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Connecting Communities: Third Generation Community Network Projects

Abstract
This article discuss the evolution of the community network movement and provides practical advice about how Extension educators can work with local leaders and community residents to initiate projects that increase diffusion and adoption of information technologies in their communities. Experience in Pennsylvania shows that the community development processes used to develop third generation community network projects increases the diffusion and adoption of information technologies and builds human and organizational capacity useful for addressing a wide variety of community issues. Readers are introduced to "Connecting Rural Communities," a guide to enhancing adoption of technology tools and infrastructure in rural communities.

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Globalization of economies and production has fundamentally altered the rural landscape. Manufacturing, a mainstay of rural economies, has steadily declined over the past two decades, and many industries have moved overseas, attracted by wage structures and lax environmental standards that dramatically lower production costs. Shrinking economies have forced many rural residents, often the "best and the brightest," to leave rural areas in search of greater opportunity elsewhere.

Scholars, policy makers, local leaders, and residents are gradually coming to the realization that what worked in the past is simply not effective in a global economy. Instead, there is growing consensus that rural areas will have to find ways to match local assets with emerging market opportunities (Schafft, Alter, & Bridger, 2005). Many analysts now believe that the best hope for full participation of rural areas in the national and global economies lies in the development of small manufacturing and service firms that produce custom products for local and export niche markets (Drabenstott, 2004; Lyson & Tolbert, 1993; Malecki, 1996, 2003).

The potential economic benefits of high-speed Internet service and adoption of information technologies are substantial. Studies conducted for the state of Michigan estimate that accelerated high-speed Internet deployment could potentially increase the gross state product by $440 billion and create 500,000 new jobs over the next decade (Michigan Economic Development Corporation, 2001). Regardless of location, access to high-speed Internet infrastructure is becoming increasingly important for economic development, provision of healthcare and government services, and education and workforce training (McLaren, 2002).

Unfortunately, many communities--especially those in rural areas--lack the technological infrastructure required to take full advantage of new developments in information technologies. (Parker, 2000; Strover, 2001). Communities with a poorly developed telecommunication network will have difficulty generating employment opportunities, retaining existing businesses, and participating in the global economy.

Although rural high-speed Internet access is improving, many rural communities still lag behind their urban and suburban counterparts (Grubesic & Murry, 2004). In 2006, the National Exchange Carriers Association put the cost of upgrading 5.9 million rural telephone lines to 8Mbps at $11.9 billion. Unfortunately, the low population densities characteristic of rural communities do not provide a sufficient financial return on investment to enable telecommunication providers to extend fiber optic cable lines or other high-speed Internet delivery networks to rural customers.

High-speed Internet service is a necessary, but often overlooked, infrastructure for community and economic development; however, the benefits of this infrastructure will on only be realized if individuals and organizations in communities adopt and use high-speed Internet and information technologies to participate in the global economy. Leaders and residents in rural communities need help facing the challenges associated with increasing the availability of high-speed Internet service and the diffusion and adoption of information technologies in rural communities. In this article, we discuss the evolution of the community network movement and provide practical advice about how Extension educators can work with community development professionals, local leaders, and community residents to initiate projects that increase diffusion and adoption of information technologies in their communities.

The Evolution of Community Networks

The community network movement has been at the forefront of recent efforts that use technology to foster community development.

> The community networking movement has the same goals as the movements that in the past century brought community centers, public libraries, and public broadcasting stations to cities and towns across the United States. It seeks to rebuild the sense of community which many of us believe our neighborhoods have lost within living memory (Stallings, 1996).

Community network projects are grounded in community development theory and practices. Community development theory "promotes broad-based, participatory decision making in order to initiate social action processes to improve local economic, social, cultural, or environmental situations" (Christenson & Robinson, 1989, p.14). Cooperative Extension has had little involvement in the community network movement to date. However, the Extension system has the potential to provide leadership for developing the capacity and organizing skills that are needed in many communities to increase the diffusion and adoption of digital technologies. Sustainable community network projects require community-level leadership, facilitation, volunteer development, project planning, evaluation, and education. Historically the land-grant university system and Cooperative Extension have participated in other similar community movements, including the development of electric and telephone cooperatives and farmer cooperatives across America.

The first electronic community networks were FreeNets, volunteer organizations that used technology to host information about community events, organizations, and people (Clarke, et al, 2000). Many FreeNets focus on geographic communities, while others are built around communities of interest, such as professions, hobbies, and special interests topics. Public access to FreeNets was usually through public computers in libraries or community centers. Most FreeNets were developed through a grass roots approach, which relied on volunteers for operating and maintaining the FreeNet. For this reason, FreeNets are sustainable only as long as volunteers maintain their interest and have the ability to rally local support for public access to computers and the Internet.

Second generation community networks represent a more bureaucratic and formal approach to the provision of high-speed Internet and other information technology tools. Most of these projects served a specific geographic community, were developed and managed by an institution in the community (e.g., university or government agency), and were initially supported by federal or foundation grants. These community networks typically have two foci, community centers and training. Community centers were developed using grant funds to provide public access to computers and high-speed Internet. Training and education programs were then developed and offered in the center to teach the public how to use computers, software, and the Internet. Many second generation community networks have struggled to sustain themselves when grant funding ceased. In many fundamental ways, building community is a necessary precursor to building a

successful community network (Strover, Chapman, & Waters, 2004).

Third generation community networks are designed to overcome the limitations of earlier approaches. Penn State Cooperative Extension has adopted a third generation community network model developed by Ellwood "Woody" Kerkeslager (http://pubs.cas.psu.edu/FreePubs/pdfs/ua384.pdf). The third generation community network model uses community development processes and techniques that engage leaders and organizations in a geographic community in projects that speed up the diffusion and adoption of information technology across all sectors of the community. Engaging community leaders in the process of identifying, planning, and implementing third generation community network projects leverages local resources, reducing the projects dependence on outside funding, and increase the likelihood the project will be sustainable. Like FreeNets, these projects use volunteers to implement specific segments of the project. In the course of these efforts, new linkages between local groups are created and individual and community capacity to address a wide range of issues and problems is enhanced.

Third Generation Community Network Components

Mature third generation community networks build on the attributes of FreeNets and second generation community networks and have four components:

1. A Web portal that provides a free Web site for every organization in the community;

2. One or more community centers that provide free access to computers, productivity software, and high speed Internet;

3. Public access to free basic training in the use of computers, productivity software and the Internet; and

4. Projects that increase the availability of advanced telecommunications services in the community (http://pubs.cas.psu.edu/FreePubs/pdfs/ua384.pdf).

These projects are initiated by an individual or small group of local leaders that recognize the importance of broadband Internet service and the adoption of information technology to their community's economic and social well-being. The local leadership team engages others in the community in a series of projects to assess the availability and use of digital tools in the community, identify projects that will increase the diffusion and adoption of information technology in the community, and implement those projects. The grass-roots process used in the third generation community network process builds shared ownership and buy-in across the community.

Third Generation Community Network Project Stages

The third generation community network model incorporates the concepts, principles, and techniques associated with the classic model of diffusion and adoption of innovations (Rogers, 2003). The process engages community leaders and volunteers in reflective discussion about the community, its future, and the development of a community information technology (IT) vision that is an interdependent component of a broader community vision. The IT vision is used by community leaders to develop a plan that provides a framework for implementing a sustainable community network project that capitalizes on a community's assets and history to move the e community (government, education, healthcare, business, families, and individuals) into the information age.

The rate of IT adoption is affected by the type of decision involved in choosing to adopt or reject a particular telecommunications tool. (Lamble & Seaman, 1994, p. 49-54). Although these innovation decisions fall along a continuum they may be classified according to four basic types.

1. Optional decisions--These are innovation decisions made by individuals in an organization or community regardless of the decisions of other members of the system.

2. Collective decisions--These include innovation decisions made by the individuals in a social system as a group and to which all members must conform.

3. Authority decisions--In this instance, innovation decisions are forced upon an individual, an organization, or a community by someone or some group in a super ordinate power position.

4. Contingent decisions--These depend on a sequential combination of two or more of the previously identified types of decisions.

While each of these innovation decisions can occur in communities implementing third generation community network projects, the emphasis in these projects is placed on increasing the adoption of information technology tools by individuals (optional decisions) and the community social systems (collective decisions), including businesses, governmental entities, schools, healthcare providers, and non-profits.

Developing a mature third generation community network is a process that can take several months to several years. Extension staff in Pennsylvania found it very time consuming and difficult to find communities willing to commit to undertaking full-blown community network projects, usually because community leaders are unwilling, or lack the capacity, to work together. However, projects were initiated in several communities where Extension staff introduced the third generation community network model. Leaders in Potter County, located in Pennsylvania's rural northern tier, initiated a comprehensive project that included developing a community Web-site; initiating an extensive educational component; establishing community centers in partnership with schools and non-profits to provide access to high-speed Internet and computers to residents; and initiating efforts to increase high-speed Internet service throughout the county.

Extension staff in Susquehanna County, located in Pennsylvania's northern tier, worked with the county library system to establish a community Web site and partnered with organizations that provided computer training in the county to expand the types of training they offer. In Somerset County, in the rural southern tier, Extension staff partnered with the Chamber of Commerce to undertake an effort to increase the availability of affordable high-speed Internet service across the county.

Cooperative Extension provided expertise in a number of areas that were critical to successful development and implementation of these projects, including community visioning, strategic planning, project planning and management, conducting community surveys and assessments, volunteer development and management, program development, and evaluation. This expertise was provided throughout the process of introducing individuals and leaders to the benefits of undertaking projects that would increase the adoption and diffusion of information technologies in their communities. Cooperative Extension staff also delivered educational programs, including eBusiness, eGovernment, PowerPoint, and Excel basics in communities where these needs were identified by the community network leadership teams.

Connecting Rural Communities

The work with community networks in Pennsylvania resulted in valuable information and tools that Cooperative Extension educators can use to help community leaders identify and implement projects that increase the diffusion and adoption of information technology. The Southern Rural Development Center funded a project, Connecting Rural Communities (http://www.connectingcommunities.info), to develop an on-line guide to make this information and these resources available to Extension educators across the country.

Most community network projects are initiated by an individual or small group of residents that believe the widespread adoption of information technology is crucial to their community's current and future well-being (Connecting Rural Communities). These project champions are not necessarily technology experts, but they must be continuously learning how information technology can benefit their community. They must also develop community organizing skills. Successful champions become evangelists for the community network project, providing leadership in their day-to-day individual and group meetings and constantly identifying and recruiting volunteers to create a vision and implement a plan for the community network project.

Buy-in from key stakeholders is a critical component of any communitywide effort. Extension educators can use Connecting Rural Communities "Leadership Team Identification Worksheet" to identify potential project "champions" and formal and non-formal leaders who are influential with one or more of the following stakeholder groups: education, government, business, non-profits, library, health care, and economic development. The Extension educator works with the community project champions to organize meetings with representatives of these groups to introduce them to the benefits of undertaking a project, explain the Connecting Communities process, and assess their interest in becoming a member of a Community network leadership team.

Once the leadership team has been created, Extension staff work with team members to assess how digital technologies are being used and how they might be used in the community and to understand the Internet infrastructure in the community using assessment tools available in the Connecting Communities guide. They also identify volunteers, donors, and corporate partners and develop a community network project plan.

This phase of the project may be as short as a few months or as long as a year. The length of time will depend to a large degree on how well the community has cooperated in the past to address community issues or the levels of activeness in the community (Wilkinson, 1991; Claude et al., 2000). If there is a history of cooperation across stakeholder groups, the leadership team can be organized quickly and begin building the project in a few months. If there is little history of cooperation across the community, this stage of community network development could take a year or more. Extension educators can use the "Community Readiness Assessment" in the

Connecting Communities guide to determine the likelihood of a community successfully initiating a community network project.

Extension educators can play a number of roles in organizing leadership teams. They can provide visioning, strategic planning, and community development process expertise to enable the planning team to effectively organize, develop, and begin to implement their community network project. Extension educators can also provide more mundane but very important functions, including arranging for team meetings, developing agendas, hosting and chairing meetings in local Extension offices, and ensuring that meeting minutes are taken.

Extension educators can use the assessment tools in Connecting Rural Communities to help the Leadership Team learn about the IT capacity across the community and identify community organizations that should be involved in the project. Leadership teams use assessment results to engage other individuals and organizations to develop and implement projects. For example, the assessments may identify the existence of a computer lab and a high-speed Internet connection in a community library or senior citizen center. The leadership team would then work with the library or senior center staff to develop and implement a plan to create a community center open to the public. Or the assessment process may identify several organizations that provide computer training. The leadership team would bring those organizations together to discuss the community network project and determine if any of the organizations are willing to participate in the project to expand the range of computer training in the community.

Conclusion

Local leaders across the country increasingly recognize the importance of information technologies to their community's future well-being, and they are searching for ways to foster widespread adoption of these tools. Third generation community network projects increase the diffusion and adoption of digital tools by organizations and individuals in the community, improving their ability to participate in the information and knowledge economy.

As we detail in this article, trained Extension educators can help local leaders develop a community information technology vision and strategic plan to work toward that vision and provide leadership to mobilize a technology project team, assess local technology needs and develop and implement an action plan. Extension educators can also integrate a number of Extension education activities and programs into community network projects, including news articles or community events to increase awareness about the benefits of high-speed Internet service, small group training on how to use the Internet, and personalized training sessions that will help key individuals better understand the benefits high-speed Internet services can bring to local businesses, government, and organizations.

Extension educators can expand their professional networks and affect a wider range of stakeholder groups through participation in community network projects. For example, many educators are using computer labs, global positioning system (GPS) units, and high-speed Internet or other digital tools to deliver farm management, 4-H technology projects, family financial management, and a host of other educational programs. These hands-on programs provide skills in the use of digital tools that participants can easily transfer to other areas of their lives to enhance their economic well-being, access information to improve their quality of life, and participate in virtual education and training opportunities. Integrating these programs into a community network project will likely increase the visibility for these Extension programs in the community in addition to strengthening the educational component of the project.

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