and measurement of specific *indicators*.
4. Upon *close-out* of the project, barriers, lessons learned, and evidence of success from the project are reported. The main outcome of this phase includes plans, if any, for *sustainability*.

4.3.2 The Community Networking Intervention

The *intervention* employed during the Technology Opportunities Program was *community networking*, defined, for purposes of the analytical section of this study, as the use of information and communication technologies (ICT) to enhance communities. Community networking interventions in TOP projects included Internet access, training, hardware, various software applications, and other innovations that were designed to help disadvantaged communities gain access to things like services, skills, and information. Rather than describing the technological aspects of the different types of proposed interventions, this analysis focused on the *relationship*, fostered by TOP *grant funding*, between the *proposed intervention* and its *intended beneficiaries*. Of specific interest was which specific community networking projects showed the most promise for leading to positive “transformative” outcomes for enhancing the lives of its intended beneficiaries – particularly for individuals in disadvantaged communities.

4.3.3 Vulnerable Communities

While conducting theoretical sampling to the point of saturation, types of intended beneficiaries included communities or populations that were disadvantaged due to:

- Geography (i.e., remote and/or rural communities)
- Socioeconomics (e.g., low income; high levels of unemployment; low education levels; unskilled, outdated, or obsolete workforce; high racial/ethnic diversity)
- Limited mobility (e.g., “place-bound” individuals, such as the severely ill, injured, or handicapped; students who have to be educated at home; mothers with young children; prisoners)
- Service need (e.g., individuals who require social services intervention such as AIDS patients, the mentally ill, at-risk youth, ex-offenders).

Disadvantaged communities or populations are particularly susceptible to utopian claims that technologies can level the playing field (Virnoche & Marx, 1997). *Vulnerable communities (VC)* is a term coined in this study to denote disadvantaged populations or communities that are often repeatedly targeted for intervention, particularly in grant proposals. What makes these populations or communities vulnerable is the potential for exploiting them in order to attract grant funding while they themselves gain no lasting benefit from the infusion of funding. Thus, the VC construct contains three parts: 1) disadvantage, 2) identification as an intended beneficiary in grants, 3) at risk for receiving little or no lasting benefit from grant funding.

Three of the four seed evaluations suggest the existence of vulnerable communities:

- The Tribal Virtual Network (TVN) project involved a consortium of Native American communities. As indicated by the number of available grant opportunities (83 of them, according to <http://www.rlnn.com/types-grants-native-americans>), Native Americans are often specifically identified as disadvantaged, although it is unclear from this TOP evaluation whether the five tribal museums and culture centers targeted for this community networking intervention had repeatedly been identified in other grants.

- In Project Rural Urban Network (RUN), there were two suspected VCs. This first was an Enterprise Community, “an inner-city area that is experiencing a high level of poverty.” By definition, Enterprise Communities are explicitly and aggressively targeted for intervention through “public-private partnerships with financial institutions, governments, community organizations and other partners...” (Enterprise, 2014) A second VC was remote rural Pike County. “Pike County is in the Appalachian Mountains, at the opposite end of Kentucky from Louisville... largest county in the state, but the population is only 72,000... Three teleconferencing centers were already located in the Louisville area and one was installed in Pike County as a part of the TIIAP project. (Pike County has two additional teleconferencing facilities that were funded through other sources.)” The fact that such a sparsely-populated region received three grant-funded teleconferencing ICT interventions is a strong indicator of a vulnerable community.

- The most clear example of a VC among the seed evaluations was the Tri-State Network (TSN). “Tishomingo County ranks 46th out of the 82 counties in Mississippi with a per capita income of \$10,446... The federal government spent billions of dollars on failed ventures over the years at the Yellow Creek site in the northeast corner of Tishomingo County... As a result of these failed ventures [1975, 1982, 1995], the economy of the region has experienced tremendous up and down cycles in which the economy temporarily booms as thousands of people move to the area and new hospitals, schools, cultural facilities and highways are built, and then the economy suddenly crashes. Consequently, residents in the area are very hostile toward the federal government and suspicious of any new initiatives” In this case, harm had historically befallen the VC as a result of repeated interventions.

There was evidence of potential VCs in nearly all of the TOP projects. Of particular note,

however, were several projects that exemplified the “town and gown” phenomenon (McGirr, Kull, & Enns, 2003). The Plugged In project (06-60-95039) served “East Palo Alto...a diverse and underserved community” and former U.S. “leader in per capita murders,” which is located next to “Palo Alto...home to Silicon Valley executives and Stanford University professors.” Connecticut’s L.E.A.P. National Youth Center Networking Project (09-40-94002) served New Haven, “one of the poorest cities in the country [which] meets the eligibility requirements for Community Empowerment Zone status. The city has high unemployment and much drug-related gang activity. The high school dropout rate is around 50 percent. At the same time, the city has resources such as Yale University. Many of the L.E.A.P. senior counselors are Yale students, who value participation in such an effort.” The Harlem Environmental Access Project (36-40-94057) “serves the communities surrounding Columbia University, [which] rests on the edge of Harlem and other neighborhoods that constitute the New York City Economic Empowerment Zone... The project was an attempt to ‘lower the barrier between traditional ‘haves’ and ‘have-nots’ of the information world.’” These communities, located near major research institutions, represent particularly “convenient” populations for research.

4.3.4 Evidence of Positive Outcomes

One of the most promising aspects of community networking was to leverage ICT to make people job-ready and to connect them to actual jobs. This was particularly the hope of TOP projects, since they were funded through the Department of Commerce. Each of the following TOP projects demonstrated positive outcomes with regard to enhancing employment opportunities. Other noteworthy aspects of these projects are their connections to educational institutions, the level of investment made by the intended beneficiaries, and their varying levels of impact – at individual, neighborhood, city, and even state level.

The El Puente program (06-60-01048), which offered free evening computer classes either in English or Spanish by the San Diego City Heights Community Technology Center, illustrates the value of using local schools to connect to the community and how individual investment can yield great dividends. “Personal interviews were conducted with four women and two men – four Hispanics, one Asian, and one African American – who, upon completion of the El Puente program received a free computer for use in their home...Four of the six respondents discovered the El Puente classes through flyers their children received at school...One woman received a promotion because of her newly acquired computer skills, while two others confidently applied for and accepted jobs requiring computer skills...Another woman is planning to return to college to obtain her teaching credential...Still another woman is in the process of moving from ‘Welfare to Work’ and has recently enrolled in an insurance billing course...[An injured construction worker] seeking job rehabilitation...now has hope for the future [and] uses his home computer to send out his resume.”

The Grace Hill Neighborhood Services project (29-40-94083) employed a unique approach to investing primarily at the neighborhood level. Serving “11 low-income area neighborhoods in or near St. Louis, the project was designed to strengthen and expand...the Member Organized Resource Exchange (MORE)...a community-based network of services that can be exchanged like currency [allowing] neighbors to earn and save ‘time dollars’ when they volunteer their services to one another...A debit card provided residents with computerized access to a bank account, [with] over 500 residents using the cards to manage their financial resources.” Unfortunately however, “the bank holding the clients' accounts [was] acquired by an out-of-state bank [which] subsequently decided to end its participation in the debit card project.” The project also contributed to workforce opportunities at the state level. “Funding was used...to

help the Missouri Department of Labor and Industrial Relations develop and implement MO Works, an online database containing information on job opportunities... to develop a comprehensive online resource bank of services available...”

At the city level, the Kansas City Area Development Council’s (KCADC) SmartCities™ project (29-60-94059) developed a replicable model to aggressively facilitate partnerships that were focused on job creation through the leveraging of technology. “Through the KCADC’s partners, the project began to take shape as a comprehensive attempt to re-train the area’s unemployed. The local community college, Metropolitan Community College (MCC), learned that there were over 40,000 employees serving 21 major companies in the call center field... The partners developed a customer service call training center at MCC to provide hands-on education in this growing area [and] KCADC subsequently approached Sprint to develop a call center in the downtown area, where jobs were needed, using the graduates of the MCC program... According to a front page article on the Sprint Call Center in the Washington Post (Havemann & Vobejda, 1998), 6 months after opening its doors, 85 percent of former welfare employees remained on the job, compared with just 33 percent of suburban recruits.

These projects highlight the positive outcomes facilitated by three types of connections:

- Communication: leveraging existing communication channels, such as children’s schools, to connect with intended beneficiaries
- Financial: engaging local financial institutions to provide the financial infrastructure to facilitate trade within the community
- Employment: connecting training to actual jobs.

4.4 Substantive Theory: The TOP Initiative and Disadvantaged Community Outcomes

Based on examining the TOP evaluations, I have developed the following preliminary substantive (empirical) theory about the Technology Opportunities Program: TOP projects differ in their contribution to positive outcomes for intended disadvantaged community beneficiaries

based on the extent and manner in which they involve the disadvantaged community during four grant process phases: partnership building, project execution, evaluation, and close-out. During partnership building, the project team often failed to communicate with and engage members of the disadvantaged community to arrive at a shared purpose. During project execution, when faced with formidable barriers to serving the disadvantaged community, the project team often made changes that resulted in reducing the disadvantaged community's likelihood of benefitting from the project – such as changes in purpose, partners, geographical boundaries, or target audience. In addition, opportunities were overlooked for engaging members of the disadvantaged community as volunteers and employees. During evaluation, the project team often either failed to put in place or dropped measurement indicators to assess the impact on disadvantaged communities. During close-out, “success” of the effort was usually defined by the project's sustainability, rather than sustainability of and commitment by the collaboration toward continuing to strive to enhance the lives of individuals within the disadvantaged community.

4.5 Formal Theory: Grant-Funded Projects and Disadvantaged Community Outcomes

Extending the substantive theory to a more conceptual level, I propose the following formal theory about funding initiatives and disadvantaged communities: All grant-funded projects differ in their contribution to positive outcomes for intended disadvantaged community beneficiaries based on the extent and manner in which they involve the disadvantaged community during four grant process phases: partnership building, project execution, evaluation, and close-out. The value of a formal theory is its potential transferability from the specific domain of empirical study to another domain. While TOP provided empirical evidence for the substantive theory, the formal theory might be applied to other grant-funded initiatives that seek to achieve “broader impacts” that help disadvantaged communities. For example, the formal

theory would suggest that a funding initiative for monitoring urban forest health in an impoverished urban area would have an increased chance of positively impacting the target community (as measured through an indicator like tree survival rate) by directly involving that community in all phases of the grant process: establishing a shared purpose between collaborators and the community for the project, creating job opportunities for local residents (e.g., volunteers, skills training, or paid jobs working on the project itself), assessing community impact using measures meaningful to the community, and developing plans for selected continued collaborations once the project grant ends.

4.6 Summary

In this chapter, I described the results of the grounded theory process followed. Coding and categorization from four seed evaluations led to the identification of a core theme relating to the phases of the grant process around which the components of the evolving theory emerged. All the while, I stayed immersed in the data, sought out new cases to compare, developed and linked concepts, and attempted to create a coherent story from what the data were telling me. The substantive and formal theories presented here are the ultimate result of that process.

CHAPTER 5

CONCLUSION

In this dissertation, I employed a grounded theory approach to develop a theory about community networking, based on a finite cache of material – 63 community networking project evaluations from the NTIA’s Technology Opportunities (TOP) initiative, which ran from 1994 until it was defunded in 2005. I developed two theories of the relationship between the project team pursuing funding and positive outcomes for disadvantaged communities: a substantive (empirical) theory specifically pertaining to the TOP initiative and a formal (conceptual) theory, which extends to other funding initiatives:

- The substantive theory is: TOP projects differ in their contribution to positive outcomes for intended disadvantaged community beneficiaries based on the extent and manner in which they involve the disadvantaged community during four grant process phases: partnership building, project execution, evaluation, and close-out.
- The formal theory is: All grant-funded projects differ in their contribution to positive outcomes for intended disadvantaged community beneficiaries based on the extent and manner in which they involve the disadvantaged community during four grant process phases: partnership building, project execution, evaluation, and close-out.

Table 5.1 summarizes the extent and manner of disadvantaged community involvement, which can vary from project to project during each phase of the grant process.

Table 5.1

Disadvantaged Community Involvement during the Grant Process

Grant Process Phase	Extent and Manner of Disadvantaged Community Involvement
Partnership Building	Agreement upon a shared purpose and communication and engagement with members of the disadvantaged community.
Project Execution	Changes made to the project that might affect involvement of the disadvantaged community, such as changes in purpose, partners, geographical boundaries, or target audience. Inclusion of opportunities for volunteering and employment by members of the disadvantaged community
Evaluation	Measurement indicators put and kept in place to assess the impact on disadvantaged communities.
Close-out	Reporting of honest outcomes and prospects for sustainability – whether as sustainability of the project or as sustainability of the project team collaboration (or a derivation) and its commitment toward enhancing the lives of individuals within the disadvantaged community.

5.1 Research Question

The primary research question of this study was: How can community networking initiatives be structured to maximize positive outcomes for individuals from disadvantaged communities? The grounded theory developed in the course of this study suggests that positive outcomes for individuals from disadvantaged communities are maximized when the project team explicitly engages with the disadvantaged community throughout all phases of the grant process, including partnership building, project execution, evaluation, and close-out.

5.2 Limitations of the Study

5.2.1 Limited Coverage and Variability of the Dataset

One limitation of the study is the limited cache of data used as the dataset. Of the 606 TOP-funded projects, only 63 evaluations could be located for this study. Some of those could not really be characterized as formal evaluations, but they provided insight nonetheless. Of the 63 “evaluations,” only 25 were completed after the year 2000. In contrast with the evaluations completed by Westat in 1998 and 1999 (titled as “Case Study Reports” in Appendix A), the later evaluations were not standardized, making direct comparisons more challenging.

5.2.2 Too Much Data in Each Evaluation

Another limitation of the study is that, even though the dataset consisted of only 63 evaluations, the total number of pages was estimated at nearly 2000, making it impossible to capture all the salient information.

5.2.3 Personal Bias

Without question, my training and background let me to filter out certain bits of information, while focusing on others. The notion of vulnerable communities resonates with my personal experience as a community networking champion for a remote, rural, impoverished

county. One of the complaints expressed by local residents in my community was that the county's demographics were often used in order to get grants that benefitted other regions instead. Thus, I acknowledge that the vulnerable community (VC) construct represents one of my own long-held concerns and potential biases. It is this sensitivity to vulnerability of disconnected places that has underscored much of my doctoral work. However, while proponents of total objectivity in academia may find this "weakness" particularly unacceptable, my "insider" status affords me a level of insight into disadvantaged communities that is not often seen in academic research.

5.2.4 Incomplete Theory

The theory developed is preliminary and incomplete – but at least it is a start. Once again, I am encouraged by Corbin and Strauss (2008): "The moral here is to work within the limits of the time, energy, and money...[remembering] that doing qualitative analysis is an art as well as a science" (pp. 273-274). Completing the theory would entail operationalizing the key concepts described in each grant phase, such as shared purpose, employment opportunities, measurement indicators, and sustainability. Once operationalized, these concepts could be used to develop a set of hypotheses that could be tested. For example, during project execution, one of the important observations of this study is that the community networking project itself contains employment-related opportunities for the disadvantaged community that are often overlooked – ranging from volunteering to job-related training to paying jobs. A hypothesis could then be "TOP communities that included paying jobs for community members experienced a greater reduction in unemployment and/or a greater increase in per capita income (over time) than TOP communities that did not include paying jobs for community members." Admittedly, a challenge

with this kind of hypothesis is knowing what time range to look at, and understanding that several different variables can contribute to such a change.

5.3 Contributions of the Study

This study makes several significant contributions to theory, method, and practice.

5.3.1 Theoretical Contributions

Contributions to theory include situating the outcomes for disadvantaged communities within the context of the grant process; introducing the “vulnerable community” concept; and identifying other concepts and properties that may be useful in further theoretical explorations.

5.3.1.1 Situating Disadvantaged Community Outcomes within the Grant Process

In the substantive grounded theory developed from empirical data from the National Telecommunications and Information Administration’s (NTIA) Technology Opportunities Program (TOP), it is notable that specifics about the community networking intervention employed are absent; it is almost as if the technology itself were irrelevant. Such a theory is consistent with a social informatics approach. Social informatics studies examine “the design, uses and consequences of information technologies [taking] into account their interaction with institutional and cultural contexts” (Kling, 1999, 1.0 Introduction). A social informatics approach views with skepticism the extent to which disadvantaged communities will actually benefit as a result of community networking interventions employed through an inherently political grant process. This might also provide some insight into why the BTOP initiative, described in Chapter 1, has minimized its investments in “vulnerable populations.” Achieving lasting positive outcomes, such as project sustainability, for disadvantaged communities is very difficult. One way to hide the likely lack of positive outcomes (which does not look good politically) would be to reduce the number of efforts that really try to achieve these goals. A socio-technical

interaction network (STIN; Kling, McKim, & King, 2003) might prove useful in representing this. While creating a STIN is outside the scope of this study, a theoretical contribution of this study is positioning it within social informatics, a field which has not yet reached maturity.

5.3.1.2 The Vulnerable Communities Concept

Another theoretical contribution of this study is introduction of the concept of a “vulnerable community” (VC). A VC refers to a community that is at risk for exploitation via the grant process. These are communities that are: 1) disadvantaged, 2) often identified as intended beneficiaries in grants, and 3) at risk for receiving little or no lasting benefit from grant funding. An unintended consequence of the grant process, vulnerable communities are at risk of being created when project teams fail to engage closely with disadvantaged communities throughout the four grant process phases.

5.3.1.3 Other Concepts Relevant to Grants Aimed at Disadvantaged Communities

A formal codebook was not developed in this grounded theory study as is permissible (Borgotti, n.d.), since the aim was theory generation, rather than verification. However, Table 5.2 presents other concepts and properties identified from theoretical sampling employed in this study that may be useful in further theory development or refinement – and which may serve as a starting point for future codebook development.

5.3.2 Methodological Contributions

This grounded theory study contributes methodologically by demonstrating GT as a viable method for information science researchers in tackling problems of the data deluge; providing visual representations of the process and approaches used; paving the way for machine learning approaches to analyzing qualitative data; and illustrating how project evaluations can be used in a similar fashion as interview data.

Table 5.2

Key Concepts and Properties

Concept	Properties
Method of Impact	<ul style="list-style-type: none"> • Direct • Indirect • Both direct and indirect
Collaboration Shared Purpose	<ul style="list-style-type: none"> • Workforce • Clients • Consumers • Personal connection • Topics of interest
Grant Process Phases	<ul style="list-style-type: none"> • Partnership building • Project execution • Evaluation • Close-out
Disadvantaged Community Type	<ul style="list-style-type: none"> • Geography • Socioeconomics • Limited mobility • Service need
Collaboration Sustainability	<ul style="list-style-type: none"> • End at end of grant period • Continue on same course • Spinoff in related directions • Morph completely

5.3.2.1 Use in Information Science for Tackling Problems of the Data Deluge

This project demonstrates the usefulness of employing grounded theory in the field of information science, where it has seldom been used. This is particularly important in this era of “big data,” also known as the data deluge or data overload. Much information has already been collected on initiatives involving community ICT. Rather than creating and collecting more data, this project showed grounded theory to be a particularly powerful method for examining finite caches of secondary data – with the aim of developing theory from these caches, rather than merely describing their contents.

5.3.2.2 Visual Representations of the Grounded Theory Process

This study presents, in Figure 3.1, a visual model for the process I used to conduct grounded theory for theory development, along with a visual representation, in Figure 3.2, of the

approach I used to identify and elaborate upon concepts, properties, dimensions, themes, and theory. These approaches may be useful to other researchers.

5.3.2.3 Preparation for Machine Learning Approaches

The data memos I used in this study (see Appendix B) allowed me to focus on threads that might not have stood out using more quantitative approaches, such as content analysis. The memo format also allowed me to identify specific “trigger words” to possibly use later for developing natural language processing or machine learning approaches to analyzing large caches of qualitative material.

5.3.2.4 The Eyes of Others

In essence, the TOP project evaluations served the same role as a set of interviews, enabling me to view the data through the eyes of those who had been entrusted to assess each project’s impact. This approach differs from the process of meta-evaluation in which the already synthesized findings contained in evaluations are even further synthesized. Instead, this approach allows for the surfacing of neglected or overlooked findings mentioned in evaluation reports regardless of their quantitative occurrence – as long as the findings relate to the theory under development.

5.3.2.5 Longitudinal and Comparative Analysis

Thanks to the careful preservation of data from the TOP initiative by Kate Williams (Williams, 2007), this study was able to examine a 15-year initiative involving many multi-year case studies – providing a rare opportunity for analyzing data over time and across cases.

5.3.3 Practical Contributions

The study provides valuable information to guide current and future community networking-related policies and initiatives from the perspectives of policy makers and funders,

higher education administrators and educators, and disadvantaged communities and their champions.

5.3.3.1 Policy Makers and Funders

By breaking down the grant process into different phases, this study has exposed several potential “weak spots” at each phase where communities might be exploited, rather than effectively served, by funded project teams. It is hoped that such awareness might lead to more effective oversight, guidance, and safeguards to ensure that the intended beneficiaries of grant funds are indeed the ones who benefit.

For example, funders should ensure that, in the grant proposal, all project team members have defined and agreed upon a shared purpose that has involved members of the disadvantaged community (partnership building phase). Once the grant has been awarded (project execution phase), funders should approve any changes to the project, such as its purpose, partners, geographical boundaries, or target audience. The goal of such approval is to ensure there are no changes that might negatively impact the disadvantaged community’s likelihood of benefitting from the project. In addition, funders should encourage project teams to include opportunities for volunteering and employment by members of the disadvantaged community. Funders should make sure that grant proposals include measurement indicators designed to assess the impact on disadvantaged communities – and that the proposed evaluation measures are carried out (evaluation phase). Mechanisms for continued reporting of long-term measures even beyond funding periods are encouraged, such as engaging members of the disadvantaged community in data collection efforts. Funders should welcome the honest presentation of barriers to success, challenges, and outright failures from the projects – along with plans for sustaining, dissolving, or reconstituting the project team assembled to carry out the funded project (close-out phase). All

too often, project teams feel pressured to present only positive results and elaborate schemes to ensure project sustainability – even if the project has failed to truly produce positive outcomes. Sustainability of the specific project is of less importance than the sustainability of the partnership – even if the partnership goes in different directions. Additionally, with disadvantaged communities, positive results can sometimes only realistically be reported at the individual level – and often only after long periods of time. Policy makers and funders should enhance methods for encouraging this kind of honest and longitudinal reporting. Thus, the notion of sustainability should be broadened to include continuation of the grant partnership in the same, changed, or new forms (such as spin-offs and derivations) for the purpose of shared commitment to enhancing the lives of individuals within the disadvantaged community. Success should also be reported down to the individual level – particularly in disadvantaged communities where large-scale changes are very difficult to achieve.

5.3.3.2 Higher Education Administrators and Educators

The “town-and-gown” phenomenon noted in this study highlights the heightened potential for universities to exploit, rather than serve, disadvantaged communities – as charged by Stoecker (2005). The publish or perish imperative incentivizes universities to focus on producing innovative research and to educate only the best and brightest. Instead of universities treating neighboring communities merely as a playground in which to conduct short-term experiments or studies – leaving when the grant funds run out, it would be worthwhile to focus on how to actually touch people’s lives in a meaningful way perhaps through longer-term relationships, such as internships with local organizations.

As another example, universities should strive to serve as partners in the partnership building phase in efforts to utilize ICT for the benefit of disadvantaged communities.

Universities are in a good position to help ensure that disadvantaged communities themselves have direct representation on project teams assembled ostensibly for their benefit. The digital divide problem is highly complex with many questions needing further investigation. Embedded within every disadvantaged community are “champions,” individuals who have demonstrated a selfless commitment to and investment in their community. Universities would do well to find these individuals, consider offering them scholarships, and cultivate them as researchers who remain embedded in their communities – perhaps while serving roles on funded grant projects. The technology for distance learning is now available – albeit still challenging in some communities. As one who has lived in a “disconnected” remote, rural community while pursuing a Ph.D., I can attest to how keenly aware you become of the digital divide when you live it. Given the opportunity, well-selected individuals from disadvantaged communities can become productive researchers, teachers, and community leaders in their own right – without having to leave their home communities. Programs of community informatics present such opportunities and should be encouraged among the iSchools, in particular. Such programs can also help ensure that higher education partners remain aware of the pitfalls pointed out in this study at the other phases in the grant process – including changes during project execution, the tendency to leave out or drop off disadvantaged community evaluation indicators, and the sometimes misguided tendency to focus on project sustainability, rather than collaboration sustainability, upon close-out.

5.3.3.3 Disadvantaged Communities and Their Champions

Community champions rarely have the training or luxury of wading through scholarly literature or evaluations from related initiatives. It is hoped that the theories generated in this study are digestible enough to be useful to these champions – providing insights into the points

during the grant process where opportunities for positive outcomes can get de-railed. Constant vigilance and engagement, without apology, are critical to successful outcomes.

For example, community champions need to be constantly aware of funding initiatives involving their disadvantaged communities in order to become involved in partnership building. This is done through social networking. Community champions do not work in isolation, waiting for others to contact them and come to meetings they schedule. Instead, they should strive to have a seat at the table at not only grant-related meetings, but also other meetings going on in the community. Reading the local papers, attending government meetings, and engaging with public libraries and schools are a great way to start – and to remain involved. Most funding initiatives start with existing organizations. Since many funding initiatives are subject to public scrutiny, even during project execution, community champions who have not been actively included in the project team can exercise their voice by ensuring that project changes do not undermine potential positive outcomes for their community and by suggesting qualified local individuals to serve roles on the grant – whether paid or as volunteers. Champions can help ensure that appropriate evaluation indicators remain in place by offering to collect and track such data, including longitudinal, harder-to-obtain measures, such as employment indicators and receipt of scholarships by local residents. Such steps might even be precursors to becoming community informatics researchers, teachers, and community leaders, as discussed above in the recommendations for higher education. Champions can also help ensure that, upon close-out, closer engagement with the disadvantaged community, success stories even at the individual level, and new ways of looking at sustainability, are among the lessons learned and reported to funders. Community champions would do well to see themselves as positive partners in grant

initiatives, rather than as adversaries. After all, grants still follow “the golden rule” – he with the gold rules.

5.4 Future Directions

Plans for future research include the following – all with an aim toward keeping the focus on outcomes for disadvantaged communities:

- Assessing the fit of the grounded theory by conducting a more quantitative content analysis of the TOP project evaluation dataset
- Situating the grounded theory within the framework of a sociotechnical interaction network (STIN)
- Assessing the effectiveness of different collaborators (such as institutions of higher education) in relationship to disadvantaged communities
- Testing and verifying the theory against a different secondary dataset, such as Broadband Technology Opportunities Program evaluations
- Developing machine learning methods for identifying indicators related to disadvantaged communities and their treatment in funding initiatives
- Mapping disadvantaged communities from the TOP initiative, adding to the map as additional funding initiatives targeting disadvantaged communities are examined; the aim will be to see which communities are most often targeted in grants
- Helping obtain funding for and conducting additional studies that will add to the understanding of how to achieve positive outcomes for disadvantaged communities – particularly involving ICT; above all, I want to get back to the important work of making the world a better place.

5.5 Epilogue

It has been nearly 20 years since my first exposure to this grand community experiment called “the World Wide Web.” Most would agree that that experiment has indeed turned out to be a transformative success. While the two community networks I helped to found long ago no longer exist and some would say they were unsustainable, I now understand that does not mean they were unsuccessful. To the contrary, their lasting legacy lives in the many community collaborations between organizations, government, business, and citizens that began with the

community networking grants invested in them nearly 20 years ago and in the individuals who benefited from those investments.

As eloquently described in the starfish story, adapted from Eiseley (1969):

A young man is walking along the ocean and sees a beach on which thousands and thousands of starfish have washed ashore. Further along he sees an old man, walking slowly and stooping often, picking up one starfish after another and tossing each one gently into the ocean. “Why are you throwing starfish into the ocean?” he asks. “Because the sun is up and the tide is going out and if I don’t throw them further in they will die.” “But, old man, don’t you realize there are miles and miles of beach and starfish all along it! You can’t possibly save them all, you can’t even save one-tenth of them. In fact, even if you work all day, your efforts won’t make any difference at all.” The old man listened calmly and then bent down to pick up another starfish and threw it into the sea. “It made a difference to that one.” (Starfish story, n.d.)

Scattered through initiatives like the Technology Opportunities Program are stories of starfish, like me. My engagement in community networking nearly 20 years ago as a volunteer from a remote, rural, impoverished community certainly transformed me and ultimately led to this dissertation. The skills I gained as a community collaborator, grant writer, and webmaster continue to serve me well professionally and personally and also made a difference to the communities I have served. It is that quest for positive outcomes for disadvantaged communities, at any level, that drives me still...

APPENDIX A
TOP EVALUATIONS

Project	TOP Number	Eval. Year	City	State	Document Name	Authors
Mobile Community Health Information Network	01-60-95002	1998	Mobile	AL	Case Study Report: Mobile Community Health Information Network	Barbara Kapinus and Laurie Somers
Los Angeles Free-Net (LAFN)	06-40-94026	1998	Tarzana	CA	Case Study Report: Los Angeles Free-Net	Paul Tuss and Laurie Somers
Coastal Monitoring Network	06-60-01015	2005			Coastal Monitoring Network: Final Report	Albert Hydeman Associates
El Puente Program	06-60-01048	2003	San Diego	CA	City Heights Community Technology Center: El Puente Program: Pre- and Post-Survey Analysis	Regional Technology Alliance: San Diego
Plugged In	06-60-95039	1999	Palo Alto	CA	Case Study Report: Plugged In – Learning Through Technology	Laurie Somers
Western Brokering Project	08-50-94067	1998	Boulder	CO	Case Study Report: Western Brokering Project	Gary Silverstein and Laurie Somers
Parker Fire Protection	08-60-04010	2006	Parker	CO	Colorado 4.9 GHz Project: Parker Fire Protection District	Unknown
L.E.A.P.	09-40-94002	1998	New Haven	CT	Case Study Report: L.E.A.P. National Youth Center Networking Project (NYCN)	Joan Michie and Nancy Speicher
DTV Datacast Planning Grant	16-60-99006	1999-S ²		ID	Project Evaluation: DTV Datacast Planning Grant: Idaho Public Television	Unknown
Access Community Health Network	17-60-01040	2003	Chicago	IL	Access Community Health Network: West Side Collaborative Care Coalition: Evaluation Documentation	Metro Chicago Information Center
Ready for Life	18-60-01066	2004	Region	IN	Ready for Life/ Connexions: PAC Program Assessment	Perspectives Consulting Alliance
Rural Urban Network (RUN)	21-40-95062	1998	Louisville	KY	Case Study Report: Project Rural Urban Network (RUN)	Joan Michie and Nicole Bartfai
Community Information Network and Information Access Center	21-60-99034	2004	Bowling Green	KY	Community Information Network and Information Access Center at the L&N Train Depot Location	Jeffrey A. Scherer, FAIA
Distance Learning and Literacy Networks in Louisiana	22-40-94079	1998	New Orleans	LA	Case Study Report: Distance Learning and Literacy Networks in Louisiana; Loyola, University	Paul Tuss and Nicole Bartfai
Greater New Orleans Free-Net	22-40-95135	1999	New Orleans	LA	Case Study Report: Greater New Orleans Free-Net	Kyle Snow
City of New Iberia	22-60-99004	2004	New Iberia	LA	City of New Iberia	Premier Wireless Communications, LLC
Pine Tree Society	23-60-01026	2003	Scarborough	ME	Pine Tree Society: Deaf Services: Evaluation Report	Douglas Newton
Middle Schools	24-40-	1999	Baltimore	MD	Case Study Report: Middle	Gary Silverstein

² The –S indicates this evaluation was done “separately” from the 1999 NTIA case studies.

Project	TOP Number	Eval. Year	City	State	Document Name	Authors
Online	96043				Schools Online	and Nicole Bartfai
QUEST	25-60-95018	1998	Pittsfield	MA	Case Study Report: Quality Educational Scholastic Trust, Inc. (QUEST)	Paul Tuss and Nancy Speicher
Kalamazoo Metropolitan Area Network	26-40-95065	1997	Kalamazoo	MI	Kalamazoo Metropolitan Area Network	Greater Kalamazoo TeleCITY USA
CTC Mott Community College and University of Michigan-Flint	26-60-01059	2005	Flint	MI	Community Technology Center Mott Community College and University of Michigan-Flint: Evaluation Report	Formative Evaluation Research Associates
BizPathways	27-60-01024	2003		MN	BizPathways – Minnesota’s Virtual Entrepreneurs Network: Ongoing Evaluation of Effective Practice	Center for Rural Entrepreneurship
Tri-State Network (TSN)	28-40-94068	1998	Starkville	MS	Case Study Report: Tri-State Network Demonstration Project	Paul Tuss & Debra Prescott
Grace Hill Neighborhood Services	29-40-94083	1998	St. Louis	MO	Case Study Report: Grace Hill Neighborhood Services	Gary Silverstein and Becky Rak
St. Louis WhizKids	29-60-03001	2006	St. Louis	MO	St. Louis WhizKids: Final Evaluation Report	Philliber Research Associates
SmartCities	29-60-94059	1998	Kansas City	MO	Case Study Report: SmartCities	John Lockwood and Debra Prescott
Choices Bank	30-60-01045	2005	Missoula	MT	The Choices Bank Project: Final Evaluation	Ira Byock, Ph.D.
Project InterLinc	31-60-95010	1998	Lincoln	NE	Case Study Report: Project InterLinc: Information Services Division	Nicole Bartfai and Barbara Kapinus
NebWorks	31-60-98021	2002		NE	External Evaluation Review: The NebWorks Project	Applied Information Management Institute
SafetyNet-NH	33-60-95045	1998	Concord	NH	Case Study Report: Children’s Alliance of New Hampshire SafetyNet-NH	Gary Silverstein and Becky Rak
Northern New Mexico Rural Telemedicine	35-40-96006	1999	Espanola	NM	Case Study Report: Northern New Mexico Rural Telemedicine Project	Gary Silverstein
Tribal Virtual Network (TVN)	35-60-01068	2004		NM	Tribal Virtual Network: Evaluation Report	Unknown
NYCHANIS	35-60-02007	2004	New York	NY	An Evaluation of the New York City Housing and Neighborhood Information System (NYCHANIS)	Alfred F. Schwartz, Ph.D.
Juvenile Information Network	36-40-49010	2003	Harlem	NY	Evaluation of the Implementation of the Juvenile Information Network	Faith Samples-Smart, Ph.D.
Harlem	36-40-	1999	Harlem	NY	Case Study Report: Harlem	Kyle Snow

Project	TOP Number	Eval. Year	City	State	Document Name	Authors
Environmental Access Project (HEAP)	94057				Environmental Access Project (HEAP)	
Information Technology Initiative	36-40-94066	1999	New York	NY	Case Study Report: Information Technology Initiative	Gary Silverstein
Parenthood Plus	36-60-01018	2004	New York	NY	Evaluation of Parenthood Plus	Rebecca Stone
Charlotte's Web	37-40-94022	1998	Charlotte	NC	Case Study Report: Charlotte's Web	Joan Michie and John Lockwood
North Carolina TeleMed	37-60-01070	1997		NC	North Carolina TeleMed Project: NTIA Final Report	Office of State Planning
Dakota Telemedicine System	38-40-96092	1999	Bismarck	ND	Case Study Report: Dakota Telemedicine System	Kyle Snow
NetWellness	39-40-94081	1998	Cincinnati	OH	Case Study Report: NetWellness—Ohio Valley Community Health Information Network	Paul Tuss and Kathy Sharp
Comanche County Memorial Hospital	40-40-94015	1998	Lawton	OK	Case Study Report: Comanche County Memorial Hospital	John Lockwood and Katherine Sharp
Oklahoma Department of Commerce	40-40-95113	1998	Oklahoma City	OK	Case Study Report: Oklahoma Department of Commerce	Gary Silverstein and John Lockwood
Innovative Decision-Making Model Project	41-60-02012	2004		OR	Innovative Decision-Making Model Project: Preliminary Evaluation Report	Petra Schuetz
Interactive University (IU)	41-60-96071	1999	Berkeley	CA	Case Study Report: The University of California at Berkeley Interactive University (IU) Project	Gary Silverstein and Nicole Bartfai
South Coast Telecommunication	41-60-96073	1999	Coos Bay	OR	Case Study Report: South Coast Telecommunication Project	Nicole Bartfai
Pennsylvania Kiosk	42-40-94050	1998	Harrisburg	PA	Case Study Report: Pennsylvania Kiosk Project	Gary Silverstein and Debra Prescott
Women's Opportunities Resource Center (WORC)	42-60-01053	2005			Women's Opportunities Resource Center Electronic Commerce Initiative (ECI): Evaluation Report	Kerk Burbank, Ph.D. and Mary Virtue
Providence Plan	44-60-99019	2003	Providence	RI	The Providence Plan Community Opportunity Zone Information Network: Project Closeout	Unknown
South Carolina's Information Highway (SCIway)	45-50-94014	1998	Columbia	SC	Case Study Report: South Carolina's Information Highway (SCIway)	Carin Celebuski and Laurie Somers
Mni Sose Intertribal Water Rights Coalition	46-50-95111	1998	Rapid City	SD	Case Study Report: Mni Sose Intertribal Water Rights Coalition	Joan Michie and Debra Prescott

Project	TOP Number	Eval. Year	City	State	Document Name	Authors
Tele-Guild	47-60-03016	2006		TN	Summary Report of an Independent Annual Evaluation of the Tele-Guild Project	Jean Garner Stead, Ph.D.
Tele-Democracy Network	47-60-99041	2003		TN	Tele-Democracy Network Report	Clinch-Powell RC&D
NETmobile	48-40-95137	1998	Edinburg	TX	Case Study Report: Project NETmobile	Paul Tuss and Nicole Bartfai
Trans-Border Information Technology Collaborative (TB-ITC)	48-60-94056	1998	El Paso	TX	Case Study Report: The Trans-Border Information Technology Collaborative (TB-ITC) University of Texas at El Paso	John Lockwood and Debra Prescott
East Austin Community Network	48-60-96049	1999	Austin	TX	Case Study Report: East Austin Community Network	Laurie Somers
Vermont Millenium Arts Partnership	50-60-98028	2001 (est.)		VT	Vermont Millenium Arts Partnership: Final Report	Unknown
Nonprofit Electronic Reporting	51-60-03006	2004	Washington	DC	EDIN Ad Hoc Working Group on Nonprofit Electronic Reporting	Independent Sector
Alliance of Information and Referral Systems — NERIN	53-50-95105	1998	Seattle	WA	Case Study Report: Alliance of Information and Referral Systems — NERIN	Joan Michie and John Lockwood
Tele-Network for Remote Pain Management	53-60-96078	1999	Seattle	WA	Case Study Report: Tele-Network for Remote Pain Management	Laurie Somers
Blacksburg Electronic Village (BEV)	54-40-95052	1999	Blacksburg	VA	Blacksburg Electronic Village: Community Network Briefing Book	Andrew Cohill, Ph.D. Andrea Kavanaugh, Ph.D. Et al.
Regional Electronic Alternative Learning Center (REAL)	54-40-96012	1999	Fairmont	WV	Case Study Report: Regional Electronic Alternative Learning Center (REAL)	Nicole Bartfai and Kyle Snow
Nonprofit Collaboratives to Facilitate Rural Community Networking	54-60-99032	2003		WV	Nonprofit Collaboratives to Facilitate Rural Community Networking	Karen V. Harper-Dorton, Ph.D. David Williams, Ph.D.

APPENDIX B
DATA MEMOS

Data Memo: LAFN 06-40-94026

Data Description

Item	Description
Data Description	
Project Name	LA Free-Net
Entity Name	LA Free-Net
Website	
Year Funded	1994
Code (40,50,60)	40
State	CA
Date of Coding	8/2/13, 8/3/13
Coding Duration	

Quotes & Concepts

Item	Description
Quote/Data & page #	“...expansion of an existing network, the Los Angeles Free-Net (LAFN)...a nonprofit organization providing communication, education, and information services for the nearly 19 million residents of greater Los Angeles” (p.1)
Trigger words	Expansion, existing
Conditions	LAFN existed prior to the grant
Inter/actions	Connected LAFN with LA residents
Consequences	Poised for continued expansion
Concept	<i>Entity Existence</i>
Property	Entity Type
Dimensions	<i>Free-net, Fee-based</i>
Property	Timeframe started
Dimensions	<i>Prior to grant, Part of grant, After grant started</i>
Quote/Data & page #	“...enthusiasm and dedication of the volunteers who keep the network operating” (p.1)
Trigger words	Enthusiasm, dedication, volunteers
Conditions	Volunteer involvement existed prior to grant
Inter/actions	Connected LAFN with volunteers
Consequences	Poised for success
Concept	<i>Stakeholder Engagement</i>
Property	Volunteer involvement
Dimensions	<i>Extensive, Limited, None</i>
Property	Timeframe started
Dimensions	<i>Prior to grant, Upon grant award, After grant started</i>
Quote/Data & page #	“...the decision (made prior to the TIAP award) to break from the traditional free-net philosophy and charge subscribers a nominal annual fee for

Item	Description
	accounts.” (p.1)
Trigger words	Prior, break, charge
Conditions	Prior to grant was part of free-net model, with no charging for access
Inter/actions	Disconnected LAFN from free-net movement
Consequences	Sustainable funding stream
Concept	<i>Investment Relationship</i>
Property	Funding Type
Dimensions	<i>User fees</i>
Property	Timeframe started
Dimensions	<i>Prior to grant, Part of grant, After grant started</i>
Quote/Data & page #	“The LAFN President, a clinical professor of medicine at the University of Southern California and former Chief of Staff at both Encino Hospital and the Tarzana Regional Medical Center, was the founder of the LA Free-Net and remains a driving force behind its growth and its evolution.” (p.4)
Trigger words	Founder, remains, driving force
Conditions	Academic, medical professional already
Inter/actions	Connected LAFN with university and medical institutions
Consequences	Benefited LA community as a whole
Concept	<i>Champion Characteristics (may also be Stakeholder?)</i>
Property	Champion Type
Dimensions	<i>Working professional with other paying job, Paid staff on project</i>
Property	Timeframe started
Dimensions	<i>Prior to grant, Part of grant, After grant started</i>
Property	Current relationship
Dimensions	<i>Remains involved, No longer involved</i>
Quote/Data & page #	“no-strings grant of \$50,000 from AMI (the owners of the Tarzana Regional Medical Center at the time). In addition, the room in the computer center of the hospital was and is provided at no cost as are the 80+ phone lines at the site.” (p.5)
Trigger words	No-strings, no cost
Conditions	Investment by medical institutions
Inter/actions	Connected LAFN with medical institutions
Consequences	
Concept	<i>Investment Relationship</i>
Property	Funding Type
Dimensions	<i>User fees, Grant, In-kind</i>
Property	Timeframe started
Dimensions	<i>Prior to grant, Part of grant, After grant started</i>
Quote/Data & page #	“USC-Kenneth Norris Jr. Comprehensive Cancer Center provides 15 free telephone lines in addition to the physical space for equipment.” (p.5)
Trigger words	Free, in addition to, would cost
Conditions	Investment by medical institutions

Item	Description
Inter/actions	Demonstrates stronger connection between LAFN and medical “external node” over other non-medical external nodes
Consequences	
Concept	<i>Investment Relationship</i>
Property	Funding Type
Dimensions	User fees, Grant, <i>In-kind</i>
Property	Timeframe started
Dimensions	Prior to grant, Part of grant, After grant started
Concept	<i>Investment Relationship</i>
Property	Funding Type
Dimensions	User fees, Grant, In-kind, <i>Matching funds</i>
Property	Timeframe started
Dimensions	Prior to grant, Part of grant, After grant started
Quote/Data & page #	“The idea for developing the LAFN originated in 1986 when the current LAFN President contacted a well-known telecommunications visionary at Case Western Reserve University in Cleveland, Ohio, [the founder of Cleveland Free-Net] to help him set up an online resource to facilitate the exchange of medical information between physicians and the general public ...After 8 years of effort by a dedicated team in Los Angeles, the Los Angeles Free-Net was inaugurated on May 10, 1994. It was, at the time, one of nearly 100 free-nets in existence...” (p.7).
Trigger words	Idea, originated, contacted
Conditions	Cleveland Free-Net already in existence
Inter/actions	LAFN became a member of free-net movement
Consequences	
Concept	<i>Project Origination</i>
Property	Driving Need
Dimensions	<i>Specific (medical)</i> , General
Property	Model
Dimensions	<i>Existing model</i> , No model
Quote/Data & page #	“plans are underway to reinstate one of the original services offered through LAFN, Ask the Doctor, which allows users to anonymously receive answers to medical questions from experienced physicians. Ask the Doctor had been discontinued prior to the TIIAP award due to a lack of participation on the part of physicians. The network now has a large base of doctors who use the system” (p.8).
Trigger words	Receive answers to...from; reinstate, discontinued; lack of participation, large base
Conditions	Lack of participation by physicians
Inter/actions	Unfamiliarity impeded connection between “haves and have nots” with regard to medical knowledge; new attempt at interconnection
Consequences	Discontinued Ask the Doctor service to be reinstated
Concept	<i>Higher-Resourced Actor (The “Haves”)</i>
Property	Resource Type

Item	Description
Dimensions	Financial, <i>Knowledge/Information</i> , Power, Prestige/Influence
Property	Engagement Level in Project (project start)
Dimensions	High, Low
Property	Engagement Level in Project (project at time of report)
Dimensions	<i>High</i> , Low
Concept	<i>Lower-Resourced Actor (The “Have-Nots”)</i>
Property	Need Type
Dimensions	Financial, <i>Knowledge/Information</i> , Power, Prestige/Influence
Property	Engagement Level in Project (project start)
Dimensions	<i>High</i> , Low
Property	Engagement Level in Project (project at time of report)
Dimensions	<i>High</i> , Low
Concept	<i>Service Opportunity (The Connection)</i>
Property	Service Type
Dimensions	Financial, <i>Knowledge/Information</i> , Power, Prestige/Influence
Property	Activation Level (project start)
Dimensions	Active, <i>Inactive</i>
Property	Activation Level (project of report)
Dimensions	Active, <i>Planned</i> , Inactive
Property	Service Delivery Method
Dimensions	Face-to-Face, <i>Electronic</i> , Telephone
Quote/Data & page #	<p>“The network relies for the most part on word-of-mouth for publicity. Project management believes that a lack of public relations savvy is one of their largest defects...Nevertheless, there has been a great deal of positive press...project management personnel were interviewed on a local public radio station, KPFK, about the LAFN. This 2-hour program is reported by the station to be its most popular program ever.” (p.9).</p>
Trigger words	Word-of-mouth, publicity, positive press, popular
Conditions	Forgot to include publicity in grant
Inter/actions	Connected with press
Consequences	Positive coverage by newspaper and radio, despite “no formal [publicity] system”
Concept	<i>Public relations strategy</i>
Property	Venue
Dimensions	<i>Word-of-mouth</i> , newspaper, radio, TV
Property	Effectiveness/Favorability
Dimensions	<i>High</i> , Low
Quote/Data & page #	<p>“Training and technical assistance to LAFN users is provided by a network of volunteers. The biggest challenge for the volunteers is establishing the initial connection for new users...Ongoing technical assistance is typically provided upon request via e-mail although volunteer mentors also provide assistance via telephone or home visits</p>

Item	Description
	when necessary.” (p.9).
Trigger words	Training, assistance to, provided by, challenge for, establishing...for
Conditions	Volunteers are ready to provide services and assist users
Inter/actions	Connection between volunteers and users
Consequences	
Concept	<i>Service Opportunity (the Connection) [also actors of volunteers & users]</i>
Property	Service Type
Dimensions	Financial, Knowledge/Information, Power, Prestige/Influence, <i>Training, Technical Assistance</i>
Property	Activation Level (project start)
Dimensions	<i>Active, Inactive</i>
Property	Activation Level (project of report)
Dimensions	<i>Active, Planned, Inactive</i>
Property	Service Delivery Method
Dimensions	<i>Face-to-Face, Electronic, Telephone</i>
Quote/Data & page #	“Project administrators had several problems working with local telephone companies, describing them as amorphous organizations in which it is hard to determine anyone’s responsibility.” (p.10).
Trigger words	Working with, hard to
Conditions	Good information from telco’s was necessary and hard to get
Inter/actions	Bad connection between LAFN staff and telephone companies
Consequences	Difficulty in running the network
Concept	<i>Service Opportunity (the Connection)</i>
Property	Service Type
Dimensions	Financial, <i>Knowledge/Information</i> , Power, Prestige/Influence, Training, <i>Technical Assistance</i>
Property	Activation Level (project start)
Dimensions	<i>Active, Inactive</i>
Property	Activation Level (project of report)
Dimensions	<i>Active, Planned, Inactive</i>
Property	Service Delivery Method
Dimensions	<i>Face-to-Face, Electronic, Telephone</i>
Property	Service Quality
Dimensions	Good, <i>Bad</i>
Quote/Data & page #	“There was a short time period in the beginning of the LAFN’s history when the network was considered to be a threat by some of the larger ISPs...LAFN has come to be viewed as a gateway to the larger ISPs, serving an important role in exposing people to the Internet...LAFN absorbs some of the burden of training new users that is often faced by the larger ISPs” (p.11).
Trigger words	considered...threat; viewed as; serving...role; absorbs...burden
Conditions	Conditions of distrust existed when LAFN started when roles weren’t clear

Item	Description
Inter/actions	LAFN connected general public to ISPs (served as broker, conduit)
Consequences	More people moved to larger ISPs [possibly leading to reduced need for LAFN?]
Concept	<i>Brokering Outcome (of the CN)</i>
Property	Transformation Type
Dimensions	Establishment (new relationship), Reinforcement (of existing relationship), <i>Positive Change (between actors – ISP & general public)</i> , <i>Negative Change (between actors)</i>
Quote/Data & page #	“The LAFN project is clearly a success in that has managed to expand network access to a degree far beyond what the project planners anticipated.” (p.11).
Trigger words	Success, expand, beyond, anticipated
Conditions	Expectations were not high
Inter/actions	Connected many users to LAFN [web generally? Specific community content?]
Consequences	
Concept	<i>Brokering Outcome</i>
Property	Transformation Reason
Dimensions	<i>Technical capability, Information Access, Longevity/Familiarity, Service quality</i>
Quote/Data & page #	“Clearly, the incentive for a community group to establish a link on the LAFN website is much higher now that LAFN has more subscribers and a wider service area.” (p.13).
Trigger words	Incentive, to establish, higher, more, wider
Conditions	Weren’t enough people to justify community group engagement
Inter/actions	Connected community groups with web presence
Consequences	More engagement on the web by community groups
Concept	<i>Brokering Outcome</i>
Property	Tipping Point
Dimensions	<i>Reached, Not reached</i>
Quote/Data & page #	“The LAFN site incorporates numerous feedback mechanisms whereby users can provide comments and suggestions for improvement.” (p.13).
Trigger words	Feedback mechanisms
Conditions	Not just top-down approach
Inter/actions	Connects users with system administrators
Consequences	Constant enhancements to the system
Concept	<i>Feedback Opportunity</i> [Service implies top-down from higher- to lower-resourced actors; Feedback implies bottom-up]
Property	Feedback Type
Dimensions	<i>Open</i> [free form comments], <i>Closed</i> [fixed topics and responses]
Property	Feedback Method
Dimensions	Face-to-Face, <i>Electronic</i> , Telephone
Quote/Data & page #	“According to the operations director for the TIIAP project, the most important outcome of the grant was that it enabled LAFN to become

Item	Description
	L.A.'s most significant presence on the Internet." (p.14).
Trigger words	Important, outcome, enabled, significant
Conditions	Without the grant, LAFN was unable to be as significant a presence
Inter/actions	The funding connected LAFN to larger user base
Consequences	"thousands of Los Angeles residents, schools, and libraries to have access to a computer network offering a wealth of community-specialized services as well as to the Internet" (p. 14)
Concept	<i>Brokering Outcome</i>
Property	Transformation Reason
Dimensions	Technical capability, Information Access, Longevity/Familiarity, Service quality, <i>Financial assistance</i>
Quote/Data & page #	"LAFN also provides free home pages to nonprofit organizations that have accounts on LAFN." (p.15).
Trigger words	Provides, free
Conditions	Nonprofits must have an account
Inter/actions	Connects nonprofits to WWW
Consequences	
Concept	<i>Service Opportunity (the Connection)</i>
Property	Service Type
Dimensions	Financial, Knowledge/Information, Power, Prestige/Influence, Training, Technical Assistance, <i>Web presence</i>
Quote/Data & page #	"There are several noteworthy examples of how LAFN is benefiting the educational community." (p.15).
Trigger words	Benefiting, educational [or "x type"] community
Conditions	Students were previously unconnected to opportunities
Inter/actions	LAFN connects students to educational initiatives
Consequences	Implies enhancement of student educational performance
Concept	<i>Service Opportunity (the Connection)</i>
Property	Service Type
Dimensions	Financial; Knowledge/Information; Power; Personality-enabled networking (Prestige/Influence); Training; Technical Assistance; <i>Education; Technology-enabled networking (Connection to other online services, organizations, & programs)</i>
Concept	<i>Brokering Outcome</i>
Property	Transformation Reason
Dimensions	Technical capability, Information Access, Longevity/Familiarity, Service quality, <i>Educational Access</i>
Quote/Data & page #	"LAFN has also facilitated a great deal of networking and communication among the local medical community." (p.16).
Trigger words	Facilitated, networking, communication, medical [or "x type"] community
Conditions	Average people were previously unconnected to advanced medical knowledge

Item	Description
Inter/actions	LAFN connects people to medical experts & expertise
Consequences	Implies enhancement of public medical awareness
Concept	<i>Service Opportunity (the Connection)</i>
Property	Service Type
Dimensions	Financial; <i>Knowledge/Information</i> ; Power; Personality-enabled networking (Prestige/Influence); Training; Technical Assistance; Education; <i>Technology-enabled networking (Connection to other online services, organizations, & programs)</i>
Concept	<i>Brokering Outcome</i>
Property	Transformation Reason
Dimensions	Technical capability, <i>Information Access</i> , Longevity/Familiarity, Service quality, Educational Access
Quote/Data & page #	“...disadvantaged community segments indirectly benefit from the network although no specific information is available about the impact of these services.” (p.16).
Trigger words	Indirectly benefit, no specific information, impact
Conditions	Uncertainty of what these services actually are about
Inter/actions	LAFN connects people to jobs, needy people to food, people to political information, girls with computer skills, etc. <i>via</i> third party entities
Consequences	
Concept	<i>Brokering Outcome</i>
Property	Pathway
Dimensions	Direct, <i>Indirect</i>
Quote/Data & page #	The Encino-Tarzana Regional Medical Center, which houses the main computer center for LAFN, enjoys many benefits from its association with LAFN.” (p.17).
Trigger words	Enjoys many benefits, from association
Conditions	There is a relationship between LAFN and entity
Inter/actions	Connection between LAFN and entity continues to yield benefits
Consequences	The relationship gets stronger
Concept	<i>Brokering Outcome</i>
Property	Network Tie Direction
Dimensions	Transformation: Weak→Strong; Strong→Weak; Reinforcement: Weak—Weak; Strong—Strong; Weaker→Weaker (poor get poorer); Strong→Stronger (Matthew effect)
Quote/Data & page #	“...the main computer center had to be upgraded substantially to handle the increased usage. With the added communications infrastructure, there has been greater need for problem solving and system maintenance.” (p.17).
Trigger words	Had to be, greater need for
Conditions	Existing resources insufficient to accommodate change brought about by enhanced services
Inter/actions	Connected people to jobs
Consequences	Unexpected need for more personnel

Item	Description
Concept	<i>Brokering Outcome</i>
Property	Consequence Type
Dimensions	Intended/expected, <i>Unintended/unanticipated</i>
Property	Consequence Effect
Dimensions	Positive (benefit), <i>Negative (cost)</i>
Quote/Data & page #	“...volunteers report that they are motivated to work with the network primarily by the intrinsic rewards their assistance offers...[and] intrinsic rewards of their efforts have increased as the network expanded...” (p.17).
Trigger words	Motivated, intrinsic rewards
Conditions	Dedicated and enthusiastic volunteers
Inter/actions	Volunteers connect to providing services via LAFN
Consequences	Strengthened commitment of volunteers with network growth
Concept	<i>Brokering Outcome</i>
Property	Benefit Type
Dimensions	Tangible, <i>Intangible/Intrinsic</i>
Quote/Data & page #	“The TIIAP initiative established a low-cost communications infrastructure that allows toll-free access to LAFN and the Internet from over 90 percent of Los Angeles County...” (p.17).
Trigger words	Low-cost, toll-free, infrastructure, access
Conditions	Leveraged existing technology
Inter/actions	connected most people to LAFN
Consequences	Removed barriers to access
Concept	<i>Service Opportunity (the Connection)</i>
Property	Connection Cost
Dimensions	<i>No cost (free)</i> , Low Cost (ability to pay), Market Cost (retail)
Property	Connection Effort
Dimensions	<i>No new system/knowledge</i> [e.g., telephone toll-free], Easy-to-use new system/knowledge, Difficult to use new system/knowledge
Quote/Data & page #	“TIIAP funding not only was critical for implementing the network, but it validated the network in the eyes of the community. Universities and community organizations were found to be more willing to work with a network that has received a seal of approval from the Department of Commerce.” (p.17-18).
Trigger words	Validated, more willing to work with, seal of approval
Conditions	Level of riskiness perceived before TIIAP
Inter/actions	Connected community organizations & universities indirectly to Dept of Commerce via LAFN
Consequences	Successful network implementation & expansion because of buy-in
Concept	<i>Brokering Outcome</i>
Property	Transformation mechanism
Dimensions	<i>Validation, Funding</i>
Quote/Data & page #	“Sensitivity to the privacy concerns of subscriber have also hampered efforts to collect detailed information about the user base and how the

Item	Description
	network is being used.” (p. 18).
Trigger words	Hampered, collect detailed information
Conditions	Evaluation efforts not high priority
Inter/actions	Descriptive and quantitative info about the connection between users & LAFN is limited
Consequences	Don’t know detailed info about user base
Concept	<i>Brokering Outcome</i>
Property	User (stakeholder) details
Dimensions	<i>Who, How many, when, why, what purpose, where from</i>
Property	User details collection barriers
Dimensions	<i>Privacy concerns, technical limitations, time, low priority</i>
Property	
Quote/Data & page #	“However, LAFN staff appear to be doing an adequate job of discerning (and responding to) the needs of subscribers.” (p. 18).
Trigger words	However, adequate job
Conditions	Some limitation to an activity exists, resulting in less than optimal outcomes
Inter/actions	Connection between LAFN staff and knowledge of user needs
Consequences	Results are adequate
Concept	<i>Brokering Outcome</i>
Property	User details collection techniques
Dimensions	<i>Registration demographics, system feedback/comments, system usage</i>
Quote/Data & page #	“Although LAFN has dropped this service due to a lack of participation on the part of physicians, the article presents observations to help guide the development of similar systems around the nation.” (p. 18).
Trigger words	Help guide the development of similar
Conditions	A good idea had to be dropped
Inter/actions	Connecting the idea with others who might be able to carry it out
Consequences	Foundation for sharing best practices and lessons learned
Concept	<i>Brokering Outcome</i>
Property	Legacy Type
Dimensions	Best Practices, Lessons Learned, <i>Latent Idea (whose time has not yet come)</i>
Property	Legacy Format
Dimensions	<i>Article, Interview-Audio, Interview-Written, Model, Report</i>
Quote/Data & page #	“To encourage potential site owners to house project equipment, LAFN management recommend helping site owners recognize that their assistance would make a very positive contribution to the surrounding community. They also recommend publicly acknowledging the site owners’ generosity.” (p.19).
Trigger words	Recognize, acknowledging
Conditions	Without awareness of value, potential equipment site owners may not help
Inter/actions	Connects unused space with network space needs [notion of “excess

Item	Description
	capacity”]
Consequences	Increased space and partnering organizations
Concept	<i>Brokering Outcome</i>
Property	Transformation mechanism
Dimensions	Validation, Funding, <i>Public Recognition, Acknowledge Contribution Value</i>
Quote/Data & page #	“Ask for discounted services.” (p.19).
Trigger words	discounted
Conditions	Unaffordable services
Inter/actions	Connects network with higher quality services
Consequences	Lessons learned
Concept	<i>Service Opportunity (the Connection)</i>
Property	Connection Cost
Dimensions	No cost (free), <i>Low Cost/Discounted</i> (ability to pay), Market Cost (retail)
Quote/Data & page #	“The local phone companies that participated in LAFN’s original network design convinced LAFN management of the need for dozens of POP sites. After careful analysis of telephone exchanges, LAFN management determined that LAFN could provide toll-free access to almost all of Los Angeles County with just four POPs.” (p.19).
Trigger words	Convinced, determined, just
Conditions	Local phone companies assumed superior knowledge
Inter/actions	Connection between local phone companies and LAFN included erroneous information
Consequences	Distrust of telco’s; lessons learned
Concept	<i>Service Opportunity (The Connection)</i>
Property	Connection Quality
Dimensions	Incorrect, Asymmetrical, Correct, Strong, <i>Misleading</i>

5.5.1 Discussion

Discussion	
Emerging Categories	<ul style="list-style-type: none"> • Cross-boundary connections (circuit): higher-resourced actor, lower-resourced actor, service opportunity, potential transformation • Pre-existing project factors (inertia): money, motivation, philosophy
Questions	
Gaps	
Other	<ul style="list-style-type: none"> • A potential category of Cross-boundary connection is emerging, shows unequal in terms of difference in potential (excess, deficit) – if can put a path in between (circuit) they will seek equilibrium • Inertia: kinetic energy going into a project • Interesting that educational and medical services have clearly

articulated benefits, but disadvantaged community benefits are not clear. This supports my driving concern that “benefits to the disadvantaged” is used a way to attract funding, but in terms of actually showing or providing benefits, grant recipients tend to fall short. The actual benefits accrue to the already powerful and well-resourced (rich get richer).

- An advantage of using evaluations for GT is that they already include a notion of change over time – that’s specifically what they look at.

Data Memo: RUN 06-40-94026

Data Description

Item	Description
Data Description	TIIAP Case Study: Project Rural Urban Network (RUN)
# of pages	13
Project Name	Project Rural Urban Network (RUN)
Entity Name	Rural Urban Network (RUN)
Website	
Year Funded	
Code (40,50,60)	40
State	KY
Date of Coding	9/23/13, 9/24/13
Coding Duration	7 hours

Quotes & Concepts

Item	Description
Quote/Data & page #	Project Rural Urban Network (RUN) was established for three purposes: one is to install a 17-mile fiber optic network that will link the city government of Louisville, Kentucky; Jefferson County Public Schools (JCPS); the library system; the science center; the zoo; and Bellarmine College, a private institution of higher education. (p1)
Trigger words	Established; purposes
Conditions	
Inter/actions	Links public, nonprofit, education
Consequences	
Concept	Linkage
Property	Linkage Type
Dimensions	<i>Intersectoral</i> (horizontal), Same sector (vertical)
Property	Commonality

Item	Description
Dimensions	Need to exchange information; serving same customer(s); just a nice idea; common leadership; <i>share resources; share support services; physical co-location</i>
Quote/Data & page #	This is being done by sharing resources, including financial, and installing one cable system that will support all partners. (p1)
Trigger words	Sharing, support
Conditions	Resources not currently shared
Inter/actions	
Consequences	
Concept	<i>Linkage</i>
Property	Linkage Mechanism
Dimensions	<i>Financial; technical support; infrastructure: cable</i>
Quote/Data & page #	A second purpose of the project is to provide services to all students and citizens via the cable. (p1)
Trigger words	Purpose, services, via
Conditions	Services not provided well currently
Inter/actions	Facilitate between service providers & students & citizens
Consequences	
Concept	<i>Purpose</i>
Property	Purpose Motivation
Dimensions	<i>Provide service; get grant</i>
Property	Economic incentive/orientation
Dimensions	<i>No mention; explicit</i>
Quote/Data & page #	One area of the city that is specifically targeted for the TIIAP project is the Enterprise Community, an inner-city area that is experiencing a high level of poverty. (p1)
Trigger words	Specifically targeted, experiencing, high level of, poverty
Conditions	Service area/population in need
Inter/actions	Connect this population with services
Consequences	
Concept	<i>Neediness</i>
Property	Population Identified
Dimensions	None, Specific population identified, General need identified
Property	Population Type
Dimensions	<i>Inner-city, rural</i>
Quote/Data & page #	The third project purpose is to reach out to Pike County, a very rural area at the other end of the state. (p1)
Trigger words	Reach out, rural, other end of
Conditions	Distance is barrier
Inter/actions	Connect rural to center
Consequences	
Concept	<i>Barrier</i>
Property	Geography
Dimensions	Inner city, <i>rural</i>

Item	Description
Concept	<i>Purpose</i>
Property	Purpose Motivation
Dimensions	<i>Target needy populations in order to get grant</i>
Quote/Data & page #	The approach used for this component of the project is the installation of teleconferencing classrooms in Pike County and Louisville. (p1)
Trigger words	Approach used
Conditions	Assumes Pike County needs to connect with Louisville
Inter/actions	Teleconferencing connects
Consequences	
Concept	<i>Linkage</i>
Property	Linkage Mechanism
Dimensions	<i>Infrastructure: Teleconferencing classrooms</i>
Quote/Data & page #	The school and the city realized that they could merge their efforts and thus avoid duplication of effort and cost. (p1)
Trigger words	Realized, could merge their efforts, avoid
Conditions	School & city were separate entities
Inter/actions	Connect school & city
Consequences	Potentially save time & money
Concept	<i>Purpose</i>
Property	Purpose Motivation
Dimensions	Save time, <i>save effort, save money</i>
Concept	<i>Linkage</i>
Property	Linkage Mechanism
Dimensions	<i>Merge efforts</i>
Quote/Data & page #	For each section of the cable, the partners had to decide whose budget would be used to install and later maintain it. Working this out in advance took time and careful negotiation, but it was worth the effort in the end. (p2)
Trigger words	Negotiation, political, legal, technical aspects
Conditions	No “a priori” agreements between partners
Inter/actions	Agreements worked out to connect partners as part of this project
Consequences	Effort was worth it
Concept	<i>Cooperation</i>
Property	Cooperation Mechanism
Dimensions	<i>Negotiation, budget</i>
Quote/Data & page #	The political and legal aspects of the project rather than the technical produce the main problems... Getting the contract signed is what takes the time... Read legal contracts very carefully. Legal counsel is needed. (p2)
Trigger words	Rather than, problems, takes the time, carefully, needed
Conditions	Technical is easy
Inter/actions	Legal counsel needs to be connected with effort
Consequences	Implication is that without it, project will fail
Concept	<i>Problem</i>

Item	Description
Property	Problem Source
Dimensions	<i>Lack of legal clarity</i>
Quote/Data & page #	for TIIAP, the district decided to build a demonstration network in the Enterprise Community, which has a high level of poverty.
Trigger words	demonstration
Conditions	Too expensive to connect everyone
Inter/actions	Connect the most difficult (highest poverty)
Consequences	
Concept	<i>Choice</i>
Property	Who to serve for grant
Dimensions	<i>Neediest, Easiest</i>
Quote/Data & page #	JCPS has been on the cutting edge of technology by putting computers in classrooms, labs, and libraries. As of the 1997-98 school year, JCPS reports a student-to-computers ratio of 6.4:1. Some schools also allow students to check out laptops for at-home use. Since 1995, JCPS has put into place annual computer assessments in grades P4 (Grade 3), 5, 8, and 10. It measures the students' skills to see if they are on target with Jefferson County's Computer Skills Continuum. (p3)
Trigger words	Cutting edge
Conditions	Schools already cutting edge
Inter/actions	Students and schools already engaged with computers
Consequences	Continues to strengthen computerization
Concept	<i>Pre-existing conditions (on the relationship) – this case students & schools</i>
Property	# of computers
Dimensions	<i>High</i>
Property	Length of time
Dimensions	<i>Long</i>
Property	Ratio – users: computers
Dimensions	<i>Low # users per computer</i>
Property	Assessments in place
Dimensions	<i>In place</i>
Property	Curriculum in place
Dimensions	<i>In place</i>
Quote/Data & page #	JCPS recognizes the need for overall community involvement in school improvement. More than \$41 million has contributed to the district through more than 1,100 partnerships over the past 10 years. (p3)
Trigger words	Community involvement, partnerships
Conditions	History of partnering
Inter/actions	Community has been contributing \$ to the schools
Consequences	
Concept	<i>Investment Relationship</i>

Item	Description
Property	Investment Direction
Dimensions	<i>From community to the funded entity</i>
Quote/Data & page #	<p>Specific staff from JCPS work on the project (p3):</p> <ul style="list-style-type: none"> • The Executive Director of Educational Technology serves as the TIIAP project director. He is a member of the planning committee that is implementing the statewide telecommunications system and electronic network. • The Voice and Data Communications Specialist serves as the project coordinator. • The 12 resource teachers of the Computer Education Support Unit provide training and ongoing daily support to users involved in the project. • A consultant with expertise in networking will serve as the project evaluator.
Trigger words	Staff, director, coordinator, training, support
Conditions	JCPS already has plans to get networked
Inter/actions	JCPS gets connected with funding to move existing plans forward
Consequences	Who might get left behind – those who weren't part of existing JCPS plans?
Concept	<i>Staff</i>
Property	Staff Role
Dimensions	<i>Project Director, Project Coordinator, Trainer, Support, Evaluator</i>
Property	Staff Existing Expertise
Dimensions	<i>Education technology management, statewide telecommunications planning, voice and data communications, teaching, networking expertise</i>
Quote/Data & page #	<ul style="list-style-type: none"> • The City of Louisville already had a fiber optic cabling project underway when the TIIAP project was funded. Several government buildings within a few city blocks had already been linked up (p4)... Project RUN is one mechanism that the city is using to develop its telecommunications capabilities. (p5) • The Louisville Free Public Library...was in the midst of changing its infrastructure. All buildings are being completely rewired. (p4) • The Louisville Science Center [will have] four interactive communication exhibits, which enable students and citizens throughout the state to take an “electronic field trip” to the Science Center. • Bellarmine College...is in the process of building a \$8.5 million library with state-of-the-art information and telecommunications technology, which will be available to TIIAP project partners...
Trigger words	Already, underway, when...funded, already...linked up, in the midst of, are being, in the process of
Conditions	Louisville was already cabling government buildings
Inter/actions	City of Louisville & JCPS connected to get this grant

Item	Description
Consequences	
Concept	<i>Existing Status</i> (momentum/inertia)
Property	PhysicalNetworkingOfKeyEntity
Dimensions	<i>Underway, Planned, Not Thought Of</i>
Property	PhysicalNetworkingOfPartners
Dimensions	<i>All Underway, Most Underway, All Planned, Most Planned, All Not Thought Of, Most Not Thought Of</i>
Quote/Data & page #	Pike County is in the Appalachian Mountains, at the opposite end of Kentucky from Louisville... largest county in the state, but the population is only 72,000... Many of the schools are small and can offer only the basic required courses. The school system has a technology van that travels to various parts of the county on a regular basis to give citizens hands-on experiences with new technologies. It also has 31 school technology coordinators. (p4)... Pike County was the home of the Kentucky Governor at the time the project began. (p4) ... Three teleconferencing centers were already located in the Louisville area and one was installed in Pike County as a part of the TIIAP project. (Pike County has two additional teleconferencing facilities that were funded through other sources.) (p7)
Trigger words	Population is only, basic, travels, home of the, at the time the project began, Already, funded through other
Conditions	Vast distances to cover for only a sparse population; Governor from there; Teleconferencing existed in Louisville & Pike
Inter/actions	Connects this county with broader grant based out of Louisville Pike County got abundance of teleconferencing
Consequences	
Concept	<i>Existing Resources (prior to grant)</i>
Property	Resources Technology
Dimensions	School technology coordinators, traveling technologies
Quote/Data & page #	The Louisville Chamber of Commerce brought together representatives from the city, county, and state governments as well as local big business to look for niches in which the city could stand out as a means of attracting further growth and development. They called their vision, "A Community of Access," and decided to focus on three service areas: health, distribution, and telecommunications. The TIIAP project director served on the telecommunications committee of this endeavor. (p4)
Trigger words	vision, served on
Conditions	Political and economic efforts underway
Inter/actions	Supports aims of Governor & Chamber of Commerce
Consequences	
Concept	<i>Purpose</i>
Property	Purpose Motivation
Dimensions	Political, Economic

Item	Description
Concept	<i>Existing Ties (prior to grant)</i>
Property	Connections Political
Dimensions	<i>Governor (elected official)</i>
Property	Connections Economic
Dimensions	<i>Chamber of Commerce</i>
Property	Connections Technological
Dimensions	<i>School technology specialist</i>
Quote/Data & page #	The project has received two extensions. At the time of the site visit, it was considering asking for a third... (p7) The project took longer than anticipated. Aspects that took a long time were finalizing contracts, deciding where to lay the cable (above or below ground), processing easements, and bargaining for a contractor. (p8)... There were delays in approval of various aspects of the project by the school system, which were related to an internal political situation. The city network also experienced delays at various times along the way. (p8)
Trigger words	Extension, took longer, long time, delays
Conditions	Political situations
Inter/actions	Agreements between parties
Consequences	Delays
Concept	<i>Success Factors</i>
Property	Time to completion
Dimensions	Ahead of schedule; on schedule; <i>delayed</i> or behind schedule
Quote/Data & page #	Scheduling time for the necessary connections is very complex. Some classes had to be cancelled because of snow days during the winter months and then had to be rescheduled. On two occasions, the hookup was delayed...difficult to get students to use the teleconferencing equipment appropriately, such as speaking up, pushing the buttons to speak, and interacting with people at the other site. (p8)
Trigger words	Complex, canceled, delayed, difficult
Conditions	Details to ensure success not handled
Inter/actions	
Consequences	Things didn't happen as hoped
Concept	<i>Barriers</i>
Property	Scheduling
Dimensions	<i>Class schedule, equipment schedule</i>

Item	Description
Quote/Data & page #	The availability of the teleconferencing equipment gave students the opportunity to experience real-life applications to what they had been studying. It gave the Louisville Zoo the opportunity to educate students who could not normally come to the zoo and built a much stronger link between the zoo and Pike County...Also, it gave the incentive to a few classes to visit the zoo. In fact, at least one of the classes was put on a video, which was shown on a TV station in West Virginia. On the basis of the video, a class from West Virginia took a field trip to the Louisville Zoo, and drove right by the Cincinnati Zoo...(p9)
Trigger words	Opportunity, not normally, stronger link, incentive
Conditions	Prior to grant, no opportunity for rural kids to visit zoo
Inter/actions	Connected Zoo with Pike Co schools; Connected Pike & WVa schools & zoo
Consequences	
Concept	Brokering outcome (linkage)
Property	Prior Connection
Dimensions	Strong, Weak, None
Quote/Data & page #	The third evaluation component is “quality and effectiveness of new applications and services.” It was expected that the “education process” would be greatly transformed by the facilities and services provided by the project. No details about what would be evaluated were included. A qualitative approach was proposed and instruments would include student evaluations, participant interviews, participant surveys, program records, and doctoral research papers.
Trigger words	Quality, transformed, no details, what would be, proposed
Conditions	Qualitative evaluation aspects not described in detail for grant
Inter/actions	
Consequences	
Concept	Expected Transformation
Property	Transformation area
Dimensions	<i>Education</i>
Discussion	
Discussion	Seems as if this is a Louisville school-centric proposal, with serendipitous partners thrown in who would have accomplished their goals without the grant, and a gratuitous remote county (Pike) thrown in both for political (governor’s home) and grant (neediness) purposes.
Emerging Categories	Notion of “transformation” – areas, direction, reality
Questions	
Gaps	
Other	

Data Memo: TSN 28-40-94068

Data Description

Item	Description
Data Description	Tri-State Network Demonstration Project Case Study
# of pages	29
Project Name	Tri-State Network Demonstration Project
Entity Name	
Website	
Year Funded	1998
Code (40,50,60)	40
State	MS
Date of Coding	9/25/13 started
Coding Duration	Approximately 21 hours over a couple of weeks

Quotes & Concepts

Item	Description
Quote/Data & page #	designed to significantly expand an interactive framework and technological infrastructure developed by the Tri-State Education Initiative (TSEI), an educational initiative established by the National Aeronautics and Space Administration (NASA) to support the simultaneous advancement of the educational, economic, and social/cultural goals of the people of the region... Conceived as an economic and community development project, the primary objective of the \$600,000 TIAP demonstration project was to implement a community-based advanced telecommunications infrastructure that would support economic development efforts focusing upon Tishomingo County and impacting the surrounding region. (p3)
Trigger words	Expand, economic development
Conditions	Builds on existing efforts
Inter/actions	
Consequences	
Concept	<i>Existing Collaboration</i>
Property	Collaboration Type
Dimensions	Federal/Regional
Property	Collaboration Purpose
Dimensions	Economic development, education, social/cultural

Item	Description
Quote/Data & page #	The original proposal was developed and submitted by the Tri-State Education Initiative Consortium (TSEIC), a 501-C-3 not-for-profit organization of 30 school districts organized to work cooperatively to enhance and broaden the capabilities of their respective education systems. After the grant was awarded, TSEIC had second thoughts about their capabilities to oversee a project with such a strong economic development focus. With approval from TIIAP, the project was reassigned to the State of Mississippi Department of Economic and Community Development (MDECD). Mississippi State University (MSU) was contracted to manage project operations with Johnson Controls World Services, Inc., as the onsite subcontractor. (p3)
Trigger words	Original, after awarded, second thoughts, reassigned, contracted
Conditions	Original awardee changed;
Inter/actions	TSEIC (secondary educ) out, MCECD (econ dev) & MSU (higher ed) & Johnson Controls (private) in
Consequences	original purpose changed
Concept	<i>Collaboration Change</i>
Property	Change Type
Dimensions	Awardee, Purpose
Property	Change Timeframe
Dimensions	Prior to award, <i>Upon award</i> , After award (during project)
Quote/Data & page #	The complexity of the Tri-State Demonstration Project presented many challenges to those involved. The large number of components and players involved in the project created issues of coordination and organization. Another related frustration involved dealing with new and rapidly changing technologies 4 while meeting tight project deadlines. During the implementation stage, crossing LATA ₁ lines across states was reported to be the biggest and most unexpected difficulty the project team had to deal with (p3)
Trigger words	Challenges, issues, frustration, changing, biggest, unexpected, difficulty
Conditions	This project was too big
Inter/actions	Difficulty dealing with telecom (LATA lines)
Consequences	Issues of coordination & organization
Concept	<i>Network Composition</i>
Property	Quantity of players
Dimensions	<i>Many</i> , few
Property	Variety of players
Dimensions	Homogeneous, <i>Heterogeneous</i>
Property	Existing constraints
Dimensions	Well understood, <i>Unexpected</i>

Item	Description
Quote/Data & page #	Although there were only limited data available at the time of the site visit to demonstrate the project's impact to date, the project's ultimate impact will undoubtedly be widespread, encompassing education, industry, and community development. The educational aspects of the project in particular should establish lasting impacts on the county's teachers and students. And the economic development supports and resources developed through the project have already begun to stimulate local industries to take advantage of worldwide commercial opportunities available via the World Wide Web and encourage non-local businesses and industries to consider locating in the area. P4
Trigger words	Impact, undoubtedly, stimulate, encourage
Conditions	Insufficient data to demonstrate
Inter/actions	Teachers & students, business & industry – connect to WWW
Consequences	
Concept	<i>Impact</i>
Property	Impact Area
Dimensions	Education, Industry, Community Development
Property	Impacted Population
Dimensions	Teachers, Students, Businesses, Industries
Quote/Data & page #	An important factor in the project's success was the extensive collaboration among several departments on the MSU campus. P4
Trigger words	Important, success, collaboration
Conditions	Collaboration was enabled due to project
Inter/actions	New connections between MSU departments
Consequences	Project was successful because of these collaborations
Concept	<i>Collaboration</i>
Property	Collaboration timeframe started
Dimensions	Before project, <i>during project</i> , after project
Concept	<i>Collaboration</i>
Property	Collaboration impact
Dimensions	Positive, negative
Concept	<i>Collaboration</i>
Property	Collaboration partners
Dimensions	Different institutions, <i>same institution</i>
Quote/Data & page #	The project's geographic parameter seemed to change throughout the course of the project. In the beginning, the potential universe of end users included everyone in the Tri-State Network region, which included communities within a 98,700 square mile region incorporating parts of Alabama, Mississippi, and Tennessee... Despite these intentions, the initial implementation efforts concentrated on Tishomingo County, Mississippi. Later, the focus expanded to encompass Alcorn and Prentiss Counties, also in Mississippi. Ultimately, project administrators and team members were advised to further enlarge the scope to once again include areas in Alabama and

Item	Description
	Tennessee. Despite the changing geographical dimensions of the project, the target demographics remained all-inclusive—everyone “from kids to grandmas.” (p6)
Trigger words	Geographical, change, despite, concentrated, encompass, enlarge, scope, include, target, all-inclusive
Conditions	Geographic boundaries changed in response to changes in direction [from who?]
Inter/actions	
Consequences	Demographics remained all-inclusive
Concept	<i>Geography</i>
Property	Physical boundary changes
Dimensions	Remained as set before project, <i>Expanded during project, Contracted during project</i>
Concept	<i>Beneficiary</i>
Property	Beneficiary demographics
Dimensions	Remained as set before project, <i>Expanded during project, Contracted during project</i>
Quote/Data & page #	During its 3-year existence, the Tri State Initiative has also incorporated the efforts of over 150 professional facilitators and trainers and a volunteer work force that has donated more than 25,000 hours of their own personal time to its projects. (p6-7)
Trigger words	Efforts, volunteer, work force, donated, personal time
Conditions	It took a village
Inter/actions	Both paid staff and volunteers
Consequences	Success?
Concept	<i>Workforce</i>
Property	Workforce status
Dimensions	<i>Paid, volunteer</i>
Quote/Data & page #	After the grant was awarded, TSEIC decided against involvement and responsibility for the project and returned the award to the U.S. Department of Commerce because they had reservations about their capabilities for managing a complex project with such a large economic development component. Officials in the State of Mississippi Department of Economic and Community Development (MDECD) convinced Commerce to fund the project through them instead. MSU was contracted to take over project operations with Johnson Controls World Services, Inc., as the onsite subcontractor. MDECD had little involvement in the project’s operations beyond garnering the support of the Yellow Creek site that housed the network hub. MDECD was interested in sponsoring the grant for the economic development gains it would bring to the region, but recognized that Mississippi State was in a better position to manage the project. The project was reassigned (with approval from TIAP) from TSEIC to MDECD. (p7)

Item	Description
Trigger words	Decided against, returned the award, reservations, convinced, instead, little involvement, better position, reassigned
Conditions	Different thoughts about chief aim of project and who in best position
Inter/actions	Broken between original grantee (education) & funder (DOC) Logical grantee with shared purpose with funder (both commerce) Project management (higher ed) Technical (private)
Consequences	Total change of course & emphasis for project – from education to commerce? This is an important passage, indicating social networking – homophily at different levels (US commerce & regional commerce; Higher Ed & High School)
Concept	<i>Project</i>
Property	Official Award Administration
Dimensions	<i>Commerce</i>
Concept	<i>Project</i>
Property	Project Management
Dimensions	Commerce, <i>Education</i>
Concept	<i>Project</i>
Property	Technical Management
Dimensions	<i>Private</i>
Quote/Data & page #	Project Partners...Project Staff...Project Costs... (headings p7-9)
Trigger words	project
Conditions	Multiple sources for partners, staff, and costs
Inter/actions	Interaction among multiple players at all levels
Consequences	
Concept	<i>Project</i>
Property	Partners Vertical (sector)
Dimensions	Homogenous, <i>Heterogeneous</i>
Concept	<i>Project</i>
Property	Partners Horizontal (level – eg, global, federal, regional, local)
Dimensions	Homogenous, <i>Heterogeneous</i>
Quote/Data & page #	Johnson Controls operates the Yellow Springs facility that was originally intended to serve as the network hub. When NASA delayed turning the site over to the state of Mississippi, the hub and offices were set up instead at the Tishomingo County Educational Complex near Iuka. Johnson Controls, had to build the hubs telecommunications transmission system from scratch rather than use the existing infrastructure at the Yellow Springs site. (p8 footnote)
Trigger words	Originally intended, delayed, instead, had to, rather than
Conditions	Original plan had to be changed
Inter/actions	Johnson Controls, NASA, state of Mississippi, County Education Complex – relationships all contingent on one another
Consequences	Cost? Delay?
Concept	<i>Change</i>
Property	Change Type

Item	Description
Dimensions	Award administration, Project management, Technical lead, Network location
Concept	<i>Change</i>
Property	Change Action
Dimensions	Eliminated, Replaced
Concept	<i>Change</i>
Property	Change Timeframe
Dimensions	Before grant, At grant start, After grant start, After grant end
Quote/Data & page #	Other than a few graduate students who were involved in training, materials development, web development, and programming, all project staff were employed full time at MSU and worked with the Tri-State Network initiative on a part-time basis. (p9)
Trigger words	All project staff
Conditions	Paid staff
Inter/actions	Tri-State Network initiative provided supplemental part-time opportunity for already full-time staff; also provided some opportunities for grad students
Consequences	Increased cost, learning reduced, less risk, more professional?
Concept	<i>Employment Benefit</i>
Property	On-the-job Learning
Dimensions	By students, by volunteers, <i>by paid staff</i>
Property	Job Pay
Dimensions	<i>By currently employed</i> , by new hires, by new hires from disadvantaged groups
Property	Co-location of staff
Dimensions	<i>All from same location</i> , From different locations
Quote/Data & page #	Tishomingo County, however, is the major focus of the project. Located in the northeast corner of the state, it more closely resembles a county in the heart of the Appalachian Region than a typical Mississippi county. It is a rural county, with timber and other agricultural pursuits occupying a large sector of the economy. Tishomingo County ranks 46th out of the 82 counties in Mississippi with a per capita income of \$10,446. (p9) The federal government spent billions of dollars on failed ventures over the years at the Yellow Creek site in the northeast corner of Tishomingo County... As a result of these failed ventures [1975, 1982, 1995], the economy of the region has experienced tremendous up and down cycles in which the economy temporarily booms as thousands of people move to the area and new hospitals, schools, cultural facilities and highways are built, and then the economy suddenly crashes. Consequently, residents in the area are very hostile toward the federal government and suspicious of any new initiatives. (p10)
Trigger words	Rural, per capita, failed ventures, up and down cycles, crashes, hostile, suspicious
Conditions	Distrust by locals of federal government

Item	Description
Inter/actions	Looks like yet another forced connection between county and feds that has begun on shaky ground
Consequences	Likely failure?
Concept	<i>Sympathetic Community [Name for entity that has historically been used to attract funds, but does not have a real say in how to have its own needs met]</i>
Property	Victim Timeframe
Dimensions	None yet (no actual grants pursued in its name), Recent only (within 5 years), Long history (over 5 years)
Property	Victim Quantity
Dimensions	None yet, 1-2 times, 3+ times
Concept	<i>Intended Beneficiary</i>
Property	Past History with other actors
Dimensions	Positive, <i>negative</i> , none, unknown
Property	Project Receptiveness
Dimensions	Receptive, <i>not receptive</i>
Quote/Data & page #	In 1991, the National Aeronautics and Space Administration (NASA) inaugurated the TSEI...[which] operated an Interactive Learning Network in Tishomingo County that served a total of 30 school districts (5,600 teachers, 102,000 students) in the 9,800 square mile tri-state area. The network included PCs and printers in each of its 30 school district offices, a 1-800 modem access to the file server, electronic mail, and bulletin board system, connectivity between the Tri-State Learning Center and NASA's Marshall Space Flight Center in Huntsville, Alabama, and access to the world via Internet. The TIIAP grant was designed to significantly expand this infrastructure through the inclusion of an interactive framework and technological infrastructure to support the simultaneous advancement of the educational, economic, and social/cultural goals of the people of the tri-state region. (p10-11)
Trigger words	Designed to significantly expand, support
Conditions	NASA was already invested in this region; TIIAP just expanding
Inter/actions	Aim was to connect schools with NASA jobs; community with world
Consequences	Are these really the "goals of the people"?
Concept	<i>Intended Beneficiary</i>
Property	Ownership
Dimensions	Felt full ownership of grant (selection of problem/goals & resolution/action); little; none; <i>unknown</i>

Item	Description
Quote/Data & page #	The School of Architecture worked for nearly a year to complete a site survey of the Iuka site that included comprehensive video taping of the entire site...the first of several teacher workshops was held at Mississippi State University...four remote nodes were located within the boundaries of Tishomingo County to provide access to the WEB for all citizens of the county and the region either through a direct network connection, a dial-in terminal server, or by a simple voice telephone. A gateway node was installed at MSU to interconnect the WEB to the resources available at and through the university. Equipment was also installed at the network expansion sites in Lawrenceberg, Tennessee, and Muscle Shoals, Alabama...(p11)
Trigger words	Survey, workshops, nodes, interconnect, expansion
Conditions	Several resources available in community
Inter/actions	Citizens have opportunity to get connected via various resources and have part in the project
Consequences	
Concept	<i>Development Opportunity (working on the project)</i>
Property	Development Type
Dimensions	<i>Site survey, videotaping, workshop</i>
Property	
Dimensions	
Quote/Data & page #	After a long process of generating and editing extensive video footage, interviews, computer models, and animations of the network sites, two promotional videos were produced and distributed. A Community Design Workshop was conducted in March on the development of the region around the Yellow Creek site. (p12)
Trigger words	promotional
Conditions	Needed to promote the effort
Inter/actions	Heavy use of videos
Consequences	
Concept	<i>Marketing</i>
Property	Marketing Timeframe
Dimensions	Prior to grant, <i>during grant</i> , at point of self-sufficiency
Quote/Data & page #	Project activities began to be scaled back at the end of 1996 to begin a transition phase in which the network could begin moving into a self-supporting mode. Because the demand for more dial-in capabilities to area citizens had increased significantly, dial-in Internet access was expanded. (p12)
Trigger words	Transition, begin moving, self-supporting
Conditions	Need to become self-supporting
Inter/actions	Dial-in services popular
Consequences	
Concept	<i>Service Opportunity</i>
Property	Self-supporting potential

Item	Description
Dimensions	Likely, promising, unlikely, unknown
Quote/Data & page #	The intent of the project was to get the network up and running, get the schools that it would serve involved, and then turn network operations over to school district personnel. Project staff intended to set up a non-profit organization to enable school officials to run the network, but the state Attorney General ruled to disallow the project to compete as an Internet service provider (ISP) forced the project to turn over the accounts to ISPs. MDECD retained control of the network until an agreement could be worked out with the Tishomingo School District to take the network over at a later date using ISPs to provide service. (p12)
Trigger words	Intent, intended, rules to disallow, forced
Conditions	Plan to be non-profit ISP run by and for the schools [thought it was broader audience?]
Inter/actions	AG got involved (by whom?) and wouldn't allow it
Consequences	Concern over long-term sustainability and commitment to disadvantaged Success may be measured by whether private sector is willing, and is fighting, to take over service provision
Concept	Service Opportunity
Property	Ongoing operations
Dimensions	Private, non-profit, other
Property	Others willing to take over
Dimensions	Yes, No, unknown
Concept	Legal
Property	Legal Action Type
Dimensions	Attorney General decision
Quote/Data & page #	Plans were also developed to move the Tri-State Resource Center into a self-sustaining mode of operation so that its community incubator program would remain in operation after the grant period ended. (p12) ...Network operations were smoothly transitioned to the Tishomingo County school system. (p.12)
Trigger words	Move into, self-sustaining, remain in operation, after the grant period ended
Conditions	Community incubator program desirable
Inter/actions	Resource Center to become self-sustaining
Consequences	What happened? Did it?
Concept	Service Opportunity
Property	Continuation Plans
Dimensions	Plan to continue without modification, Plan to continue with modification, plan to discontinue
Concept	Sustainability Plans
Property	Service to be sustained
Dimensions	Internet, community incubator, network operations
Concept	Sustainability Plans

Item	Description
Property	Who to take over service
Dimensions	ISP, Resource Center, School
Quote/Data & page #	...hostile atmosphere existing in the region toward "outsiders." This hostility was due to the economic devastation that the Tri-State Region had experienced over the last 10 years. As explained previously, the local economy had been devastated by a series of abandoned federal initiatives; the community was very reluctant to support the TIIAP initiative. However, once the communities came to understand that this project was being carried out by a local state university rather than a federal agency, the atmosphere changed. Project staff worked hard to reward the community's trust by providing opportunities for citizens to improve their economic and educational opportunities. (p.13)
Trigger words	Hostile, outsiders, devastation, experienced, reluctant, atmosphere, changed. trust
Conditions	Environment of distrust between community and federal government
Inter/actions	Local university became the lead
Consequences	Trust was instilled
Concept	Barrier
Property	Trust Experience between beneficiaries and project awardee (sponsor?)
Dimensions	<i>Significant, Low, Untested</i>
Concept	Barrier
Property	Trust Level between beneficiaries and project awardee (legitimacy)
Dimensions	High, Moderate, <i>Low</i>
Quote/Data & page #	Enticing businesses to venture into electronic commerce was more of an obstacle than was anticipated. The project staff attribute this fact to a lack of understanding of telecommunications, the Internet, the technology, the business potential, and obstacles that they would face in cyberspace. Project staff visited Tishomingo County 2-3 days a week during early phases of the project to attend Rotary Club board meetings, conduct press releases, and otherwise meet and dialogue with community members and business leaders. (p13)
Trigger words	more of an obstacle, than was anticipated, lack of understanding
Conditions	Higher & easier level of business participation expected
Inter/actions	Project staff had to reach out
Consequences	
Concept	<i>Partner</i>
Property	Partner Type
Dimensions	<i>Business, School</i>
Concept	<i>Partner</i>
Property	Partner Willingness to get Involved
Dimensions	Eager, <i>Reluctant</i>

Item	Description
Quote/Data & page #	to expedite the establishment of the TSRC, NASA offered temporary space for the hub at the Tishomingo County Educational Complex near Iuka. The hub and officers were set up there, with the hope and design that they would be moved to Building 1000 at the Yellow Creek site as soon as it became available. Unfortunately, this did not happen, and the offices of the hub site remained at the Educational Complex. This in itself meant that Johnson Controls did not have the transmission lines and telecommunications infrastructure readily available, as defined by the project had it been established at the Yellow Creek Site. Essentially, this involved building a system “from scratch,” which delayed the full operation. (p13)
Trigger words	Unfortunately, did not happen, remained, did not have, readily available, as defined by the project, had it been, involved, delayed
Conditions	Well-developed plans had been in place for network operations
Inter/actions	NASA did not make hub available for project
Consequences	Technical partner Johnson Controls incurred significant unanticipated work, expense, and delays for network operations
Concept	Plan
Property	Plan Component
Dimensions	Network operations
Property	Planned Solution
Dimensions	Existing site/facilities, New site/facilities
Concept	Vulnerability or Changeability (initial condition that is not solid; theory is that the more of these initial conditions are uncertain and that later change, the more likely the indication is that this is a vulnerable community that has been targeted to attract funding, rather than to genuinely help)
Property	Vulnerability Area
Dimensions	Network operations, Project administration, Targeted beneficiary
Quote/Data & page #	The large number of components and players involved in the project created issues of coordination and organization. As mentioned previously, the original major player in the demonstration project was the TSEIC, in the role of project administration. The overall project administration was later turned over to individuals who, 1 year earlier, had been involved in writing just one component of the proposal. Changing key players midstream was a significant issue in both the organization and execution of the project goals...Furthermore, the broad scope and multifaceted organization of the project made it difficult for area residents to know whom to contact with which questions or concerns. This was alleviated to some extent by the addition of a 1-800 number so that people could direct their queries to the proper source. (p13-14)
Trigger words	Issues, original, later, just one, changing
Conditions	It was thought that TSEIC would be administrator, but this too changed

Item	Description
Inter/actions	Instead of dropping the project, administration was turned over to others who had not been continuously involved
Consequences	This was “an issue”
Concept	Vulnerability
Property	Vulnerability Area
Dimensions	Network operations, <i>Project administration</i> , Targeted beneficiary
Concept	Barrier
Property	Project Coordination
Dimensions	Well-coordinated, Some coordination problems, <i>significant coordination problems</i>
Concept	Solution
Property	Solution Type
Dimensions	Coordination Issues
Concept	Solution
Property	Solution Description
Dimensions	Toll-free contact number
Quote/Data & page #	the original 18-month timeframe were ambitious to begin with and, undoubtedly, the complexities and limitations of the project were magnified when compressed into what would have been essentially a period of 7 months (based on the initial project end-date of March 31, 1996). (p14)
Trigger words	Timeframe, ambitious, undoubtedly, complexities, limitations, magnified, compressed, essentially, initial end-date
Conditions	Original 18 month timeframe already difficult
Inter/actions	Compressed timeframe due to all changes
Consequences	More issues
Concept	Vulnerability
Property	Vulnerability Area
Dimensions	Network operations, Project administration, Targeted beneficiary, <i>Project Timeframe</i>
Quote/Data & page #	the technology employed in the project changed rapidly from the time of the conception of the project to its actual implementation, leading to several changes in the project’s approach and conduct... The experience of generating high-quality, creative products and events under pressure, using leading-edge software and hardware was nevertheless considered beneficial by the project team because it increased their knowledge about technical systems and the time requirements necessary to produce quality results.
Trigger words	
Conditions	
Inter/actions	
Consequences	
Concept	Benefit [this is related to connection]
Property	Benefit Type

Item	Description
Dimensions	Experience with new technology
Concept	Vulnerability
Property	Vulnerability Type
Dimensions	Network operations, Project administration, Targeted beneficiary, Project Timeframe, <i>Keeping up with technology</i>
Quote/Data & page #	During the implementation stage, crossing LATA ₄ lines across states was reported to be the biggest and most unexpected headache project staff had to deal with. It took considerable effort to determine the rules and regulations governing LATA lines, and there were substantial costs associated with setting up the network across LATA lines. Despite these difficulties, and despite the fact that the network nodes in Tennessee and Alabama ultimately received only minor use, the project director felt that the out-of-state nodes were worth installing because they provided an opportunity to learn about the issues involved in interstate telecommunications. (p14)
Trigger words	Biggest, unexpected, headache, considerable effort, substantial costs, difficulties, worth, opportunity
Conditions	Didn't anticipate LATA issues
Inter/actions	Difficult to set up network across LATAs
Consequences	
Concept	Benefit
Property	Level of Cognitive dissonance
Dimensions	<i>High level (high cost justified by some benefit)</i> , moderate, low, none
Concept	Benefit
Property	Benefit type
Dimensions	<i>Experience (with telecommunications policy)</i>
Quote/Data & page #	Project staff also had a difficult time accessing several federal databases containing information about the project site that was needed for the architectural survey. Despite a prior commitment from NASA to share aerial photography, satellite imagery, and other needed data, it turned out to be extremely difficult and in some cases impossible to obtain access. Part of the problem was due to a lack of coordination between divisions within the agency and part of the problem had to do with security and proprietary issues. (p14)
Trigger words	Difficult, databases, information about, needed, despite, prior commitment, share, impossible, obtain access, problem, lack of coordination, security, proprietary, issues
Conditions	Promises of info sharing were made & not kept
Inter/actions	NASA did not share info with project
Consequences	
Concept	Barrier
Property	Information Sharing
Dimensions	Open sharing as planned, open sharing despite plans, limited sharing as planned, limited sharing despite plans, no sharing as planned, <i>no sharing despite plans</i>

Item	Description
Concept	<i>Connection</i>
Property	Connection Opportunity
Dimensions	Fully realized, partially realized, <i>not realized</i>
Quote/Data & page #	NASA was not the only organization unwilling to share data. As part of the project, a GIS user interface was developed to allow network users to easily access local GIS data from a web browser such as Netscape. However, MDECD directed the project staff to limit the GIS data available to the general public and economic developers from around the country. Therefore, the demonstration that existed on the website at the time of the site visit was said to represent only a small portion of what is possible. MDECD's rationale for reserving exclusive access to majority of data was that the state would then be in a better position to sell Mississippi during presentations for prospective businesses. (p14)
Trigger words	Unwilling to share, however, limit, small portion of what is possible, rationale, reserving, exclusive access, majority of data, sell
Conditions	Expectation that the public could access GIS data
Inter/actions	New administrator (MCECD) restricted GIS data access
Consequences	Not really an "open" system intended to benefit the public
Concept	Information (content)
Property	Information Type
Dimensions	GIS-based data
Property	Public Access
Dimensions	Open, restricted
Quote/Data & page #	Perhaps the most important indicator of the success and the impact of the total project is the tremendous level of community support that was garnered in an initially reluctant population. Community members became involved in all aspects of the project. The educational aspects of the project in particular should establish lasting impacts on the county's teachers and students. And the economic development supports and resources developed through the project have encouraged local industry to take advantage of worldwide commercial opportunities available via the World Wide Web and persuaded businesses and industries to locate in the area. (p15) An important factor in the project's success was the multi-discipline collaboration that occurred between campus groups that typically do not work with each other. (p15).
Trigger words	Most important, indicator, success, impact, tremendous level, community support, initially reluctant, involved, educational aspects
Conditions	Community initially reluctant
Inter/actions	Connection to Education and commerce via WWW have helped
Consequences	Community enthusiastic supporter
Concept	<i>Community Support</i>
Property	Startup Support Level
Dimensions	High, Moderate, <i>Low</i>

Item	Description
Property	Evaluation Timeframe Level
Dimensions	<i>High, Moderate, Low</i>
Concept	<i>Success Contributor</i>
Property	Collaborations Enabled
Dimensions	<i>Multi-disciplinary campus units</i>
Quote/Data & page #	A prototype for a comprehensive cultural/education network for schools and the community was initiated with a linkage to the Smithsonian Museum of Natural History in Washington, D.C. (p15)
Trigger words	Prototype, initiated, linkage
Conditions	Limited cultural opportunities
Inter/actions	Connected community with Smithsonian
Consequences	
Concept	<i>Linkage</i>
Property	Linkage Type
Dimensions	Cultural
Quote/Data & page #	While the original proposal called for the production of about 30 maps for Tishomingo County, additional data allowed for the production of additional maps in Alcorn and Prentiss Counties. Additionally, the location coordinates on more sites than originally anticipated were available, thus allowing for the depiction of the region in greater detail. Database files that will allow the future completion of maps for Alcorn County and Pretiss Counties have also been produced.
Trigger words	Original, allowed for, additional, originally anticipated, will allow, maps
Conditions	Not as many maps were planned as what were made available
Inter/actions	Maps extended to all 3 counties, not just Tishomingo
Consequences	
Concept	<i>Services</i>
Property	Service Type
Dimensions	Mapping
Concept	<i>Services</i>
Property	Service Level Planned
Dimensions	More than planned, Amount planned, Less than planned
Quote/Data & page #	Small businesses in the tri-state region were offered the opportunity to design or have designed web pages for them to represent their business or organization on the website. Many small businesses exercised this option and were pleased to have the capability for Internet users to gain access to information about their businesses and the products and services that they offered. The website created for the project is located at the URL http://www.tristatenet.org . (p18)
Trigger words	Opportunity, Web pages, pleased
Conditions	Businesses didn't have websites before this project
Inter/actions	Web page development connected businesses to the web

Item	Description
Consequences	
Concept	<i>Service</i>
Property	Service type
Dimensions	Website development
Quote/Data & page #	The TIIAP project fulfilled a great need among the residents of Tishomingo County for access to the telecommunications infrastructure and training in its use. Residents are acutely aware that the use of technology and telecommunications are an important factor in their abilities to compete in the technological world of the 21 st century. Project staff reported that people often had to be turned away from town meetings about the project due to a lack of standing room. The outpouring of volunteers to assist with various project activities was reported to be phenomenal. Community members not only provided technical assistance but also went so far as to offer their extra bedrooms for use by the project staff when they were in town. (And project training staff had more requests for training sessions than could be accommodated.) When the demand for training outstripped the availability of computer systems in the community of Belmont (population 1,200), for example, over \$30,000 in local contributions were raised in a 2-week period to purchase 25 state-of-the-art computers for the community's electronic classroom. (p18)
Trigger words	Fulfilled a great need, acutely aware, important factor, abilities to compete, lack of standing room, outpouring, phenomenal, not only...but also, more requests for... demand...outstripped, local contributions
Conditions	This intervention was needed
Inter/actions	Positive interactions between community and the project
Consequences	High level of community engagement and support
Concept	<i>Success Indicators</i>
Property	Success Indicator Type/Category
Dimensions	<i>Community Support</i>
Concept	<i>Success Indicators</i>
Property	Success Indicator Result
Dimensions	<i>Meeting turnout, Infrastructure access, Training Attendance, Volunteers, Extras (offering rooms), Requests for Training, Mobilization (fundraising drive)</i>
Quote/Data & page #	Other indicators of the impact of the project on end users can be judged in relation to the baseline technology literacy study conducted as part of the project. The study, which is described further in section F, found that at the beginning of the project there was a very limited level of knowledge or use of technology and telecommunications within the region. However, during the latter stages of the project one of the new small businesses (a computer sales company) spawned from the impact of the project sold over 100 computer systems within one small rural community. As the project matured and the citizens of

Item	Description
	the area developed a better understanding of the technology and its potential, the demand on the telecommunications system grew at a rate far greater than imagined. Pp18-19
Trigger words	Indicators, impact, judged, in relation to, baseline, technology literacy, found, level of, use of, spawned from the, demand
Conditions	Low technology literacy in community before project
Inter/actions	Demand for computers & telecommunications seen as evidence that technology literacy increased – suggesting it was due to the project
Consequences	May be a false attribution, since the Internet generally was gaining in popularity during this same timeframe
Concept	<i>Success Indicators</i>
Property	Success Indicator Type/Category
Dimensions	Community Support, <i>Technology Literacy</i> , <i>Classroom Instruction Impact</i>
Concept	<i>Success Indicators</i>
Property	Success Indicator Measure
Dimensions	<i>Computer Demand</i> , <i>Telecom Demand</i>
Concept	<i>Success Indicators</i>
Property	Success Indicator Result
Dimensions	<i>Significant positive change (increase)</i> , about the same, significant negative change (decrease)
Quote/Data & page #	Although there has been no attempt made to determine and document how and how often the Tri-State Network is used by teachers and students in the Tishomingo County schools, project staff and school administrators believe that the training activities and the provision of equipment and access has significantly changed classroom instruction throughout the county. (p19)
Trigger words	Although, no attempt, how, how often, believe, significantly changed
Conditions	An unsupported claim is about to be made
Inter/actions	Project staff and school administrators are trying to convince the evaluators of positive impact
Consequences	No proof, only “belief”
Concept	<i>Success Indicators</i>
Property	Success Indicator Verification
Dimensions	Objective results available (formal study), anecdotal evidence (single example), conjecture only (should)

Item	Description
Quote/Data & page #	Several examples of how the Tri-State Network has been used by the schools were provided, the most notable being a pilot project with the Smithsonian Institution's National Museum of Natural History called the Natural Partners Initiative. This collaborative program was designed to enliven the way science is taught to elementary and middle school students. Through the initiative, the electronic communication and information technology provided by the TIIAP project made possible the interaction between school children in Mississippi and museum scientists and curators at the National Museum of Natural History. (p19) Interactive experiences were made possible through other Internet broadcasts from the National Museum of Natural History such as "Live from Antarctica," sessions with Peace Corps representatives, an "electronic field trip to the live Marine Ecosystem exhibit, and a "Live from the Stratosphere" session with atmospheric researchers. These events typically reach about 5,000 students and teachers. (p19)... eight middle school teachers were selected to participate in the Smithsonian's Natural Partner's Initiative. The teachers were brought to the museum (p22)... an MSU professor from the School of Architecture spent 5 weeks at the Museum of Natural History with a group of his students in the summer of 1997 conducting a 3-D mapping inventory of artifacts and exhibits in the museum's archives. The university funded the effort to make the museum's collection available electronically to anyone with Internet access. This endeavor has expanded further with the Smithsonian using software created for the 3-D mapping project to create new museum exhibits. (p22)
Trigger words	Most notable, made possible the interaction between, brought to, spent 5 weeks at, expanded further
Conditions	Limited science program in school
Inter/actions	Connected Mississippi students, teachers/professors to National Museum of Natural History scientists & curators
Consequences	
Concept	Connection
Property	Inequality (between nodes that connect)
Dimensions	Academic level, access to resources, technology know-how
Quote/Data & page #	The network's interactive video systems have also been used to assess and improve student teaching. Using the interactive video equipment, faculty and administrators can unobtrusively observe student teachers in the classroom from a remote location. The technology also allows for more frequent communication between the student teachers and their colleagues. The interactive technology also allows the schools of education to place student teachers in more geographically isolated areas away from the university. (p19)
Trigger words	remote, geographically isolated

Item	Description
Conditions	Student teachers used to be limited by geographical proximity to universities
Inter/actions	Connects remote areas with student teachers
Consequences	
Concept	<i>Connection</i>
Property	Connection Type
Dimensions	Student teaching
Property	Inequality (barrier)
Dimensions	<i>Community proximity to university</i>
Quote/Data & page #	the Tri-State Project became a vehicle for area businesses to take part in the competitive arena. At the time of the site visit, 16 businesses had participated in the network by using electronic commerce via home pages advertising for their businesses. (p19-20)
Trigger words	Vehicle for, businesses, competitive, electronic commerce
Conditions	Businesses were new to web
Inter/actions	Connected businesses to broader commerce
Consequences	
Concept	<i>Connection</i>
Property	Connection Type (service?)
Dimensions	Business website (e-commerce)
Quote/Data & page #	Through the TSRC and under the direction of the MDECD, economic development was a major thrust of the project. The TSRC provided assistance to businesses and industries within the region in a variety of ways. These included providing technical support and expertise in 1) simple and complex networking, 2) a wide range of telecommunications technologies, 3) integrated facility management, 4) the Internet and World Wide Web access, 5) web/home page development, and 6) strategic planning. In addition, major efforts were expended in providing consulting services and technology training. These activities included 1) ISO 9000, 2) quality, 3) Stephen Covey's "Seven Habits of Highly Effective People," 4) business management, and 5) small business administration and development...A unique "electronic incubation" concept was developed by the TSRC team that created a virtual business incubator to foster the development of new small businesses within the region...A minority consortium incubator concept was also developed and implemented by the TSRC during the final stages of the networking project. Additional efforts were directed toward developing the climate to attract high tech, diversified industries and businesses that could take advantage of the advanced telecommunications systems implemented under the networking project. (p20)... Unfortunately, there is no available documentation of the amount of new business generated via the World Wide Web...several new technology-related small businesses were spawned in the region as a result of the impact of this

Item	Description
	project...Computer sales climbed...Three new ISPs and one new computer retailer started up. (p20)
Trigger words	Economic development, major thrust, assistance, technical support, expertise, consulting services, technology training
Conditions	Region needed economic development
Inter/actions	Connected business & industry to econ dev services
Consequences	No measurement of actual impact (eg new business)
Concept	<i>Services</i>
Property	Service type
Dimensions	<i>Economic development</i> , educational, cultural, community-oriented
Concept	<i>Missing Data</i>
Property	Missing data type
Dimensions	<i>Economic development</i>
Quote/Data & page #	The MSU School of Architecture carried out a number of tasks to support master planning and economic and community development efforts involving the re-use of the Yellow Creek site. These included conducting a community design workshop on the development of the region around the Yellow Creek site, and the compilation, organization, and creation of new digital data on the physical infrastructure of the site...Participants in the community design workshop were drawn from the tri-state area and included architecture and landscape students and faculty from MSU and from Auburn University in Alabama, faculty from the University of Arkansas, nationally recognized consultants in energy and environmental systems design, members of the communities surrounding Yellow Creek, as well as representatives of MDECD and the MSU School of Architecture...Community response was warm and enthusiastic, although turnout was low. (p21)
Trigger words	Participants, included, turnout
Conditions	Needed plan for Yellow Creek reuse
Inter/actions	Connected universities, consultants, community members
Consequences	
Concept	<i>Connection</i>
Property	Connection Type
Dimensions	Planning & development
Concept	<i>Community Engagement</i>
Property	Participation Level
Dimensions	High, Medium, <i>Low</i> , None

Item	Description
Quote/Data & page #	A beneficial part of the project was the establishment of ties by MSU to the Smithsonian, NASA, and the U.S. Department of Education. The continuation of these ties and the development of future projects with these agencies has been an added benefit from the project. The positive working relationship between these federal organizations and MSU helped to break down existing barriers typically encountered when states deal with federal entities. The cooperative nature of this project allowed the state government to maintain creative control of the project while using federal partners as advisors and mentors. (p21) In addition to the relationships with federal entities, the TIIAP initiative also strengthened ties between MSU and the Tishomingo County Special Municipal Separate School District. Tri-state project staff from MSU were involved in the development of the district's 1996-97 Educational Technology Plan. Tri-State staff members helped the school district understand the capabilities of existing technology, incorporate Tri- State Network Project plans into the school system's technology plan, and recognize the need for additional electronic access including the requirements for additional phone lines... technological advances stimulated by the TIIAP project also motivated the school system in Tishomingo County to pursue additional grants to maintain the momentum
Trigger words	Establishment of ties, continuation of these ties, development of future projects, benefit, break down existing barriers, cooperative nature, partners, relationships, strengthened ties between, helped
Conditions	There were barriers with federal entities
Inter/actions	MSU served to connect community with Smithsonian, NASA, and DOEd Tri-state project staff from MSU and the Tishomingo County Special Municipal Separate School District
Consequences	Barriers removed, cooperative agreement reached
Concept	<i>Connection</i>
Property	Connection status prior to grant
Dimensions	Positive, negative, non-existent
Property	Connection status due to grant
Dimensions	Positive, negative, non-existent
Property	Connection Type
Dimensions	Network administrative operation, school planning
Quote/Data & page #	technological advances stimulated by the TIIAP project also motivated the school system in Tishomingo County to pursue additional grants to maintain the momentum (p21)
Trigger words	Stimulated, motivated, pursue, additional, momentum
Conditions	Needed catalyzing activity
Inter/actions	Tech advances connected schools with idea of seeking money
Consequences	Additional grants
Concept	<i>Catalyst</i>
Property	Catalyst source

Item	Description
Dimensions	Grant funding, technology advances
Quote/Data & page #	The TIIAP initiative had several unexpected effects on the grantee organization, MSU. Prior to the TIIAP initiative, MSU was only involved in a limited amount of educational and training activities outside the university using distance learning technologies. Now, the university is involved in several such projects...the TIIAP grant directly led to the establishment of the University's new Center for Education and Training. The vice president of the university suggested that a center be formed to provide a mechanism for interdisciplinary ventures because he was so impressed with the way the various university groups worked together on the TIIAP initiative across departmental and college lines. The TIIAP project also put MSU's School of Architecture on the map by securing their reputation with state agencies and within the architecture community. (p22)
Trigger words	Unexpected effects
Conditions	
Inter/actions	
Consequences	
Concept	<i>Unplanned Benefits</i>
Property	For Whom
Dimensions	Grantee
Quote/Data & page #	Project staff would have liked to have had greater involvement within the medical component of the project. Unfortunately, the project didn't have enough buy-in from that segment of the community and the network node at the county hospital is not realizing its full potential. Similarly, the expanded nodes in Lawrenceberg, Tennessee, and Muscle Shoals, Alabama, have shown a much lower involvement in network activities than was anticipated at the time of the proposal. (p23)
Trigger words	
Conditions	
Inter/actions	
Consequences	
Concept	<i>Unplanned negative outcomes</i>
Property	Type
Dimensions	Community participation less, not all segments bought-in (medical)

Item	Description
Quote/Data & page #	<p>The evaluators made several recommendations for the project communities and the project staff to consider as the project moved forward in subsequent years...</p> <ul style="list-style-type: none"> • ...project staff will need to reformulate project goals to better reflect community desires and ambitions. • There are three substantial resources within the community that can be more effectively coordinated with the conduct of the project...volunteerism...an untapped resource that holds potential promise for not only expanding the program, but also entrenching the technology in the social fabric of the community. Also, substantial resources such as the Tri-State Education Initiative (NASA's role), along with the Tri-State Educational Initiative Consortium (the role of regional educational leaders) need to be brought into the project as major collaborators and players in any future phases of the project. • Paradoxically, communications between project components and the project management and the community players should be given the highest priority in all future project activities. (p26)
Trigger words	community desires, resources, within the community, community players
Conditions	
Inter/actions	
Consequences	
Concept	<i>Community Engagement Recommendations</i>
Property	Type to increase
Dimensions	s
Discussion	
Discussion	<p>There were many changes in this project – from the original awardee, partners, and geographical boundaries. What was really going on? Why this reluctance for economic development? Seems as if it’s only thru “need” that grants can be awarded, but that it’s only thru achieving economic purposes that grants can be effectively administered. Those with the need are reluctant to manage. And those with management expertise are perhaps reluctant or unable to effectively incorporate the most needy? Impressive the contributions of and variety of partners – different levels of government and different sectors. This has a political component: involvement of attorney general – other one had governor’s hometown</p>
Emerging Categories	<ul style="list-style-type: none"> • <i>Change</i> – the notion of changing aspects of the project is important; huge differences is in this project between what was original planned & envisioned, and what actually got implemented; need to

capture before (planned) & after (implemented/actual) Add political component Introduce instability – how many knowingly induced/introduced/deliberately not avoided (omission/commission)

- **Community Victim/Target** (sacrificial lamb? Sympathetic communities? Vulnerable communities? Funding attractors? Patsy?) – a community that: often finds itself (repeatedly and over time) included in grant proposals to demonstrate high need in order to attract funding, BUT rarely has any real input into the proposal or its implementation (the thing that could be varied and have real impact on the outcome – the dependent variable) AND rarely finds itself any better off because of the grant (before, during, or especially afterwards) —I can make this a hypothesis: first, find these communities, second, quantify/describe level of true local involvement in proposal or implementation [input from community could tell you where the hole in the bucket was – if not how to fix it; especially when repeated]
- **Typology of CNs – strong founder (self-serving/professional?), vulnerable community (political), economic** – which most likely to succeed – as defined by...? ; can things change from one type to another, what can you change (IVs, DVs) – how to transform disadvantaged community so that you know the funds won't be wasted – explicit things to watch for depending on which type
- **Silver lining:** At what expense; time is money, cost benefit analysis, positive spin; everything is possible with unlimited time & money Do always decide to move forward with current design, change design, or drop project; a lot about who is chosen to participate; must anticipate things not going as planned – always pick the best people to make silk purse out of sow's ear when there's still only so much time & money; good for Interdisciplinarity teams
- **Corrupted capitalism:** the data made available thru the initiative was not 'theirs' to sell; should not be for exclusive access, should be for public
- **Success Indicator vs. Success Contributor:** “vectors” for indicators – Type, Measure, Result
- **Connection Inequality:** the notion that there are various dimensions of inequality that can 1) be used as connection points (node-node), 2) be bridged (link itself) in order to enabled connection
- **Missing data:** notion that what is missing can tell us much about the real priorities and intentions – did they ever really intend to find out that something wasn't materializing the way hoped?
- **Community Engagement Recommendations** – anything prefaced with “community” that is specifically called out

Questions	
Gaps	Evidence of “after” the grant – continued existence? Benefit to intended audience – long or short term.
Other	The nature of sympathetic communities may prevent true transformation

– they need to remain vulnerable & needy in order to be continuous sources for attracting funding. While they’re not actively victimized, they are not actively helped in any meaningful way (at least based on any notion of local community members) either. It would be interesting to see how many of these efforts display evidence (all facets) of being a sympathetic community.

- Study 1: What theory about this type of community?
- Study 2: Which specific communities are continually exploited?
- Study 3: How can you really help these specific communities? What are the safeguards/funding requirements to ensure “success”?

It’s curious that so many maps were created – beyond those originally planned and for all 3 counties. Does that reflect the different priorities of the different awardees?

Data Memo: TVN 35-60-01068

Data Description

Item	Description
Data Description	Tribal Virtual Network (TVN) Evaluation Report
Project Name	Tribal Virtual Network
Entity Name	Tribal Virtual Network
Entity Description	“Consortium dedicated to bridging the digital divide through the use of Access Grid technology supported by a broadband infrastructure” (p.1)
Evaluation Method	Surveys of 10 (of 14) TVN Consortium members
Evaluator	Commissioned by the TVN; a single evaluator conducted it
Website	
Year Funded	2001
Code (40,50,60)	60
State	NM
Date of Coding	8/6/13
Coding Duration	

Quotes & Concepts

Item	Description
Quote/Data & page #	“While most of the responding members did not attend the first AG training, most attended the training in Chicago and found it beneficial.” (p.1)
Trigger words	Did not attend, attended
Conditions	For some reason an initial training somewhere unspecified had low attendance, but why Chicago?
Inter/actions	TVN connected tribal members with training
Consequences	Beneficial

Item	Description
Concept	<i>Barrier</i>
Property	Access to Training
Dimensions	Onsite, Nearby, <i>Far away</i> , Virtual
Concept	<i>Usage Indicator</i>
Property	Uptake
Dimensions	None, <i>Poor</i> , <i>Good</i> , Excellent
Quote/Data & page #	“Consortium members are most frequently using the AG for the monthly meetings, however, some are have used it to present health education to other members’ communities.” (p.1)
Trigger words	Using, used to
Conditions	There is an existing need for technology to support meetings and health care
Inter/actions	AG helps members connect to each other and to connect to health information
Consequences	
Concept	<i>Usage Indicator</i>
Property	Activity
Dimensions	<i>Monthly meetings</i> , <i>health education</i>
Quote/Data & page #	“Previously, the members have experienced technical difficulties with the computer equipment and the AG software; however, these problems are being resolved with the assistance of UNM TVN technical support.” (p.1)
Trigger words	Difficulties, problems, support
Conditions	Equipment and software problems exist
Inter/actions	Members are connected with technical support
Consequences	Gradual resolution of equipment and software problems
Concept	<i>Barrier</i>
Property	Equipment
Dimensions	Working well consistently, Working sometimes, <i>Not working (technical difficulties)</i>
Concept	<i>Barrier</i>
Property	Software
Dimensions	Able to use intuitively, Able to use with training, <i>Not able to use (technical difficulties)</i>
Quote/Data & page #	“Some members indicated that it was hard to make future plans until the present problems were resolved. With more support and better understanding of the AG, members are likely to begin making future plans” (p.1)
Trigger words	Future plans, resolved
Conditions	Paralysis due to technical difficulties; implied lack of understanding of AG value
Inter/actions	Connects members with AG usage via support & understanding
Consequences	Unable to plan
Concept	<i>Barrier</i>

Item	Description
Property	Technical support
Dimensions	<i>Available consistently</i> , Available sporadically, Not available
Concept	<i>Barrier</i>
Property	Understanding
Dimensions	High degree of understanding value of service; Moderate degree; <i>Little or no understanding</i>
Quote/Data & page #	“Training sessions were held for Dreamweaver, PhotoShop, Digitizing Photos, Premier, Fabrication and Museum Planning from February 2002 to April 2003; however the members did not attend all the sessions... Some members had particular interests in only some of the sessions” (p.2) “According to a 2003 NEH Project Performance Report, over 300 community members from each of the five tribal communities attended these workshops.” (p.8)
Trigger words	Sessions were held; did not attend
Conditions	Somehow these specific topics were identified
Inter/actions	Members connected to software via training
Consequences	Not all trainings were of interest
Concept	<i>Indicator</i>
Property	Attendance
Dimensions	Attended all available; <i>attended some available</i> ; attended none
Concept	<i>Indicator</i>
Property	Interest
Dimensions	High degree of interest, <i>moderate degree of interest</i> , little or no interest
Quote/Data & page #	“Some were not a part of the TVN at the time of the training.” (p.2)
Trigger words	Part of
Conditions	Individuals have the opportunity to formally belong
Inter/actions	Connects individuals to the organization (TVN)
Consequences	Failure to be part of the organization excludes from participation
Concept	<i>Members</i>
Property	Membership Status
Dimensions	<i>Member, Able to be member but not</i> , Not able to be Member
Quote/Data & page #	“Some members noted that not having the equipment in their communities when they attended training hampered the transfer of the knowledge and skills.” (p. 2) “Over half of the members mentioned infrastructure barriers such as equipment problems, needing larger rooms for training and reliable internet connections.” (p.9) “Also, the gap between attending training and obtaining the proper equipment served as a barrier.” (p.10)
Trigger words	Not having, hampered
Conditions	Equipment was not placed in local communities
Inter/actions	Connected members to training, but not the equipment to apply training
Consequences	Knowledge and skills not transferred as well as could have been
Concept	<i>Barrier</i>
Property	Access to equipment [this has location, cost, and usability dimensions]

Item	Description
Dimensions	Readily available locally, Available within reasonable distance, <i>Not available nearby</i>
Property	Perceived relevance of training
Dimensions	Highly relevant; moderately relevant; <i>little or no relevance</i>
Property	Training Space
Dimensions	Adequate, <i>inadequate</i>
Property	Time gap between training and getting equipment
Dimensions	None, Low (<i>reasonable amount of time delay</i>), High (<i>unreasonable delay</i>)
Quote/Data & page #	“Time is mentioned most frequently as a barrier to using the technology provided by the TVN.” (p. 2) “Lack of time and frustration were also noted as barriers.” (p.9)
Trigger words	Time, barrier
Conditions	Like everyone else, “members” have limited time to spend
Inter/actions	Connecting members to TVN requires a commitment of time
Consequences	The time required impacts usage of TVN
Concept	Barrier
Property	Time
Dimensions	Minimal time investment to gain value, Moderate time investment, <i>Substantial time investment</i>
Concept	Barrier
Property	Frustration
Dimensions	Low degree of frustration in trying to use; moderate degree; <i>high degree of frustration</i>
Quote/Data & page #	“UNM TVN staff expressed the opinion that it is likely that consortium members have not assimilated the technology into their typical duties” (p. 2)...[and] “some members may not have an adequate vision for the future use of the technology” (p.10)
Trigger words	Assimilated, typical duties
Conditions	Members have a job to do
Inter/actions	Connection between members and TVN has not become standard practice
Consequences	Implied reason for low usage of AG
Concept	Indicator
Property	Assimilation [related to relevance & usefulness (Technology Acceptance Model)]
Dimensions	Highly assimilated into existing practices; Moderately assimilated; <i>Little or no assimilation</i>
Quote/Data & page #	“Community use of the new technology has been minimal. This is partly due the prior equipment problems and a lack of internet connectivity. Members also observe that community members lack sufficient knowledge to use the equipment and further community based training is needed.” (p. 2) “How comfortable the members are with the AG technology now that most of the technical problems have been resolved

Item	Description
	and that there is a technical person to refer to? (p.3) “Most of the TVN consortium members did not have Internet connectivity when the initial AG training was offered” (p.6)
Trigger words	Community use, minimal, problems, lack, community based, needed
Conditions	Use of AG by community is not reasonable without internet, working equipment, and training
Inter/actions	Connecting community to AG is not happening
Consequences	Minimal use of AG by likely intended beneficiaries – the general community, not just members of TVN
Concept	Community
Property	Community use
Dimensions	High, moderate, <i>little to none</i>
Property	Community based
Dimensions	High, moderate, <i>little to none</i>
Property	Internet availability
Dimensions	Available, <i>Not available</i>
Quote/Data & page #	“Consortium members should be encouraged to develop community wide use of the technology, as well as becoming members of a wider digital community” (p.2) “How are the Consortium members encouraging community-wide use of the technology?” (p.3)
Trigger words	members, should, Community wide use; wider digital community;
Conditions	Expectation is on members to encourage broader adoption and engagement
Inter/actions	Members are expected to connect local community with broader digital community [although not specified exactly how, given the issues]
Consequences	Implied lack of success for TVN
Concept	Community
Property	Connection to wider digital community
Dimensions	High, moderate, <i>little to none</i>
Concept	Members
Property	Member Responsibilities
Dimensions	<i>Champion technology use, champion membership in wider digital community</i>
Quote/Data & page #	“Quarterly trainings could focus on ways to get each community started on projects that would financially sustain the technology as well as offering e-commerce opportunities for their communities” (p.2) “What further training is needed to support the members as they develop e-commerce opportunities?” (p.3)
Trigger words	Ways to get, financially sustain, e-commerce, projects, opportunities, training, support
Conditions	Implies low-income communities, insufficient funds to sustain the technology
Inter/actions	Connect communities to money to sustain technology via training to develop e-commerce projects

Item	Description
Consequences	Implication is that without financial sustainability, the technology will go away
Concept	<i>Sustainability</i>
Property	Projects
Dimensions	<i>E-commerce, revenue-generating</i>
Concept	<i>Training</i>
Property	Topic
Dimensions	<i>Encouraging community projects aimed at sustainability; e-commerce project development</i>
Quote/Data & page #	“It is also important to note the during this time period, two key positions for the TVN, the program coordinator and technical support, were vacated and not filled for several months. The vacancy in these positions likely contributed to the communities not getting needed equipment and technical support.” (p.6)
Trigger words	Vacated, not filled, not getting
Conditions	Failure to adequately staff TVN
Inter/actions	Lack of connection between members and TVN usage via adequate staff
Consequences	Lack of working equipment and technical support
Concept	<i>Network Broker [related to actors/nodes, services]</i>
Property	Service Provided
Dimensions	Training, Technical Support
Property	Network Broker Type [related to staff, management, volunteer, etc.]
Dimensions	Program Coordinator, Technical Support
Property	Level of Service Provided
Dimensions	Complete, Partial, Little or None
Quote/Data & page #	“The Chicago training helped them learn more about how to operate the AG and offered solutions to the problems they were experiencing. Most reported gaining a better understanding of the capabilities and limitations of the AG.” (p.6)
Trigger words	Understanding, capabilities, limitations
Conditions	Unrealistic expectations beforehand
Inter/actions	Connected members to knowledge/expectations via training/knowledge
Consequences	More realistic expectations
Concept	<i>Indicators</i>
Property	Expectations
Dimensions	Realistic, Skeptical, Unrealistic
Quote/Data & page #	“Future plans include using the AG technology to offer distance education to their communities. One community plans on marketing the AG technology to other businesses and organizations in their community. Overcoming the equipment and technology limitations will be an important part of any future plans.” (p.6)
Trigger words	Distance education, businesses, organizations, to their communities, in their community, overcoming, limitations
Conditions	Communities are currently disconnected from opportunities that will

Item	Description
	enhance education, commerce, and services
Inter/actions	AG is seen as a way to connect <i>local</i> entities with education, commerce, and services
Consequences	Not a reality yet
Concept	<i>Usage Indicator</i>
Property	Activity
Dimensions	Monthly meetings, health education, <i>distance education, business needs, organization needs</i>
Property	Activity Status
Dimensions	Current, <i>Planned</i> , Abandoned
Property	Customer
Dimensions	<i>Community members, community businesses, community organizations</i>
Quote/Data & page #	“It is important to note that at the time of survey administration, the TVN had recently hired a new technical support staff. Over the past months, this new staff member has worked extensively to troubleshoot AG hardware and software problems.” (p.9) “Need for basic backup training for assistants to the techies – at present if the one tech is unavailable AG system cannot function.” (p.10)
Trigger words	Troubleshoot, backup, unavailable, cannot function
Conditions	Precarious position to have only one person who knows how to operate the system
Inter/actions	A single tech support staff member is the connection point being system users and a working system
Consequences	A system that doesn’t work, is deemed unreliable, and therefore not used
Concept	<i>Network Broker [related to actors/nodes, services]</i>
Property	Criticality
Dimensions	<i>High, Moderate, Low</i>
Property	Backup
Dimensions	Available, <i>Not available</i>
Quote/Data & page #	“Consortium members indicated a need for more AG oriented training – in particular, troubleshooting, designing and setting up an AG room, and ways to address the sound difficulties they had encountered.” (p.11)
Trigger words	Need, difficulties
Conditions	Members are experiencing a number of problems with the system.
Inter/actions	Training needed to connect members with positive system use.
Consequences	
Concept	<i>Training</i>
Property	Topic
Dimensions	Encouraging community projects aimed at sustainability; e-commerce project development, <i>troubleshooting, designing & setting up AG room, running sound</i>
Quote/Data & page #	“...hopefully we can develop community computer labs to enable more use.” “Community members are using the computers. Additional

Item	Description
	computers would be appreciated. Additional funding for extended hours.” “...the computers that purchased at the time were done so with budgetary constraints and were not configured to the needs of the sites.” “Not advertised, not in easily accessible location.” (p.11)
Trigger words	Additional, not
Conditions	A number of barriers exist that limit computer usage by community
Inter/actions	Community members want to connect with computers that, in turn, connect them to the things that interest them
Consequences	It’s hard to connect to the computers due to barriers
Concept	Community
Property	Gap between Perceived (by evaluator) vs. Actual (expressed in results) Interest
Dimensions	<i>Large gap</i> (implies a disconnect), Some gap, Little to no gap (realistic perception)
Concept	Barrier
Property	Computer Lab location
Dimensions	Excellent, Good, Fair, Poor
Property	Computer Lab advertising
Dimensions	Excellent, Good, Fair, Poor
Property	Computer Lab equipment
Dimensions	Excellent, Good, Fair, Poor
Property	Computer Lab software
Dimensions	Excellent, Good, Fair, Poor
Property	Computer Lab hours
Dimensions	Excellent, Good, Fair, Poor
Quote/Data & page #	“One community is using the video editing with youth, and there have been TVN sponsored diabetes education programs for the elders in the communities. One consortium member has plans to market the usage of the AG to groups within the community for distance education and teleconferencing.” (p.12)
Trigger words	Video editing, Youth, diabetes education, elders, community distance education, teleconferencing
Conditions	Several specialized communities have been using AG for targeted audiences and uses
Inter/actions	Connects specialized populations (youth, elderly, general community) with opportunities
Consequences	It is suspected that the more targeted the use, the more successful (greater the uptake)
Concept	Brokering Outcome [related to audiences, connectors, outcomes; this also gets to that gap between perceived & actual community interest – which community?]
Property	Audience transformed/affected
Dimensions	<i>Youth, Elderly, General</i>

Discussion

Emerging Categories

Questions

Gaps

Other

Interesting how this contrasts with 06-40-94026. This eval seems to take a very negative stance, so my codes have a lot to do with barriers. Whereas other one took a positive stance, so codes had to do with positive transformation potential – brokering outcomes & service opportunities, codes I need to go back and use here. Seems like this project can't even get off the ground – and it started a lot later, when Lessons Learned from early rounds should have informed the new projects. I think it's the network connections pieces that need to be called out – there must be strong fabric of multiple connective fibers that is either already built, or will be built through the grant right up front, that predicts success or failure.

There seems to be a discounting of community interest. Perhaps it's because they're not interested in what the founders thought they should be. Instead, they're interested in video, sound, multimedia. How to capture this as a concept?

APPENDIX C
PROCESS MEMOS

Memo 1: Overview of Evaluations

I have organized the TOP projects based on whether or not I have, or can get from the TOP archive at University of Michigan, some kind of evaluation document for the project. In total, I have 67 evaluations of TOP projects – some quarterly, annual, final, etc. I already have 34 of these evaluations that I was able to pull from the project website:

- 1998: 22
- 1999: 12

I have reduced the list of project abstracts to include abstracts only for those 67 projects. In reading through these abstracts, I have decided to quickly code them according to the type of community network they are, with the codes below emerging as I code:

Code	Meaning
B	Business
C	Cultural
E	Education
G	General
LI	Low Income
M	Medical
S	Safety
SP	Special Population
SS	Social Services

I will probably revisit these later. It appears that the classification is breaking down according to:

- 1) topical – based on the partners
- 2) population – based on the people being served (for example, for 25-60-01037, I originally had “D” for disabled, but I remembered that 29-60-00025 was for senior citizens over 55, and I had tagged that as “general.” I’ve now coded it SP for Special Population. Then I’ll probably need to add a qualifier for Disabled, Senior Citizen, or Low Income.

An interesting one is 35-60-01068 for tribal museums. Is this based on the various tribal museum partners or to serve the tribal population? I coded it as Culture, as opposed to SP.

Some projects like 36-40-94057 purport to connect a higher resourced partner like Columbia University, with lower resourced populations like Harlem, via the Harlem schools. I think I’ll start coding these as “X: connexion.” This will be one of the main elements I’m looking for – connection between unequal partners (e.g. resources, power, geography, SES, education level/access, etc.). But the “X” also denotes using institutional partners (topical) as a way to reach special populations. This may be more appropriate as a separate category. Then couple it with the topical/partners & the population. For now, I’m going to code this as LI.

36-60-01018 appears to be another effort that really seeks to benefit the partners in doing their jobs better, rather than directly benefiting the target population – in this case mothers of at-risk children. By this, I mean that the technology will be put in the hands of the day care providers, rather than the mothers. It is assumed that mothers will indirectly benefit. That’s probably an

assumption underlying many of these projects – that by giving service providers access to technology, it will help them do their jobs better – in turn improving the services they deliver. In 36-60-01049, it's Medicare counselors who benefit.

I need to check if I'm equating Rural with General when coding – and whether that's appropriate. I note that there's much mention of lower income and rural together. This reminds me of the THAP workshop I went to years ago where Al Gore was keynote speaker. I was always puzzled why inner poor and rural communities were targeted in the same initiative.

Identification of TOP Numbering Scheme

As I'm creating the appendix listing all of the TOP projects with evaluations that will be included in my study, I'm starting to understand the project numbering pattern. For example, in the project numbered 53-50-95105.

- 53 indicates the state: Washington (WA)
- 50 indicates the category of project: TBD later (possible choices appear to be 40, 50, & 60)
- 95 indicates the year the project was awarded funding: 1995
- 105 may indicate the next sequential number among all projects funded in that year (1995)

Memo 2: Themes

In doing a quick read of the cases, here are some themes:

- Collaboration challenges – sustainability, agreements
- Collaboration features – levels of partners, pre-existing
- Original plan changes: purpose, partners, funding, users
- Focus on people, not tech
- What does not get done – focus groups/assessment for low-income
- Specifics on how tech can help with low income issues, such as literacy & learning
- Acceleration of what was happening anyway – email, online service delivery
- Evaluators trying to focus on technology, but having to report on people instead
- Connecting existing organizations – challenges, rewards
- Clients as indirect beneficiaries
- Networking benefits: Communication, information access, new lasting collaborations
- Barriers: lack of time to use new tech (eg video), broken/not working,
- Abandoned efforts (competing, spinoffs): community email, govt databases
- Consumer/user involvement
- Innovativeness
- Existing community demographics – no attempt to measure change for participants
- Existing goals/direction – no new innovation
- Political considerations overriding others
- Uncooperative info/svc providers – info sharing

- Community building
- Direct benefits: Increased computer skills
- Incentives
- Capacity building: strengthened ability for future collabs & grants
- Computer network building vs human/org network
- Direct (people to tech) vs. indirect (people-serving organization to tech)
- Rural vs. urban
- Existing vs. new
- Volunteer vs staff-run
- Impact/outcomes data not collected, no baseline data
- Changing technology – NII
- Free-net vs not
- Staff retention
- Innovative connections: NOLA Baptist student interns (training/staffing)
- Assumption that connecting “disadvantaged” (outlier) to “advantaged” (central) is best (bridging) – what about building on internal strengths (bonding)?
- Extremes: Columbia & Harlem; Yale & New Haven – town vs. gown [Harlem project has transform, exploratory, sophisticated]
- Legitimization of partnership (especially when previous “bad blood”)
- Grant(s) as connecting thread – before, during, after TOP
- Varying infrastructure needs & capabilities at start affected success
- Partners changed after project ended
- Connection with library – not always good – competitors?
- Use in specific, relevant way

Verbs:

Federally-Funded Community Networking Projects: The Treatment of Vulnerable Communities

- Application: Assembling project teams to apply for funding
- Qualification: Using vulnerable communities to qualify for funding
- Startup: Changing original project design with regard to role of vulnerable communities
- During: Identifying and addressing barriers facing vulnerable communities
- During: Connecting vulnerable communities to others
- Evaluation: Failing to assess impact on vulnerable communities
- Next round: Modifying treatment of vulnerable communities in future funding

Important words:

“originally”

“own...system”

“transform”

Memo 3: Theory

Preliminary Thoughts on Theory

Item	Description
Date	Started 10/13/13
Statement/Formula	<p>All community ICT projects can be categorized as a primary type. Possible community ICT project types are based on the initial conditions spawning the project and include:</p> <ul style="list-style-type: none">• Strong Founder• Vulnerable Community• Other/Unspecified <p>Based on the primary project type, different safeguards or conditions must be put in place in order to enhance the probability of project success. Categories of conditions include:</p> <ul style="list-style-type: none">• Degree of community environmental readiness• Degree of closeness to founder's area of interest• Number of changes from initial grant conditions• Degree of local community involvement in planning and implementation <p>Project success is defined by:</p> <ul style="list-style-type: none">• Extent to which goals articulated by the community have been met• Length of time the network that was created or enhanced by the grant continued to survive beyond the grant period• Extent to which services (connection opportunities) provided by the network were taken over by other entities• Number, type, and quality of new connections fostered by the community network <p>Transformation at the individual/community level is a side effect of community networking and occurs when:</p> <ul style="list-style-type: none">• Previously unconnected partners connect for a tangible purpose• A trusted broker fosters the connection (e.g., a university) AND delivers positive results
Graphic	
Full description	
Shortcomings	
Future Work	

More Refined Thoughts on Theory

After re-reading chapters 7-12 of Corbin and Strauss (2008), I've started to re-read my 4 coded case study memos and to quickly read through all of the early TOP case studies (1998 & 1999) that are coded with a "40." These seem to be those most likely to align with my definition of "community networks." As shown in the memo started on 10/26/13 of emerging themes, I started to write out a list of topics that are covered, and noticed that I'm mainly using nouns to describe the themes encountered. In deciding to explore further the process surrounding the notion of "vulnerable communities" I discovered earlier, and in attempting to use verbs instead of nouns, below are the themes that seem to make sense.

Federally-funded community networking projects: The treatment of vulnerable communities throughout the grant process.

1. Qualification: Identifying problems facing vulnerable communities to qualify for funding
2. Application: Assembling project teams to apply for funding, sometimes including vulnerable community representation, sometimes not
3. Start-up: Changing original project design with regard to role of vulnerable communities
4. During Operations: Identifying and addressing barriers facing vulnerable communities
5. Formative Assessment: Connecting vulnerable communities to others
6. Summative Evaluation: Failing to assess impact on vulnerable communities
7. Recommendations: Modifying treatment of vulnerable communities in future funding

Note: I don't want to lose sight of three broad themes emerging for me: grant funding (lots of data), tracking transformation (some data), cultivation of champions (likely no data)

What is a vulnerable community.

For purposes of this dissertation, a vulnerable community is a geographically-based community (established based on geographic descriptors) that is targeted for a specific intervention (in this case, community networking) in order to enhance it by addressing its perceived disadvantages in some way.

Substantive theory about the grants process.

What I'm seeing is a general process involving grant funding that will likely apply to any type of grant:

1. Identifying problem: Making sure the project is eligible and will stand out from the crowd based on its effort to address specific criteria – in the case of TOP (and many grants), this requires inclusion of a target population that could be classified as "needy"
2. Applying: Assembling a team, often based on existing connections amongst the key partners or even with the vulnerable community
3. Starting up: Upon award, re-examining the project plan and making changes in partners, target beneficiary or coverage area, resources needed, and even in the awardee to ensure success

4. During the project: Finding out that there are obstacles getting in the way of achieving the plans laid out, and having to expend time, energy, and funds to address those unanticipated barriers
5. Identifying potential positive contributions of the project (formative): Looking for the silver lining in the project that suggests it may have made a positive difference. This is more an effort to please the funders and perhaps even some “cognitive dissonance” – particularly in the face of evidence that suggests the project may not have made a dent.
6. Evaluating (summative): An oft-repeated “oops” about failing to collect baseline data, data about actual outcomes rather than inputs/outputs, and longitudinal data—even data collected at the start of the project & re-measured at the end to indicate any kind of change, let alone any plans for continuing to collect data beyond the end of the project.
7. Future: A recognition that more input from the target community should have been included from the beginning, along with promises to do so next time.

Substantive theory about vulnerable communities.

1. On record as Targeted Beneficiary: It is not uncommon to see the same vulnerable communities being used over and over again in grant-funded projects. Their inclusion was successful in the past (best predictor is past behavior), investments (often quite substantial) have already been made (Concorde Fallacy), and usually there is no one to speak for that community to get in the way of the vision of the non-community project team.
2. Left out of Project Team: Members drawn from “vulnerable communities” are not often seen as part of the actual project team that applies for funding – Why not? perhaps because they haven’t typically been included in the past and perhaps because it’s hard to identify people from within those communities who are perceived as being able to effectively contribute.
3. Reduced prominence in grant: The role first identified for vulnerable communities, such as being the primary beneficiary, is lessened through actions, upon granting of the award, such as modifying partners and their roles; primary purpose of the project; location, type, and quantity of resources to be used; primary area to be served; and even project awardee [watch for the key word “originally”]. Since the grant has already been awarded, funders are reluctant to withdraw funding, and would rather repurpose the grant than give the money back.
4. Presenting of Insurmountable Barriers: The project team has outlined its vision for how the project *should* work, but reality sets in that, oh my gosh, there are a lot of things standing in the way that we didn’t anticipate – and these usually have to do with specific characteristics of the vulnerable community that were unknown or not taken into consideration at the time of the application. The community itself then is seen as being the main obstacle – aligning with Kling’s notion of computerization movements: uncooperative people are seen as barriers to the new technology. Much of the remaining efforts of the grant are then targeted to removing these obstacles or addressing these barriers.
5. Connecting with more powerful “Others” outside the Vulnerable Community: One of the enduring findings from examining the project evaluations as well as the scholarly literature, is that these projects themselves offer fertile ground for building “bridging

social capital,” enabling members of the vulnerable community to connect with others who are often affiliated with more powerful or better-resourced institutions. Rather than simply being tangential artifacts or inconsequential by-products of the project that make funders and the project team “feel good,” this enabling of connections may, in fact, be the most promising key to “vulnerable community transformation.” If not directly and immediately within the current project, perhaps later as the project morphs and evolves into new forms. An overlooked aspect of this, however, is the notion that perhaps the more powerful or well-resourced could benefit from the vulnerable community as well; bridging social capital works both ways.

6. Overlooking locally-defined impacts: Opportunities are missed, or perhaps deliberately not established, for identifying impacts that the Vulnerable Community itself would like to achieve, and being realistic about where it is currently. Many communities already have, for example, strategic plans and baseline and ongoing data that have been compiled by other service agencies. Rather than reinventing the wheel, why are these already existing data not incorporated into grant efforts – at the start, during, and after the grant ends?
7. Repeating the cycle: Despite explicit directions from funders to show evidence of needs assessment and local community involvement, the cycle starts over with the same observed phenomena regarding vulnerable communities.

Implications about vulnerable community theory.

It is the pattern of use and abuse of vulnerable communities, often by the same players, that erodes trust and ability to effect change in these communities. This cycle needs to be broken. But how? The main remedy is to change the reward structure. Institutions are incentivized to get grants – free money for doing often fun things that leads to further rewards, such as publications, commercial products, and fame. When institutions (and certain individuals within them) repeatedly abuse, or fail to really serve, the vulnerable communities they purport to serve, they should be penalized, for a period, by being denied the ability to receive, or possibly even pursue, the grants that enable them to keep on reaping these rewards. And those institutions that do illustrate evidence of positive inclusion of vulnerable communities should be rewarded for doing so by continuing to receive grants, and being allowed to continue to pursue those grants. Under the current system, there is no visibility of level of vulnerable community involvement in the grant process. There needs to be some kind of assessment and indicator for this – not unlike a credit score. Coming up with an algorithm for this is beyond the scope of this dissertation, but remains a fruitful area for future research. In the grant selection process, there should be some weighting for these factors. And then “success” could be predicted and measured, based on the accuracy of the Vulnerable Community scores.

It’s important to point out that institutions, and the individuals within them, may not be cognizant of the vulnerable community theory derived from this research. After all, all of us believe we’re doing good works. Academics have worked long and hard to become experts in their respective fields, and this expertise is not to be discounted or undermined. Businesses have likewise worked long and hard and at great expense, often under very competitive conditions. But the evidence from this research on community networks is clear – interventions at the community level WILL NOT yield the positive impacts hoped for by the tax paying public if the

vulnerable community itself, or at least a credible representative of that community, has no real say throughout ALL stages of the project – from before it starts until long after it ends.

What are some ways to engage vulnerable communities? Ironically, academics and businesses have, at their disposal, the most effective ways to do this. Every vulnerable community or population has individuals within it who are talented or gifted in some way. But they have not been noticed or presented with the opportunities to connect to something bigger. [discuss concept of “*vulnerable community champion*”] Some of these individuals may already be participating actively in some way within their community – often in a low-paying or volunteer position. Or it may be a promising high school student who has given up hope in attending college. Academics should strive to identify such promising students and cultivate them to become college students, perhaps levying the grant funding to help support their education, supplemented by other means through the university. Businesses should likewise strive to identify promising employees from among the vulnerable community. Mentoring new students or employees from the vulnerable community might be an appropriate outcome from grant projects. It is through connecting these vulnerable community champions with more powerful institutions that positive individual transformation, if not full vulnerable community transformation, can occur [discuss concept of “*vulnerable community transformation*”]. And it may be that the obvious champions are already in powerful or influential positions – either within the vulnerable community (such as director of a hospital or bank) or elsewhere (such as the governor of a state who hails from the vulnerable community). These kinds of champions might lead the community networking effort or serve as a high level sponsor, helping the vulnerable community navigate through social and/or political waters.

The Spin-Off Effect [Spin-Off not Sustainability as the goal]: Another important conclusion is that sustainability of the network forged by the grant-funded project is not necessarily the right outcome. One of the great things about our federalist system is the potential for experimentation at the state or regional level. Many of these community networking projects were just that – experiments. The greatest contribution of many of the networks forged or strengthened as a result of TOP funding may, in fact, be their own dissolution – only to have their products taken over by another entity or coalition. Future research would do well to capture this phenomenon as well – that of measuring the spin-off impact of funding experiments. The proper unit of analysis should be the vulnerable community that served as the intended beneficiary – not the community network as an institution. Recognizing and resisting the artificial “iron cage” forces of institutionalization (Dimaggio & Powell) that are often built-in to grants under the guise of “sustainability,” while embracing the process of natural selection (survival of the fittest, recognizing that adaptation can and should occur), might yield more positive outcomes for vulnerable communities.

Formal theory about community networking.

Tie in with Sawhney and Organizations Evolving

Action.

- Need to define vulnerable communities, and show examples
- Need to parse out a couple of case studies completely

- Show what has worked (transformation) – proof of the pudding is in the eating
- Show what has not worked (failure to transform)
- Show why things have not worked – barriers, and connection with lack of vulnerable community involvement – poor get poorer and how current grant process, especially sustainability requirement, contributes to this phenomenon
- Grant making context: geographical distribution of awards, specifics of the grant RFP pointing to specific partners, community needs, matching, and sustainability

Why community (place-based) and not “populations” (could be non-place-based).

- Place matters (Bohland):
 - political jurisdictions form an important part of the grant decision-making process (part of the grant-making context)
 - building out the NII is geographically-based
 - federal reports all point to statistics about the digital divide
- Distance matters (Olsons)

Future research.

- Natural Language Processing: There are clues embedded within the evaluations for identify each phase of the vulnerable community grant funding phenomena. These clues come in the form of keywords. In future research, I plan to develop employ a machine learning approach to train how to identify when these phases occur. For example, occurrence of the word “originally” often signifies a Phase 3: Startup change.
- Visualization:

Validation.

The notion of vulnerable communities resonates with my own experience as a community networking champion. I helped found two community networks back in the mid-1990s. The first community network was from a county adjacent to the state capital where I happened to live when the World Wide Web and Mosaic were launched. My community was selected as one of three communities in the state to try out this new thing called “The Internet” – for free. The second community network was where I moved to about a year later – in a remote region of the state, a sparsely populated county with low per capita income and little or no political clout at the state capital 3 hours away. When I moved to this community and fairly quickly became a champion of pursuing community network funding for the community, one of the complaints expressed by local residents was that the county’s demographics of poverty were often used by others in order to get grants that benefit someone else. The local board of directors I had assembled in order to pursue the grant very quickly decided that the community network grant we were pursuing would be to serve ONLY the one county. This is a decision I disagreed with at the time, since I thought more could be accomplished if the county kept the door open for collaborating with other nearby counties. However, now, with the benefit of this research, I see that these very real concerns of the local population were indeed quite valid. Collaboration under the best of circumstances is quite challenging. And collaboration between unequal partners can often leave the less powerful partners out in the cold.

The notion of vulnerable communities also resonates with my experience in assisting faculty and graduate students in pursuing research grants. Many RFPs require that researchers address the

notion of “broader impacts” or “diversity.” I have found that academics seem to be totally stumped at how to do this. Most often, they will resort to very general phrases such as “efforts will be made to engage students or participants from diverse backgrounds,” without going into either more specifics about the diverse population to be reached, or how to “engage” the population if outreach is successful. This lack of ability to conceive of why and how to build bridging social capital between the, ostensibly more powerful academic, and the less powerful/resourced “other” from a vulnerable community is rather alarming and frustrating to me. After all, I consider myself to be one of those “others,” having come from a socioeconomically disadvantaged family in the rural Midwest. But what I did have was parents and grandparents who were highly educated, so I knew I would be going to college. My peers often did not have that advantage. With education as the great equalizer, and having been a direct beneficiary myself of this effect, one of my driving passions has been to figure out how to reach rural America and pluck out the most promising candidates for higher education. With no institutions of higher learning nearby, rural children don’t grow up thinking about this as an option. And with no rural communities nearby, the academic elite don’t seem to have any real awareness of the hidden gems of very bright and talented potential students that grow up never darkening the door of a college.

With institutions of higher education often as key partners, the great community networking experiments that have been fostered by TOP, and now BTOP, have had the potential to help forge this connection between rural communities and academia. I want to see how well they’ve done, and figure out ways to improve this.

Memo 4: Problem Identification

Stage 1: Grant Qualification: Identifying problem or need & population/community → is this a VC?

Identifying vulnerable communities in order to leverage grant funding.

This memo expands and explores the first step in the grant process: qualifying to apply for a grant by articulating a problem or need, and identifying a population or community that is intended to benefit from the grant. The analytical task here is to ascertain whether or not the targeted beneficiary might be considered a vulnerable community (VC) – and what the properties of a VC might be. My suspicion is that the identifying of a specific VC is seen as more likely to attract grant funding. Some VCs are more likely to attract grant funding than others. Good examples of VCs would be anything New Orleans or Harlem.

Questions guiding further data collection to flesh out properties & dimensions of this concept include:

- What specific populations or communities are identified in the projects?
- (of lesser concern here) What are their identified needs and problems to be addressed?
- Is there any evidence/intuition that the specified populations or communities are likely to often/repeatedly be targeted for intervention?
- What are the properties that might differentiate a VC from some other intended beneficiary (non-VC)? Delineate cases according to this concept.

Formal	Grant	VC (my theory)
1. Idea: Initiator (person or organization) decides to pursue the grant opportunity	Searching for grant: Seek ways of funding development or enhancement of existing service or product	Not even thought about: VC not part of original plan
2. <i>Qualification: Identifying problems facing VCs to qualify for funding</i>	<i>Identifying problem: Inclusion of a target population that could be classified as “needy”</i>	<i>Selected as a Targeted Beneficiary: Same VCs used over and over again</i>
3. Application: Assembling project teams sometimes including VC, sometimes not	Applying: Assembling a team, often based on existing connections amongst the key partners or even with VC	Left out of Project Team: Members drawn from VC are not often seen as part of the actual project team
4. Start-up Refinement: Changing original project design with regard to VC role	Starting up: Upon award, change partners, target beneficiary or coverage area, resources needed, or awardee	Reduced prominence in grant: The role first identified for VC is lessened upon award [question: does this revert back to original plan where VC wasn’t thought about?]
5. During Operations: Identifying and addressing barriers facing vulnerable communities	During the project: obstacles getting in the way of achieving the plans laid out	Presenting of Insurmountable Barriers: often specific characteristics of VC
6. Formative Assessment: Connecting vulnerable communities to others	Identifying potential positive contributions of the project (formative): what may have made a positive difference	Connecting with more powerful “Others” outside VC: building “bridging social capital” (two-way) fostering VC transformation
7. Summative Evaluation: Failing to assess impact on VCs	Evaluating (summative): failing to collect baseline, outcomes, or longitudinal data	Overlooking locally-defined impacts: what VC itself would like to achieve
8. Recommendations: Modifying treatment of VCs in future funding	Future: more input from the target community.	Repeating the cycle: cycle starts over with same observed phenomena regarding VC being used for new projects.
9. Lingering effects: Planting the seed for related projects or collaborations	Changing: spin-off efforts result from the grant	Transforming part of the VC: Collaborations that resulted from the project (spin-offs) continue to effect the VC

Case studies.

- Some project beneficiary descriptions appear to “assume” disadvantage. For example, Mobile CHIN serves the Mobile, Alabama area, which is assumed to be disadvantaged due to socioeconomics; whereas the Western Brokering Project covering 15 western states assumes a disadvantage due to vast distances of these spaces.

- The notion of “disadvantage” is kind of an umbrella catch-all. Projects like 1) Kentucky’s Rural Urban Net lump together urban poor of Louisville with remote rural Pike County, and 2) Ohio’s rural Appalachian and urban minority populations
- Most projects purport to serve the disadvantaged indirectly by providing technology to organizations that are already set up to serve the disadvantaged. Such organizations, presumably, should already have metrics in place to measure their success. [Question] Is anyone capturing baseline and ongoing data from these organizations? Or is it always collected “new,” specific to the TOP project?
- I notice that the word “underserved” seems to be synonymous with “disadvantaged.” I may need to explore this a little further, and refine if necessary.
- Palo Alto has vivid description of the digital divide – Silicon Valley execs & professors vs. East Palo Alto diversity. See p. 4. Reminds of the Fort Wayne BB conference – the problem facing urban planners is what to do with the servants? Don’t want them too close, but they need to be close enough in order to work for the elite. Added new Property for whether a specific contrasting Digital Divide Community is described.
- Other indicators of “disadvantage,” but that likely co-occur with low SES: high unemployment, high crime, and low access to technology & Internet both at home and in school (Baltimore).
- Present how many provide indirect to agencies. Shows a big difference between my lit review and the empirical data, I think.
- Might be good to add whether or not VC input was included prior to the grant.
- Berkeley specifically mentions “lack of opportunities” – provides a good quote. Oregon addresses “brain drain” of rural, formerly prosperous regions in changing industry – causing lack of employment opportunities locally. This underlying notion of “*lack of employment opportunity*” is a good one as the united reason for disadvantage that TOP aims to address. Coos Bay, OR: Brain drain due to industry loss; increasing elderly & Native American; lack of employment; high poverty & unemployment; limited access to computers at home; limited access to technology and other educational resources in schools; great distances between communities; fewer opportunities for teacher professional development and collaboration.
- Austin points out a new angle of being disadvantaged – not valuing poor people’s time; with the proposed solution of making info available online that would help alleviate that. Austin vs. East Austin: "intent of leveling the playing field in computer and Internet access and skills with other neighborhoods in Austin."
- Vivid description of health care underserved area in Washington Virginia Mason
- Separate out what is truly a *characteristic of the population* (e.g., low SES) vs. an *institutional causal factor* (e.g., industry loss). These may indicate continued victimization of VCs. For remedy, new jobs don’t need to be high pay – just enough to support living in the specific community. Allow people to choose with their feet.
- **Method of reaching:** Direct to (vulnerable) community members or Indirect to teachers, health care providers, etc.
- New Orleans Freenet & Baltimore: do all low SES have the same characteristics?: High Unemployment; Low Per Capita; High Crime; High Illiteracy; Low graduation; Low Computer & Internet Access at Home; Low Computer & Internet Access at School; low per-pupil expenditures – addressing these individually, even tracking them doesn’t make things better. The bigger thing in common, across both remote/rural and

urban/poor/ethnic is “*lack of employment opportunities locally.*” Is this ever defined as being the very description of “disadvantaged” – lack of local (within commuting distance & means of transport), decent paying jobs? It is THAT claim of IT to make people job-ready AND to connect them to actual jobs that is at the heart of CNs. Part of the poor get poorer. Coos Bay Oregon describes issues well – industry loss.

- BizPathways in MN: good description of shifting economy; how capture people who are working, just not making as much (low commodity prices)

Future.

- A consistent theme is “**turf**” (see NERIN project – precursor to 211), and the related notion that all partners need to get something out of the project – and this needs to be clearly communicated. Note: This is a great example of a seed project that led to significant outcomes, but probably didn’t get credit. I need to call these out – as a group. Needs to be another stage in the process about Remnants (Spin-Offs). The notion of spin-offs ties in with Sawhney, and with my previous work on islands of innovation – T610/paper2.doc. – do a map of these “islands” (the projects in the study). Also mention Vannevar Bush.
- Another good word is “**organic**” (see Palo Alto): “The organization is very organic and has always worked in an iterative manner, ever changing to meet the needs of the community and its own longevity.” (p3) Is “artificial” the opposite of organic? “strained relations among the main partner organizations... largely due to shared goals but different strategies, and while these issues were never fully understood, nor were they resolved,” (Austin) is a consistent theme to be followed up on. (Problem, Founder, Partners, Product/Solution, Barriers, Successes, Lessons Learned).
- Note: When describing these projects, I might want to leave off the actual product and call it “x,” in order to keep the focus on the community intended to benefit, since that’s my actual unit of analysis or topic of interest. This will also allow for more abstraction. Or, might it be an important variable to consider when crafting the theory – that the “type” of service provided makes a difference in project success, as defined by **community transformation**? My hunch is that the product angle has been covered adequately by others, since it’s the technological one that everyone was looking at (sexy).
- Maybe a good indicator for likely success of a grant might be the number of times a particular community has been exploited for grant purposes. I’m not sure which way this would go – a good or bad thing?
- Is this tendency for repeating VCs similar to the “disease model” of our health care system? Because we’re based on capitalism, we have to treat everything as a commodity, and therefore, there must be a set of consumers for everything. We need to keep certain communities “sick” so that there will always be a market for technological innovations. Just as there need to be sick people to consume medical treatments that have been developed. Toward that end, add a step about **Product** in the cycle. Then describe that as part of step 1: Idea. It would capture both the primary initiator (not necessarily the awardee?) and the product developed/conceived of. This model makes complete sense, since this is a DOC grant. The issue comes when the model “harms” a VC, as opposed to just “failing to transform in a positive manner” or “leave no trace” (Boy Scouts) or “harm none” (Hippocrates?). For example, in the case of the Johns Hopkins professor who is called as an expert witness in coal miner black lung claims, he is actually harming the VC

– and likely exploiting them as well. <http://abcnews.go.com/Blotter/black-lung-investigation-johns-hopkins-full-statement/story?id=20714454> This is how they pay for medical students – by providing expert testimony! So it’s not just the evil military-industrial complex, it’s the educational-industrial complex. There’s a “sin tax” for the exploitation – but note that it does not go back to the VC to support a scholarship for someone coming from a mine family. VCs are experimented on with regard to consuming new products (technology). Successful products are marketed to/in more profitable areas. Undesirable products disappear. Necessary but risky products (like coal) are produced by the VC. Frame it as a market cycle.

- Interstate Highway 35 literally separates East Austin from the rest of the city. [is there a lack of bus routes? Example of structural separation – other side of the tracks]. WVa project also uses highway to define target area.
- Emerging categories of Barriers (disadvantaged): 1) (socio)Economic, 2) Geographic
- Future: Impacting success: 1) “lack of referrals the project received from the counties” (WVa Fairmount) – what would this be called? Not invented here? Falls under partnering?, 2) long delays experienced in connecting a student to the center via ISDN lines (the word “delay” keeps coming up
- Nature of solution: using tech to minimize contact between disparate groups – e.g., WVa teachers & suspended students. Do other techs bring closer together?
- Mentors & protégés (Flint-Mott)
- Parenthood plus: combines content dev with access at both indiv & inst levels; shows that integration of IT into low-resourced environments is slowed and can be compromised by high need for training and support of end users; due to lack of resources, unrealistic expectations, & soc svc sluggishness to incorporate new ideas/methods – really aimed to identify issues and way to overcome – know your users
- Lane Oregon Council of Governments – flow of important decisions could affect “positive change” – language of transformation – look for this via NLP
- Emerging categories of Disadvantaged: Physical, Geographic (remote vs. rural), Economic, Institutional? In need of special services (home-bound students; medically home-bound; INS: in need of services, like the addicted or AIDS);; In legal trouble. Look at what works and what doesn’t for each category.

Memo 5: Partnerships

Stage 2: Partnerships: Assembling a project team from conception, write-up, start-up, throughout the project, and beyond → To what extent is the VC included?

Assembling partners ostensibly to address the needs of the vulnerable communities.

This memo expands and explores the second step in the grant process: assembling partners who can address the identified problem or need facing the population or community that is intended to benefit from the grant. The analytical task here is to ascertain to what extent the targeted beneficiary or vulnerable community (VC) is involved in the actual project team make-up throughout the process – from when the grant idea is first conceived, the proposal is written, the project starts up, during implementation, and for the future. My suspicion is that if the VC is included at all, it is only during the write-up and perhaps at start-up. But along the way, there will be little evidence that a true collaboration between the VC and other partners exists AND that what was there got dropped – either immediately or as the project went on. My suspicion is

that this will be especially true of remote, rural VCs, since the “last mile” problems are often the hardest in Internet access projects.

Questions guiding further data collection to flesh out properties & dimensions of this concept include:

- What specific partners are identified in the projects?
- What partnerships exhibit the most durability – prior to and after the grant period?
- What mention is there of the VC with regard to partnering?
- What changes occur throughout the grant cycle – particularly with regard to the VC?

Formal	Grant	VC (my theory)
1. Qualification: Identifying problems facing VCs to qualify for funding	Identifying problem: Inclusion of a target population that could be classified as “needy”	VC selected as target beneficiary
2. <i>Partnership: Initiator/Lead (person or organization) assembles partners to serve on project team based on “expertise” with VC</i>	<i>Assembling project team: Pre-award, Post-award, Close-out</i>	<i>VC not significant and/or persistent member of project team</i>
3. During Operations: Identifying and addressing barriers facing vulnerable communities	During the project: obstacles getting in the way of achieving the plans laid out	Presenting of Insurmountable Barriers: often specific characteristics of VC
4. Formative Assessment: Connecting vulnerable communities to others	Identifying potential positive contributions of the project (formative): what may have made a positive difference	Connecting with more powerful “Others” outside VC: building “bridging social capital” (two-way) fostering VC transformation
5. Summative Evaluation: Failing to assess impact on VCs	Evaluating (summative): failing to collect baseline, outcomes, or longitudinal data	Overlooking locally-defined impacts: what VC itself would like to achieve [capture how VC gave input throughout]
6. Recommendations: Modifying treatment of VCs in future funding	Future: more input from the target community.	Repeating the cycle: cycle starts over with same observed phenomena regarding VC being used for new projects.
7. Lingering effects: Planting the seed for related projects or collaborations	Changing: spin-off efforts result from the grant	Transforming part of the VC: Collaborations that resulted from the project (spin-offs) continue to effect the VC

Case studies.

- The concept of Enterprise Communities keeps coming up (see Bowling Green). This may be a synonym for my notion of a VC. What is their real purpose or how do they really fare? A cynic might say they just keep the money flowing, which is later diverted to those

more well-off. But perhaps this is how change occurs – one community at a time through highly concentrated effort and the pouring of resources?

- 21-60-99034 & 22-40-94079 illustrate a different kind of Prior Relationship, which I'll call "Solidify." These are when efforts to form a partnership have been in motion and the TOP grant is used as one more way to try to get the partnership "solidified." This is in contrast to partnerships that are "Existing-Expanded." These (like El Puente & Plugged In) have been in place for a while, and are using TOP to go in new directions, enhanced existing programs, or serve more/different clients [may need to parse this down more]. I think the key thing to look at is the nature of efforts to solidify or expand – the *degree to which the effort is related to the existing relationship*. For example, Metro Chicago was an attempt to provide a shared network to strengthen efforts between NFPs that already referred clients to each other. My suspicion is that this would be well-received and likely to endure – IF it is successful as a result of the TOP grant. If not, then Metro Chicago might not continue to exist, but the attempt to strengthen that connection might go on. So this would be an **Architectural Choice Point** – to use Kling's vernacular.
- What's emerging then is a decision tree:
 - 1) existing relationship: a) no, b) emergent/being forged, c) already in place,
 - 2) if yes, is TOP grant a) reinforcing or b) changing that relationship;
 - if no, proceed
- Now, what is the impact of changes to the original grant? These things, I suspect, always wind up undermining the ability of the VC to benefit. This might be a way to define a VC – one that is negatively impacted by the change. There is an emerging typology of changes. Let's see how prevalent they seem to be.
 - 3) were Changes made to TOP grant: If yes, what type
- A measurable, or at least identifiable, OUTCOME for TOP projects is whether or not partnerships will continue – whether or not in their current form (often not).
 - 4) Outcome (prospects for future continued partnering – as opposed to continuation of the TOP effort specifically): a) none, b) not likely, c) likely, d) assured
 - 5) If yes, then a) what aspect of TOP, b) in current or changed form, and c) by whom i) founding org, ii) partner, or iii) new player (non-partner in TOP effort)
- 24-40-9604 Middle Schools: is it always the pattern that schools don't take input from community beforehand? Just not part of the culture? Or possibly product of Dept of Ed/universities? That might be worth investigating in future research. What ARE they teaching education grads? More importantly, what AREN'T they teaching? Will we see the same thing with university-led projects – no community involvement in planning? But some nominal community engagement upon award – only with regard to the how to implement the money in the pre-design fashion rather than whether or not the proposal served the needs as seen by the community. This is an example of an aggressive, comprehensive, and enduring approach for addressing a VC. What are the results? Are lives actually changed? Is anyone looking at that? Or is this just a way to benefit partners?
- Notion of *existing ties*: broaden (taken on new ventures/directions between existing partners), deepen (strengthen existing ties through enhanced communication), solidify

(cement a partnership that was already in progress), new (forge new relationship in order to pursue grant)

- 25-60-95018: Neat concept – NFP Chamber spin-off dedicated to improving the schools. Invoking support of local schools is a winning fundraising tool.
- St. Louis MORENET (29-40-94083) has the best, more unique VC solutions – which are consistently undermined. See VC Involvement. Shows that somehow these need to be flagged and sustained thru special effort. Identify these throughout projects. It's not necessarily the partners that seek to undermine, it's the broader context that is driven by economics. Somehow these projects need to show their outcomes better! When something works, highlight it, replicate it, publicize it, and politicize it! It's this connection with politicians that seems to NEVER be mentioned. Watch for this. In looking at VC definition, it would be one often used as a magnet for experimental efforts – only to be disappointed when the funding (or the spotlight) ends.
- St Louis WhizKids shows how community input can catalyze positive change in how grant funds are used, demonstrable measurable results at individual level. Many positive lessons learned that may be generalizable to VCs. How many kids actually got jobs?
- KC SmartCities changed to facilitate partnerships focused on job creation leveraging tech. Great model! 1) hire project director from telecom (ATT). 2) The planning trip to Singapore got the focus right – 3) on welfare-to-work apps, not the infrastructure itself. Replicable! But – how are VCs incorporated explicitly? 4) Indirectly – thru the organizations (NFPs, foundations, higher ed) that serve them – all with focus on work. 5) Decides to forego the “last mile” problem. So this model requires an economic focus – high impact – focus on 80%—get the jobs in, then that will lift up the people. How is transport addressed? By bringing jobs into inner city – with Sprint! So also DIRECT benefit to VC. As training was held in a suburban location, it would have been difficult for employees to arrange transportation. The Full Employment Council (FEC) provided transportation to and from training until the 18th and Vine Center opened in 1997. Employment results (after 6 months, 85% welfare recipients remaining on job than 33% suburban recruits – over 300 went thru MCC call center training) suggest that, if done right (overcome the barriers of transport, child care, aptitude assessment fees, job readiness skills training & re-training), creating jobs for the poor can really work because they'll stay with it! Had a good title (SmartCities), simple goal "to be and be known as the best place in the country to do business electronically," building on existing strengths of partners, and excellent focused business leadership. This was an example where a complete turnabout between proposal and implementation worked out for the better! I suspect it's important, as these projects are formed, to consider pre-, during, and post-relationship planning. These should not be seen as isolated one-offs, formed for immediate gain, but for long-term investment. The extent to which that appears to be the vision is a likely factor in success. Now, how to get the powerful to invest in VCs – looks like *indirect coalition building, with a plan for direct job creation, is a great way to go.*
- Choices Bank: some hypos had baseline data; others didn't.
- InterLinc: staff asked to take over existing NebraskaNet, run by public TV which had to stop due to laws (supposedly). This was kind of weird. Also, villages seemed resistant and did not embrace public use of tech provided. Public access to the system led to some misuses. Sites were broken into and terminals were stolen.
- Networks is classic example of minimizing the inability to reach difficult populations

and “assuming” that there will be a halo effect – in some way (black box) the efforts made will have a positive impact, but we don’t know exactly how many, how, when, or in what way. Why was \$10,000 spent on IT reference materials for remote areas? Salt on the wound – can’t ever have internet access, so we’ll let you read about it?

- TVN: The disconnect between the project staff and the intended beneficiaries appears to be so big, and I couldn’t figure out who the partners were, that I looked up the original abstract. “The University of New Mexico's Arts of the Americas Institute will work with a consortium of Native American communities to provide broadband Internet connectivity to five tribal museums and culture centers.” Yet even with such a narrow focus, they were unable to find broad interest in workshops claiming: “some . . . workshops were seen as relevant to only particular sites.” There was no effort to fill 2 vacant positions with or train tribal members as technical backup. This indicates a “missed opportunity” – another potential useful concept in my emerging theory. And why on earth did they send consortium members for AG training in Chicago using software, equipment, and Internet they didn’t have back in their home communities? Blame it on the VC (very Kling & computerization movements): “Concerning the lack of time [barrier], UNM TVN staff expressed that it is likely that consortium members have not assimilated the technology and training into their duties. . . and . . . may not have an adequate vision for the future use of the technology.” It’s funny to see the “positive spin” [another potentially useful concept] put on this (and others) by the evaluators by providing one-off instances of use as the closing argument.
- Issue of analysis NYCHANIS: web-server data do not indicate number of housing and community development organizations have used NYCHANIS, making it impossible to determine how close NYCHANIS came to its goal of serving 50 organizations during its first year of operation. [another potentially useful concept] *Evaluation Tactic*: setting a goal that is, in reality, unable to be measured. [in doing web search for NYCHANIS, I found out Furman has replaced it, but concept remains – indicating potentially good use of funds and a positive outcome]. This is an example of “stick to the knitting”—“more success as a searchable Internet-based data resource with graphing and mapping capabilities. Has attracted non-employment related users – personal interest. This might be a “citizen scientist” sort of phenomenon – but rather “data scientist.” Points to connection between unequals.
- ParenthoodPlus (Brandeis): concurrence of participant enrollment with web application development – a very familiar refrain that the emphasis on the constantly changing technology detracted from other tasks that would directly support intended beneficiaries. “The Fund for the City of New York deserves credit for integrating the strengths and objectives of other, related, projects. . . in reciprocally beneficial ways. . .” – this quote gets at what DOES work – using technology to integrate fragmented efforts. This is part of an umbrella project. Picks from families who’ve already taken steps to improve. See p. 19 for example of creative program with books & training youth. Training youth to learn valuable skills seems to be a special highlight of TOP projects. Very thoughtful, thorough, and well-written report & implications. Draws upon prior Westat evaluations.
- Harlem Juvenile Information Network mentions a “Systems of Care” model. Also suggests the distinction between formative (short-term) and summative (longer-term) evaluation.
- 37-60-01070: Projects like pure CNs and NC Telemed could be viewed as nodes on the

NII, meant to be enablers for other good connections. Would be good to map these out, as a visual representation of how the NII was fleshing out as a result of these projects.

- 35-60-01068 TVN appears to be one of the worst types of partnerships – predicated on an “object of study” model by a research institution. A partnership between a university and another organization shares a “common population of interest”
- NetWellness: Novel: In an attempt to institutionalize NetWellness within the UCMC community, UCMC education staff have incorporated NetWellness training into four ongoing medical informatics courses. Maintaining solid communications with partners was reported to be the most critical and difficult aspect of the NetWellness project, especially because the partners were extremely varied and geographically dispersed (p. 15).
- 36-40-94057 HEAP Harlem: similar to MS project, Columbia had bad relationship with community, which was overcome because of this grant – especially its successor. Is this because the tech is so compelling? But what really happened is that the goose laying the golden egg was the schools. The bigger Eiffel project was funded by Dept of Ed. Environmental Defense Fund & Libraries were dropped (or dropped off) as partners. There is an acknowledgement of need for legitimacy.

Discussion.

- Show different patterns of project team formation and use that for coding: spoke & wheel; solid tube (all equal); hierarchy; then show formation & deformation over time (pre-, post-, close).
- Something I want to keep hold of is the notion that it’s often not the specific projects that should be sustained, rather it’s 1) the organizations that run them (project owner) or 2) the websites that are generated as part of the project (sub-project). Grant-funded projects are a way for organizations to demonstrate their value, gain valuable experience, and perhaps expand or modify their existing services as a result. Alternatively, a component website may serve as a lasting legacy for a larger project. An example is clinchpowell.net (TN), the website for 47-60-99041’s Tele-Democracy Network. The website still exists, but since it was just part of the larger project, I might have missed the longevity, while searching for something about the broader effort.
- I wonder if there’s any predictability between Founder Type & Partner Type, such as like + like is more likely to endure vs. like + unlike. What is it about the nature of these lasting, enduring partnerships (sustained), as a positive OUTCOME, that helps them accomplish great things – particularly for disadvantaged communities. Perhaps compare those in existence prior and those without prior. Look at type of goal, similarity of founder & partner “type,” evidence of hiring from within the VC, founder, or partner. Is that less overhead is spent on things like negotiating contracts, changing things up? So another OUTCOME is “degree to which VC is served or benefits.” Separate that out from any other outcome.
- Types of VC Involvement that are emerging: needs assessment conducted, official part of planning, support letters

Theoretical sampling.

		Prior Relationship between Partners?	
		Yes	No
VC as target	Yes		Most costly &

beneficiary?			Least likely to last
	No	Least costly Most likely to last	

Questions.

- So, what are the real aims of US Dept of Commerce NTIA?
- How is success defined?
- Be sure to plot projects by year
- Does the number of cases change when plot the two different batches of years
- Is the actual important factor whether the Awardee and/or One Partner have a successful track record of serving the VC?

More musings.

- “Token” communities, like token blacks (similar to the history of affirmative action, hiring). To make them not be a token, you give them a role. In some cases, VCs appear to be beneficiaries only in order to get the grant; they are “token” communities in the sense that they are beneficiaries in name only, without having played any actual part at any stage of the grant process – from project design, thru implementation & evaluation. There is this notion that some awardees will only possibly get the grant if they serve vulnerable communities; however, if they have no successful track record or mission of serving vulnerable communities, isn’t that risky and likely to fail? Who are they bringing on board that DOES already serve the VC? The VC is simply an attractor of the funding; as soon as the funding is received, the impetus to serve the VC is gone.
- I’m starting to see a sea change in my attitude about what’s most likely to lead to positive community transformation – it’s not the connection of unequal partners as I originally surmised (although that may be a useful and/or necessary second step); it’s the support of organizations that are already doing good works, but who need recognition and further support to maintain – let alone to keep advancing (expand) – and even innovate. It’s the institutional partnership (or at least of one influential person within the partnership), and its understanding of and commitment to the VC, that matters most. Without that necessary condition, other efforts will come to nothing. This may actually be the same thing as the unequal partners idea, just framed a bit differently.
- I think the lesson is inertia. At whatever level, whether awardee or individual, the change has to already be in motion. Parenthood Plus worked because it was an individual intervention targeted at mothers who wanted, and had already made a choice, to make a positive change. KC SmartCities worked because it was community-wide intervention targeted at a community that had a vision for being the best – and that recognized to do that, you have to invest at all levels, and work on integrating rather than trying to become the be all and end all.
- It’s important to turn the lens onto the institutional arrangements – the partners and their inherent knowledge and proven commitment to the VC. This is very social informatics vs. techno utopianism.
- All this can be wrapped into a concluding chapter about Broader Impacts.
- Important things to look at with partnership: what’s the common link between the founder and the partners? For example, some are competitors (esp higher ed), some are connected via the founder (eg LA-Freenet).
- In looking at the Common Links, it appears that *the strongest is when the primary constituency (clients) is the same*. This would explain why university-led efforts that include

Vcs have a hard time being sustained. Universities see their primary clients as college-age students that can come from anywhere, rather than seeing any need to “cultivate” students from the surrounding K-12 areas. Or at least the extent to which universities see that connection will, in my emerging theory, play a role in determining success of their efforts. The distance between university and community is even further when you understand that for many universities, research, rather than education, is deemed most important; this limits shared constituency only to the best and brightest graduate students.

- QUEST (25-60-95018) is interesting because it illustrates the pull between Workforce Needs and the powerful K-12 institutions who see the students as exclusively their domain. K-12 winds up likely to be the ones sustaining the effort. 28-40-94068 illustrates another struggle/conflict K-12 vs. EconDev over the workforce.
- This notion of *workforce development* is very important – and probably at the very heart of TOP. Also important is the notion of *competition* – for control, for resources, for students. In recommendations, we should look at incentives for collaboration among like-minded institutions.
- And is *workforce* the strongest type of client? Workforce implies both *supply side* (a trainee or student) and a *demand side* (a business or employer). It may be that the extent that this equation is part of a proposed project team pursuing a grant is the holy grail – the most important predictor of success of a community ICT effort! Can I glean that from these data? Need to add columns for *Supply/Demand Level & Success Level (likelihood of sustaining the partnership)*. For example, what may be missing in 09-40-94002 LEAP NY youth is no connection with the demand side. It is when there’s a buyer (or someone to pay for things) that keeps a coalition together. “Greed is good.” Well, rather, self-interest—at least to a point. You’ve got to have some tangible incentive for sticking together and *sustaining partnerships* – grants and jobs will do it!
- The lack of business connections in the NY STEW-MAP project demonstrates a traditional weakness in the ultimate effectiveness of nonprofits. If networks would include employers, they would be greatly strengthened.
- It appears that the links that are solely based on geography (eg, 28-40-94068 Tri-State-Network in AL) are the projects least likely to succeed. Place alone is not strong enough a binder or call to action. 28-40-94068 in particular seems to be way too fragmented, with econ dev in charge in name only.
- The big players in local communities seem to be K-12 and economic development.
- It’s a shame that no individual names are ever mentioned in these projects. I know that behind each one of them is a person who has poured their soul into this. It’s funny that academics, the ones who do the evaluations and publish papers, are the only ones who ever get any credit! I suspect the leaving out of names has to do with attempts to protect confidentiality, when it’s really publicity that can most help these efforts.
- The goal should be to *sustain the partnership, not necessarily the specific project*. This would eliminate a lot of the waste that currently goes on! The way current funding goes, “innovation” is taken to mean new partners, new clients, etc. Instead, it should be new ways of current partners expanding the things they offer, to whom, and in what ways. This era of newness for the Internet was a “boom” period. And like other booms before it, too many things were funded that shouldn’t have been. These led to “bubbles” and “busts.” Those should be avoided.
- Should also look at how well the organization is currently serving its constituents before giving them a grant. (normative)

- Community input would probably be – JOBS! And the skills to get real jobs. And a removal of the barriers to get to the real jobs.
- The two things that will enhance sustainability, both related to money: consumers & workforce. The sequence (where is communication – ICT specifically):
 1. There must be an understanding that there is a connection between learning & consuming (learning skills → locally available jobs → consuming)
 2. There must be jobs that require certain skills
 3. There must be no physical/geographic barriers to obtaining those jobs
 4. There must be a clear pathway for obtaining the skills for the available jobs
 5. There must be a mechanism for connecting people with jobs
 6. There should be something desirable to consume
- The big changes with Internet: jobs are available locally via computer, but must have the skills & access/connection to get them
- An important thing to keep in mind if I'm trying to develop a theory related to writing a sustainable grant that impacts vulnerable communities is “what are the goals of the funder.” In this case, all data tend to support the need for the grant to have partners that will enable achievement of the economic development goals that one would expect from a DOC grant. However, for an NEH grant, the goals, and thus the partners required to achieve sustainability, might be quite different. But, would VCs be enhanced by such grants, or is there a Maslow's Needs Hierarchy thing going on here – first cover the basics of food, clothing, and shelter that need to be achieved thru economic means.

Categories.

Maybe I should look at partnership type (network) categories of:

- Service
- Research
- Employment
- Geography
- Personal
- Consumer

This might be a useful typology for grantmakers to use in order to more narrowly target their RFPs – eg allocate so many for each type and experiment with outcomes & sustainability.

Memo 6: Summary of Progress-to-Date

I thought I would take a moment to describe how I've executed my grounded theory study so far, and where it's taken me. I started out by going thru four case studies line-by-line, pulling out quotes and analyzing them for Concepts, Properties, and Dimensions, while also taking notes of insights, items of interest, and possible future directions. The information for these four cases was captured in four separate “Data Memos.” A general rule of thumb for me: For every page written in a Data Memo, it took me about one hour of review of the case. I created an Excel spreadsheet, and captured all the Concepts, Properties, and Dimensions gleaned from the four cases.

At this point, I re-read the final chapters of Corbin and Strauss, and went back to review and ponder the contents of these data memos. On 10/26/13, I created a “Process Memo” for capturing the various Themes or Categories that seemed to be present in the cases. Thinking about

Corbin's notion of "process," it occurred to me that the process of interest to me for this study is that of "the grant process" – in particular how "vulnerable communities" are used to attract funding and then often do not benefit from the results of the funding that is brought in. On 10/27/13, I created another process memo where I started breaking down this notion of vulnerable communities and the grant process into stages. I'm seeing the "vulnerable communities" notion as a substantive theory, whereas the "grant process" is a more formal theory that might be applicable to more than just the vulnerable communities as defined by the digital divide problem.

On 10/30, I went back to the separate cases (63 of them), to identify properties and dimensions related to the Step 1 concept of "Identifying populations or communities in need." I was able to break this concept down into properties of "Method of Reaching," "Disadvantaged Type," and "Digital Divide Comparison." Another property that I'm still pondering is that of "Institutional Causes of Disadvantage." And I'm still deciding whether or not the explicit notion of "vulnerable communities" that are repeatedly used to attract grant funding is a useful concept. It took several days to go thru the cases to code them all along these dimensions. However, I'm mindful that the purpose of my study is to generate theory, not to test it. So quantifying the 63 cases along each of these dimensions is not my primary aim. Rather, I'm trying to ensure saturation – that I've identified all the potential properties and dimensions for the concepts of interest.

On 11/5, I modified my Excel spreadsheet to start capturing all of the phases of my emerging vulnerable communities grants process, with the intent of starting to code all the cases of Step 2: Assembling the project team. This will have to do with how partners are pulled together – and specifically the inclusion (or not) of the vulnerable community or VC – the community or population intended to benefit from the grant – whether directly or indirectly.

Memo 7: Theoretical Sampling Strategy

I've been looking in-depth at evaluations for some time now, mainly focusing on the first two steps of the "grants process": identifying the population and assembling the team. Specifically, I've uncovered that there seems to be a disconnect between plans laid out in the original proposal, specifically with regard to vulnerable communities—not only the outcomes, but also the final project team and its goals. These change as the project encounters seemingly insurmountable barriers in "reaching" (which can mean many things) the vulnerable community.

Project method.

One variable that I codified for each evaluation was whether the project was direct or indirect (***Project Method***), defined roughly as:

- Direct: to be used directly by or directly benefits individual citizens or a specific population
- Indirect: to be used by or directly enhances operations of organizations who serve the citizens or a specific population

Difference or change in planned & actual with regard to vulnerable community.

Another variable I feel I need to codify for all cases is the level of disconnect with regard to specific population to benefit between what was proposed and what was observed in the evaluation. It is those cases in which a specific disadvantaged population was identified that are of analytical interest to me. These can then be broken down based on the extent to which the original proposal abstract and evaluation seem to be congruent with regard to intended beneficiary. What is important here is not as much whether the intended benefits to the VC materialized (since we already know that results are dismal) but the extent to which *intended benefits* to the VC remained in the foreground.

Specifically, I'll be looking for indicators of expected results (proposal) and actual results (evaluation) – for the specific population. This is one indicator of significant CHANGE: **VC Intended Benefits Congruence** (between Proposal Abstract & Evaluation). Here are the types:

1. High – Intentions toward VC in proposal were pursued as described (although results may not have been satisfactory or as expected)
2. Mixed – some of the intended benefits were dropped, but some were actively pursued
3. Low (omitted) – no mention was made of intended benefits to VC in evaluation (omitted)
4. None (overtly removed) – VC was removed (when or why?)

Nature of partnership.

Another item of interest is in the TYPE of partnership itself. *Why was this particular partnership formed?* What do they have in common? Is there a way to look at this as monolithic (single org)- [not of interest to me], vertical (intra/within geog) or horizontal (inter/between geospaces)? Here are the **Partnership Types** so far (can be more than one?):

- Geographic
 - Same region, city, or even Co-location (in same building or space) – another form of geographic, just closer in proximity?
- Personal Connection
 - Founder
 - Political (eg governor's home county)
- Object of interest
 - understanding of social problem (e.g., higher ed + NFP re: poverty?)
 - area of work (e.g., oceans)
 - area of study (e.g., Native American artifacts)
- Line of work (Same services or line of work, but different clients?)
 - (e.g., all educational institutions – possible competitors is the implication due to no rigid service areas)
 - medical providers
 - type of business
- Common clients (precisely the same or overlapping people, but different services)—serve
- Common workforce (e.g., schools & businesses who hire them) – train &/or employ
- Common consumers (eg of infrastructure, communication services, banking services, healthcare) – sell to

For the intended beneficiary, what is the primary underlying reason for the planned and final partnerships – between the Founder and the Partners? Indicate which cases go where.

Columns (end result): If the project is successful, will the intended beneficiary benefit from 1) having access to enhanced services and/or the ability to overcome barriers (Client), 2) being able to buy something (like infrastructure itself) with the promise of having a broader consumer base or competitive edge (Consumer), or 3) having genuine access to enhanced training & employment opportunities leading to actual jobs (Employee). The first two are Indirect benefits, whereas the last one is Direct.

Rows: Indicate the basis on which the partnership relationship was established: 1) common geographic only – the only common thread seems to be where things are, 2) common personal connection – the partners share a personality who has brought them together, 3) common object of interest – such as a topic of study for a researcher that aligns with the main service delivered by providers or the same batch of kids being cultivated to work in a local industry, or 4) common line of work – such as several institutions that do the same thing but for different regions or sets of clients and want to leverage technology to do it with less redundancy.

Note: It may be best to stick with describing one direction – ie., what is the relationship FROM the Awardee TO the Partners. E.g., *Awardee A enlisted Partner P because of Reason R – specifically in relation to VulnerablePopulation V.*

A→P for V(R)

What are these components in the evaluations: A→P for V(R)

And then, what happened (Outcome) with regard to this arrangement of partners? A→P for V(R)→O

Note: A & P have types. One of those types is U – University.

A→P could also be coded based on the presence of University in the pair. These are possible values: AU(0,1); PU(0,1)

Partnership table.

Another option:

U0- no university

U1-univ as lead

UP-univ as partner

[earlier note to self: Are these mutually exclusive? What property (predicate) is this?]

This table will help with theoretical sampling, as well as refinement & later testing of theory...

Create a different table for the different “types” (e.g., university role)

Color code the sustainability prospects (O or Outcome) of both the partnership and the project?

Or maybe the sustained benefit to the VC?

	Intended benefit as...			
Partnership based on...	Consumer (buy/sell) - weakest	Client (serve) - better	Employee (train & employ) *use only if jobs part of partnership - best	Other (specify)

Geographic only				
Personal connection only				
Object of interest	<ul style="list-style-type: none"> 01-60-95002: SES (U1) 	<ul style="list-style-type: none"> 44-60-99019 (Providence) -SES (U0) 47-60-99041 (TN RC&D)-SES (U0) 		
Line of work				
Other (specify)				

Theories (put in discussion):

- Consumer – SCOT or SST & evolution – survival of fittest not necessarily based on best technology; this was era of computerization movement
- Client – SNA, strength of ties between service agencies
- Employee – Marx? - STIN can show how the organization moves from 1) Consumer: getting connected to the I/S to 2) Client: getting connected to other related service providers targeting same clientele (reducing duplication & improved efficiency & info sharing) to 3) Employee: preparing clients for being prepared workers that can get actual jobs

The direction and nature of the partnership may matter. So to the Awardee, the type of relationship may be: Serve, Sell, Teach, Employ, Study. To the partner, the type of relationship may be: To enhance/provide the same x (service, product, education, employment, research) to the same population (compete), to provide the same x to different population (cohort), to provide different x to the same population (complement).

Case	Common Criterion: Education (E) Job (J) Product (P) Research (R) Service (S)	Awardee/ Partner Relationships			
		Compete (Same X/Same Population)	Cohort (Same X/Diff Population)	Complement (Diff X/Same Population)	(Diff X/Diff population)

I want to get at the notion of “commitment” to the common purpose. Kind of a hierarchy.

Then theoretically sample from the different typologies for further items of interest.

Universities, vulnerable populations, & sustainability.

What's becoming clear to me is that when a university is involved, the notion of sustainability is very different than when key players (founder) are rooted within the community. It would be interesting to compare those initiatives with universities as lead, as opposed to those without universities and those with universities merely as partners. Universities do not seem to be incentivized to keep a good thing going. When the research is done, they move on. The sustainability perhaps needs to become better institutionalized via "community engagement" thru the educational aspects of the university program. After all, if a professor deemed it worthy to be engaged in the project at its start, couldn't the university display an interest and provide the means for keeping the project going – such as through internships and course projects? Did this ever happen in the TOP projects? Is broadband for all just a buzz word and passing phase? The whole notion of sustainability means different things to different project partners. How is this manifested in these evaluations? What does the future for each of these projects appear to be, based on what's in these evaluations? Is there a taking advantage of vulnerable communities that is worse when a university is involved? If so, how might this be prevented, curbed, or overcome?

Look at the cases in the Partnership Table and couple them with their Prospects for Sustainability (both at Project & Partnership level) – as I've assessed them. Code for University Involvement: As lead, as partner, none. What's the relationship between universities and VCs?

Reaching saturation.

In quickly going thru the cases where I've already coded the partners, I'm finding that there seem to be two university types that stand out – med schools & community colleges. It's probably because they're vocational. Are universities involved at all when it's social services-oriented toward a particular VC? We'll find out.

I think I need to finish the coding of all cases for partners – and then whether they include universities. Then I'll be able to saturate the categories for cases based on whether universities play a role. So right now, I'm seeking saturation. I want to feel comfortable that, at least in this dataset, I have covered, for every possible case where universities play a role or are omitted (which would be at least glancing through all of the cases):

- 1) the inclusion/treatment of VCs AND
- 2) the important outcomes (sustainability of partners, project, or VC benefit).

It will be interesting to focus on what (goal/purpose/population) got DROPPED, rather than what was ACHIEVED, since it's the achievements that evaluations tend to focus on. And then the EXCUSE/REASON for dropping. Can be as simple as Barrier (since they're well-articulated elsewhere). So is there a correlation between Reason for Inclusion as a Partner, and Reason for Dropping (e.g., the partners selected did not have a sufficiently strong vested interest in the outcome; the common thread between Awardee & Partner – or specifically Awardee & VC, or Partner & VC- was not strong enough. Each of these relationship pairs has properties or qualities: Reasons for the relationship, Quality (good, bad, pre-existing), Outcomes (such as severing/dropping or sustaining). These can all be codified.

A→P & P→A

A→VC & VC→A

P→VC & VC→P

AP→VC & VC→AP: This is the relationship between the CN partnership as a whole & the VC.

In those cases where universities WERE NOT partners, what role might they have played if they had been? Could their role perhaps be to ensure that VCs are kept front & center – anticipating the barriers to be overcome so that research can truly address these issues effectively? The low-hanging fruit is to serve a broad user base that can pay for services. The holy grail is to reach those who are continually under-served – or not served at all. The poor get poorer because there are no safeguards in place, and because universities are shirking, or are not even aware of, their potential role in effecting this naturally widening gap between the haves & have-nots.

Universities & education generally are considered to be the great equalizers. Instead, the tendency appears to be one of universities being part of the digital divide problem – by catering to their own needs rather than keeping the VC needs front & center. Future work: I could write different papers for each type of institutional player in this game, and their role in widening or closing the digital divide: libraries, social service agencies, economic development organizations, K-12, etc. Each will have its own self-reflecting to do about constituents/motivators and natural tendencies. And then reflection on its real commitment to improving the plight of VCs.

Social network theory implications/applications.

It occurs to me that it might be useful to couch my findings in terms of social network theory – using terms from physics or the physical world. The term “density” is already used in SNA.

What physical term would describe the quality (good/bad), nature (reason), and product (outcome) or prediction of continuance (sustainability) of these relationships? How might these aspects be represented in network diagrams?

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