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Bridging the Innovation Divide:

An Agenda for Disseminating Technology Innovations within the Nonprofit Sector

A Report by PolicyLink and BCT Partners

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Preface

PolicyLink, BCT Partners, and the Hewlett-Packard Company have long partnered in the search for solutions to bridge the gap between the power of new information and communications technologies (ICTs) and the ability of marginalized communities and their advocates to access and use them. We are pleased to share *Bridging the Innovation Divide: An Agenda for Disseminating Technology Innovations within the Nonprofit Sector*, which presents a new framework for understanding today's digital divide—the innovation divide—and the policy options for transcending it.

Nonprofit community building organizations are crucial innovators when it comes to responding to social needs. They are entrepreneurial in designing new programs and policies. Nonprofits also innovate with technology. The growth of technology-infused programs and organizations—largely created from the past decade of digital divide policy—attests that the sector can be a rich venue for incubating emerging information and communications technologies. In contrast to the private sector, which has poured billions of dollars into technology research and development, nonprofits adopt and further develop—or adapt—new technologies on shoestring budgets, creatively leveraging philanthropic and corporate resources to create innovations that are relevant to their particular needs.

Although nonprofits are increasingly innovating with technology, they have yet to fully realize the potential of new technologies. The sector faces what this report articulates as the *Innovation Divide:* the lack of infrastructure and support for adopting and effectively using ICT innovations as well as the paucity of mechanisms for sharing knowledge about innovations among practitioners.

Though the innovation divide has always existed, the urgent need for a plan to address innovation dissemination within the nonprofit sector became apparent at a 2004 meeting of technology leaders convened by HP. Responding to this need, PolicyLink, BCT Partners, and HP combined our collective knowledge of technology development in both the nonprofit and for-profit worlds to craft a five-point policy agenda for bridging the innovation divide. This agenda was built upon the groundbreaking efforts by nonprofit leaders from within four key areas of community building practice: neighborhood information systems, electronic advocacy, internet-based microenterprise support, and digital inclusion initiatives. As policymakers, philanthropic institutions, and technology companies search for the next generation of technology strategies to advance economic and social equity, we hope this agenda will catalyze a national dialogue about the future of technology innovations in the nonprofit sector, which will ultimately inspire new solutions.

We deeply appreciate the tireless efforts of the research team lead by PolicyLink. Sarah Treuhaft, Arnold Chandler, and Josh Kirschenbaum of PolicyLink were the primary researchers and authors of the report with contributions and leadership from Melissa Magallanes at BCT Partners.

Angela Glover Blackwell, Founder and CEO, PolicyLink

Randal Pinkett, Chairman & CEO, BCT Partners

Bess Stephens, Vice President, Corporate Philanthropy, Hewlett-Packard Company

Executive Summary

Nonprofit organizations form the backbone of civil society and are at the forefront of efforts to build healthier, more vibrant, and more inclusive communities. They are being called upon to take on expanded roles and responsibilities in service delivery and community revitalization in a time of increasing social inequality. In response, they have become major innovators, continually creating new programs and policies that grow the social, economic, physical, and civic infrastructure of disinvested neighborhoods.

Technology plays an important role in enabling nonprofits to respond to social needs at this critical moment. The rise of information and communications technologies (ICTs) has created unprecedented opportunities for nonprofits. Computers and the Internet allow nonprofit organizations to perform fundamental functions—research, communications, public education, advocacy, fundraising, and program development, and service delivery—with ever-greater speed and efficiency. A number of entrepreneurial nonprofits have not only infused their activities with information technology, but have emerged as forerunners in adopting emerging ICT innovations. For example:

- The Providence Plan, a nonprofit data intermediary, customized a Geographic Information System (GIS), a computerized mapping application, to map and analyze individual property parcels in Providence to support community development and organizing efforts.
- Southern California Tribal Digital Village, a nonprofit organization established to further the development of 18 dispersed Native American reservations in San Diego County, built a wireless network that connects 15 of the reservations located over a 150 square mile area of rural Southern California to high-speed Internet.
- The No on Proposition 54 campaign, developed by the American Civil Liberties Union (ACLU) of Northern California to challenge an initiative banning the collection of race and ethnicity data, used targeted e-mail messaging to catalyze a viral electronic advocacy campaign that defeated this potentially harmful legislation.
- Micromentor, a microenterprise support organization, uses an Internet-based matching program that it developed to link microentrepreneurs across the country with mentors that have specific knowledge on how to build and sustain small business.

These "early adopters" of emerging technologies offer compelling evidence that ICT innovations can strengthen the nonprofit sector. Unfortunately, such success stories are too few and far between. While many nonprofits have entered the 21st century with access to computers and some form of Internet access, many ICT innovations remain concentrated among a handful of organizations with high technology capacity—the financial and human resources needed to access and use technology innovations. Beyond the problem of access is the issue of effective use. Even among the pool of nonprofits that have gained access to particular ICT innovations, it is often the case that only a few have manifested the full potential of the innovation. Most nonprofit practitioners sense that new and relevant technologies exist, but they lack the knowledge needed to choose among the increasing number of products as well as the technical know-how required to apply new technology tools to their particular organizational goals or problems. Consequently, the vast potential for new ICTs to strengthen the sector remains unrealized.

This report articulates the key technology challenge currently facing nonprofits as the *Innovation Divide:* the lack of infrastructure and support for adopting and effectively using ICT innovations as well as the paucity of mechanisms for sharing knowledge about innovations among practitioners.

As a part of the "Community Building in the Digital Age" initiative to bring technology resources to organizations working to promote equity, PolicyLink collaborated with BCT Partners, a consulting firm with extensive experience in nonprofit technology, to investigate the problem and devise a strategic agenda for bridging this manifestation of the digital divide. Through consultations with practitioners and leaders in the community technology field, literature reviews, and case study research, we sought to answer three questions:

(1) What are the causes of the innovation divide?

(2) How and why do nonprofit organizations adopt new technology innovations and assimilate them into their work?

(3) What can be done to speed up the diffusion of innovations within the nonprofit sector?

Included in this report are the results of this investigation and a five-part agenda to empower the nonprofit sector with new technology applications. Implementing the proposed agenda would help build the capacity of the sector to carry out its work—connecting people to economic and social opportunities and making all neighborhoods healthy and livable—more efficiently and more effectively.

The Innovation Divide in the Nonprofit Sector

Why is there an innovation divide? What is it about the nonprofit sector that makes the adoption and use of new ICTs particularly difficult? While the causes are numerous, the nonprofit sector faces a few key challenges for adopting ICT innovations:

- *Innovation development is geared toward the technology needs of the private sector and is less likely to fit the needs and capacities of nonprofits.* Over the past decade, the private sector has invested heavily in technology research and development (R&D) to keep pace with technology changes and stay ahead of the competition. Comparatively little investment has gone into R&D for technologies oriented for nonprofit organizations, resulting in few new ICTs oriented to the sector's needs and capabilities.
- *Nonprofit organizations lack resources for technology adoption and technology capacity.* The adoption and implementation of new technologies require a significant financial commitment. Not only must organizations invest in the equipment and software, but they also must invest in training, maintenance, support, and technology capacity. Nonprofit funding streams often do not provide the flexibility or the resources needed to adopt new ICTs.
- *There is a lack of information flow about innovations within the nonprofit sector and between the nonprofit sector and the private and public sectors.* One of the major barriers to the spread of emerging ICTs is the lack of information about how innovations could be or are being applied to nonprofit activities. The stories and lessons of nonprofits that do adopt and use new technologies need to be available to would-be adopters. There are also many lessons about technology adoption and use from the private and government sectors that could be applicable to the nonprofit sector.

Findings from the Field: The Adoption of New Technologies for Community Building

While the nonprofit sector faces significant barriers to adopting and using ICT innovations, a number of nonprofit organizations have successfully charted new territory within their domains of practice through adopting and implementing new technologies. The experiences of these early adopters shed important insights into the adoption of innovations by nonprofits.

This report profiles 12 innovators within four areas of technology innovation, which correspond with four different areas of community building practice (see Table 1).

Table 1. Technology Innovations, Community Building Practices, and Case Studies

Technology Innovation Area	*Community Building Practice*	*Case Studies*
Neighborhood Information Systems	Geographic Data Analysis and Use	The Providence Plan (Providence, RI) Neighborhood Data Center (Milwaukee, WI) Neighborhood Knowledge California (CA)
Electronic Advocacy	Policy Advocacy	Free the Schuylkill River Park Campaign (Philadelphia, PA) Inner Purple Line Campaign (Montgomery County, MD) No on Prop. 54 Campaign (CA)
Internet-based Microenterprise Support	Microenterprise Development	MicroMentor (National) Count Me In (National) CircleLending (National)
Digital Inclusion Initiatives	Technology Access and Training	East Palo Alto Digital Village (East Palo Alto, CA) Southern California Tribal Digital Village (San Diego County, CA) East Baltimore Digital Village (Baltimore, MD)

Neighborhood Information Systems (NIS). NIS combines data, maps, and data analysis tools into a single system, usually available online, that enables community building organizations to obtain, analyze, and apply geographic data.

Electronic Advocacy. E-advocacy incorporates Internet-based technology tools—websites, e-mail programs, and Flash web animations, for example—as part of advocacy campaigns that aim to influence policy decisions.

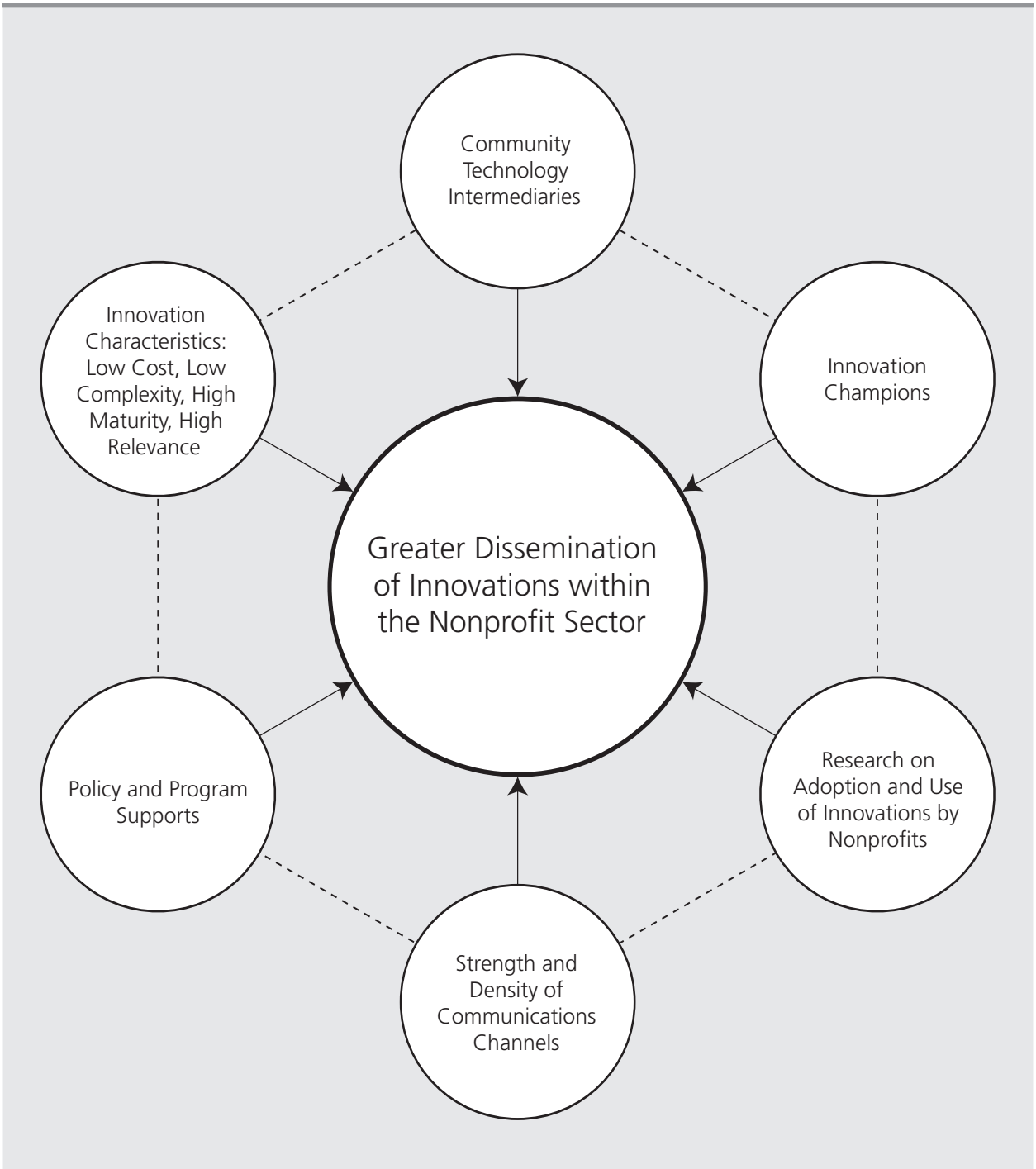
Internet-based Microenterprise Support. A number of microenterprise-supporting organizations are adopting internet-based tools that enable them to deliver services such as mentoring and access to credit more efficiently to a greater number of dispersed microentrepreneurs.

Digital Inclusion Initiatives. Community-based technology initiatives integrate different ICTs into community building strategies within practice areas such as IT access and training, job training, economic development, and education.

Dissemination: Spreading New Technologies among Community Building Organizations

Beyond demonstrating how early adopters of emerging technologies successfully adapt these tools to meet the needs of community building practice, the case study research also revealed an incipient infrastructure for technology dissemination within the nonprofit sector. This infrastructure consists of six main components, or factors for diffusion, that provide information, support, and resources for adopting and implementing new technologies. These factors work both independently and in concert to help disseminate technology innovations, as illustrated by Figure 1.

Figure 1. Six Key Factors for Innovation Dissemination among Nonprofits



The six factors for diffusion include:

(1) ***Community Technology Intermediaries.*** The strength and capacity of organizations that facilitate the adoption and dissemination of innovations can greatly influence the diffusion of technology among nonprofits.

(2) ***Innovation Champions.*** Nonprofit employees, volunteers, and board members, as well as advocates of particular technology tools, can play important roles in encouraging organizations to innovate and in helping them apply technology to community building practice.

(3) ***Research on Adoption and Use of Innovations by Nonprofits.*** Applied research and case studies that describe the experiences of nonprofits using new technologies can inform and inspire other nonprofits and spur additional adoption of technology innovations.

(4) ***Strength and Density of Communications Channels.*** Many reliable and high-quality information sources on ICT innovations (such as conferences, print media, and online forums) can help nonprofits decide whether to adopt new technologies as well as help with their implementation.

(5) ***Policy and Program Supports.*** Supportive policies and programs can help ensure that innovation development results in useful tools for nonprofits (making them more adoptable) and can also provide resources and incentives for organizations to take the risk entailed in adopting such tools.

(6) ***Innovation Characteristics: Low Cost, Low Complexity, High Maturity, High Relevance.*** Technology innovations that are affordable, not too complex, mature in their development, and highly relevant to community building are more easily disseminated.

An Agenda for Bridging the Innovation Divide

Addressing the innovation divide within the nonprofit sector requires an approach that is targeted, strategic, and creative. This approach must build upon previous investments and the current technology infrastructure among nonprofits. To be effective, it must discover win-win solutions that leverage private-sector resources.

The following agenda provides a policy roadmap for addressing the barriers to innovation adoption and dissemination in the nonprofit sector.

1. **Establish new federal, state, philanthropic, and corporate funding programs to develop and disseminate technology innovations within the nonprofit sector.** Funding is the most significant barrier to creating and disseminating technology innovations within the nonprofit sector. The recent elimination of the majority of federal, state, and local community technology funding streams has produced a resource gap that will continue to hinder innovation development and diffusion.
   - Produce new funding opportunities at the national and state levels for the development, adoption, and dissemination of technology innovations in the nonprofit sector.
   - Expand private philanthropy grantmaking to include resources in all grants specifically earmarked for developing, using, and sharing technology tools.
   - Encourage technology sector corporate philanthropy to support innovation adoption and dissemination among nonprofits.

2. **Create forums and intermediaries—at the local and national levels—to facilitate the adoption and dissemination of technology innovations.** Of the six factors for technology dissemination, strong intermediary organizations and dense communications channels are arguably the most important levers for increasing technology diffusion among third sector organizations.

- Support existing intermediaries that work within specific nonprofit domains of practice (such as health, housing, or education) in promoting the dissemination of ICT innovations within those domains.
- Establish incentives for nonprofit technical-assistance organizations to develop and refine technology tools that are useful for nonprofit organizations and disseminate best practices research to practitioners.
- Create venues for new partnerships and strategic alliances whose purpose is to disseminate information about technology innovations and their uses by early adopters.
- Support the development and use of public, online repositories of technology tools (such as www.TechSoup.org).

3. **Support universal service reforms that enable nonprofits to gain broadband access to best take advantage of ICT innovations.** Although broadband technology has rapidly become more accessible and less expensive, it remains cost-prohibitive to many nonprofits. There is a need to ensure that nonprofits have access to high-speed Internet connectivity. In large part, this means that the sector must be included in the ongoing policy dialogue about universal service reforms and how they will impact both access and service provision for nonprofits.
   - Advocate for a dynamic definition of "universal service" that incorporates the unique technology needs of the nonprofit sector and strives toward technological and regulatory convergence in information services.
   - Encourage municipal wireless networks to subsidize and underwrite nonprofit broadband access to these networks.
   - Further develop fiber to the home (FTTH) and fiber to the premises (FTTP) efforts, which enable the provision of multiple telecommunications services including very high-speed Internet access through a single fiber-optic cable. These technologies could possibly further reduce the cost of providing broadband Internet access at affordable rates for nonprofit organizations.

4. **Create forums for learning from the private sector about the adoption and use of new ICTs.** The private sector maintains a wealth of knowledge about the adoption and application of technology tools. New partnerships should be encouraged between nonprofits and for-profit technology developers to create technology tools for the nonprofit sector. The private sector could:
   - Partner with community technology intermediaries to identify opportunities for ICT tools to improve the efficiency or efficacy of nonprofits.
   - Facilitate the transfer of innovative technology tools and innovative uses from the private sector to the nonprofit sector.
   - Create forums for sharing best practices of technology adoption and adaptation to encourage greater collaboration between the nonprofit and for-profit sectors.

5. **Establish standards and mechanisms for data sharing and interoperability.** The power of many new ICTs—such as Geographic Information Systems (GIS)—relies upon open access to timely and relevant data from multiple sources. Standards that enable different data-producing government agencies to share data can make these innovations more applicable to the nonprofit activities and useful for the sector.
   - Create a Nonprofit Technology Standards Board or working committee responsible for updating existing standards and establishing new standards for data sharing and interoperability.
   - Further develop emergent technologies that support data sharing and interoperability, including Web Services—web applications engineered specifically to allow more sophisticated interactions and interoperability among web applications—and Data Services—intermediary software applications whose purpose is to aggregate multiple data sources or data repositories.

Introduction

Overview

The nonprofit sector—a diverse assortment of organizations that deliver services ranging from health care to housing, contribute to the development of culture and the arts, and enable civic participation and advocacy—has long played a crucial role in U.S. social and economic life. The sector includes over 1.5 million organizations, accounts for 10 percent of the U.S. economy, and employs 11.7 million people.[1] It has been growing at a faster rate than the for-profit sector and can be expected to remain a powerful force.

Continued growth within the sector illustrates its strength and importance as well as its resilience in the face of major changes. Over the past 20 years the environment in which nonprofits operated has shifted dramatically: demands for services have far outpaced financial support from government and philanthropies, competition from for-profit companies has increased, funders have demanded greater accountability and measurable outcomes, public confidence has wavered, human resources have dwindled, and technology has advanced rapidly.[2]

This report focuses on the technology challenge facing nonprofits, which is simultaneously a tremendous opportunity. The oncoming of the "information society" and the revolution in information and communications technologies (ICTs) that occurred over the past decade has opened new possibilities for organizations in all sectors. Internet services (e-mail and web content in particular) and desktop computer applications enable the delivery of information, products, and services to larger audiences across much larger geographical areas and at much lower costs. As these new technologies developed, private-sector companies were at the forefront of incorporating them into regular business practices. Nonprofits quickly recognized the possibilities created by these new technologies to fulfill their missions with greater efficacy and efficiency, but lagged in their ability to access them and use them effectively. In 2001, PolicyLink described the lack of technology capacity among nonprofit community organizations as the "organizational divide."[3]

Although nonprofits remain technology-challenged, the situation has changed since PolicyLink first began working to promote policies and programs that enable nonprofits to use technology as a tool to build strong and healthy communities. Over the past decade, nonprofits have begun to embrace ICTs. They have made impressive inroads in gaining Internet access, establishing basic technology capacity, and creating online content. A review of the literature about nonprofit technology adoption conducted by the Institute of Nonprofit Organizational Management at the University of San Francisco found that Internet access rates for nonprofit organizations have attained 70 percent and that most organizations with Internet access have some basic capacity to use this technology.[4] In the absence of relevant and useful online content for underserved communities, nonprofits have been steadily populating the World Wide Web with a rich array of local information on jobs, housing, child care, and other services, written in a culturally appropriate manner and at a basic literacy level.[5]

Beyond these accomplishments in community technology access, capacity, and content, the external environment for nonprofits to use ICTs has become

much more supportive. The number and variety of organizations that play (or can play) such a role has become more extensive; dozens of technology-related intermediaries—or organizations whose goals include helping other organizations access and use technology—have sprung up in communities across America. In addition, many technology vendors are beginning to perceive nonprofits as new niche markets and to market their products to them.

While nonprofits are making some headway, the transformative potential of ICTs for the sector remains largely untapped. A few ICT innovations, such as the websites and e-mail, have been widely adopted by the nonprofit community but are often incompletely integrated into organizational practices. Other emerging or advanced ICTs have been adopted by only a few nonprofits, even though they have potential utility for many more organizations. The experiences of these "early adopters" of innovations show how new ICTs can radically transform everyday communications, policy advocacy, data analysis and use, fundraising, and other key practice areas.

In the spring of 2004, PolicyLink and the Hewlett-Packard Company brought together experts from community building organizations, philanthropies, and private-sector companies to discuss the most important technology issues facing nonprofits. At the convening, community technology leaders agreed that community organizations—and the nonprofit sector more broadly—lacked the technology tools and know-how needed to support their endeavors. They identified three critical needs: (1) identification and development of relevant ICT applications; (2) knowledge about how organizations are adopting and using ICT applications; and (3) sharing of information about new applications and their uses among practitioners.[6]

As part of the "Community Building in the Digital Age" initiative to bring technology resources to organizations working to promote equity, PolicyLink collaborated with BCT Partners—a consulting firm with extensive experience in nonprofit technology—to understand and develop solutions to these challenges. In line with the needs articulated by practitioners and other stakeholders in the community technology field, this report describes the key technology challenge facing nonprofits as the *Innovation Divide*—the lack of infrastructure and support for developing, adopting, and effectively using ICT innovations among nonprofit organizations and the paucity of mechanisms for sharing information about them and their uses among practitioners.

Research Focus and Methods

To develop a strategic agenda for bridging the innovation divide within the nonprofit sector—one that leverages the technology knowledge, skills, and infrastructure that exist among nonprofits—PolicyLink and BCT Partners sought to understand how innovations can become incorporated and used by more nonprofit organizations. The primary questions that drove the research include:

(1) What are the causes of the innovation divide? Why does the nonprofit sector lag in its ability to take advantage of new ICTs?

(2) How and why do nonprofit organizations adopt new technology innovations and assimilate them into their work?

(3) What can enable more nonprofit organizations to adopt and use new ICT innovations? What can be done to speed the diffusion of innovations within the nonprofit sector?

To answer these questions, we spoke with people working in the field of community technology, reviewed the literature on innovations and nonprofit technology, and conducted case study research on organizations that have successfully adopted ICT innovations.

We selected the community building field—a small yet important and vibrant segment of the nonprofit sector—for our case study research because it represents the local organizations with whom PolicyLink and BCT Partners work and with whose technology needs and capacity we have the most familiarity. The field includes organizations that seek to increase equity through strategies that improve the quality of place and the lives of the people living in low-income neighborhoods as well as the array of organizations and vendors (both nonprofit and for-profit) that inform and assist them. This diverse group includes multiservice agencies that conduct job

training and provide social services, advocacy and community organizing groups, nonprofit housing developers, and intermediary organizations.

While the nonprofit sector as a whole faces considerable technology challenges (as described in the next section), community building organizations, which are usually small and under-resourced, experience these challenges even more acutely. At the same time, creative technology innovations often develop when organizations are under pressure to increase efficiency or efficacy without spending a lot on expensive solutions. Their disadvantages notwithstanding, many community building organizations have adopted technology innovations and found ways to integrate them into their work.

Case Study Selection

Cases were selected from four different technology innovation areas that correspond with four domains of community building practice:

(1) **Neighborhood Information Systems (NIS).** NIS combine data, maps, and data analysis tools into a single system, usually available online, that enable community building organizations to obtain, analyze, and apply geographic data.

(2) **Electronic Advocacy.** E-advocacy incorporates Internet-based technology tools—websites, e-mail programs, and Flash web animations—into advocacy campaigns to influence policy decisions.

(3) **Internet-based Microenterprise Support.** A number of microenterprise-supporting organizations are adopting Internet-based tools that deliver services more efficiently to a greater number of dispersed microentrepreneurs.

(4) **Digital Inclusion Initiatives.** Community-based technology initiatives use technology as a tool for building community, IT access and training, job training, economic development, and education.

Within each technology innovation area, we selected three organizations that have successfully adopted ICT innovations and incorporated them into their work. Table 1 illustrates the four technology innovation areas, their corresponding areas of community building practice, and the 12 case study projects.

Table 1. Technology Innovations, Community Building Practices, and Case Studies

Technology Innovation Area	***Community Building Practice***	***Case Studies***
Neighborhood Information Systems	Geographic Data Analysis and Use	The Providence Plan (Providence, RI) Neighborhood Data Center (Milwaukee, WI) Neighborhood Knowledge California (CA)
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Digital Inclusion Initiatives	Technology Access and Training	East Palo Alto Digital Village (East Palo Alto, CA) Southern California Tribal Digital Village (San Diego County, CA) East Baltimore Digital Village (Baltimore, MD)

Report Organization

Following this introduction, *Bridging the Innovation Divide* is organized into four sections:

"The Innovation Divide in the Nonprofit Sector" provides a context for understanding the challenge of technology adoption and use among nonprofits, describing the processes of innovation development, adoption, and diffusion and outlining barriers to technology dissemination in the nonprofit sector.

"Findings from the Field: The Adoption of New Technologies for Community Building" defines the four areas of technology innovation and community building practice and profiles how each of the 12 case study organizations successfully adopted and applied new technology innovations to achieve greater community impact.

"Dissemination: Spreading New Technologies among Community Building Organizations" describes six key factors that can facilitate technology innovation dissemination among nonprofits.

"An Agenda for Bridging the Innovation Divide" presents a set of strategic recommendations for bridging the innovation divide and enabling greater use of innovations within the nonprofit sector.

The Innovation Divide in the Nonprofit Sector

Why is there an innovation divide in the nonprofit sector? What can be done to overcome the technology challenges faced by nonprofits? Some answers can be found within the body of knowledge about innovations—how they are developed, what factors enable their adoption and use, and how they spread throughout society.

The study of innovations is a longstanding area of academic and applied research. Although most of this research has not focused particularly on the nonprofit sector, it nonetheless offers insights into the causes of the innovation divide. This section first discusses innovations, then describes the main challenges that the nonprofit sector faces in adopting and using them.

The Development, Adoption, and Diffusion of Innovations

There are three primary processes that are relevant to the incorporation of ICT innovations into the nonprofit sector:

- Innovation development
- Innovation adoption
- Innovation diffusion

Innovation Development

Innovation development refers to the process of creating innovations. Some of the most important points in relation to the innovation divide are:

Commercial innovation development occurs in stages. Creating innovations generally occurs in six stages: (1) research; (2) development; (3) patenting; (4) production; (5) marketing; and (6) adoption/use.[7] These stages illustrate how R&D—and the financing of it—are essential to the process. As the speed of ICT innovation development increased over the past decade, the private sector invested heavily in R&D to keep pace with technology changes and stay ahead of the competition.

Some Key Terms

Innovations are new or significantly improved ideas, goods, services, processes, or practices. This report focuses on ICT innovations and associated innovative uses.

Adoption may refer to an event—the physical acquisition or purchase of an innovation, or to a process—the acquisition and implementation of an innovation.

Diffusion is aggregate adoption, or the spread of an innovation across a population of potential adopters.

Users—especially early adopters—play increasingly important roles in the development process. The rise of the Internet—and the increased rate and scale of communication it has enabled—is creating a new dynamic where users play increasingly important roles in ICT innovation development. ICT innovations are frequently released as "beta" versions and users are engaged as collaborators in refining the product and contributing their experiences and intelligence to its improvement.[8] The increasing importance of user feedback means that the first users of the new technology—or "early adopters"—have a substantial voice in developing the innovation. In addition, the users of new technologies often adapt the available technology tool or use it in a manner that its developers did not intend for it to be used.

Updating the Classical Model of Innovation

Innovation research is generally associated with the work of Everett Rogers, a sociologist who, in 1962, outlined what is now known as the "classical" model of innovation. In this model, Rogers described the general factors that influence the adoption and diffusion of all types of innovations.[9] This classical model provided the field with many useful concepts for understanding innovations.

While a good number of Rogers' concepts remain relevant today, contemporary researchers have recognized that a single model cannot explain all types of innovations and all adoption contexts. Accordingly, they have adapted the classical model to describe more specific types of innovations—such as ICT innovations—or more specific types of adopters.[10]

Innovation Adoption

Studies of the organizations that adopt innovations have found that:

Adoption is an organizational process. Adoption begins when an organization first hears about an innovation and continues as the organization comprehends and evaluates it, deciding whether to adopt. If the decision is affirmative, then the organization acquires the innovation and begins incorporating the new technology into its work. This assimilation entails adapting the innovation (technologically or functionally) to the particular needs of the organization. Once the innovation has been incorporated, the organization can judge its usefulness for the organization.[11]

An organization's decision to adopt an innovation is influenced by the technological context and the organizational context. Three categories of factors determine whether an organization will adopt a particular innovation:

- Technology-related factors, such as the characteristics of the technology itself (e.g., complexity and cost) and the nature of institutions that seek to propagate the technology
- Organization-related factors, including qualities of the potential adopter, of the organizational environment or sector in which it operates, and of communications channels/information sources
- Technology-organization combination factors, such as the "fit" between the technology and the organization, perceptions about the innovation and the conversation about it among practitioners, and the organization's technology capacity

Table 2 describes these adoption factors in greater detail.

Table 2. Factors that Influence ICT Innovation Adoption[12]

Technology-related factors	Innovation characteristics	The qualities of the innovation—its complexity, cost, relative advantage, usefulness, ease of use—make it more or less attractive and easier or harder to adopt.
	Propagating institutions and subsidies	Propagating institutions such as R&D laboratories, government agencies, technology vendors, consulting firms, suppliers, and user groups influence adoption by communicating about, promoting, and enhancing innovations. These institutions may also provide sponsorship and subsidies that reduce the cost (and risk) of adoption.
Organization-related factors	Organization characteristics	Characteristics of potential adopters—size, structure, leadership, and workforce—make them more or less receptive to innovations. Larger organizations are generally more innovative (though size may serve as a proxy for scale, wealth, and available resources). Organizations that are less centralized and formal, with less vertical differentiation are more likely to embrace new ideas and adopt innovations.
	Organizational environment/sector	Characteristics such as industry concentration, competitive pressure, profitability/wealth, R&D intensity, IT intensity, and rate of technological change are thought to influence innovation adoption.
	Communications channels	Organizations that invest in a wide array of information sources and communications channels are more likely to learn about innovations and their potential benefits.
Technology-organization combination	Technology-organization "fit"	Innovations that are compatible with organizational needs, strategies, resources, and capabilities are more likely to be adopted. Wealth/resources and technology capacity play roles in determining fit.
	Innovation perceptions and social influence	Perceptions about the innovation's usefulness and ease of use influence the decision to adopt it. These perceptions are influenced both by the broader discussion about the innovation (particularly by opinion leaders and change agents) and the innovation characteristics.
	Technology capacity	Technology capacity, or the existing means to support and manage the implementation of an innovation, includes the degree of top management support, technology championship, training resources, and mechanisms provided by propagating institutions.

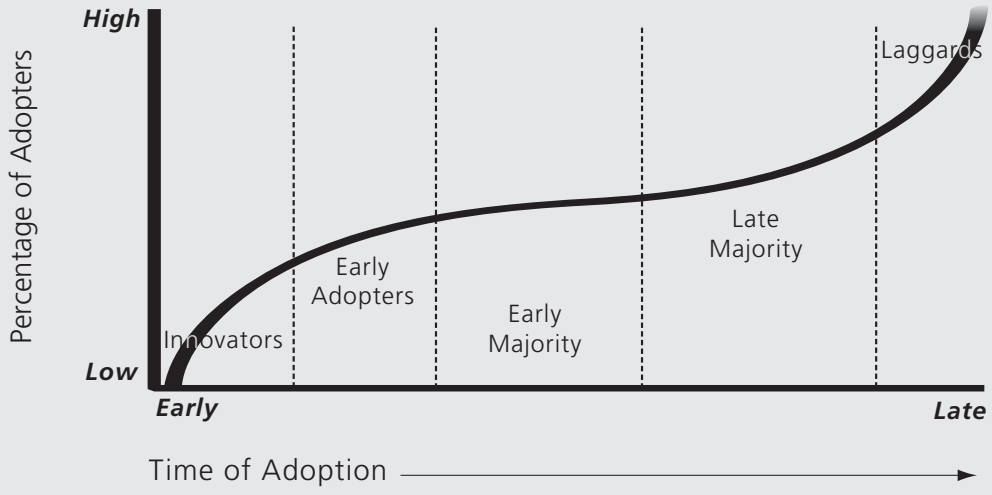
Innovation Diffusion

Whereas adoption research looks at how individual organizations choose to incorporate new technologies into their work and the factors that make them more or less likely to innovate, diffusion research looks at the population level and focuses on the rate and extent of adoption throughout a given population. This research tends to be more retrospective and has generally considered how innovations diffuse among populations of people rather than populations of organizations. Diffusion research helps place adoption into a larger context and timeframe and has provided the field with the important concept of early adopters. The two key findings are:

Innovations spread gradually, following a typical pattern. There is a lag between the time an innovation is introduced and when it becomes widely used. The process of diffusion begins slowly, "takes off" as more adopters find out about the innovation, and levels off as the population of potential adopters diminishes. This process results in an "S-shaped" diffusion curve (see Figure 1).

Adopters can be categorized based on their innovativeness. Those who adopt an innovation fall into one of five types, depending on the timing of their adoption: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. Innovators and early adopters represent a low percentage of the population that accepts the innovation shortly after its introduction. Early majority and late majority represent a much larger percentage of the population that embraces the innovation and helps establish a critical mass for its wide diffusion. Laggards represent a relatively small percentage of the population that incorporates the innovation much later.

Figure 1. The Diffusion of Innovations over Time, by Types of Adopters



Source: Adapted from Rogers' Diffusion of Innovations *by BCT Partners, 2006.*

The Nonprofit Context: Barriers to Innovation Diffusion within the Sector

What are the implications of these understandings for the nonprofit sector? To answer this question, one should keep in mind some of the characteristics of nonprofits that distinguish them from for-profit corporations or government agencies. Nonprofits operate in a very different manner than other organizations because they are fundamentally not driven by a financial bottom line, but by social missions. They tend to be small and have less wealth and resources compared to organizations within other sectors. Moreover, a large proportion of their financing comes from foundations and governments, giving these institutions a large role in shaping the way that nonprofits go about their work.

These defining characteristics add up to a uniquely challenging organizational context for the adoption of ICT innovations.

Innovation development—and R&D investment—is geared toward the technology needs of the for-profit sector and less likely to fit the needs and capacities of nonprofits. Nonprofits are at a significant disadvantage in the marketplace for technology innovations. Three reasons stand out. First, because they lack market power, they are not the primary markets for technology developers or propagating institutions (vendors and other institutions that seek to spread new technologies). When developers and propagating institutions do focus on nonprofits, they often lack an understanding of how the new technology tool can be applied to the organizations' mission-oriented activities.

Second, nonprofits are less involved in the development of innovations because they are less likely to be early adopters, who play an increasingly significant role in innovation development and refinement. This means that those who do not "get into the game" quickly end up with products that are not tailored to their needs. By the time nonprofits adopt new technology tools, they are often doing so to keep from falling behind rather than to move the field forward in new and interesting ways.

Third, there are few incentives for R&D investment in technologies geared for the nonprofit sector. ICT investments are risky: startup costs are high, and products operate in winner-take-all markets where only a select few succeed.[13] In the private sector, investors take risks because rewards are also high, and they reduce their exposure by diversifying their investments. The same profit motive and ability to reduce risk through diversification do not exist in the nonprofit sector, where investment generally comes from philanthropy. While the risk of failed technology projects remains present for nonprofit technology endeavors, there are no mechanisms for "profitable" technology investments to subsidize "unprofitable" ones in the way that is possible in the private sector.

Nonprofit organizations lack resources for technology capacity and development. Although new ICTs make many business practices easier, cheaper, and more efficient, the adoption and implementation of new technologies still requires a significant financial commitment. Investments in equipment and software require complementary investments in human and organizational development.[14] The rapid pace of innovation often leads to increasing costs for training, maintenance, support, and capacity.

For a variety of reasons, nonprofits have a difficult time obtaining resources to allocate to the adoption of new information technologies. The nature of nonprofit finance is one contributing factor. The foundations, corporations, and government agencies that fund nonprofits tend to reward funding based on a proposal that outlines the activities the organization will undertake and the way in which outcomes will be evaluated. This model disincentivizes the entrepreneurship and flexibility needed to adopt new technologies and to adapt them to fit the needs of the work and hinders the ability of nonprofits to respond quickly to changing conditions.[15] In addition, nonprofits are generally funded for specific programs and projects, which rarely include budget lines for technology development, rather than general organizational development and support—the source of funds for technology capacity building.

Beyond the sector's overall lack of funding for technology, the way that nonprofits allocate their technology funds can be myopic. The "80–20 rule"—a rule of thumb for technology planning—recommends that approximately 80 percent of a technology budget

should be spent on services such as consulting, implementation, training, and maintenance, and 20 percent on hardware and/or software. Nonprofits often allocate their funding in the opposite manner, with 80 percent or more going toward hardware and software, and only 20 percent going toward complementary investments. Another problem is the lack of targeted technology investments. Nonprofits often scatter investments among several initiatives or programs rather than making the coordinated, strategic, and catalytic investments that are needed to maximize a new technology.

Lastly, there is an ongoing tension for nonprofit practitioners between the use of funds in the short term to serve additional residents, organize additional campaigns, build additional housing, etc., and the use of funds to invest in long-term capacity building endeavors, such as technology innovations, that can enhance the organization's ability to be more efficient and effective toward achieving these outcomes.

There is a lack of information flow about innovations within the nonprofit sector and between the nonprofit sector and the private and public sectors. The external conversation about a particular ICT innovation plays a large role in determining whether or not an organization will decide to adopt the technology and begin to amass the resources and organizational capacity to do so. The structure of the nonprofit sector and its disconnection from the private and public sectors tend to create barriers to the open flow of high-quality information about ICT innovations and the ways in which they are applied to mission-oriented activities.

Nonprofits often must navigate between the mass of information generated by innovation vendors and the dearth of easily accessible information about how such innovations might be relevant to their work. One of the major barriers to the spread of emerging ICTs is the lack of information about how innovations could be or are being applied to nonprofit activities. The stories and lessons of nonprofits that do adopt and use new technologies must be widespread and accessible to would-be adopters.

Another primary barrier to fluid information flow within the sector is the tendency of nonprofits to work in distinct, programmatic areas such as workforce development, human services, health care, education, and housing. This tendency to work in "silos" can stunt communication about technology innovations and their uses among practitioners who might otherwise be able to apply the same technology tools to their different areas of practice. In addition, when there are communications channels that enable practitioners in different fields to talk to each other, they tend to be devoted to programmatic best practices and opportunities for collaboration rather than the adoption and use of technology innovations.

Many lessons about technology adoption and use could be learned from the private and public sectors that could be applicable to the nonprofit sector, but a lack of communications channels prevents this exchange of information.

Conclusion

Compared to the private sector, the nonprofit sector is at a disadvantage when it comes to information and communications technology. Since the sector is not fully engaged in a majority of the innovation development processes, it does not benefit in the same way from investments in technology R&D by the private sector. In addition, nonprofits have limited resources to devote to technology adoption and implementation. There is also a lack of information flow concerning innovations and their application to nonprofit activities. Because of the challenges of adoption, innovations diffuse slowly within the sector, and the potential of technology to aid community building can go unrealized.

Findings from the Field: The Adoption of New Technologies for Community Building

While the nonprofit sector faces significant barriers to adopting and using ICT innovations, a number of nonprofit organizations have successfully charted new territory within their domains of practice through adopting and implementing new technologies. Their experiences offer important insights into how the innovation divide can be bridged.

The adoption of innovations by an organization is a multi-staged process. This process begins when the organization learns of a new technology and continues as the organization decides whether to adopt the technology and, if the decision is to adopt, incorporates the innovation into its programmatic work. Because innovation development is not geared toward the technology needs of the nonprofit sector, nonprofit technology adopters generally need to adapt the newly-adopted technologies to fit their particular organizational needs and capacity. To put new technologies to work effectively, community building organizations must merge their expertise in community building practice with knowledge of how the new technology tool can be applied to that practice.

The twelve case studies of innovation adoption illustrate how early adopters tailor or adapt new technology tools. This process is different within each of the four innovation/practice areas:

- Neighborhood Information Systems
- Electronic Advocacy
- Digital Inclusion Initiatives
- Internet-based Microenterprise Support

Each innovation area is presented separately, with an overview of its relevance to community building, followed by three case studies. All case studies include information about the context for the adoption of the innovation, the particular ways in which the organization adapted the innovation to contribute to community building, and the impact that the innovation has had in the field.

Neighborhood Information Systems: Facilitating Data Access and Analysis by Community Organizations

As community organizations become more important players in community revitalization, economic development, and social service delivery, the ability to analyze and present data is increasingly essential to their work. At the same time, the IT revolution has vastly increased the availability of data and improved powerful data analysis and mapping technologies such as GIS.[16] And the Internet now makes it possible for the public to access large quantities of data.

Despite this seeming match between the rising sophistication of community change agents and ICT innovations, there has been a disconnect between community organizations and the data analysis tools that can help them accomplish their goals. Technology applications such as GIS hold great potential for community action, yet their cost and complexity have left them largely beyond the reach of most community organizations.

In the 1990s, a set of institutions—local nonprofit data intermediaries—emerged to help community organizations overcome these barriers.[17] Guided by missions to democratize data, these intermediaries are "hardwired" to spread the benefits of data analysis technologies. Recognizing the potential of GIS mapping for community action, they quickly adopted and developed expertise in this technology. Since 1999, a number of the strongest data intermediaries in the country have participated in a national network, the National Neighborhood Indicators Partnership (NNIP). NNIP is housed at the Urban Institute in Washington, DC and has grown to encompass 27 data intermediaries working in cities throughout the country.[18]

To make GIS and other data analysis tools available to community actors, data intermediaries incorporated these technologies into comprehensive Neighborhood Information Systems (NIS). Though these systems vary, they all contain two essential components: (1) data inputs, or information and indicators of community life, and (2) data displays, including maps, tables, and other outputs that organize and display data. They are "neighborhood" information systems because they organize data by neighborhoods and other relevant geographies for community groups.

As early adopters of GIS, local data intermediaries have played important roles in further developing data and mapping technologies to meet the needs of community building organizations. Although this ICT innovation has been around for over 30 years, commercially-available GIS software is relatively complex and does not yet meet the needs of community building organizations. In the absence of this technological development, nonprofit data intermediaries have played the role of technology developers. Intermediaries often seek to:

- Improve the quality of data available to community builders
- Access additional data from new sources or from resident surveys
- Integrate separate datasets
- Find ways to produce data displays more quickly
- Improve the quality and variety of data displays
- Reprogram Internet-based GIS to make it more useful for non-expert users
- Design user-friendly NIS websites

Data intermediaries are diverse, with differing missions, contexts, and capacities. These differences among intermediaries translate into differences among NIS, as the following descriptions of the three case study intermediaries illustrate (table 3).

The Providence Plan: Data Partnerships for Citywide Revitalization

Background and Context

The mission of The Providence Plan (TPP), founded in 1992, is to revitalize Rhode Island's capital city, promoting the social and economic well-being of its people and its neighborhoods. To accomplish its mission, the nonprofit organization builds

Table 3. Key Organizational and Technological Characteristics of NIS Case Studies

	The Providence Plan	*Neighborhood Data Center*	*Center for Neighborhood Knowledge/NKCA*
Neighborhood Information System	Integrated Citywide Information System	Data Clearinghouse	Online Statewide Information System
Organizational Mission	Citywide and Neighborhood Revitalization	Nonprofit Capacity Building	Provide Free Data and GIS Mapping
URL	http://provplan.org	http://www.nonprofitcentermilwaukee.org/datacenter	http://nkca.ucla.edu
Institutional Arrangement	Public/Nonprofit Partnership	Program of Nonprofit Technical Assistance Provider	Program of University Research Institute
Data Delivery Approach	In-House and Internet System	In-House System, Limited Internet System	Internet System
Data	Demographic, Socioeconomic, Housing, Property, Health, Education, Crime, Prisoner Reentry, Community Assets, Arts and Culture, Historic Preservation	Demographic, Socioeconomic, Housing, Property, Health, Education, Crime, Prisoner Reentry, Community Assets	Demographic, Socioeconomic, Housing, Mortgage Lending, Health
Smallest Scale of Data	Parcel, Individual	Parcel	Block Group
Widest Scope of Data	Citywide, Some Statewide	Citywide, Some Regional	Statewide

partnerships among government agencies, civic groups, and residents to advance a comprehensive approach to problem-solving. The Providence Plan is involved in community economic development, housing, early childhood learning, public safety, neighborhood planning, and youth development.

From its inception, The Providence Plan has recognized that data and mapping are essential to understanding and devising solutions to urban problems and has used GIS as a tool to support its revitalization agenda. Seeing that the city lacked a comprehensive data resource, TPP began working with the Taubman Center for Public Policy at Brown University to build a one-stop information system. Since then, TPP has become the primary source of data and mapping for public and nonprofit community builders in the city. Its system contains an impressive variety of data, at the smallest scales available, including historical data in the health, property, and education arenas as well as vital statistics. Much of this data is made available to the public via its website, which includes an interactive mapping application. The Providence Plan provides a range of assistance—from partnerships to technical assistance—to community organizations and government agencies to help them use these data resources.

Technology Strategy and Approaches

The Providence Plan has excelled at devising solutions to the challenges of data access and data integration. By developing long-term collaborative relationships with data providers, TPP has assembled rich datasets that combine property-level and individual-level data from previously separate sources. It integrates these datasets with resident-collected data and has developed innovative data displays and Internet-based data tools.

Developing Data Partnerships with Government Agencies

To gain access to administrative datasets, The Providence Plan developed reciprocal agreements with the government agencies in charge of health, public safety, education, and corrections. These agreements trade TPP staff's technical expertise in data analysis and mapping in exchange for access to agency datasets and payment for services. For example, TPP helps the local police department integrate GIS crime mapping into its normal policing routine. This agreement benefits TPP and area community groups by providing timely access to crime data, and it also benefits the community by making city services (here, police beats) more efficient and better targeted.

TPP's ability to access and work with government agencies can translate into greater access to data for advocacy groups, as illustrated by the data collaboration between TPP and the Rhode Island Department of Corrections. Since 2002, TPP has been helping the Family Life Center (FLC), a nonprofit organization working on prisoner reentry issues in Providence, use mapping for analysis, communications, and policy advocacy. FLC provides direct services to reentrants, educates the community about reentry issues that affect their neighborhoods, and addresses systemic barriers to reentry through policy advocacy and community organizing. To help FLC understand the reentry issue more thoroughly and develop policy and educational campaigns, TPP collaborated with the Department of Corrections to develop a database that includes address-level data on ex-prisoners and people on probation and parole. With this database, TPP mapped characteristics of reentrants including residential patterns, spatial mobility, and access to services. FLC has used these maps to win a statewide advocacy campaign to restore public benefits—job training, food stamps, and cash assistance—to people on parole and probation for drug-related convictions. It is also using the maps to develop educational workshops on the effects of incarceration and ex-offender reentry on the community.[19]

Assembling Datasets from Multiple Data Sources

Beyond gaining access to local datasets, TPP has integrated previously incompatible datasets obtained from different government agencies. While these agencies work in different domains (such as housing and education), community builders recognize the interrelatedness of these issues and the need for data that reflect the complexity of urban problems.

One important area of research that requires data from different domains of practice is the analysis of how community factors impact the health and educational success of children. In that year, Providence had the highest-known rate of child lead poisoning in the country, with nearly one-third of the children entering kindergarten in 2000 screening positive for lead poisoning. TPP and the Rhode Island Department of Health partnered to investigate the issue, creating a new database that combined TPP's data on school enrollment with health department data on children's blood lead levels and education department data on standardized test results. With this database, they analyzed the correlation between lead exposure and educational performance, finding that children exposed to lead early in life—especially over extended periods of time—performed poorly in school. Subsequent mapping of the lead poisoning data revealed that certain neighborhoods were disproportionately affected by lead poisoning and needed remediation and public education efforts.[20]

Obtaining Data at the Finest Scale and the Widest Scope

The Providence Plan is one of the nation's leaders in providing data at the finest grain available—parcels for place-based data and individual records for people-based data—and is also working to expand the scope of data in its NIS.

Parcel-level data (rather than blocks or census tracts) enable better analysis of property conditions and development opportunities and allow TPP to easily aggregate parcels to build new geographies that align with the neighborhoods, communities, or market areas its community partners need to investigate. For example, TPP helped the City Council with redistricting following the 2000 Census, quickly drawing new ward boundaries that incorporated the decade's population changes.

Individual-level data are also important for analyzing urban phenomena. For example, TPP uses individual data to help the Providence School District understand fluctuations in enrollment and student body composition. Armed with a powerful database

that includes data on every student enrolled in the Providence K–12 system going back to 1987, TPP analyzes student characteristics such as English-language ability, school mobility, residential mobility, and "churning," or how students move through the school system over time.[21]

In addition to gathering data at the finest grain, TPP is seeking to widen the scope of data contained in its NIS beyond the City of Providence. In partnership with the state economic development agency, TPP is developing a statewide parcel layer that will include all 39 of Rhode Island's municipalities. This expanded geographic scope of data will enable organizations to conduct regional and statewide analyses.

Community Impact

Through its data collaborations and NIS, The Providence Plan is moving toward its goal of citywide revitalization. Some of the impacts include:

- Property databases that provide information on development opportunities and an "Early Warning System" to help predict and prevent housing abandonment
- Neighborhood policing that uses weekly crime-mapping analysis to target efforts
- Information resources to understand, communicate, and advocate for issues around prisoner reentry
- Improved data and communications tools for neighborhood and regional action

Neighborhood Data Center: Data Display Tools for Milwaukee's Nonprofit Organizations

Background and Context

The Neighborhood Data Center is a program of the Nonprofit Center of Milwaukee, an organization that provides technical assistance, training, and services to the city's nonprofit community. The Data Center's mission is to help nonprofit organizations use data and information to support their activities. Since 1991, the organization has served as a data clearinghouse, organizing and archiving data from a variety of sources. It receives an important part of its funding from the Community Development Block Grant Administration (CDBGA), a public agency that supports community development efforts, and uses this flexible financing source to provide free services to its community grantees.

Milwaukee provides a strong environment for data access and GIS use by community organizations.[22] The city maintains one of the country's best property databases, the Master Property File (MPROP), which contains over 90 elements of data for each of the city's approximate 160,000 properties; it has been updated yearly since 1976. MPROP is available to the public through an online interactive mapping system, "Map Milwaukee," and another online data system provides even more detailed housing transaction data.[23] The use of GIS has been an integral part of the participatory neighborhood revitalization planning processes in Milwaukee that began in 1996. The Data Center assisted with that process, providing technical assistance to community groups as they incorporated data and maps into their neighborhood plans.

The Data Center works extensively with the MPROP database and has also gained access to address-level data on health, safety, and community assets. It specializes in creating useful graphic outputs from raw data and has developed many customized tools to facilitate this transformation. The Data Center works directly with nonprofit and public clients to meet their data and mapping needs and does not rely on the Internet to disseminate data and maps.

Technology Strategy and Approaches

The Neighborhood Data Center has leveraged its technical expertise in information systems and experience working with community based organizations to build tools that capture new data, integrate resident data with institutional datasets, produce data outputs efficiently, and create excellent visual representations of complex data.

Developing Database Solutions that Prevent Data "Leakage"

Sometimes administrative agencies process information that can be extremely valuable for community builders but lack the technology solutions to capture this information, resulting in a lost opportunity to create important data resources. In a

number of such cases, the Data Center has used its programming expertise to design customized databases with easy-to-use interfaces that allow organizations to capture, store, and organize data. For example, the city was routinely obtaining information on tax foreclosures that could be extremely useful for community organizations working to stem neighborhood decline by preventing housing abandonment. The Data Center designed a relatively simple, access-based database that has enabled the agency to capture this information. With this new database, the agency has catalogued two years' worth of foreclosure data.

Designing Tools to Supplement Institutional Knowledge with Resident Knowledge

When it comes to neighborhood conditions, residents' everyday knowledge is often more accurate and current than information possessed by government agencies. The Data Center designs customized systems to capture this knowledge and integrate it into administrative databases. For example, the Data Center developed a tool that allows organizations to update and add data to the city's online property database. This tool embeds a web browser into the database, making it easier to navigate. With this tool, residents are helping to strengthen and verify the city's property data.

Like The Providence Plan, the Data Center has also helped community groups incorporate their own survey data into administrative datasets. For the past five years, the city's Housing Coalition has undertaken an annual community survey of housing conditions. With funding from the Department of Justice's "Community Mapping, Planning, and Analysis for Safety Strategies" (COMPASS) initiative, the Data Center helped develop a data partnership among the Housing Coalition, the City of Milwaukee, and the Center for Urban Initiatives at the University of Wisconsin – Milwaukee. To help the partners better understand the relationship between crime and housing abandonment, the Data Center helped the Housing Coalition integrate its data into the city's online property and crime databases. The Housing Coalition has used this database to undertake a neighborhood reinvestment campaign, working with the city to prioritize actions on boarded-up properties and conducting a letter-writing campaign to absentee landlords to encourage owner responsibility.

Developing Effective Visual Representations of Data

As a direct service provider, the Data Center continually seeks to improve the quality and efficiency of its services. It has applied its technical expertise to these goals, developing a number of tools that quickly generate high-quality visual representations of data. To produce customized maps for clients at a low cost (clients pay $10 per map), the Center created a "map generator" template system. This system allows it to select different display variables and choose from 30 different map layouts. The Data Center also made crime data more usable for community groups by creating maps that display the number of crime incidents occurring in census tracts or block groups across the city and overlays these maps with a parcel basemap to better point to the more precise location of crime in Milwaukee neighborhoods.

The Data Center has also created a standardized data report template that includes tables, charts, and visualizations of data to illustrate community conditions. Using Excel macros, it can generate this rich community portrait for clients in under 10 minutes. Its technology team is also working to create effective visualizations of historical data and is experimenting with three-dimensional data displays.

Forming a Citywide Data Collaborative

The Data Center has taken a leadership role in creating an organization that is working to improve data access in Milwaukee. Formed in early 2004, the Milwaukee Data Consortium is a partnership of 20 data providers and user groups that seek to build a "virtual data clearinghouse," enabling the integration and sharing of data via the Internet. This clearinghouse would develop protocols for data access and data sharing to enable data to be housed in cyberspace instead of within a particular institution.

Community Impact

Because of the Data Center's efforts to support community action:

- Community groups are incorporating data and maps in their planning, program implementation, organizing, and advocacy activities
- Communities have better data resources to inform their efforts to prevent housing abandonment

- Information from the Housing Coalition's annual community survey is now merged with the city's online database and available to the coalition
- Advocates have ready access to high-quality maps and data displays that communicate neighborhood conditions

Neighborhood Knowledge California: Online Mapping and Data for Advocates

Background and Context

Neighborhood Knowledge California (NKCA), launched in December 2002, is a project of the Center for Neighborhood Knowledge (CNK) of the University of California, Los Angeles. CNK works to formulate and implement urban policy, and develops information technology tools to support community building, including NKCA and four other Internet-based Neighborhood Information Systems.[24] NKCA is a statewide system that aims to promote greater equity in addressing banking, housing policy, and other metropolitan issues. The system assembles a variety of databases into a web-based toolkit that can be used to document, analyze, and map demographic, housing, economic, financial, and health indicators.

As the only NIS in the country that includes data and maps for an entire state, NKCA enables organizations to gather data and maps to apply to their neighborhood, regional, and state level work. The system provides data at multiple geographical scales and makes available home mortgage lending data for a four-year period (1997–2000).[25] NKCA's approach is to create a user-friendly system that makes data and interactive mapping available to anyone that can access its website. To implement this goal, CNK streamlined its interactive mapping software program to provide users with a few specific and powerful GIS functions.

Unlike The Providence Plan and the Data Center, CNK's Neighborhood Knowledge system is designed to assist any community organization within its state boundaries. This is accomplished, in part, by providing online training materials and periodically conducting

How Organizations are Using NKCA: Legal Services of Northern California

Legal Services of Northern California's (LSNC) use of NKCA is an excellent example of how nonprofit organizations can adopt web-based data tools. LSNC's eight offices provide representation to low-income clients in 23 counties in northern California. The organization is committed to using mapping to inform its services and advocacy and has prioritized its use in community economic development, fair and affordable housing, and income stability program areas.

Legal Services found its way to NKCA after repeatedly experiencing difficulty with trying to use desktop GIS. Desiring to analyze and display data from the census and other sources, LSNC was ready to try a different approach. After leaders from the organization attended an outreach event held by NKCA's partner organization, the California Coalition for Rural Housing (CCRH), they decided to use NKCA's accessible and well-designed tool as a substitute for desktop GIS.

With CCRH's assistance, LSNC devised an office-wide training strategy to raise employee awareness of how NKCA could help them in their work and provide the necessary training and assistance. They created their own tutorials and trained 20 of 120 employees in the use of the site. The office has set up officewide "My NKCA" accounts and workspaces. Having developed its capacity to use the site's advanced functions, LSNC has been uploading client data to the site. Its attorneys have been using community mapping to understand patterns of poverty in the areas in which they work and to analyze their outreach and service delivery efforts.

hands-on training sessions in Los Angeles and other locations. To reach potential users outside of the metropolitan areas, CNK partners with the California Coalition for Rural Housing (CCRH), which is a statewide organization located in Sacramento but works statewide.

Technology Strategy and Approaches

As an exclusively online NIS, NKCA's adaptations create a user-friendly system that provides flexibility, choice, and powerful analytical tools.

Creating User-Friendly Interfaces for Mapping and Data Acquisition

To understand how to create an accessible yet powerful Internet-based dynamic mapping and data retrieval system, CNK conducted a series of focus groups soliciting input from users. Based on this information, the Center redesigned NKCA for interactive GIS mapping to make it more user-friendly and intuitive, streamlining the application generally while increasing its analytical functions in key areas. The result is a well-designed interface, making site navigation, data retrieval, and mapping highly accessible.

Providing Flexibility and Choice in Data Displays

NKCA's site provides its users with many choices of data displays, including tables, charts, and maps. The site's interactive mapping application can be used for many purposes, from exploratory data analysis to creating formal presentations. With the NIS, users can produce simple context maps that illustrate community conditions or more complex, analytical maps that layer and analyze multiple variables. They can tailor their maps by selecting up to two layers each of thematic data and point data, choose among numerous color and data classification schemes, set map size and scale, and provide their own map title.

Enabling Users to Customize Their Analysis

Commercially-available Internet mapping applications are often not user friendly, and they often lack some of the most useful and powerful functionalities of desktop GIS that allow users to customize their analysis. NKCA has reprogrammed ArcIMS GIS-mapping software to provide system users with three important functions:

- With the "Neighborhood Selector" tool, users can combine census tracts to define and retrieve data on their own community.
- The "Data Uploader" tool allows site users to upload and map their own address data contained in Excel or Access spreadsheets.
- The "My NKCA" area of the site enables users to set up personal accounts. Account holders receive free server space (currently with unlimited capacity), where they can save their datasets, map templates, geographies created with the "Neighborhood Selector" function, settings, and finished maps.

Expanding the Scope and Variety of Data

As noted earlier, NKCA was the first NIS in the country to provide tract-level data for an entire state. In addition to census data, the system provides Home Mortgage Disclosure Act data—applications and denials—by race, type of loan, and prime versus subprime lenders. With these data, users can track and analyze lending disparities across the neighborhoods of a city and the cities in a region.

Community Impact

NKCA is providing the online public with powerful data and mapping tools to support community building efforts. As a result of the system:

- The public has access to:
  - Census and mortgage lending data for every census tract in California
  - Data on the location of check-cashing establishments and brownfields
  - A user-friendly NIS that enables easy data and mapping retrieval and powerful GIS functions
- Community organizations and government agency employees are adopting NKCA as their primary data analysis and mapping tool to support their programs and advocacy efforts.

The Greater New Orleans Community Data Center: Responding to the Community's Information Needs with User-Centered Design

The Greater New Orleans Community Data Center (GNOCDC), a relatively new data intermediary, has quickly become known in the field for its expertise in the design of user-friendly Web-based tools for accessing and using local data. Their team takes an approach—user-centered design—that is well-established in other sectors but unique among data intermediaries.

In creating an online NIS for New Orleans' nonprofit community, the organization's goal of meeting their users "where they are" is guided by three underlying principles:

1) Understand the skills, knowledge, motivations, and needs of the audience;
2) Use the simplest possible technology to support the intended use of the system; and
3) Integrate contextual content into the system for just-in-time learning.

With a TOP grant, GNOCDC has added dynamic mapping to their NIS, which currently contains static maps and tables. The organization is undertaking a number of innovative strategies to maintain their commitment to developing a user-friendly, intuitive site while adding new functionality.

- *Incorporating lessons from other disciplines:* Borrowing concepts from the field of human-computer interaction (HCI), GNOCDC is methodically evaluating interactive mapping sites—ranging commercial properties in Massachusetts, plant disease in California, and tourist sites in Europe—for usability. This evaluation, combineïd with best practices research from the fields of e-commerce and instructional design, is guiding their development of their emerging interactive system.
- *Understanding their user community:* To better understand how data and mapping can be applied in the field, GNOCDC is working closely with coalitions in two nonprofit sectors—after school programs and literacy—as it develops its NIS. These partnerships are helping GNOCDC incorporate the relevant geographies and data for these users. They also provide the intermediary with access to many community groups. See http://afterschool.gnocdc.org and http://literacy.gnocdc.org.
- *Including resident voice and knowledge:* GNOCDC is interviewing residents in 20 of the city's 73 neighborhoods to elicit community residents' explanations of data about their neighborhood, asking them how it came to be that way, the effect it has, and what they think should be done about it. This information aims to help decision-makers, including collaboratives and agencies, understand the complexity of the neighborhoods beyond just the numbers. The Lower Ninth Ward was the first neighborhood for which these resident explanations were posted.

With the devastation and displacement caused by Hurricane Katrina, conditions have changed so quickly that much of GNOCDC's data has become obsolete. Through the crisis, the organization continued to serve as an important information resource for the community and the media. Since the flooding, GNOCDC has been working to provide relevant information on current conditions, publishing maps that depict elevation, extent of flooding, areas of high ground, and concentrations of historic housing outside the protection of federal historic districts. As it rebuilds its datasets, GNOCDC is also lending its expertise in designing user-friendly online systems to the development of web-based information resources that provide members of the New Orleans diaspora with information they need to begin rebuilding their lives after the disaster.

For more information, see www.gnocdc.org.

E-Advocacy: Using Information Technology for Policy Change

For years, nonprofits have been using telephones, printed materials, and fax machines to disseminate their messages and mobilize public will around issues that concern their constituencies. More recently, the Internet has become increasingly important in political and advocacy campaigns across the country, with Internet technologies increasingly becoming the "price of admission" to impact policy. Stories about the successful use of the Internet in campaigns—such as MoveOn.org's activities, Amnesty International's formation of an online network of human rights advocates, and the Dean for President Campaign—have spurred community and advocacy organizations to think more seriously about the power of the Internet in promoting social change. According to a survey conducted in 2000, 63 percent of nonprofit organizations that do policy work used e-mail, although smaller organizations were less likely to access and use internet-based tools.[26]

E-advocacy—bringing together Internet strategy and advocacy practice—is empowering new forms of civic participation among community organizations and individuals alike. Although definitions of "e-advocacy" in the nonprofit field can vary, what is meant by the use of the term here is the practice of Internet-supported advocacy, which involves two distinct areas of technical competence: Internet Strategy and Advocacy Strategy.

- *Internet Strategy* concerns knowing what type of technology tools exist, how and when they should be deployed, and what combination of tools can be integrated. Developing an internet strategy can include building an online presence, developing and implementing outreach strategies, using technology applications to facilitate user engagement and promote interaction (through mechanisms such as online discussion forums, blogs, or "tell-a-friend" tools), and controlling website traffic through online ad buys and search engines.

- *Advocacy Strategy* involves effectively framing policy problems; researching, proposing, and supporting solutions; organizing constituents and activists; building coalitions; lobbying public officials; and interacting with the media.

E-advocacy combines these two distinct forms of expertise into a coherent, overall approach, integrating a wide selection of information technologies into offline advocacy methods.

As the following case studies illustrate, it is the strategic and tactical rationale of the particular advocacy campaign that determines the nature of e-advocacy tools that a nonprofit organization chooses to adopt and implement. Key decisions involved in the adoption process include selecting which communications tools to use, when to use them, which audiences to target, how to target them, and how to evaluate the campaign. Table 4 presents the campaign goals and Internet strategy for each campaign.

Free the Schuylkill River Park Campaign: Using the Internet to Amplify Resident Voices to Pressure for Policy Change

Background and Context

The Free the Schuylkill River Park Campaign is an ongoing advocacy effort led by neighborhood residents living near Schuylkill (pronounced "Skookle") River Park in central Philadelphia. The campaign has combined an effective advocacy strategy and powerfully inventive use of the Internet to pressure CSX the largest rail transport provider in the eastern United States—to provide neighborhood residents with street-level access to the recently completed Schuylkill River Park Trail, currently blocked on a regular basis by CSX freight trains. The campaign began as an ad hoc committee of the Logan Square Neighborhood Association and

Table 4. Key Organizational and Technological Characteristics of E-Advocacy Case Studies

	Free the Schuylkill River Park Campaign	*Inner Purple Line Campaign*	*No on Prop. 54 Campaign*
Goal of the Campaign	To pressure the CSX rail transport company to provide convenient access to the Schuylkill River Park Trail for local community residents.	To pressure federal, state, and local elected officials to approve construction of the Inner Purple Line transit line from Bethesda to New Carrollton, MD.	To persuade California voters to vote against Proposition 54 on the October 2003 statewide ballot.
Organization	Logan Square Neighborhood Association - 501(c)(3) Neighborhood Association	Action Committee for Transit (ACT) - Nonstock Membership Corporation	American Civil Liberties Union of Northern California (member of statewide coalition) - 501(c)(3) and 501(c)(4) organization
URL	http://www.freetheriverpark.org	http://www.innerpurpleline.org	No longer available
Internet Strategy	From the outset, the Internet was utilized as a central component for mobilizing constituents to pressure policy-makers and key decision-makers to ensure local residents have access to the Schuylkill River Park.	The Internet strategy in combination with the media strategy was used to help reframe the media debate surrounding the construction of the Inner Purple Line.	Using a sophisticated online communications platform, the Internet strategy was critical to helping the campaign target unique messages to key constituencies among voters across the state.

eventually expanded into a coalition with other neighborhood associations as well as community organizations from across the city.

Many of the resident volunteers who initially became involved in the Schuylkill River effort were experienced organizers, including Rob Stuart, the lead Internet strategist for the campaign who lived in a neighborhood prevented from accessing the park trail. A former lobbyist with 15 years' experience who now works on developing public relations Internet strategies as the Vice President of Strategic Relations for Advocacy Inc., Stuart spearheaded the campaign's decision to use the Internet and, along with another campaign coordinator, was primarily responsible for selecting and physically interacting with all of the technology tools involved. As a result, the learning curve for adoption of the technologies used in the campaign was substantially shortened.

From its outset, the campaign saw resident engagement and mobilization as central to the advocacy strategy. Because of limited initial resources, the campaign relied heavily on the use of the Internet to build and nurture an online community of engaged "virtual" activists who could help the campaign to exploit strategic pressure points among several key political actors. Over time the Internet strategy would prove not only essential to the campaign, but also extraordinarily effective.

In addition to being used to pressure CSX directly, the Internet was also used to help secure the support of an array of secondary actors—the local parks commission, city council members, the Mayor of Philadelphia, U.S. Senators from Pennsylvania, and local media—to apply pressure indirectly to CSX. The primary target audiences of the online communications for the campaign are local residents living near the Schuylkill River Park Trail in particular, as well as residents from across the city.

Technology Strategy and Approaches

Building an Online Constituency

To launch a communications outreach strategy on a limited budget that would get community residents involved, the campaign used an online electronic letter-writing tool known as CitizenSpeak (www.citizenspeak.org; see the text box), combined with an online faxing service called Greenfax (www.greenfax.com). The electronic letters provided a convenient way for local residents not only to take action in support of the campaign, but also to express their own voice by tailoring prewritten campaign statements to reflect personal experiences and concerns. The combination of CitizenSpeak and the Greenfax service made the letter-writing campaign as convenient as possible for local residents, and yet ensured that the letters reached CSX and local officials in an effective way. E-mail letters created with CitizenSpeak would be sent as e-mails directly from the website to Greenfax, which would then forward the messages on as faxes to a single or several specified fax numbers. The initial targets using this system included CSX and the local parks commission.

Activating Viral Dissemination

CitizenSpeak lets constituents forward e-mails to their circle of friends, allowing messages to be "virally" disseminated across the community. With this action system in place, the critical task for the campaign became generating "viral" action and building an e-mail list to begin developing and nurturing an online community of engaged activists. The initial campaign list began with approximately 50 to 60 e-mails maintained by the Logan Square Neighborhood Association. When e-mails containing links to the web-based CitizenSpeak letter campaign were first sent, viral action began to develop slowly. This precipitated the campaign to use an offline approach—tabling in the Schuylkill River Park—to gather signatures and e-mail addresses on a paper petition. Within weeks the campaign had more than 150 signatures and e-mail addresses. Armed with this new constituent list, the campaign used CitizenSpeak to begin generating precipitous viral action that produced an e-mail contact list that currently numbers greater than 750 people.

Using Constituent Feedback to Refine Campaign Strategy

Unlike offline letter-writing campaigns that rely on constituents independently sending letters by mail, the CitizenSpeak tool allowed campaign organizers to see what their constituents had to say. By reviewing letters submitted by campaign constituents, campaign organizers could see how the park trail mattered to residents in their own words. They could get fresh insights and perspective about what the community really cared about and why. In addition, statistical reports allowed the campaign to see a variety of information about how the campaign was doing. It could review the total number of e-mails sent and, through the address information provided by users, the zip codes of where those constituents lived. This way the campaign could do a rough geographic tracking of where its online support in the city was coming from.

The ability to garner this type of direct feedback proved helpful when the campaign began to generate local media coverage. When a reporter from the *Philadelphia Inquirer* contacted the campaign to write a story about the effort and sought the perspective of an actual park user, Rob Stuart, the lead Internet strategist, reviewed the many e-mails submitted by constituents through CitizenSpeak to find a neighbor who was particularly articulate and passionate about the issue. He then put the reporter in touch with the constituent, whose personalized account was incorporated into a story that ran on the front page of the local news section of the newspaper.

Coordinating Online and Offline Tactics

Following the local media coverage, the campaign decided it needed a website for posting the newspaper article, photos, and other information about the campaign. Stuart elected to create a blog (www.freetheriverpark.typepad.com), using the TypePad weblogging service (www.typepad.com). Later, a campaign website was developed that is hosted at www.freetheriverpark.org.

To send out alerts and updates to its e-mail list, which had grown to more than 500 people, the campaign began using "ConstituentMail," a mass e-mailing software service hosted by Advocacy, Inc. (www.advocacyinc.com). ConstituentMail allowed the campaign to send rich-text and HTML-formatted

e–mails as well as to monitor how many people opened the e-mails and whether they forwarded them to others. This tool led to the discovery that over 70 percent of people receiving campaign e-mails actually opened them, and that 80 percent of those who opened e-mails took the action requested of them. This insight precipitated the decision to hold a campaign rally that, despite the fact that it occurred on a below-freezing day, turned out over 100 people. To document the event, the resulting television coverage of the rally was recorded on VHS, converted to the MPEG video file format suitable for web-based video, and made accessible online via a link from the campaign's main website. Perhaps the most innovative feature of the campaign website was the use of streaming video feeds, available 24 hours a day, showing whether CSX trains are blocking street entrances to the Schuylkill River Park. Through this feature, residents are empowered with information they can then use to submit a complaint to CSX e-mailed directly from the website.

The use of tabling to jumpstart the viral action around CitizenSpeak, the surveying of electronic letters from constituents to find a personalized community voice to speak for the campaign, and the monitoring of indirect feedback in the form of e-mail "open rates" and other metrics to decide when to have a rally demonstrate how the campaign effectively integrated elements of its offline and online tactics and strategies so that they reinforced each other. The campaign used its website and e-mail to inform constituents about its planned rally in the park. At the rally it both promoted its website address and took many photos to document the event for later posting to the website. Similarly, at a news conference held by the campaign, it prominently displayed its web address and took photos to post to the website. While gathering e-mails on location was not effectively implemented at first, the website address was effectively promoted at offline events throughout the campaign.

Empowering the Grassroots with Decision-Making Authority

The goal of the advocacy strategy for the Schuylkill River campaign was to create an engaged online constituency that was informed, in regular contact, and empowered with individual and collective voice to shape the strategic and tactical decision-making of campaign leaders. The campaign organizers knew this goal had been achieved when they were able to poll constituents (using ConstituentMail) to determine how to respond to a proposed agreement with CSX being brokered by U.S. Senator Arlen Specter. Specter's office had been contacted by the lead campaign strategist to lend support to the campaign, which led to a proposed compromise. Within two days, the campaign polled its constituents for feedback on the proposal. Based on a response rate of 50 percent, an overwhelming 91 percent of constituents opposed the offer. The campaign leaders informed Specter's office that they could not accept the deal, using the poll to articulate the problems that the proposal presented to the community. The e-advocacy strategy enabled informative and extremely timely community decision-making.

CitizenSpeak: A Tool for Electronic Letter-Writing Campaigns

CitizenSpeak is a free electronic letter-writing tool that allows campaign organizers to provide constituents with prewritten letters that they can supplement with personal statements to be e-mailed from the CitizenSpeak website directly to targeted policymakers or organizations. The tool is very easy for organizations to set up and very user friendly and convenient for constituents. In addition, CitizenSpeak includes "tell-a-friend" functionality, which allows campaigns to use viral action to build their e-mail list by making it easy for constituents to tell their friends and family about the campaign. The application's greatest asset, however, is its ability to create reports monitoring interaction with online constituents in the form of the content of their letters, collecting their contact information, and tracking how many messages have been sent from different zip codes in a city.

For more information, visit www.citizenspeak.org.

Community Impact

The Schuylkill River Park Trail campaign has been extraordinarily successful. Not only has it garnered substantial political support, including a city council resolution in support of the campaign, but CSX has had to resort to going to the federal district court to attempt to thwart the political alliances forged by the campaign. As the battle to secure street-level access to the Schuylkill River Park Trail moves forward, the campaign is also carving out a long-term role as the community voice on park issues. With an engaged and activist online community of local residents in place, the campaign is poised to advocate for new issues in new and evolving ways.[27]

The Inner Purple Line Campaign: Using the Internet to Help Reframe the Media Debate

Background and Context

The Inner Purple Line Campaign is an ongoing advocacy effort based in Montgomery County, Maryland. Launched in the early 1990s by an advocacy organization called the Action Committee for Transit (ACT), the campaign has expanded to a broad "Inner Purple Line Coalition," comprised of a number of civic and community organizations. For the past few years, the coalition has advocated for the construction of a light-rail transit line that would connect the cities of Bethesda and New Carrollton in Montgomery County and Prince George's County, respectively, to provide access to employment centers for a number of inner-ring suburb and transit-dependent communities. The campaign faces entrenched opposition by the well-financed and well-connected Columbia Country Club, located in the town of Chevy Chase that, because of the proximity of the proposed line to its golf course, has launched a sweeping NIMBY ("not-in-my-back-yard") campaign to block the project. The country club, according to research conducted by ACT, has assumed more than half a million dollars in lobbying-related expenditures to prevent the Inner Purple Line from being constructed.

Founded in Montgomery County in 1986, ACT is an all-volunteer nonstock membership corporation with approximately 600–700 dues-paying members.[28] Similar to the Free the Schuylkill River Park Trail Campaign, a single individual was instrumental in convincing campaign leadership to develop an Internet strategy to complement its offline advocacy efforts. ACT and the Inner Purple Line campaign had created websites, but it took the vision, knowledge, and experience of neighborhood resident Marty Kearns, who had previously used technology for organizing and advocacy, to develop an e-advocacy strategy. Conversations with his neighbor, an active member of ACT, led Kearns to begin self-financed experimentation with inexpensive Internet tools.

The central campaign strategy, in addition to direct lobbying of politicians, has been to persuade community residents to pressure their local, state, and federal elected representatives—county council members, the county executive, state legislative representatives, the governor, and the district's U.S. congressional delegation—to support construction of the rail line.

For years, the core outreach strategy of the campaign focused exclusively offline, using printed fliers and letters to reach out to community members. At Metro stations throughout the county and in local neighborhoods, the campaign has hand-distributed or mailed nearly 100,000 pieces. The fliers asked constituents to take action on the rail expansion and donate to the campaign. This technique for communicating with constituents and mobilizing action has been effective on a number of occasions in pressuring key political actors at decisive moments in the campaign. The incorporation of an Internet strategy, however, has effectively met campaign goals in ways not possible with the flier strategy alone.

Through support of activities by allied organizations and lobbying of elected officials, the opposing Columbia Country Club has helped generate a negative media portrayal of the Inner Purple Line project. For years opponents had argued that the project would destroy the Capital Crescent Bike Trail running near a proposed section of the line. Over time the story gained traction in the media, painting the picture of a zero-sum game that pitted the benefits of mass transit against the benefits of the

existing bike trail. Viewing the "save the trail" campaign by opponents of the Inner Purple Line as a misleading, but nevertheless effective, red herring, the transit campaign began developing an Internet strategy to help shift the public debate to the real merits of the transit project. Kearns became involved in the ACT campaign around this time, deciding that the trail issue was undermining the effectiveness of the campaign in building public support for the project.

Technology Strategy and Approaches

Creating an Enhanced Campaign Website

Updating the campaign website was the first element of the Internet-enhanced advocacy strategy. The first step was to add to the campaign's website a body of information that ACT held but was not available online. This material included a detailed explanation of the benefits of the Inner Purple Line, combined with arguments debunking misleading claims in the media about the project. The campaign also purchased the Innerpurpleline.org, Innerpurpleline.net, and Innerpurpleline.com domain names to control the primary web addresses making direct reference to the project. New information added to the campaign website included position statements and research demonstrating the benefits of constructing the Inner Purple Line, links to news coverage about the project on the Internet, a list of groups and individuals endorsing the campaign and a list of key opponents, and a breakdown of financial contributions given by the central opponent of the project, the Columbia Country Club, to elected officials across the state.

Using the Media Strategy to Support the Internet Strategy

In addition to securing the three primary domain names and broadly documenting the campaign, another major element of the Internet strategy was a disciplined offline communications campaign that deliberately referred to the "Inner Purple Line" in all media interactions, including statements to the media, op-eds, and letters to the editor, as well as regularly mentioning the web address for the campaign in external communications. This helped ensure that any discussions of the project in the media and elsewhere were tied to the name "Inner Purple Line," to drive traffic to the campaign website. The project had previously been referred to by different names in the media, making it crucial to engender a single reference. To further support driving online traffic to the website, the campaign—spearheaded by the President of ACT—utilized the online ad services of the Google search engine. By using the Google AdWords service, when certain keywords were entered into the Google search engine, such as "save the trail," a link to the ACT website with a short description would be displayed, along with the other search results.

Community Impact

The overarching goal of the Internet strategy was to drive traffic to the campaign's website, where visitors could find evidence debunking misleading depictions of the project that had emerged in the media. In that pursuit, the Internet strategy was effective. Through the use of its website, the campaign was able to shift the public debate around the rail line away from the trail issue and towards the Columbia Country Club.[29] Even Maryland's then governor, Robert Ehrlich—who opposed the transit project—tried to shift the campaign's focus by renaming the project the "Bi-County Transitway" (BCT).[30] Despite his efforts, references to the BCT—both online and in the offline media—usually noted that the project is also known as the "Inner Purple Line."

This case study highlights the importance of a media communications strategy that can reinforce or retard efforts to drive online traffic to a campaign's website. In this instance, the control the campaign exercised over domain names referring to the project allowed it to enjoy the benefit of spikes in traffic—even when the project was discussed negatively in a media report. By controlling a domain name that includes key words that online information seekers are likely to submit to search engines, a campaign can use its online presence as its own media center to refute erroneous claims that may arise elsewhere.

No on Prop. 54 Campaign: Using Internet Technologies for Targeted Grassroots Mobilization

Background and Context

The No on Proposition 54 campaign in California was an advocacy effort led by a coalition of civil rights organizations to oppose an initiative placed on the statewide ballot in October 2003. Named Proposition 54, but also known in the media as the "Racial Privacy Initiative," the proposed state Constitutional amendment would have effectively banned the collection of data identifying individuals by their race, ethnicity, or national origin in a wide array of state operations. The coalition—concerned about the ramifications of such an initiative on public health research, discrimination, and education—quickly came together to organize opposition to the ballot measure.

The American Civil Liberties Union (ACLU) of Northern California was one of the anchor organizations in the "No on Prop. 54" campaign from its inception. Maya Harris, Director of the Racial Justice Project at the ACLU of Northern California, was the Northern California political director for the statewide campaign. Harris, along with leaders from other coalition organizations, sat on the executive committee of the campaign, which served as its primary decision-making and fundraising body. The single most important strategic priority that emerged out of deliberations of the executive committee in terms of the overall communications strategy was to raise enough money to pay for a variety of advertising, particularly on television.

It was clear to everyone in the campaign that they had to have a website, but beyond a simple web presence, the campaign leadership did not prioritize Internet advocacy. E-mail and a website were largely viewed as a method of disseminating information and communicating with coalition members and allies, but not as tools fundamental to supporting the strategic goals of the campaign. The impetus for forging a more comprehensive and coherent Internet strategy emerged from a group of campaign members who wanted to increase field operations and grassroots organizing efforts. This group viewed the Internet as a powerful way of leveraging limited resources and expanding grassroots operations, and they convinced key campaign leaders to develop an Internet strategy.

Executive Committee members Harris and Steve Phillips, president of a political action organization known as PowerPAC.org, partnered with David Chiu, a strategic Internet political consultant and Senior Vice President of Grassroots Enterprise, to develop and implement an Internet strategy that would raise money for the campaign and provide a new avenue for spreading the advocacy message. They developed a plan and foundation proposal for revamping the campaign's website and developing Flash animation to disseminate through the Internet. PowerPAC.org created an updated version of the campaign website, and Harris and Chiu, along with a team at Grassroots Enterprise, developed the Flash e-mails for the campaign. A fast-tracked grant from the Community Technology Foundation of California received just weeks before the October election provided the critical infusion of money necessary to launch the campaign's remarkably innovative and successful multimedia Internet strategy.

As a ballot initiative campaign, the target audience of the No on Prop. 54 campaign's media strategy was the voters who could approve or deny an amendment to California's constitution. While the campaign website featured a wide variety of background information, the most engaging aspects of the campaign's Internet strategy did not get underway until a few weeks before the election. Up to that point, the core elements of the communications strategy had been implementing a comprehensive "earned" media strategy (thematic news conferences, editorial board visits, opinion-editorials, and letters to the editor) and developing the "paid" media strategy (television and radio advertisements). This communications work, combined with grassroots activity and prominent endorsements of the No on Prop. 54 campaign from across the political, professional, and constituency spectrum, had the gradual and sustained effect of eroding support for the initiative. However, just a few weeks out from the election, support for the proposition was still ahead in the polls.

Although polling data suggested that one of the campaign's core messages—that Proposition 54 would ban information that doctors use to save

lives—resonated broadly with voters in general, targeted messages were essential to mobilize different communities of color. With limited resources to comprehensively tap into ethnic media outlets and desiring the broadest dissemination of targeted messaging to voters within communities of color, a "viral" multimedia Internet strategy was developed as an additional targeting mechanism across the state.

Technology Strategy and Approaches

Framing Unique Messages to Different Constituent Groups

Grassroots organizing had received limited resources within the strategic priorities of the campaign leading up to the weeks prior to the election. The Internet strategy team realized that using the Internet could be a cost-effective way of mobilizing voters to spread the campaign's key messages to other voters. In addition, it was hoped, the Internet strategy could provide a means to make more extensive re-use of the content contained in television and radio ads already developed. The team decided to create a series of short Flash animation pieces that would frame the campaign message in an effective and a compelling fashion and that would be targeted to resonate with the issues that different ethnic or racial communities in the state cared about. In this way the campaign could segment California voters into racial and ethnic audiences and then communicate customized messages that would appeal to them. A Flash piece modeled on the general voter message, along with videos tailored to African American, Asian American, and Latino voters, was developed. These Flash pieces were placed on the web and integrated with the Grassroots Multiplier advocacy platform so that "indirect feedback" about what actions constituents were taking with the online campaign could be tracked.

Targeting Campaign Messages through Online Communications

While the campaign developed compelling Flash videos that could selectively frame the campaign message to targeted groups in the state, the problem became one of how to disseminate the videos to the racial and ethnic communities themselves. The campaign had only a small initial list of e-mail addresses with which to begin building the type of "viral" dissemination required to get the custom-framed messages to their targeted recipients. In addition, the campaign was heavily constrained in terms of how much it could rely on "viral" action from such a small list to develop right before the election. E-mail addresses do not come with racial or ethnic descriptors allowing the campaign to easily target the tailored messages it had created for the communities it was trying to reach. The solution the campaign adopted relied on the offline collaboration among several organizations. It requested access to the e-mail lists of allied organizations representing particular racial or ethnic communities; such lists would jumpstart the targeted dissemination of the Flash pieces across the state. Large organizations with extensive e-mail lists, however, often have proprietary or privacy concerns about sharing them. As a result, some organizations supplied their lists to the campaign and other organizations and individuals agreed to forward the Flash pieces to their own lists. Within two weeks, the campaign sent out six different e-mail "blasts" to 40-50 e-mail lists of allied organizations. In addition to containing links to the Flash pieces the campaign developed, some of the e-mails contained links to web-based streaming video with a digitized version of the television ad the campaign was using in its larger media strategy.

Facilitating and Tracking Constituent Action Online

Building on its starting point, the e-mail-integrated Flash campaign generated enormous "viral" action during the three weeks before the election. Using online metrics that could be tracked through the Grassroots Multiplier platform, the campaign was able to generate a great deal of helpful, indirect feedback. These metrics included: the percent of recipients who opened the e-mail messages containing links to the Flash videos; the percent that "clicked through" and viewed the videos; and the percent who forwarded the message on to others. With those data, the campaign determined after the election that for each initial recipient of the video piece targeted to African Americans, the video was viewed 60 times; the piece targeting Latinos was viewed 20 times; the piece targeting Asian Americans was viewed seven times; and the "mainstream" piece targeting all voters was viewed 1.5 times. These numbers illustrate how important "viral" action can be in disseminating a message to targeted constituencies.

Community Impact

On October 7, 2003, Proposition 54 was defeated by a landslide margin. For leaders of the Internet strategy, a number of important lessons and questions emerged. In particular, it became increasingly apparent that the Internet must be prioritized as a core advocacy strategy in the campaign early enough to maximize its effectiveness, especially as it relates to building "viral" action. Moreover, a key question going forward is how traditional civil rights and progressive organizations can build large, targeted e-mail lists that can be managed and shared to harness support necessary to respond to key strategic opportunities.

Internet-based Microenterprise Support: Developing Online Tools for Microentrepreneurs

The cultivation of entrepreneurship and small businesses is an important area of community building practice: a thriving small business environment contributes to community economic development by providing job opportunities and circulating money in the local economy. The field of microenterprise support emerged in the 1980s, largely out of the efforts of women's organizations that saw business ownership as an essential component of economic improvement and empowerment for low-income women. Microenterprise programs provide business advice, skills training, and credit to very small, budding businesses with the goals of building the assets of lower-income people and fostering neighborhood revitalization in disinvested communities.

Today, over 500 microenterprise development programs around the country provide services to many diverse and traditionally underserved communities, including immigrants and refugees, people of color, veterans, individuals transitioning off of welfare, and persons with disabilities.[31] Microentrepreneurship has grown tremendously, as indicated by the burgeoning number of micro-businesses. The Association for Enterprise Opportunity, the national trade association for microenterprise programs, estimates that 20 million microenterprises in the United States account for almost 17 percent of total private-sector employment.[32]

Although the microenterprise support field has grown rapidly, its infrastructure remains insufficient vis-à-vis the needs of microentrepreneurs. Microenterprise programs serve roughly 100,000 people per year—about one percent of the potential market.[33] To maximize impact, the microenterprise field has to grow, yet attaining a greater scale has proven to be challenging for the field. Only a few of the largest microenterprise programs have the organizational commitment and capacity to expand their program services. Most programs remain relatively small, serving fewer than 100 individuals annually and making fewer than 40 loans per year.[34] At this small scale, the cost of maintaining these services on a per-loan or per-client basis is considerable.

The second major challenge facing microenterprise programs is program sustainability. As programs begin to serve larger numbers of clients, they often gain scale efficiencies and their per-client cost decreases. But such scale efficiencies may be countered by the increased cost of operating a larger program. Most—though not all—microenterprise programs are nonprofits and rely on foundation grants or government funds to subsidize their services. Absent innovations that enable more efficient service delivery, increasing a program's scale requires additional fundraising and may impinge on long-term sustainability.

A 2005 report on the future of the microenterprise field asserted that the use of information technology is a key strategy for viability and impact.[35] Internet-based innovations can enable microenterprise support programs to deliver new and vital services to more microentrepreneurs at lower per-unit cost. The development and dissemination of these innovations can help the microenterprise field as it wrestles with the persistent question of how to achieve greater scale and sustainability. MicroMentor, Count Me In (CMI), and CircleLending exemplify how microenterprise support organizations are adopting, reconfiguring, and applying Internet-based tools—and supplementing them with phone and e-mail support services—to meet the challenges of widely dispersed microentrepreneurs. Two of these case studies, MicroMentor and Count Me In, are nonprofit organizations, and CircleLending represents a for-profit microenterprise support organization whose technology model offers some insight for the nonprofit sector. Table 5, following, describes some of the key characteristics of the case study organizations.

Table 5. Key Organizational and Technological Characteristics of Microenterprise Support Case Studies

	MicroMentor	*Count Me In (CMI)*	*CircleLending*
Primary Technology Innovation	Online matching software to connect protégés and mentors from within similar business sectors or industries	Internet-based model for credit scoring and lending to women with poor credit	Web-enabled loan-servicing software for interpersonal, informal credit market
Tax Status	Nonprofit	Nonprofit	For-profit
URL	http://www.micromentor.org	http://www.count-me-in.org	http://www.circlelending.com
Scale or Sustainability Goal	To make 6,000 matches between mentors and protégés	To reduce the cost of microlending and maintain portfolio quality	To serve interpersonal lending market at a profit
Interactivity of Website	Moderate: users can volunteer to mentor or request a mentor	High: users can apply for a loan, ask questions, take workshops, join discussion groups, and donate to CMI	Moderate: users can download free materials and purchase some products and services
Technology Innovations	• Mentors can choose protégés • Protégés can find mentors • System enables multiple matches • Message board, listserv, discussion groups, online seminars	• Adapted a FICO credit-scoring model • Added a credit bureau report and CMI's own questions to supplement loan application • Created a credit-scoring model designed for lending to women	• Tailors repayment schedules for each client • Keeps costs low by using Automated Clearing House (ACH) system of direct debit/deposit • Allows clients to report payment information to Equifax to build credit history

MicroMentor: Internet-based Mentoring for Microentrepreneurs

Background and Context

Microentrepreneurs lack access to business and social networks, market information, capital, and business savvy—essential resources for business success. MicroMentor, an online microenterprise support intermediary, was founded with the goal of connecting microentrepreneurs in underserved and disadvantaged communities to these resources through the development of mentoring relationships with individuals who have successfully navigated business ownership or management in the same industry.

The idea for MicroMentor came out of a three-year long study of microenterprises conducted by the Aspen Institute, which described expert mentoring as a key need of microentrepreneurs. The same study found that the high cost of expert business consulting services made it cost-prohibitive for local microenterprise support organizations to provide this service and that the most cost-effective approach would be to establish a national intermediary to provide such services. This suggested a business model well-suited to the Internet, if an appropriate online system of matching prospective protégés (microentrepreneurs) and mentors (industry experts with business savvy) could be developed and

implemented. The national intermediary could develop relationships with local microenterprise support organizations to facilitate the use of its online services.

Staff at the Aspen Institute's FIELD (The Microenterprise Fund for Innovation, Effectiveness, Learning, and Dissemination) program, with the support of grants from the Technology Opportunities Program (TOP) grant and the Charles Stewart Mott Foundation, began developing an online matching application that would become known as MicroMentor Online Matching Application, or MOMA.

With the matching technology in place, MicroMentor was officially launched in 2001 in collaboration with three California-based microenterprise programs that help identify and prepare protégés to participate in MicroMentor. The program, has established partnerships with over 26 microenterprise agencies across the country in order to meet its goal of making 6,000 mentoring matches. Additional support from the Hewlett-Packard Company and others is currently enabling MicroMentor to move toward this goal and to create an active community of mentors and protégés.

Technology Strategy and Approaches

The vision for the MOMA application was to facilitate an automated matching process that required minimal staff intervention. Developing such an application turned out to be challenging and time-consuming. It took two years to develop the first version of MOMA (1.0), during which time MicroMentor staff made mentoring matches by hand. Initial feedback from users of MOMA 1.0 was incorporated into an improved application, MOMA 2.0.

From One-to-One to Many-to-Many Mentoring Matches

MOMA was initially designed to automatically match one microentrepreneur to one mentor. These matches would be based on information entered into its system that identified the business problems and goals of prospective protégés with the expertise of potential mentors. As MicroMentor began implementing its matching tool, the organization learned that mentors were able and willing to assist more than one protégé, and that protégés sometimes needed more than one mentor to assist with the myriad business issues and constraints they faced. To make its online system more responsive to the needs and preferences of its users, MicroMentor revised MOMA's matchmaking capabilities to permit each mentor to work with multiple protégés and allow each protégé to select multiple mentors.

Enhanced Protégé and Mentor Selection

MicroMentor also learned that most mentors want to have an active role in selecting the small business owners with whom they are matched. The first version of MOMA automatically made matches based on mentor and protégé application data: matches were made, approved by MicroMentor staff; mentors and protégés were told they had been connected and encouraged to correspond and begin the mentoring relationship. This first version of MOMA (1.0) effectively took most of the "romance" out of the matching process. Instead of this "arranged marriage" approach, MOMA 2.0 gives mentors, based on their mentor application data, a list of potential protégé matches. With this list of candidates, mentors can ask MOMA for more information to choose which protégé or protégés to mentor. Likewise, MOMA 2.0 allows microentrepreneurs to search its database of mentors to find those with the skills, experience, or other traits they are seeking and send a query to a mentor as part of the initial matchmaking process.

Greater Interactivity and Online Community Building

MOMA 2.0 also includes website features that encourage more interaction among mentors and protégés. The enhanced site includes a message board, listservs, discussion groups, and video streaming of industry-specific and general business advice (an example is a 30-minute seminar on cash flow management).

Community Impact

MicroMentor is delivering a critically needed piece of infrastructure that local microenterprise support institutions could not afford to create on their own. It is also increasing the use of technology among microentrepreneurs. Ninety-six percent of the entrepreneurs enrolled in MicroMentor reported increased familiarity with and comfort in using technology tools such as Excel, Quicken, and other commonly accepted technology tools that enhance

business efficiency. In addition, a quarter of microentrepreneurs in MicroMentor have built websites and explored e-commerce, web marketing, and web links for the first time to market their goods or services.

Count Me In: Online Lending for Women Microentrepreneurs

Background and Context

Founded by women leaders with extensive experience in communications and the women's movement, particularly in women's economic empowerment, Count Me In (CMI) is the first online microlending program dedicated to helping women. The nonprofit organization uses a unique woman-friendly credit scoring system to make business loans of $500 to $10,000 available to women. In addition, the organization provides access to business networks that expand the contacts, markets, skills, and confidence of these microentrepreneurs.

Begun before the dot-com crash in the late 1990s, when it was more expensive than it is today to develop an Internet-based business model, the founders of Count Me In conducted intensive market research to discover the potential of offering a loan product through the Internet. They saw the Internet as a way to reduce the cost of extending loans to microentrepreneurs and to deliver a good credit product to women who lacked access to mainstream financial services.

Count Me In wanted to test the idea that you can make a good assessment of a woman's creditworthiness without sitting down for a face-to-face interaction. In the context of the vast majority of microenterprise lending, this idea is a radical departure from accepted practice. To put this idea in practice, CMI developed an original credit-scoring model that was based on the most commonly used credit-scoring model in the U.S., FICO (a name taken from the corporate developer of the model, Fair Isaac and Company).[36] Their adapted model blends established industry standards with their knowledge of the needs and characteristics of their target borrower population.

CMI's system has been working well for the past two years, and it has had to make only minor adjustments to its scoring system to account for the economic recession that began in 2001. CMI needs to provide 3,000 loans to have a large enough database to formally test how well its tailored credit-scoring model predicts borrower behavior. To achieve this level of lending and test its model, CMI is partnering with local microenterprise agencies and technical assistance providers to reach potential borrowers.

Technology Strategy and Approaches

To adapt a FICO credit-scoring model to the needs of women microentrepreneurs, CMI had to undertake extensive programming to integrate the different elements of its model into a report that staff can use to make lending decisions. CMI also had to address issues of data storage and security. It took one year to get CMI's credit-scoring model online, and CMI spent an additional two years post-launch experimenting with and tailoring its model.

Incorporating Expertise from the Private Sector

Before adapting the FICO credit-scoring model to serve its needs, Count Me In staff learned a great deal about how the FICO model was typically used in private-sector lending. The nonprofit worked with both Fair Isaac and Company and American Express. CMI's Chief Credit Officer observed first-hand how AmEx did its own credit scoring. CMI also hosted a retreat where leaders in the credit-scoring industry agreed to share some of their credit application forms with CMI. The first CMI loan application was a mix of these forms and questions developed by CMI. In addition, CMI pays for a credit bureau report on each applicant. Loan decisions are based on data from these two sources.

Creating a Woman-Friendly Credit Scoring System

The loan application developed by CMI adjusted the mainstream credit rating tool to more accurately capture the creditworthiness of women by eliminating its gender bias. One source of bias relates to the effect of divorce on a woman's credit. Divorce often results in women having poorer credit but bears no relationship to creditworthiness. Recognizing that the mainstream credit-scoring model does not account for the effect of divorce, CMI asks its applicants about

their marital status and adjusts the rating based on that question. CMI expects to demonstrate that divorced women with low credit scores should be considered less risky than others with the same score.

CMI also believes there is a bias inherent in most existing credit-scoring models that ask about an applicant's business experience in terms of years of business "ownership." Questions worded in this manner often fail to account for many women who have years of experience making and selling a product yet do not think of themselves as business owners and consequently respond in a way that lowers their score. CMI's adaptation is to ask about the extent of a woman's experience making and selling her product and to score her on business "experience" rather than business "ownership."

CMI also streamlines the application process by not asking for the submission of a complete business plan or other attachments (applicants are asked whether anyone else has read their business plan, and this question is scored). Count Me In estimates that it takes a woman from 15 to 30 minutes to complete the loan application, which contains 30 questions.

Community Impact

CMI has demonstrated to the microenterprise industry that an Internet-based lending model, combined with a credit-scoring model that incorporates an analysis of the specific lending population—in this case, female entrepreneurs—can dramatically lower the cost of lending in the industry. So far, CMI's portfolio quality is roughly in line with the rest of the U.S. microcredit industry. Its loan loss rate is 10 percent, about 4 percent higher than the average loan loss rate reported by 31 microenterprise programs.[37] And its lending costs, at $300 per loan, are dramatically lower than face-to-face programs, approximately $7,000 per loan.[38]

Count Me In has also made strides in serving larger numbers of borrowers than most other microlending programs in the United States. Count Me In has established statewide partnerships in 14 states. These partnerships include strategic alliances with groups of microenterprise agencies that help connect women entrepreneurs in need of credit to Count Me In's services. If CMI continues to attain these outcomes, mainstream financial institutions may be encouraged to tailor their own loan products to the needs of women engaged in microenterprise.

CircleLending: Structuring and Servicing Interpersonal Loans

Background and Context

CircleLending (CL) is a for-profit business that merges informal and interpersonal lending with microenterprise development. The company was formed in 2001 to respond to the huge unmet demand for financial products by individuals engaged in informal, interpersonal lending. The organization adapted commercially-available web-enabled loan-servicing software for the interpersonal lending market. Working with a team of graduate students from the Massachusetts Institute of Technology (MIT) and initial financing of $20,000, CircleLending created the first loan-servicing software to handle unsecured loans between family members or friends. The corporation has subsequently invested over $2 million in software and loan product development. By structuring these loans and working with clients, CircleLending is demonstrating that the default rate on interpersonal lending can be dramatically reduced (from 14 percent to 5 percent) and that a huge and an untapped market awaits this type of service.

Technology Strategy and Approaches

The technology model of CircleLending is a web-enabled, loan-servicing tool built for interpersonal loans—loans between individuals. CircleLending created its loan-servicing model from scratch, and it is in its fourth version.

Tailoring Loan-Servicing Software to Interpersonal Lending Scenarios

CircleLending's loan-servicing software was built to handle the fluctuating conditions of loans between individuals. The flexible technology enables clients to restructure loans as the borrower's needs and capacities change. In addition, the system is able to generate nontraditional payment schedules to suit borrowers and lenders. One popular use of this function is the creation of graduated repayment schedules where loan payments increase in size as the

borrower's capacity to repay grows. This adaptation has been critical to CircleLending's success in lending to microentrepreneurs, since repayment schedules that grow as a business grows is precisely what most start-up businesses need and are unable to get elsewhere.

Building the Credit of Borrowers through Credit Reporting

CircleLending also helps its clients build their personal credit by providing borrowers with the option of reporting their loan repayment activity to the Equifax credit bureau. Informal loans between two individuals are normally not reported to credit bureaus such as Experian, TransUnion, and Equifax. Consequently, the successful repayment of a personal loan does not become a positive part of the borrower's personal credit history. The lack of a positive personal credit record can make it difficult for people who rely on informal sources of credit to access mainstream bank loans on favorable terms.

Incorporating credit reporting into its system required an additional investment in human and financial resources. To provide Equifax all the data it needed, CL had to rework its software's reporting capability to capture different data than it had been collecting. CL had to hire two full-time programmers for a full quarter to make its loan-servicing software comply with Equifax's data reporting requirements.

By reporting personal loans to a credit agency, CL helps its clients boost their credit ratings. The service is voluntary, and forty percent of CL clients currently take advantage of the credit reporting service. CircleLending expects this option will become more central to its business model as it grows.

Community Impact

CircleLending has clients in 40 states and wants to grow to every state. It already services over $18 million in loans and, impressively, has grown at about 25 percent per quarter for the past 12 quarters. CL builds relationships with local microenterprise agencies by attending industry conferences. It has also published and distributed a small business lending guide to 25 microlending programs. To reach a broader audience, CL has an agreement with the makers of Biz Plan Pro software (in Office Depot), who distribute CL materials with every software box. CircleLending's business model has broadened the notion of what constitutes service to the microenterprise industry. Perhaps most importantly, its success to date demonstrates that the microenterprise industry should be taken seriously as a market where thoughtful for-profit firms can succeed.

Face-to-Face vs. Internet-based: Microentrepreneurs Describe the Benefits of Online Support

Those concerned with the use of Internet-based services in community building activities often note the continued importance of face-to-face interactions alongside Internet-based efforts. While the main interventions of microenterprise support programs such as business planning courses, reviewing loan applications, and technical assistance involve face-to-face interactions, the organizations profiled in this section illustrate how Internet-based services can help reach more microentrepreneurs and deliver different services.

Anecdotal evidence from MicroMentor and Count Me In also suggests that—at least in some cases—clients actually have a preference for the more anonymous interactions enabled by these online services. MicroMentor's protégés say that online mentoring is more efficient, allowing them to focus on obtaining the advice needed to solve very specific business problems. They also describe feeling more comfortable not sitting down face to face with their mentors, saying that this anonymity results in more frank and open exchanges. Similarly, Count Me In's online credit-scoring model is explicitly testing the idea that a credit officer does not need to sit down with every microloan applicant to gauge creditworthiness. Clients say they appreciate the flexibility of CMI's approach, which enables them to complete the loan applications and request technical assistance whenever their schedules allow.

Digital Inclusion Initiatives: Empowering Communities with Technology Access and Training

Since the 1990s, policy solutions to the digital divide have sought to end the isolation of the technology "have-nots" by creating physical places of connection to IT resources within low-income communities. Out of this access-based policy paradigm emerged a community technology movement that focused on building points of access and training—community technology centers (CTCs)—in underserved communities.[39] As the movement has matured, new policy initiatives have recognized that meaningful access means more than just access to computers and the Internet, but also supportive resources, such as relevant content and education.[40]

The Digital Villages Program of the Hewlett-Packard Company is a keystone of this new generation of digital inclusion initiatives. The central goal was to transform low-income and technology-deprived communities from spaces of exclusion to spaces of inclusion by infusing them with technology resources and training in their use (see inset).

HP's comprehensive approach, community partnerships, and substantial investment of time and resources resulted in a unique corporate philanthropic endeavor. The combination of community and corporate knowledge and resources led to the development of an innovative technology approach as well as to a number of innovative technology interventions. Each site developed technology projects that addressed a comprehensive array of community issues including access and training, education, economic development, and job training. Out of these projects, one or two became signature projects, which offers many lessons for future digital inclusion initiatives. Table 6 (following page) describes the key characteristics of the Digital Villages, including its signature innovations. Tables 7, 8, and 9 describe the various programs of each Digital Village site.

Digital Villages: Bringing a Concept to Life

The concept: A Digital Village is a community in which all people can benefit from digital resources and use information and skills to contribute to society.

The initiative: Digital Villages were part of the Hewlett-Packard Company's "e-inclusion" philanthropic portfolio. Each of three communities received $5 million in products, consulting, and services over a three-year period to create and implement its vision of a Digital Village.

East Palo Alto Digital Village: Building a Strong Community Technology Infrastructure

Background and Context

In the late 1990s, East Palo Alto epitomized the contradictions of the digital age. Located in the heart of Silicon Valley—the epicenter of the technological revolution—the 30,000-person community was an island of poverty in a sea of prosperity. Many East Palo Alto residents, primarily immigrants and people of color, lacked the education and skills to compete for jobs in the region's high-tech sector. At the same time, housing costs were on the rise, increasing the burden on poor families.

To overcome these barriers, HP chose East Palo Alto as its first Digital Village in April of 2000. The initiative built on the foundation laid by One East Palo Alto, a $4.5 billion, six-year comprehensive neighborhood-revitalization project led by the William and Flora Hewlett Foundation. A core group of technology leaders had already emerged within the initiative. This group—TechCollab—became the primary partner for the Digital Village.[41]

Table 6. Key Organizational and Technological Characteristics of Digital Villages Case Studies

	East Palo Alto Digital Village	*Southern California Tribal Digital Village*	*East Baltimore Digital Village*
Community Size	30,000	8,000	36,000
Community Partner	TechCollab	Southern California Tribal Chairmen's Association	Maryland Center for Arts and Technology
Existing Community Technology Initiative	One East Palo Alto Neighborhood Improvement Initiative	HPWREN Wireless Infrastructure	Federal Empowerment Zone Designation, and High-tech Focused Local Economic Development Strategy
Vision	A Community Informed, Connected, Empowered	A Digital Network that Connects Rural Tribal Communities	Technology as a Part of Everyday Living
Signature Innovations	• Community Network • Economic Development • School Technology	• Wireless Network Infrastructure • Economic Development • Culture	• Residential Access • Community Access Points • School Technology
URL	http://www.epa.net	http://www.sctdv.net	http://www.baltimoredigitalvillage.org
Grant Period	April 2000–April 2003	March 2001–March 2004	June 2001–June 2004

Technology Strategy and Approaches

The vision of East Palo Alto Digital Village (EPA DV) was to deploy technology, brainpower, and collaborative energy to create an informed, connected, and empowered community. The initiative includes a number of projects that address each of the four areas of community need described in Table 7. Its premier innovations are its Community Network and its Small Business Development Initiative.

Community Network

The Community Network provides the physical, organizational, and educational resources to enable neighborhood residents to use technology to obtain information and apply it to personal and community development. The network includes four elements: (1) an online community resource center (EPA.net); (2) technology access points; (3) technology-equipped community organizations; and (4) urban wireless connectivity.

EPA.net, launched in 2002, provides residents and organizations with information and online tools that help them engage in community change. The website contains a directory of community resources, online "public forums" where visitors can participate in discussions on subjects ranging from community life to politics, and community reports on local issues, history, and culture. Residents provide much of the content, and over 60 volunteer writers have contributed articles. More than 1,200 users have formally registered on the site, which receives over one million hits per year.

Ten technology access points offer places for residents to learn to use computers and the Internet, obtain information from the web, and use IT tools for community action. The access points were created in places that are safe, welcoming, and easily accessible to schools, senior centers, and churches. Each computer laboratory hosts a community leader who serves as a technology "resource navigator" for lab users. These locations have vastly increased technology access in the community. In the past three years, the number of publicly available, Internet-connected computers in East Palo Alto has increased by 700 percent.[42]

Two smaller yet important components of the network included the community grants program, which provided HP computers and equipment to 30 small nonprofit organizations to increase their technology capacity, and an urban wireless network, which provides high-speed Internet access throughout the community.

The Community Network continues to grow. Plugged In, a community technology center located in East Palo Alto, oversees the network. The organization is developing more resident skill-building programs, including a new journalism course for EPA.net community writers, and an expanded "Young Producers" program, which trains youth in web, graphic, and video production.

Small Business Development Initiative

The Small Business Development Initiative (SBDI) used technology to help local small business owners launch and grow viable, sustainable, and profitable enterprises. The effort was managed by Start Up, which is a local microenterprise development intermediary that provides training, technical assistance, and start-up capital to entrepreneurs (the following section of the report described Internet-based microenterprise support organizations). The local Chamber of Commerce and the Rainbow/PUSH Silicon Valley Project, which seeks to create opportunities for people of color in the high-tech industry and increase IT access in communities, were also project partners.

The initiative helped Start Up strengthen its technological infrastructure and build a computer access and technology training hub that serves small business owners and community residents. With these upgrades as well as HP's hardware donations, Start Up has provided 70 small businesses with new equipment and technology training. These businesses have generated almost $3 million in revenues and approximately 160 jobs. Start Up is also helping these businesses incorporate e-commerce practices, using the web to manage and market their businesses.

Table 7. East Palo Alto Digital Village Projects

Areas of Community Need	***Projects***
IT Access and Training	• Community Network, including: ◦ Internet Portal ◦ Ten IT Access Points ◦ Community Grants ◦ Wireless Network
Education	• Increase Technology Capacity in One School
Economic Development	• Support Small Business Development
Job Training	• Plans to Build a Community Job Training Center

Community Impact

EPA DV has created a community technology infrastructure of hardware, software, connectivity, and community institutions. This infrastructure provides residents with meaningful access to IT resources. As a result of the initiative, the community now has:

- Increased community access to computers and the Internet as well as training in their use
- A website that provides relevant content and opportunities for residents to produce the content
- Increased technology capacity of community organizations

- Expanded community technology center (Plugged In)
- New technology-savvy community businesses
- Technology-infused middle school
- Wireless connectivity

Southern California Tribal Digital Village: Connecting and Empowering Native Rural Communities through Wireless Technology

Background and Context

The Southern California Tribal Digital Village (TDV) community consists of approximately 8,000 residents living in 18 remote and scattered reservations that stretch over 150 square miles from the California-Mexico border into Riverside County. Over a century of government policies toward Native Americans created this patchwork of reservations that lack healthy, diverse economies. Poverty is widespread, unemployment is high, and high school graduation rates are low. These are some of the most technology-deficient areas in America, often without even basic infrastructure such as electricity and telephones.

Despite these impediments, this community has vigilantly sought to overcome isolation and to harness IT to catalyze economic growth as well as to restore cultural ties. Though each of the tribes is its own sovereign government, a regional government—the Southern California Tribal Chairmen's Association (SCTCA)—coordinates some of their activities. Among its many functions, SCTCA has sought to improve technology infrastructure in the reservations. In 2000, SCTCA partnered with the University of California, San Diego (UCSD) on a project funded by the National Science Foundation called the "High-Performance Wireless Research and Education Network" (HPWREN) to create a noncommercial prototype, a wide-area wireless network for research and education in remote, underserved communities. The project connected three reservations to broadband Internet.

Technology Strategy and Approaches

The aspiration of TDV is to create a digital community that "mirrors and amplifies the community and kinship networks that have historically sustained Native communities."[43] Since it was selected as a Digital Village in the spring of 2001, the community has used HP's resources to leverage the HPWREN project, with plans to extend the wireless network to the remaining reservations.

This wireless technology infrastructure is TDV's most important innovation. Its powerful Internet connectivity makes possible an array of programs that create economic, educational, cultural, and civic opportunities for community members. These programs address each area of community need (see Table 8). Another important innovation is its Technology Business Development program.

Table 8. Southern California Tribal Digital Village Projects

Areas of Community Need	*Projects*
IT Access and Training	• Wireless Network • Internet Portal
Education	• Distance Learning Programs • Cultural and Language Education
Economic Development	• Incubate Technology Businesses
Job Training	• Train Youth in Web Design • Train Community Members in Wireless Installation and Maintenance

Wireless Community Network

The high-speed wireless network built by the Tribal Digital Village in partnership with UCSD spreads over 2,500 square miles and may be the largest wireless

backbone in the world. Fifteen of the 18 reservations are now linked to the backbone, connecting over 1,000 computers in over 56 buildings—including 20 computer labs—to the network's 45-megabytes-per-second of transmission power. New sites are continually connected to the network, working on "last mile" distribution within each reservation. Each tribe was given a grant and equipment to create an initial point of access in their community and to build awareness and motivation for future community initiatives.

The network is impressive not only because of the rarity of broadband access in rural Native communities, but also because of the extent of tribal involvement in its construction and SCTCA's ownership of the network. Community members designed, built, and implemented the network. TDV worked in partnership with UCSD to overcome the technical challenges of extending the network and to build its own capacity to maintain the infrastructure. The network builders had to negotiate San Diego's mountainous backcountry to set up the wireless towers, antennas, and relays that connected the remote and isolated tribes to the network. In many sites, there was no electricity, necessitating solar panels to be used to power the microwave antennas.

TDV used the construction and maintenance of the network as an opportunity to build the skills of tribal members. In the summer of 2001, youth interns mapped the terrain with handheld GPS devices to survey and identify potential sites for the wireless towers. The following summer, new youth interns installed the towers. During these internships, the youth also learned other technology skills, including website design.

The wireless network provides the technological backbone for information and communications resources that serve tribal community members, including an Internet Portal (scdtv.net), an e-mail application (Rez-mail), a TV channel (Rez-TV), video conferencing and web-cams, distance learning programs, and multimedia cultural and language resources.

Technology Business Development

In line with its goal to diversify its economic base, TDV has sought to develop technology-based businesses. Its most successful business venture is Hi Rez Digital Solutions, a digital imaging and printing business launched in October 2003. HP donated a commercial Indigo 3000 digital printing press—worth $500,000—as well as service and support to help launch the business. SCTCA funded the business's start-up phase and researched the market for printing services in San Diego County, finding that there were few digital printing businesses. Digital printing technology enables fast turnaround for small print jobs and individualized documents through variable data printing. By providing these services to the Southern California market, Hi Rez fills an unmet market niche. As a fully-owned subsidiary of SCTCA, its profits are returned to the community through SCTCA's activities.

Community Impact

The community-owned wireless network has linked the Native reservations to the Internet and provided opportunities for many other programs that harness technology for community empowerment. Outcomes include:

- A community information portal that includes a website that provides relevant community content and e-mail services for residents
- Community access to computers and high-speed Internet, and training in their use
- Increased inter-tribal communication
- Technology-empowered tribal governments
- Youth development and skill-building in technology infrastructure development and use
- Opportunities to connect with educational resources through distance learning
- Cultural and language preservation programs
- New technology-based businesses

East Baltimore Digital Village: Integrating Technology into Everyday Living

Background and Context

East Baltimore is a low-income, primarily African American community located in a city that has been steadily losing population and economic strength for the past 50 years. Over 40 percent of its residents live below the federal poverty line, and residents face inequities in access to resources and infrastructure, including technology. A 2003 survey found that 25 percent of the people living in the community used the Internet, compared to 63 percent nationwide.[44]

The community was part of Baltimore's Empowerment Zone, a federal economic development program that lasted from 1994 through 2002. The momentum from that initiative, as well as the city's current economic development strategy focused on high-tech, provided an impetus for the Digital Village initiative.

Technology Strategy and Approaches

East Baltimore Digital Village (BDV) seeks to create a culture of "e-living" where technology is a part of everyday life for residents who do not currently use computers and the Internet. BDV saw a need for a subtle approach, given the community's lack of technology. In line with this philosophy, the idea behind its programs was to weave IT into their existing social infrastructure.

BDV launched programs that address each area of community need (see Table 9). The most successful innovations of the initiative have been the Residential Access Program, its Community Network of technology access points, and its effort to improve technology standards in area schools.

Residential Access Program

BDV launched a residential access program to help community members use IT tools to access local resources—personal and family health care, city services, and educational and career opportunities—and to improve communication with their schools, churches, and community organizations. Three hundred residents received an HP computer and all-in-one printer, fax, and scanner as well as a 10-hour training in computer skills. BDV selected residents based on need and demonstrated commitment; it chose people who were in job training programs, who had school-age children, and who were involved in the community. In exchange for the equipment, recipients pay $180 for a year's worth of Internet service. The program has been extremely successful: all of the grantees have e-mail addresses and there has been 100 percent retention on the computers.

Community Access Points

As with the other Digital Villages, BDV sought to address the technology void in the community by creating community technology access points that provide opportunities for computer and Internet access and training. It chose six different sites where various segments of the community were already going to obtain services and gain skills and education: the Chance Center, the Door, Education Based Latino Outreach (EBLO), the Great Blacks in Wax Museum, Kid's Scoop, and the Perkins Community Powerhouse. Each of these sites meets the needs of a particular segment of the community. EBLO, for example, provides bilingual computer training services to East Baltimore's Spanish-speaking community, including newly arrived immigrants.

Table 9. East Baltimore Digital Village Projects

Areas of Community Need	***Projects***
IT Access and Training	• Six IT Access Points • Resident Computer Access • Internet Portal
Education	• Increase Technology Capacity in Six Schools
Economic Development	• Support Small Business Development
Job Training	• Link Employers with Employees

School Technology Program

BDV sought to increase the technology capacity of community schools. The initiative worked with six schools, providing 185 teachers with a laptop and computer training to integrate into their classroom curriculum. Recognizing that technology is constantly changing and therefore teachers need continual support, BDV hired a technology support teacher to work in the library of each school. The schools also received HP desktops, printers, projectors, scanners, and digital cameras. As a result of this program, technology is now an integral part of the students' learning experience. In 2003–04, these schools used the new technology to create their science fair projects, and five students qualified to go to the state competition.

Community Impact

BDV's subtle approach to bringing technology into an underserved community has had some powerful effects. Through its programs:

- Nearly 10 percent of community residents have benefited from the program
- Participating schools now exceed state standards for technology
- A website provides residents with information on childcare, employment, and health
- Local entrepreneurs have received computer training and equipment through the Small Business Development Institute
- The community has increased access to computers and the Internet through six community access points and 300 computers in personal homes
- Workforce development programs have linked residents with employment and training opportunities

Dissemination: Spreading New Technologies among Community Building Organizations

The 12 case studies illustrate how early adopters of ICT innovations are successfully adapting new technologies to meet the needs of community builders, with tangible impacts within their specific domains of practice. The key question among practitioners who have not yet adopted these and other ICT innovations is: how can they, too, access and use these new tools?

As described in the section of this report, a number of characteristics of technology innovations and of the nonprofit sector hinder the spread of innovations within the sector: innovations are often not tailored to their needs, the sector lacks resources for technology adoption and capacity, and there is a lack of information flow about innovations. Despite these challenges, our case study research revealed that a number of structures within the nonprofit sector provide organizations with information, support, and resources for adopting and implementing new technologies.

This infrastructure can be summarized as consisting of six key components, or factors for diffusion (see text box following page). Following is a description of each factor, with descriptions of how the factor plays out among the four innovation areas. While the factors are reviewed independently, in practice they act together to help disseminate innovations, as illustrated in Figure 2.

This incipient nonprofit technology infrastructure provides insight into the potential levers for increasing the rate and speed of technology adoption—and effective use—among nonprofits. The factors represent a starting point to consider future policy and programs to encourage dissemination.

1. ***Community Technology Intermediaries—*** Organizations that explicitly facilitate the adoption and use of new technologies by nonprofits

In the private-sector context, a host of propagating institutions—R&D laboratories, technology vendors, and consulting firms—influence the adoption of new technologies by communicating, promoting, and enhancing innovations. In the nonprofit sector, there are unique types of propagating institutions—community technology intermediaries—that facilitate the adoption and use of new technologies throughout the field. These intermediaries take varied approaches such as providing technical assistance or building the technology capacity of organizations. They also help frame new technologies as tools that can solve particular problems of nonprofits and spread this information in the field. To promote and facilitate the adoption and use of technology tools, intermediaries start and maintain networks, share information, advocate for supportive policies and programs, promote technology tools, and advance specific aspects of community building practice.

The maturity, strength, and influence of community technology intermediaries varied among the four case study innovation/practice areas analyzed in this report. Both the Neighborhood Information Systems and the Microenterprise Support areas have sophisticated and powerful intermediaries that facilitate the exchange of information and knowledge among practitioners across the country. The e-advocacy area, in contrast, lacks intermediaries, yet the field is abundant with technical assistance institutions. In the case of the Digital Inclusion Initiatives, the Hewlett-Packard Company has played a substantial role in enabling the

Six Key Factors for Innovation Dissemination among Nonprofits

1 ***Community Technology Intermediaries—***The strength and capacity of organizations that facilitate the adoption and dissemination of innovations can greatly influence the diffusion of technology among nonprofits.

2 ***Innovation Champions—***Nonprofit employees, volunteers, and board members, as well as advocates of particular technology tools, can play important roles in encouraging organizations to innovate and in helping them apply technology to community building practice.

3 ***Research on Adoption and Use of Innovations by Nonprofits—***Applied research and case studies that describe the experiences of nonprofits using new technologies can inform and inspire other nonprofits and spur additional adoption of technology innovations.

4 ***Strength and Density of Communications Channels—***Many reliable and high-quality information sources on ICT innovations (such as conferences, print media, and online forums) can help nonprofits decide whether to adopt new technologies as well as help with their implementation.

5 ***Policy and Program Supports—***Supportive policies and programs can help ensure that innovation development results in useful tools for nonprofits (making them more adoptable) and can also provide resources and incentives for organizations to take the risk entailed in adopting such tools.

6 ***Innovation Characteristics: Low Cost, Low Complexity, High Maturity, High Relevance—*** Technology innovations that are affordable, not too complex, mature in their development, and highly relevant to community building are more easily disseminated.

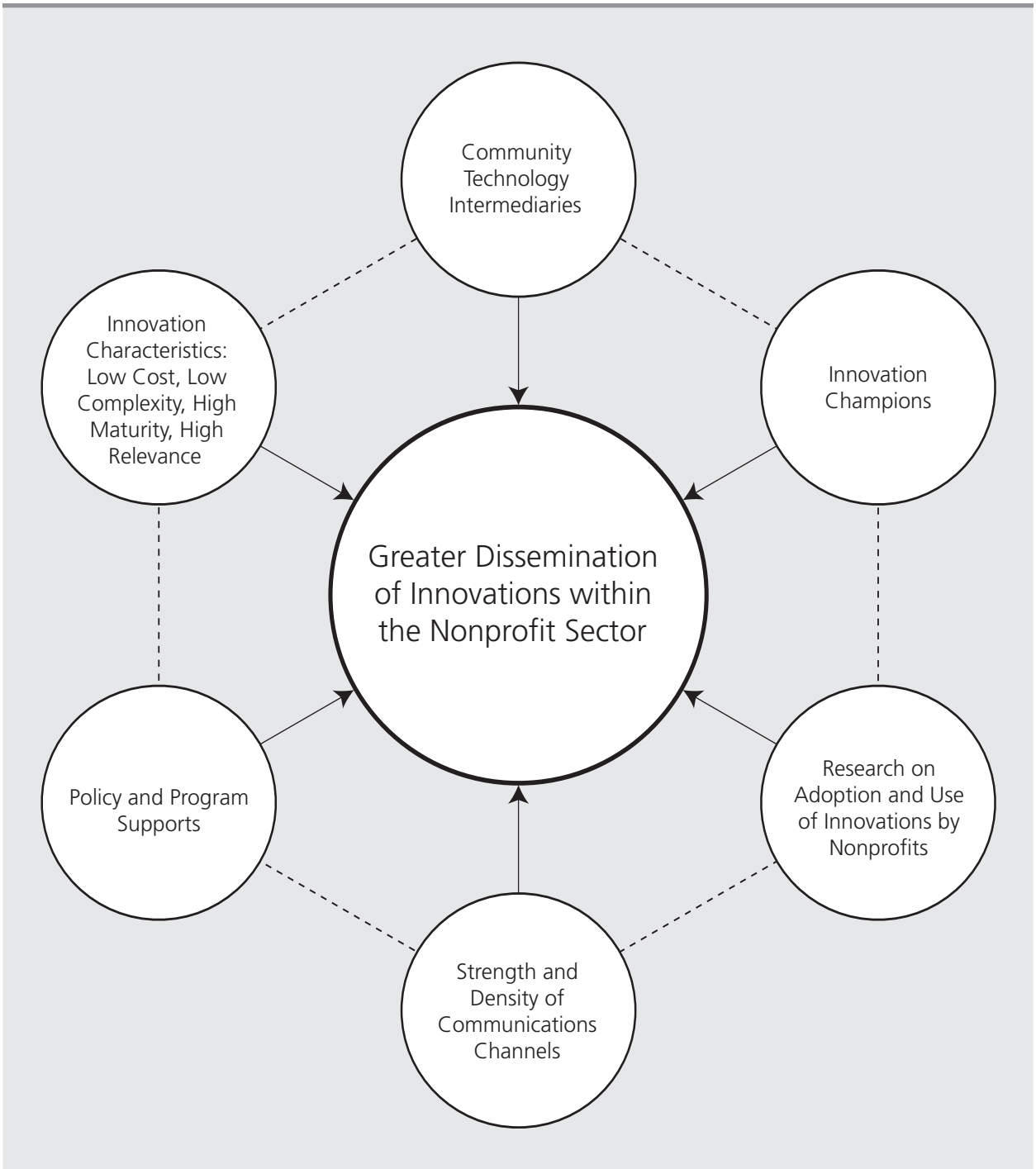
adoption and use of technology tools among the three Digital Villages, but has not yet reached out to other U.S. communities in the same in-depth manner.

2. ***Innovation Champions—***Key change agents who promote the use of technology within their organizations and share their innovation knowledge with other organizations

How an organization perceives a new technology, and its applicability and relevance to the organization's work, plays an important role in its decision whether to adopt the innovation. Individual "innovation champions," or change agents, often influence the perception of a new technology and the ease and value of its adoption. Innovation champions may be internal or external to the organization. They not only push organizations to adopt technologies but are also critical to guiding their implementation. In addition, they often become spokespersons for the innovation, inspiring other organizations to adopt similar technologies and providing the technical know-how to help organizations implement them effectively.

Of the six factors for dissemination, change agents are the most common ingredient in all of the innovation/practice areas. In all 12 of the case studies, change agents served as primary catalysts in the adoption process.

Figure 2. Six Key Factors for Innovation Dissemination among Nonprofits



3. ***Research on Adoption and Use of Innovations by Nonprofits—***Applied research and case studies on how nonprofit organizations adopt new technology tools and apply them to their work

Applied research is essential for disseminating technology innovations. Researchers play a vital role in finding, recording, organizing, and formalizing the stories about what organizations do with technology and developing them into a form that can be communicated and shared. Research must be tailored for practitioner audiences so that it can promote the spreading of technology innovations. Adoption research, case studies of promising practices, and community development research that focuses on technology use are examples of research that can be useful in the field.

Research has greatly boosted the sharing of innovations in the NIS and Microenterprise Support fields, as these fields are replete with best practices reports, evaluations, how-to manuals, and theories of change that include technology use. The other two case study areas have much less research associated with them. Relatively little research has been conducted on the Digital Village concept, although Hewlett-Packard supported a related research initiative at the Massachusetts Institute of Technology (MIT) in Roxbury, MA, whose findings informed the program's implementation.[45] Digital inclusion initiatives also draw from research on the role of community technology centers in inspiring technology adoption. The relative newness of e-advocacy innovations has prevented them from being subjects of much applied research as of yet.

4. ***Communications Channels—***Essential pathways for spreading knowledge of successful nonprofit technology innovations, including conferences, print media, and the Internet

Communications channels are the pathways through which knowledge can be exchanged. Newspaper articles, conferences, listservs, conference calls, websites, peer networks (both informal and formal ones backed by institutions), trainings, and direct engagements by organizations with consultants are examples of communications channels.

The primary communications vehicles for sharing technology innovations are conferences and other in-person networking opportunities. A majority of these events are closely linked to the presence of community technology intermediaries. The Neighborhood Information Systems field has many networking and conference opportunities that have been responsible for the widespread sharing of GIS and other data analysis innovations. The Microenterprise Support field also has several annual conferences where innovations can be showcased. While Digital Villages does not have its own conferences, HP presents many networking opportunities through cross-site visits, and staff from the Digital Villages attend other national community technology conferences (such as the annual conference hosted by the Community Technology Centers' Network). E-advocacy, the youngest field of practice, has few formal networking opportunities, which has been a barrier to widespread distribution of its innovations.

5. ***Program and Policy Supports—***Programs and policies that provide support for the development of innovations for nonprofits, their adoption by organizations, and their dissemination throughout the sector

Policy is critical to the widespread dissemination of new technologies. Over the past decade, policy support from private, public, and philanthropic entities has stimulated the development of innovations, but little support has gone toward the diffusion of these innovations. Programs such as the Technology Opportunities Program, the Community Technology Centers' program, and HP's Digital Villages Initiative have played a role in developing some of the technology innovations used by community builders, as have investments from local governments, private foundations, and the entrepreneurial initiative of technology vendors serving the private and civil sectors. These programs have also foreshadowed the policies necessary for sharing innovations. As these programs sunset and the nation contemplates the next generation of technology policy, strategies must be created that facilitate the sharing of innovations.

6. ***Innovation Characteristics: Low Cost, Low Complexity, High Maturity, High Relevance—*** Key characteristics of technology innovations that relate to how easily and readily they will be adopted by nonprofit organization

Cost, complexity, maturity, and relevance are important factors in determining whether or not nonprofits will adopt a given innovation and the rate and extent of uptake throughout the sector. The lower the cost and complexity of the innovation, the more mature the innovation is, and the more relevant the innovation is or is perceived to be make a given innovation more adoptable for nonprofits. The relationship of cost, complexity, and relevance to the likelihood of adoption is straightforward. The characteristic of maturity is more nuanced, referring to three elements: (1) the age of the innovation; (2) how robust the technology has become over time through repeated refinement by an industry or a community of developers (commercial or open-source); and (3) whether there is a well-developed cadre of technical assistance providers or support technicians who can help adapt or troubleshoot the technology.

A comparison of the practice areas showcased in this report reveals this relationship between these innovation characteristics and dissemination. Geographic Information Systems (GIS, the primary technology underlying Neighborhood Information Systems) have been available to practitioners for over 30 years. During this long history of the technology, many organizations have had the opportunity to adopt the technology and tailor it for community development purposes. The relative maturity of the technology has led to greater dissemination among community building organizations, both in its own right and in the form of NIS. These experiences contrasted with e-advocacy and Internet-based Microenterprise support technologies, which are more recent developments and where there is much less penetration of the technology innovations within the sector.

An Agenda for Bridging the Innovation Divide

The findings of this study point to the components of a strategic agenda to bridge the innovation divide that recognizes the potential and limitations of the policy environment and proposes creative and catalytic solutions.

Since the digital divide became a public policy concern in the mid-1990s, public and private policies have played important roles in helping low-income communities—and the nonprofit organizations that serve them—access and take advantage of information technologies. These policies have primarily consisted of dedicated resources for developing technology programs and initiatives. Beginning in 1994 with the Department of Commerce's landmark Technology Opportunities Program (TOP) and its research accompaniment, the *Falling Through the Net* series, hundreds of millions in public and private dollars were invested in just a decade to address the gap between technology haves and have-nots.[46] By the late 1990s, almost every federal department, a wide selection of private-sector technology corporations, and a majority of the country's nonprofit philanthropies were investing in community technology. Yet by 2001, this flood of policy and programmatic responses from these sectors slowed to a trickle, as Internet access rates finally topped 50 percent for Americans and the technology capacity of the nonprofit sector was on the rise. After achieving these milestones, the current administration claimed that the digital divide had been bridged in its research report, *A Nation Online*.[47] Soon thereafter a campaign was launched by Congress to eliminate federal programs to bridge the digital divide, which ended the TOP initiative in 2004.

The first decade of digital divide policy was generally reactive—chasing technology solutions without doing the necessary work to connect technology to community needs and assets. This approach led to an emphasis on technology adoption by nonprofits, but offered little support for strategically applying technology to address community needs, exchanging information about innovative uses of technology tools, or disseminating innovations more broadly. As a result, many nonprofits remain unable to maximize the potential of computers and the Internet.

Today, efforts to bridge the digital divide are operating in a new milieu characterized by a lack of formal and federal support as well as a philanthropic funding environment with less of a focus on technology development. Advocates must think strategically, building on existing community technology infrastructure and leveraging private-sector resources.

The following five-point agenda outlines a policy roadmap for overcoming the barriers to adopting and disseminating technology innovations in the nonprofit sector and establishing the next generation of digital divide policy.

1. Establish new federal, state, philanthropic, and corporate funding programs to develop and disseminate technology innovations within the nonprofit sector.

Funding is the most significant barrier to creating and disseminating technology innovations within the nonprofit sector. The recent elimination of the majority of federal, state, and local community technology funding streams has produced a resource gap that—if not replaced—will continue to hinder the

development of innovations. Individual nonprofits lack the resources to invest in the adoption and refinement of new technology solutions, and there are few resources available for sharing best practices for technology adoption and use within the sector. The sector also needs better mechanisms for spreading the risks and benefits of technology innovation. Our research underscores the importance of funding for nonprofit organizations to adopt, adapt, and share technology innovations.

- Produce new funding opportunities at the national and state levels for creating and sharing technology innovations within the nonprofit sector. Programs should finance technology needs assessments as well as the creation, adoption, tailoring, and dissemination of technology innovations.
- Expand private philanthropy grantmaking to include funds within all grants that are specifically earmarked for the development, use, and sharing of technology tools. Philanthropy should leverage prior investments in technology application development to expand the market for these innovations and yield greater community benefits.
- Encourage technology sector corporate philanthropy to support innovation adoption and dissemination within the nonprofit sector. Such corporations have a great deal of knowledge and expertise that can inform nonprofit sector use of ICTs.

2. Create forums and intermediaries—at the local and national levels—to facilitate the adoption and dissemination of technology innovations.

Two of the six factors for dissemination described in this report—strong community technology intermediaries and dense communications channels—are arguably the most important levers for increasing technology diffusion among third sector organizations. Innovations—and the lessons learned in their application to community building practice—need to travel beyond the organizational boundaries of their creators. Programs and policies can strengthen intermediaries and create more communication channels.

- Support existing nontechnology intermediaries that work within specific nonprofit fields, such as health, housing, or education, to promote technology diffusion within their domain of practice. This would include building the technology capacity of existing intermediaries to incubate and share technology innovations.
- Create incentives for nonprofit technical assistance organizations to help build and refine new technology tools and share existing best practices.
- Create venues for new partnerships and strategic alliances whose purpose is to disseminate information about technology innovations and their uses by early adopters.
- Support the development and use of public, online repositories of technology tools (such as www.TechSoup.org).

3. Support universal service reforms that enable nonprofits to gain broadband access to best take advantage of ICT innovations.

Many productivity-enhancing and decision-support tools that can inform the work of nonprofits have migrated online, making access to high-speed, broadband Internet more imperative for nonprofits. Although broadband technology has rapidly become more accessible and less expensive, it remains cost-prohibitive to many nonprofits. With federal funds lacking, there is a greater need to ensure that nonprofits have access to high-speed Internet connectivity and have a voice in future regulations that govern the deployment of platforms that deliver Internet content. In large part, this means that the sector must be included in the ongoing policy dialogue about universal service reforms and how they will impact both access and service provision for nonprofits.

- Advocate for a dynamic definition of "universal service" that provides for nonprofit organizations and reflects the dominant trend toward technological and regulatory convergence in information services.
- Encourage municipal wireless networks to subsidize and underwrite nonprofit broadband access to these networks.
- Further develop fiber to the home (FTTH) and fiber to the premises (FTTP) efforts, which enable the provision of multiple telecommunications services including very high-speed Internet access through a single fiber-optic cable. These technologies could possibly further reduce the cost of providing broadband Internet access at affordable rates for nonprofit organizations.

4. Create forums for learning from the private sector about the adoption and use of new ICTs.

The private sector maintains a wealth of knowledge about and experience in the adoption, and application of technology innovations. Although certain private sector technology solutions will be too large in scale and scope to serve the unique needs of the nonprofit sector, there are many lessons and practices that are relevant and can be easily adapted for the nonprofit sector. Unfortunately, very few communications channels permit the exchange of information between nonprofit technology professionals and private-sector technology professionals to explore these possibilities. New partnerships should be encouraged between nonprofits and for-profit technology developers to discuss how to meet the technology needs of the nonprofit sector and produce mutual benefits. The private sector could:

- Partner with community technology intermediaries to identify opportunities for ICT tools to improve the efficiency or efficacy of nonprofits.
- Create forums for sharing best practices of technology adoption and adaptation to encourage greater collaboration between the nonprofit and for-profit sectors.
- Facilitate the transfer of innovative technology tools and innovative uses from the private sector to the nonprofit sector. This should include finding and adopting the appropriate technologies to address distinct needs in the nonprofit sector.

5. Establish standards and mechanisms for data sharing and interoperability.

One impediment to promoting innovation in the nonprofit sector is the lack or absence of recognized and agreed-upon protocols for data sharing and interoperability. Nonprofit organizations frequently use many separate software applications, databases, and other technologies, such as client-relationship management software, donor-management databases, surveying tools, outcomes measurement applications, and fundraising tools. Without standards for interoperability, their data will continue to be housed in separate and incompatible databases, resulting in missed opportunities to leverage their collective power. For example, a nonprofit that is working in two program areas, such as housing development and public safety, cannot determine the combined impact of both programs if their data are stored in separate, isolated databases.

The lack of standards also impedes technological and programmatic innovation. A basic standard allows nonprofits to export client data from a case management system to a Geographic Information System and visually depict the geographic locations of residents in a map. Such a function can help them organizations create more effective targeted mailings, door-to-door outreach, and organizing campaigns. A more sophisticated standard could allow that case management system to automatically update the maps produced by the GIS application. Creating standards or other mechanisms for data sharing and interoperability would unleash new possibilities in the nonprofit arena.

- Create a Nonprofit Technology Standards Board or working committee responsible for updating existing standards and establishing new standards for data sharing and interoperability. This would be most easily accomplished within specific

industries and sub-sectors (such as health and housing), suggesting that sector-specific intermediaries may be the appropriate institutions to play a large role in this task.

- Further develop emergent technologies that support data sharing and interoperability, including Web Services—web applications engineered specifically to allow more sophisticated interactions and interoperability among web applications—and Data Services—intermediary software applications whose purpose is to aggregate multiple data sources or data repositories.

Conclusion

Addressing the innovation divide within the nonprofit sector requires a targeted approach that leverages previous investments, capitalizes on existing technology infrastructure, and builds new relationships with technology companies and other private-sector actors. Nonprofits, foundations, and advocates must actively pursue policy changes that enable the nonprofit sector to access and effectively use ICT innovations—bridging the innovation divide and ensuring their long-term viability.

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[29] ACT has a very small budget that has fluctuated from roughly one thousand dollars a year in the late 1990s to a few thousand dollars a year after 2000. As a consequence of its limited funding, the leadership of the organization chose to incorporate as a nonstock, membership corporation because of the prohibitive costs associated with the tax filings required to be a 501(c)(3) or a 501(c)(4) corporation. This form of incorporation, unlike its nonprofit counterparts, allows ACT to endorse candidates for elected office.

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