"Why Research on Community Networking Matters: A practitioner's perspective"[N.B.]

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Introduction

This paper addresses two questions from a practitioner's perspective: why research on community networking matters and how. In the first part of the paper, I identify relevant theory and summarize previous research, and illustrate how existing research has changed the course or community development, adjusted expectations and altered implementation, redirected resources or guided policies. I will illustrate these points with examples from studies conducted in Canada and the United States. I conclude by stressing that the essence of community networks is social networks. In order to understand the diffusion and permanence of community networking, we need to understand social networks and the innovation diffusion process. These two phenomena are inextricably joined. Why? Information networks and social networks have a common function: to exchange resources among nodes or members. Social networks are essential to the diffusion of innovation,

Prior studies find that for a community network to form endogenously (from within the community), a core group of interested individuals and organizations must come to an agreement for mobilizing and contributing resources (human capital and financial capital, including infrastructure). This core group is typically members of linked social networks. Each of the core group members contributes resources in terms of human capital or financial capital to the diffusion process. The resources required in terms of human capital include expertise for managing personnel, and providing technology and services, such as content and communication tools (email accounts, group web sites, online databases, discussion lists, etc). The innovation diffuses through the larger social networks of core group members, and is reinforced by mass media. The diffusion of community computer networking is similar to the diffusion of other innovations in that the most effective diffusion process is one using a combination of interpersonal communication and mass media. The mass media (television, newspaper) make potential adopters aware of the innovation; interpersonal communication (through trusted members of a person's social network) clarifies and explains the innovation, thereby making the innovation more relevant and useful to the potential adopter.

I. Why does research on community networking matter?

Community computer networking is an innovation that diffuses throughout a geographic community. Research on community networking matters because the better we understand this diffusion process, the more efficiently we can allocate scarce resources to facilitate long term sustainability. To understand the diffusion process, we need to consider the context (the geographic community) throughout which the innovation is diffusing.

Communities are made up of groups of individuals, operating in social networks that form and maintain or dissolve social ties over time. As such, they are always in the process of reforming, evolving or adapting to changes in their economic and social context. Research suggests social networks are critical to diffusion of community networking in at least two essential ways:

- Initiation: one or more organizations ('evangelists' or 'advocates') must come together to plan the project, assess needs, and provide initial resources (people, capital, including technology) that launch community network services.
- Sustainability: social networks are important in building critical mass, which helps assure long term sustainability.

Innovations diffuse through the ties of social networks: individuals adopt an innovation when other members of their social network adopt. When members of a household, kinship group, friends, peers, or colleagues use an innovative technology or service, we are more likely to adopt it, as well. A community network initiative typically involves in the planning process a few high resource individuals and advocates, forming a core coalition of brick and mortar organizations of people to launch and use CN services. These individuals diffuse the innovation to others in their social network, individuals who have most often also become aware of the community network through mass media (e.g., local newspaper). Not only individual links in social networks are important, but also the larger social contexts of our lives become grounds for innovation diffusion. We learn in social contexts (the workplace, school, church, and formal or informal associations, such as sports teams, hobby groups, baby sitting circle).

It is important that local community organizations participate in the launch and use of services in order to build critical mass and long term sustainability. Successful CN projects have typically begun with high resource individuals and advocates among local public and non-profit sector groups and organizations, and typically involve a private sector organization (for infrastructure, terminal equipment and online services). Others in their social networks have followed.

Why does research on community networking matter? At least several reasons are clear from the evidence available to date:

- Research helps project designer/managers adjust their expectations and implementation strategies,
- Research redirects resources, and/or
- Research shapes policy.

Market research matters in helping the private sector reach paying customers; research on the digital divide helps the public sector target disadvantaged groups more effectively.

Resources are particularly scarce in the non-profit sector, where research helps identify best practices for training, content management and related skills and knowledge transfer.

II. Models of Community Networking

There is no single model for community networking (CN) that is universally more effective at building and sustaining critical mass. There are at least several easily distinguishable models that have developed in the U.S. since the late 1980s and early 1990s. Each of these models is based the ownership of the main site (or portal) that typically links to many other local sites and resources.

Private (commercial) model: CN portal is owned by a private company or other commercial (for-profit) organization. In this model, a local newspaper, or private company such as Microsoft, or ISP, such as AOL, offer online tools and services that provide 'community templates.' An ISP can provide a template for web pages with community information, links to local organizations, as well as services such as listservs, newsgroups, and local chat rooms. Examples of this model include AOL's idea of "Dallas Online," and the Roanoke, Virginia daily newspaper (*Roanoke Times*) link to many local resources and organizations.

Public model: CN portal is owned by government agencies. In this model, the town, county or city government, local public libraries, or schools offer infrastructure (modem pool), online tools and services to other local community organizations with links to sites and related resources. Examples of this model include Santa Monica PEN, and the many CNs based in public library systems, such as Three Rivers FreeNet, NorthStarNet, and others.

Non-profit model (BEV, PrairieNet): CN portal is owned and managed by a non-profit organization. In this model, a local university, community college, or other non-profit entity manages the front pages, and provides services and tools to other community groups and organizations.

Not surprisingly, most self-sustaining community network projects operate as a mix of these three models, or simply put, as a model of mixed ownership. These CN projects are comprised of partnerships, among public, private, and non-profit sectors. In these partnerships, the task of providing Internet connectivity, transmission infrastructure and terminal equipment typically falls to the private sector, most notably, Internet Service Providers (ISPs) and local transmission companies, such as cable TV companies or telephone companies. The task of mobilizing human capital for planning and policy,

content development and training, falls to the public and non-profit sectors (local government, schools, etc.). In some cases, the community computer networking project or entity also acts as an ISP. It may provide service and connectivity because there is no other ISP, or it may compete with local ISPs for customers. Those that compete with local ISPs have greater problems of long term sustainability (at least of this function).

III. Evidence from Prior Research: Best Practices, Lessons Learned

A number of studies conducted since the 1990s provide preliminary evidence of best practices and lessons learned for community networking. Among these are broad studies conducted in California, Indiana, and Canada. There are also a number of case studies conducted by the U.S. Department of Commerce, Technology Opportunity Program (formerly known as the Telecommunications and Information Infrastructure Assistance Program, or TIIAP). Other case studies include those conducted by the Rand Corporation, CTCNet, and the Blacksburg Electronic Village. All of these studies provide a benchmark to measure trends and a basis for further research. This section provides a summary of findings from prior research and evaluation reports.

California Study

The California Institute for Smart Communities, a research program of San Diego State University's International Center for Communications, identifies "ten steps to becoming a smart community" in a study of the same name (Eger 2000). According to Eger, a "Smart Community" is a community that has made a conscious effort to use information technology to transform life and work within its region in significant and fundamental, rather than incremental ways. The ten steps are recommendations based on years of research regarding the role of telecommunications and information technology in the economic and social development of cities, counties and other local and regional government. Below is a summary of the ten steps recommended by the study to communities seeking to implement best practices for this purpose.

1. Understand the "Smart Community Concept": the concept is linked to the basic shift in the structure of the economy and society. While technology plays a vital role as a catalyst in transforming life and work in this new economy, jobs, dollars and quality of life are the real benefits.

2. Communicate ownership of the Smart Community Concept broadly: policies and programs whether developed at the local, state or federal level, must be communicated broadly and well understood by all stakeholders in order for them to be successful.

3. Create a Decision-making Coalition and Process involving all interested stakeholders, from private, public and non-profit sectors (businesses large and small, academe at every level from K-12 through the university, non-profit organizations throughout the community and local governments, including public libraries).

4. Assess needs and interests of the community: determine the size and geographic limits of the community and the needs, as the stakeholders perceive them in order to develop a sense of priority and a well-rounded smart community initiative.

5. Develop a vision and mission statement: submit it to the city or county and/or other political bodies in the community for ratification. [This may delay the start up process, but it could ensure easier implementation and support later when local organizations are needed for managing and funding the content and related services.]

6. Establish specific goals and priorities: most communities usually organize around sectors such as health care, education, transportation, law enforcement, government services.

7. Draft a strategic plan: to implement the development of infrastructure (e.g., broadband, local POP), services, and/or regulations that must be changed in order to facilitate the development of both the new infrastructure and information services.

8. Define responsibilities and establish timelines: bring together private, public and nonprofit interests, to assign responsibilities, set timelines and identify contributions of each.

9. Make community linkages: coordinate the vision with all other elements of the community that affect, and are in turn affected by the plan (e.g., downtown redevelopment).

10. Metrics must be established and progress constantly monitored. Collect data that provides benchmark for future trends (via focus groups, mail surveys, online feedback forms), and update data on a yearly basis.

Canadian Studies

In Canada, the International Development Research Center (IDRC) conducted a study in 1997 of community experiences with information and communications technology-enabled development. Lessons learned that the study reports include:

- Align a broad range of policies and policy instruments to foster the development of communities and community-based organizational structures;
- Approach infrastructure development planning and decision-making processes as a partnership between communities and infrastructure operators;
- Each community should determine how IT can support the local development priorities they have already established;
- Each community should determine the selection and adaptation of specific IT technologies and services.

These recommendations of best practices are consistent with some of the “ten steps” outlined above.

City of Seattle Study

The City of Seattle’s Department of Information Technology, in conjunction with King County's Community Services Division and the local power company, Npower, conducted a study in 1999 (by mail survey, N=238 organizations) in order to learn more about the information technology usage and needs of non-profit organizations. As a part of the City's Information Technology Indicators Project, this survey was designed to guide the city, the county and other funding sources in offering technology assistance to non-profit organizations.

Although almost all organizations (82%) said their use of information technology is "extensive" and indispensable to their program operations and management, only 40% of organizations have a technology plan in place. Organizations prioritize technology as being essential to their work, and yet they are not finding the funding to maintain their infrastructure and update their equipment and skills. Many organizations commented that the consultant or volunteer that they use for their technology support is essential, but very expensive or not available to solve the day-to-day problems faced by their staff. Troubleshooting and a lack of staff training remain major needs for many organizations.

Indiana CN Study

A study of state-funded community networks in Indiana conducted in 1998 (Rosenbaum and Gregson 1998) concludes that there must be a statewide and concerted effort to develop viable strategies for self-sufficiency and generating a revenue stream. All of the CN Board members who either responded to the survey or were interviewed reported that their CNs had to begin generating enough revenue to at least break even. Moreover, respondents (CN Board directors) seemed to have a limited idea of who the typical users were and what these people were doing online. Most respondents did not have a sense of what their users wanted from the CN because they had no evaluation mechanism in place. Successes that Board members mention include:

- incorporating,

- having a set of by laws,
- speaking to organizations in the community about the CN, and
- gathering content and placing it online.

Many Board members planned to do more marketing of the CN locally and intended to search for other revenue sources. The goal that was mentioned most often was the development of more content. Many believed that they had been slow to gather content, a sentiment supported by the content analysis of their web sites. They realized that they were not making effective use of volunteers. Some members report that their Boards were not working together as effectively as they would have liked. Not all of the members were working as hard as they could have been and some respondents thought these members should be putting more effort into the development of the CN. Some problems that the respondents experienced came about, they believed, because they did not have the technical, business or legal experience that they needed and did not have easy access to advice and assistance. The following is a list of challenges that Board members believe would be important in 1998:

* Achieving self sufficiency and generating a revenue stream
* Improving relations with their ISPs
* Developing or gaining access to more technical expertise
* Using volunteers more effectively
* Developing procedures for self evaluation
* Becoming more deeply integrated into their communities
* Developing deeper and more extensive community content
* Learning who their users are and what they and the community want
* Defining the CN as a community information center and not an ISP or gateway
* Developing better working relationships with public schools and libraries
* Developing better relationships with local businesses
* Developing public relations and advertising strategies

Many Board members saw achieving self-sufficiency, specifically generating a steady stream of revenue, as the main challenge for the upcoming year. There has also been little information sharing by the few CNs that have been successful in generating revenues; these CNs have tended to be ISPs or have been collecting rebates from their ISPs. The report recommends that for long term sustainability, CNs should do some of the following:

- Host e-commerce and act as "virtual incubators" for transaction-based storefronts: the CN could assist local businesses interested in establishing a web storefront. Real estate, tourism, and digital product (software, reservations etc.) companies are good

candidates for such activities. CNs must work out arrangements with their ISPs to offer secure transaction processing;

- Take on web development projects for government, nonprofits, and local clubs and organizations.
- Seek grants from local governments, foundations, large employers, not-for-profits in the service area, especially for disadvantaged segments of the population;
- Provide fee-based services, such as e-mail accounts, listservs or chat areas.
- Offer training workshops for nonprofit organizations.

The CNs that are not ISPs have much less of a connection to users because the CNs do not have membership arrangements. These Boards have few mechanisms to contact their users except for posting announcements on the CN home page. Consequently, these CNs do not have a clear idea of how many people use their system from month to month, how many new users they have, or why people stop using the network. These Boards seem to be operating in a vacuum, putting up the content that they think is important. Since they have no evaluation or feedback system in place, they do not know if the content they are providing is what the people really want to see online.

Rural Virginia Counties

In studies of the diffusion of the Internet in rural areas of southwest Virginia (Cohill and Kavanaugh 2000; Kavanaugh 2000), it is clear that participatory design is key. Broad local participation is essential to planning, implementation, and oversight. Stakeholders must be representative of local participants with legitimacy among target population (particularly for disadvantaged segments of the population). Stakeholders serving needs of disadvantaged groups (e.g., community action organizations with a clothes bank, emergency help, Head Start program, and Family Resource Rooms) are aware of the needs and interests of these users. They are prime sources for data in assessing user needs and determining appropriate technology and services. Their organizational sites are typically in the critical path of disadvantaged users. For example, Family Resource Rooms are already being used for meetings by local organizations; these sites are prime candidates for several networked computers and an LCD projector for groups to integrate web-based resources into the meeting – e.g., town zoning maps, GIS maps, training materials, etc. These entities are often already information producers. The Appalachian Women's Alliance, for example, publishes information pamphlets, holds face-to-face classes and workshops, and has initiated computer training using a local primary school computer lab. With the addition of broadband network connectivity (perhaps via two way satellite dish for about $100/month), this organization serving disadvantaged groups can make a straight forward transition to online publishing, training, collaborating and skills transfer. Another key group for CN oversight groups to target is at risk youth. At risk

youth need broadband, not leased line, network connectivity at vocational education centers. VoTech Centers are typically the last buildings to be connected in a school system; yet they need it most, because at risk youth are the least likely to be exposed to computer networking after they leave high school.

IV. Summary of Best Practices from the Literature:

The various studies reviewed in this paper provide a collection of best practices and lessons learned. Clearly, there is much overlap in the recommendations that appear from different sources. The best practices for establishing a community computer network and building a critical mass of users can be summarized as follows:

- Start with advocates
- Form a coalition, commission or board
- Mobilize wide participation in planning
- Draft a written plan together
- Plan for management of a community Portal as central local online starting point
- Focus on people, not technology
- Show, don't tell, when transfering skills and knowledge to new users
- Focus on tasks where the market fails (disadvantaged members of the community)
- Let private sector manage modem pool, infrastructure, technology
- Locate public access sites in the critical path of disadvantaged users
- Mobilize through training, social networks
- Collaborate widely and across public, private, and nonprofit sectors

V. In Conclusion

In considering long term sustainability, it is important to allow the coalition or partnership that established the CN to evolve over time, and, if necessary, to diminish its role and otherwise evolve in order to perform most effectively roles that other entities are not (yet) performing. Once a CN management group (coalition, partnership or board) has launched the CN and built a critical mass of users, it is not necessary that it continue to perform these same tasks in perpetuity. Other organizations in other sectors typically take on a variety of CN tasks (training, technical connectivity, web site design and publishing).

CN coalitions, commissions, or boards can play a significant role as policy advocates and watchdogs to champion the public interest in the community; raise awareness and, if necessary, funds, mobilize human resources for training for disadvantaged segments of the population, advocate fcr local competition in online services and broadband infrastructure. Broadband access in rural areas (for health, education, small and medium sized enterprises) is only possible with low rates and competitive access among providers (see Abdullah 2000).

The important question regarding long term sustainability is ‘what is being sustained?’ Is it the original CN organization (project management group) or is it the use of community network tools and services by the local population? This distinction is non-trivial. Many CN management groups seek a steady stream of revenue to sustain themselves. However, it is often not necessary for these organizational entities to be sustained in their original form. Rather than seeking a steady stream of revenues, many of the original CN management groups can “wither away” as their roles change over time. The role they performed at the outset (mobilizing human and financial capital, planning and building critical mass) is taken on by other entities in the public, private and non-profit sectors of the community. Once a critical mass of users is in place, communities should let the market work and provide for oversight by a CN advisory group (Board, coalition or commission). Where the market fails (no competition, no private sector ISP, or related private sector inadequacies), the CN oversight entity should play a role in addressing the problems created by such network externalities and market failures.

REFERENCES, ADDITIONAL READING and RESOURCES

Beamish, A. (1995). Communities On-Line: Community Based Computer Networks. Masters Thesis. (http://alberti.mit.edu/arch/4.207/anneb/thesis/background.html)

Bishop, Ann. (2000). PrairieNet Community Network: Final Grant Report. Technology Opportunity Program, U.S. Department of Commerce.

Borsdorf, Del. (1995). "Charlotte's city within a city: the community problem-solving approach." *National Civic Review*. V. 84 (Summer/Fall) 6 pp. Online. WilsonSelect. 8 Jul 1999.

Cohill, A. and A. Kavanaugh (Eds.). (2000). *Community Networks: Lessons Learned from Blacksburg, Virginia*. Norwood, MA: Artech House.

Eger, John. (2000) Ten Steps to Building Smart Communities" (http://www.smartcommunities.org)

Gregson, Kim and Ford, Charlotte, (1998). "Evaluation of Community Networks". ASIS Midyear '98 Proceedings. www.asis.org

Hampton, K. & Wellman, B. (1999). Netville online and offline: Observing and surveying a wired suburb. *American Behavioral Scientist*, 43(3), 475-92.

Hampton and Wellman (2000). Examining Community in the Digital Neighbourhood: Early Results from Canada's Wired Suburb. In Toru Ishida and Katherine Isbister (Eds.) *Digital Cities: Technologies, Experiences, and Future Perspectives*. Lecture Notes in Computer Science 1765. Heidelberg, Germany: Springer-Verlag. 194-208.

International Development Research Center. (1997). Community Experiences with Information and Communications Technology-Enabled Development in Canada: Local Experiments in Innovation. Nordicity Group Ltd.

Jones, Mark. (1999). Can Technologies Transform: Experimenting with Wired Communities. Report for Andersen Consulting.

Jones, Steven G., editor (1998). *CyberSociety 2.0: Revisiting Computer-Mediated*

Communication and Community (Thousand Oaks, CA: Sage Publications, Inc).

Kavanaugh, A. (2000). Meeting the Education and Health Needs of Rural Appalachia: Wireless Solutions. Final Grant Report for U.S. Department of Commerce, Public Telecommunications Facilities Program.

Kavanaugh, A. and S. Patterson. (1998). The Impact of the Internet on Social Capital: A Test Case. Paper presented at the National Communications Association, November 1998.

Kavanaugh, A. and S. Patterson. (2001). The Impact of Community Computer Networks on Social Capital and Community Involvement. *American Behavioral Scientist* (forthcoming, November).

Markus, M.L. (1987). Toward a "Critical Mass" Theory of Interactive Media. *Communication Research* 14 (5), 491-511.

Masud, A. and B. Neidigh. (2000). Commonwealth of Virginia Restrictions on Municipal Telecommunications, unpublished paper, Information Systems, Virginia Polytechnic Institute & State University.

Morino, M. (1994). Assessment and Evolution of Community Networking. Paper presented at the Apple Conference on Building Community Computing Networks, Cupertino, CA, 5/5/94. (http://www.morino.org/ties94sp.html)

National Academies of Science**. (** 2001). Exploring the Digital Divide: Charting the terrain of technology access and opportunity. Washington, D.C.: NAS.

Odasz, F. (1996). Community Networking: Leveraging the Public Good Electronically! (Or, Networking in the Public Interest). http://macsky.bigsky.dillon.mt.us/

Patrick, Andrew S. & Alex Black. (1996). "Losing Sleep and Watching Less TV but Socializing More: Personal and Social Impacts of Using the National Capital FreeNet." http://debra.dgbt.doc.ca/services-research.

Patterson, S. & Kavanaugh, A. (2001). Building Critical Mass in Networked Communities. *Electronic Journal of Communication* (forthcoming).

Rogers, E. (1990) “Critical Mass” in the Diffusion of Technologies. In M. Carnevale, M. Lucertini, and S. Nicosia (eds.), Modeling the Innovation: Communications, automation and information systems (pp 79-94). North-Holland: Elsevier Science Publishers.

Rogers, E. (1995). Diffusion of Innovations (4th ed.). New York: The Free Press.

Rosenbaum, Howard and Kim Gregson. (1998). “A Study of State-Funded Community Networks in Indiana: Final Report to the Indiana Department of Education. (http://memex.lib.indiana.edu/hrosenba/www/research/commnet/reco.html)

Schuler, D. (1996). *New Community Networks: Wired For Change*. Association of Computing Machinery Press.

Schuler, D. (1996). How to Kill Community Networks - Hint: We may have already started. *The Network Observer*, 1/96a (http://www.scn.org/ip/commnet/kill-commnets.html)

Seattle, City of. (2000). Non Profit Technology Survey: Summary of Findings. http://www.cityofseattle.net

Seattle, City of. (2000). Residential Technology Survey: Summary of Findings. http://www.cityofseattle.net

Van Tassel, J. (1996), Yakety-Yak, Do Talk Back!: PEN, the Nation's First Publicly Funded Electronic Network, Makes a Difference in Santa Monica. In Kling, R. (Ed.) Computerization and Controversy: Value Conflicts and Social Choices, 2nd edition. San Diego, CA: Academic Press. p. 547-551.

Uncapher, W. (1999). New communities/new communication: Big Sky Telegraph and its community. In M. Smith & P. Kollock (Eds.), Communities in Cyberspace. London: Routledge.

Wellman, Barry, Janet Salaff, Dimitrain Dimitrova, Laura Garton, Milena Gulia, Caroline Hythornthwaite (1996). Computer Networks as Social Networks: Collaborative Work, Tele-work, and Virtual Community. *Annual Review of Sociology*, *22*, 213-239.