Implications from a Grounded Theory of Community Networking for Creating and Sustaining Partnerships with Society

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Abstract

This paper presents a grounded theory of community networking based on a set of sixty-three (63) evaluations of community networking projects funded by the National Telecommunications and Information Administration's (NTIA) Technology Opportunities Program (TOP) between 1994 and 2007. The aim of this study was to help inform efforts designed to use information and communication technologies (ICT) to enhance disadvantaged communities. The grounded theory developed was 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. This study situates outcomes for disadvantaged communities within the context of the grant process and provides useful information to inform efforts by researchers to develop effective partnerships with society.

1   Introduction

1.1   Background

Beginning in the mid-1990s, the Clinton-Gore presidential administration endeavored to create a National Information Infrastructure (NII). 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). 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).

Due to concern about the possibility of a "digital divide," defined as the gap between those connected to the NII and those who were not (Servon, 2002; Wresch, 1996), the National Telecommunications and Information Administration (NTIA) was charged with ensuring that all Americans could access the NII. The NTIA began this task by documenting and monitoring the digital divide through changes in data collection and report generation. 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 also 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).

To demonstrate the potential of emerging technological developments such as the expanding public availability of the Internet, the NTIA launched the Telecommunications and Information Infrastructure Assistance Program (TIIAP), which was later renamed the Technology Opportunities Program (TOP). The purpose of TOP was to provide funding for innovative community-driven initiatives involving information and communication technology (ICT) using the NII. 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). Community networking projects use information and communication technologies (ICT) to enhance geographically-based communities (Beamish, 1995; Schuler, 1996). Similar state and local initiatives were undertaken throughout the United States (Strover, Chapman, & Waters, 2004).

The Bush-Cheney presidential administration placed its "faith in market imperatives to address the digital divide" (Warf, 2013, p. 4) rather than publically funded initiatives. 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). The name of the NTIA reports changed 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). Compounding this was empirical evidence that 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 community networking projects 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 of community networking, on the one hand, and the practical reality on the ground. In 2005, the Bush-Cheney Administration defunded TOP, with the last approved projects running until 2007 (Williams, 2007).

However, in the wake of the U.S. economic recession of 2007-2009 (National Bureau of Economic Research, n.d.), the Obama-Biden administration launched a new federal effort using stimulus funds (as part of the American Recovery and Reinvestment Act of 2009 or ARRA) to continue the build out of the National Information Infrastructure (NII). Over $4 billion was directed to the Broadband Technology Opportunities Program (BTOP), the NTIA's successor to TOP (National Telecommunications and Information Administration, 2013). The initial portfolio of projects, funded in 2009 and 2010, included:

- $3.5 billion for 123 infrastructure projects to construct broadband networks in underserved areas
- $201 million for 66 Public Computer Center projects to provide access to broadband, computers, job training, computer training, and educational resources to the public and vulnerable populations
- $251 million for 44 Sustainable Broadband Adoption projects "to promote broadband adoption, especially among vulnerable population groups where broadband technology traditionally has been underutilized" (National Telecommunications and Information Administration, 2014, p. 1)

In its latest quarterly report to Congress on BTOP in July 2015, the NTIA reported that of the original 233 BTOP projects, 12 remained in active status, 212 had successfully concluded, and 9 were discontinued for various reasons (National Telecommunications and Information Administration, 2015, p. 1). Concerns about slow project completion and "overspending, overbuilding, and waste" (Walden, 2013) contributed to criticism of the BTOP initiative as failing to improve the lives of disadvantaged populations and resulted in congressional hearings about BTOP in 2013. As stated by the president of the "nonpartisan, nonprofit organization" Citizens Against Government Waste: "[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" (Paige, 2013).

1.2   Significance

This study offers tangible suggestions for how community ICT initiatives such as TOP and BTOP can be better structured to focus on achieving positive outcomes for the disadvantaged communities they purport to serve. 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 an opportunity to analyze data over time and across cases. With BTOP just now coming to an end, the theory of community networking developed in this study provides timely information upon which to assess the extent to which community ICT initiatives have learned from past experiences and improved over time (if at all). This study is therefore significant in its implications for those who continue to find themselves on the wrong side of the digital divide, for policy makers, for taxpayers, and for society as a whole in our quest to level the playing field through the use of ICT. Thus, the findings from this study have direct implications for researchers who partner with society.

1.3   Research Questions

The purpose of this study was to develop a grounded theory of community networking to answer the question: How can community networking initiatives be structured to maximize positive outcomes for individuals from disadvantaged communities?

1.4   Data

The dataset for the study was 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). Project 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.

1.5   Scope

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. 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). Instead, during the course of this study, an analytic story was developed which describes the points at which a specific federal grant initiative, the Technology Opportunities Program, could have done better in achieving positive outcomes for individuals from disadvantaged communities.

2   Methodology

2.1   Grounded Theory

Grounded theory (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.

Core techniques of GT include 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).

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. 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" (Corbin & Strauss, 2008, p. 150). I returned to previously analyzed data when I thought I may have overlooked something or needed to look at data from a different concept-based perspective. Because of the limited available data, it was expected that there would be gaps in the analysis.

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" (ibid, para. 5). Instead of striving for "objectivity," GT researcherS strive 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) often honed from accumulated experience.

In common among the various grounded theory books (Charmaz, 2006; Corbin & Strauss, 2008; Glaser & Strauss, 1967; Strauss, 1987) are a set of best GT practices:
- Remain in close, ongoing interaction with the data
- Be creative, flexible, open to twists in the analysis
- Follow core GT techniques of theoretical sampling and constant comparison
- Describe your methodology and provide illustrations of coding/category creation techniques
- Demonstrate theoretical sensitivity: openness to new data interpretations (emergence vs. forcing)
- Select appropriate methods for research questions based on your epistemological assumptions

2.2   Process

Figure 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. As the figure illustrates, Theory Constructing (integration) is the main aim of the activities.

- Data Gathering (collection)
- Conceptual Coding (comparison)
- Memo Writing (elaboration)
- Theoretical Sampling (saturation)
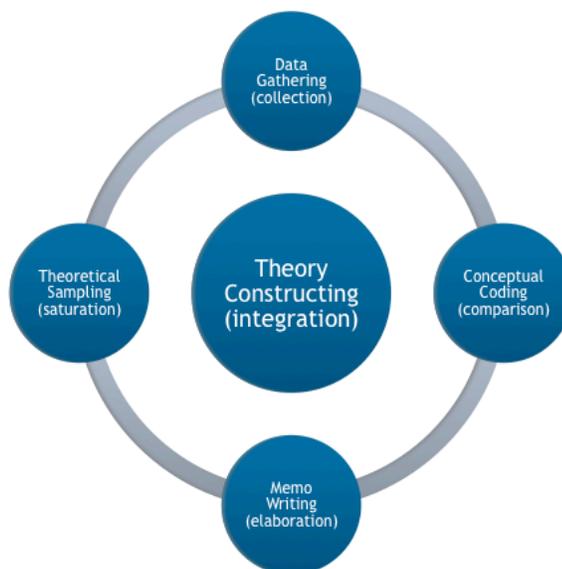- Theory Constructing (integration)

Figure 1: My Grounded Theory Approach (synthesized from Charmaz, 2006; Corbin & Strauss, 2008; Glaser & Strauss, 1967; Strauss, 1987)

2.2.1   Data gathering (collection).

The data collected for this study are secondary data: a "cache of material" that included the 63 evaluations I was able to 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.

2.2.2   Conceptual coding (comparison).

I started out by extensively coding four project evaluations as "Data Memos". The coding technique I used was to lift a quote from four "seed" 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 study 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). 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.

2.2.3   Memo writing (elaboration).

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 this way, memos served as a set of synthesized

data and notes to myself upon which I built the emergent theory, as well as a fairly faithful record of my analytical journey.

2.2.4   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 in order to provide a sense of the range of variation. 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.

2.2.5   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.
I started 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.

3   Results

This chapter presents the results of the grounded theory process. The following questions 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?

3.1   Coding and Categorization from Seed Evaluations

To initialize the research process and provide direction for the further collection of data, four TOP evaluations were examined closely with an eye toward providing insight into the guiding questions above. The four "seed" evaluations (described in Table 1) were selected because they represented several different aspects, such as: early/late timeframe during the TOP initiative, urban/rural population, new/enhanced infrastructure, and centralized/distributed population. The line-by-line reading and open coding of the four seed evaluations yielded a set of nearly 200 concepts and properties, which helped shape subsequent data collection and theory. Throughout the analysis, these concepts were organized into categories: project collaborations (history and stability, shared purpose, and investment), community networking project components (intended beneficiaries and needed resources, barriers, and indicators), and positive outcomes (reported outcomes, community involvement, and skill building opportunities).

Project Title & Acronym	Evaluation Year	Purpose
Los Angeles Free-Net (LAFN)	1997	*Expand existing interactive computer and telecommunications technology of the LAFN to all 19 million Los Angeles, California residents*
Project Rural Urban Network (RUN)	1999	*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*

Project Title & Acronym	Evaluation Year	Purpose
Tri-State Network Demonstration Project (TSN)	1999	*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)*
Virtual Tribal Network (VTN)	2004	*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*

Table 1: Seed Evaluations

3.1.1 Project Collaborations

Each 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. 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. Some collaborations remained solidly in place throughout the project evaluation period; others were less stable. For some projects, the uniting purpose is clear. For others, the sense of shared purpose seemed weak – or even non-existent. 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.

3.1.2 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). Project evaluations showed evidence of the following community networking components: intended beneficiaries and connections, barriers encountered, and measurement indicators. 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. 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. Barriers include issues relating to hardware, software, training, hours of operation, and trust. The evaluations included several indicators for measuring project outcomes, such as training attendance, ICT usage, assimilation, or sustainability.

3.1.3 Positive Outcomes

Often, a purported goal of community networking projects was the achieving of positive outcomes – particularly for individuals from disadvantaged communities or populations. The four seed projects resulted in varying types of success, ranging from very little evidence of positive outcomes to significant success of the project. Two aspects of community networking projects that appear to be particularly important factors in contributing to positive outcomes are the direct involvement of community stakeholders and technology skills-building opportunities connected to employment. 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. 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.

3.2 Identification of a Core Theme

From the original set 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, 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.

3.2.1   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. Such aspects include the strength and nature of prior relationships. 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. 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.

3.2.2   During TOP Grant Period: Interaction methods.

There were different underlying assumptions about and means of interacting between the project collaborators and the intended beneficiary community. 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.

3.2.3   At Point of Evaluation: Impact on intended beneficiaries.

There were indications of significant problems in the effective evaluation of outcomes for disadvantaged communities. There seemed to be a general lack of concrete outcome indicators at the community level – even when such indicators had explicitly been planned.

3.2.4   Toward End of TOP Grant: Sustainability.

Sustainability of the community networking efforts beyond the grant period were discussed in most of the project evaluations. 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. The strongest continued collaborations were to build upon co-developed infrastructure, while explicit commitments to serve disadvantaged communities appeared to be weak.

3.3   Theory Components

Weaving back and forth between coding and analyzing 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 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.

3.3.1   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. 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*.

3.3.2   The community networking intervention.

The *intervention* employed during the Technology Opportunities Program was *community networking*, defined as the use of information and communication technologies (ICT) to enhance communities. ICT interventions included Internet access, training, hardware, software, and other innovations designed to help disadvantaged communities gain access to services, skills, and information. Rather than describing the technological aspects of the 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 projects showed the most promise for positive outcomes for enhancing the lives of intended beneficiaries – particularly for individuals in disadvantaged communities.

3.3.3   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 repeatedly targeted for intervention. 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.

4   Discussion

4.1   Theory

Throughout the course of this study, the following theory was developed: *TOP projects differed 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.

4.2   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 the grant process, including partnership building, project execution, evaluation, and close-out.

4.3   Contributions

This study provides valuable information to guide community networking-related policies and initiatives from the perspectives of different stakeholders: policy makers and funders; disadvantaged communities and their champions, higher education, and community networking researchers.

4.3.1   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.

4.3.2   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 theory generated in this study is 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, advocacy, and engagement by community champions, without apology, are critical to successful outcomes.

4.3.3   Higher education.

This study brings attention to the potential for universities exploiting, rather than serving, disadvantaged communities, as charged by Stoecker (2005). The publish or perish imperative incentivizes researchers to engage only in research that is considered "innovative" and to educate only the best and brightest. Instead of universities treating communities merely as playgrounds in which to conduct short-term experiments or studies and leaving when the grant funds run out, it would be worthwhile to identify how to touch people's lives in a more meaningful way through longer-term relationships, such as internships with community-based organizations, jobs for community members to work on university projects, scholarship opportunities and ongoing education support for members of targeted communities, and an expansion of "service" to specifically include community engagement.

4.3.4   Community networking researchers.

This study shows the importance for researchers who engage in community networking projects to strengthen the involvement of disadvantaged community members at every stage of a research project:

- During *partnership building,* ensure that project teams include members of the disadvantaged community and that agreement is reached by all members on the project's shared purpose.
- During *project execution,* ensure that the whole team approves project changes (such as purpose, partners, geographical boundaries, or target audience) as they might have unintended consequences or negatively impact benefits intended for the disadvantaged community; additionally include opportunities for volunteering and employment by community members.
- When *evaluating,* engage members of the disadvantaged community in identifying and collecting data that actually measure the impact on their communities and community members, and make plans to continue to measure impact beyond limited grant funding periods or project timelines.
- Upon *close-out,* fully and faithfully report 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 project. Researchers should consider "sustainability" as referring to continuation of the project partnership for the purpose of ongoing, shared commitment to enhancing the lives of individuals within the disadvantaged community.

4.4   Conclusion

This study, which situates the NTIA's Technology Opportunities Program within its broader historical, political, and social context, resulted in a grounded theory that offers insights and suggestions for how to better partner with society to make a difference in disadvantaged communities.

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