

# Community network and social embeddedness: Survey and results

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## Abstract

We examine the relationship between two broadband community networking projects in New York State and its host communities. We analyze this relationship from the viewpoint of social embeddedness – defined as a measure of how broadly a community network is connected to institutional nodes in the social structure. The more broadly embedded it is, the more likely it is to be shaped by shared value systems and needs in the local community. Narrowly embedded networks, on the other hand, are likely to be more parochial in their connections and their concerns. The link with social structure is critical in understanding the form, function and developmental trajectory of a community network over time.

Our survey result shows a different trajectory. At present, both two community networks are relatively narrowly embedded, featuring resource-rich public institutions as subscribers. Non-profits and small business units are poorly represented due to resource constraints. The inter-institutional relations that appear to be the best developed are business relations between subscribers and the telephone company authorized by the program to implement the community network. The values that govern the network's developmental objectives are market-driven and not based on social considerations. The needs presently served by these networks are specific to the subscribers and appear to have no relation to broader community needs. We relate these developmental choices to decisions taken early in the project: the groups and interests involved in defining the project and their rationale, and the values and institutional relations that informed those decisions.

## Section I. Introduction

The object of the present study is broadband<sup>1</sup> community networks (CNs) that are located in geographic communities. We trace the development of two such community networks in New York (NY) State. The projects analyzed here were funded under a program aimed at diffusing advanced technology in economically depressed geographical communities in NY State.

We investigate the developmental trajectories from a structural perspective. The reason is that the aims of the Diffusion Program were to have structurally penetrated networks into community. They framed the interorganizational linkages as the ideal type of community development. The successful inter organizational networks are structurally penetrated and can be one example of the embedded community networks. The embedded network should address relationships and common ground of a community.

This embeddedness concept is different from the previous discussion of Graham and Aurigi (1997). Graham and Aurigi (1997) describe the relationship between the virtual city and the physical urban space in terms of “groundedness.” While the grounded virtual city has a digital

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<sup>1</sup> Broadband is characterized by two distinctive features; (1) high speed (384 kilobits per second) and (2) wide band of frequencies (voice, video, and data services as simultaneous multiple channels). These features accommodate high-capacity communications in a truly interactive manner supporting multi-media applications (Newton's Telecom Dictionary, 2002).

counterpart in physical space, the non-grounded forms connect people from geographically dispersed locations (1997, p.36). Although their notion of groundedness provides one typology for evaluating website, it is too vague to measure, that is, operationalizational limitation. The groundedness has only two standards-grounded and non-grounded. There is no degree of groundedness. Thus, the binary groundedness may miss the depth of complexity in the relationship between the virtual city and the physical city. The concept of embeddedness is more robust advanced than groundedness accounting for the complexity missing in the typology of groundedness. Thus, embeddedness may be a useful point of reference for assessing community networks.

Baum defines embeddedness as some notion of actor's relative depth of involvement in social relations (multiple ties, multiple social worlds). Baum (1992) emphasizes "one aspect of embeddedness-the depth of involvement in a relational structure- is captured by the extent to which a group is nested within the relational structure." Baum expands embeddedness to communities. He notes "take communities as their objects, seeking not just to change individuals but to alter the conditions in which they live. In addition, they assume that communities must be the instruments of their own change. Thus projects develop coalitions of community members, service providers, non-profits, business, elected officials, universities and the like. These alliances not only bring together many potential resources, but in themselves create capital and thus embody community development" (p.147).

Social embeddedness begins with what is already present in the community-not only capacities of residents as individuals, but also the existing relational, political economic situations. Baum (1992) indicates that embeddedness is "not just adding resources, but restructuring opportunities, institutions, cultures and practices" (p.147). The services through the cross-sectoral and embedded networks may have to bring many potential resources together, and create social capital and thus develop community benefits. Thus, embedded community networks tend to connect different sectors as a part of larger institutional and interorganizational structures.

Taken together, we define a community network embeddedness as a community network that is socially embedded in its geophysical host community to the extent that it is a part of that community's existing inter-organizational social network and value hierarchy.

### **Structure of the social context & technological development**

Iacono and Kling (1985) find that social structure significantly influences technological development, what they call the "computing arrangement." It is true that although the importance of social structure has been acknowledged, it hardly reaches a consensus what is structure. A more practical view of technology development in a society should be drawn upon the structural matrix in which technology is initiated, stabilized, accepted, deployed, and modified. In doing so, we can conceptualize the social embeddedness more clearly. We draw the structure notion from Nelson and Laumann et al.

Nelson et al (1960) approach social structure from relation and value. They argue that "community is the complex of relations among people (p.12)". Many conflicts could arise in a community when a new technology is introduced: conflicts between two or more values, conflicts between a what a community needs and what technological resources are available, conflict of values among subcultures, and finally conflicts resulting from poorly defined roles and functions (Nelson et al 1960). The complex relations and values over the relations dictate the forms and functions of community activities. So the social structure consists of (1) social relations of an instrumental nature between and among organizations and the people living in a local area

developed through communication and (2) the hierarchy of values that regulate these relations. As units of analysis, Nelson et al propose the 'groups,' 'organizations,' 'division of labor,' 'values,' and 'social differentiation.' It seems that these elements of structure form a technological nexus like network. These elements form different types of relational networks.

Out of these networks, Aiken and Alford (1970) propose interorganizational system as the best model for coordinating community system. An organization is the basic interacting units. It is the same idea with the program committee that the structural conditions as a catalyst for community innovation. Consistent with this argument, Laumann, Galaskiewicz and Marsden (1978) developed interorganizational concept. They regard each organization operates as a "node" within structural space. The structural space is deemed as "an aggregate network of interorganizational relations (Laumann, Galaskiewicz, & Marsden, 1978, p.455). These interorganizational linkages are shaped by exchanges pattern between actors that is politics. Such an interorganizational network provides services and resources to participating organizations and members of the public.

Laumann et al. point out that previous research on interorganizational relations paid less attention to the origin of interorganizational ties and assert that bounded and identified network is a necessary precondition. Their claim relates social relations and hierarchy of values. The modalities of interorganizational relations can be competitive, cooperative and complementary. These modalities represent hierarchical values. Such exchanges can also be based on the principle of "the similarity of goals", which leads to a "commonality of interests and hence interorganizational linkages" (Laumann et al. 1978: 462). Under such conditions of resource scarcity, positive interdependence in organizational communities leads to the collective strategies developing common grounds (Laumann, et al. 1978).

These conceptual frameworks allow this study to develop more comprehensive descriptions of community structure to trace the interactions of power and resource. The reasons why social structure is important to this study are several. First, the program's specified goals include socio-economic development that suggests social structure. As Knack and Keefer (1997) find, a social structure has a direct relation with social capital which is a relationships and norms shaping social interactions. Social capital is not just the sum of the institutions— it is the embedded glue and holds them together (Knack and Keefer 1997). Second, as the Diffusion Program designated a specific locality-economically disadvantaged areas in the New York State, geographically defined structure approach provides criteria for evaluating the network. The interorganizational view of community network is what the Diffusion Program intended. The steering committee hoped to connect inter sector organizations that was regarded as social capital. As Nelson et al. imply, interorganizational network has to fit into existing community structure such as social networks and hierarchical value to facilitate the linkages between different sector organizations. Third, contextualist analysis of these community networks cannot be undertaken without reference to the social structure. Particularly, Social Constructivist analysis must include analysis of the influence of the social structure.

## **Section II. Background to research: Diffusion Program**

In 1995, as part of a regulatory settlement, the New York State (NYS) Public Service Commission required NYNEX (then Bell Atlantic and now Verizon) to commit \$50 million of telecommunication infrastructure, customer premises equipments (computers etc), and related training for disadvantaged region in New York State that are served by Verizon (New York State document, 1995). These areas, geographically remote areas and underserved urban areas, would not have access to advanced services if it were left to market forces. This project was called the

New York State Advanced Telecommunication Project or Diffusion Program (DP). Advanced telecommunications here refer to applications beyond the normally associated with standard telephone service such as high-speed, switched and broadband telecommunication capability that enable users to receive high quality voice, data, graphics, and video using any technology.

Participants in the project were responsible for the monthly charges for telecommunications services that they need to implement their approved project. The plan did not provide participants with assistance for monthly telecommunications services. The plan required that approximately 80% of funds be allocated to urban/suburban regions of the state and the remaining 20% to rural areas. The grant money could not be used for hiring expertise and application development. The plan additionally specified that approximately 80% of the funds were to be disseminated for network infrastructure that is hardware and software that Verizon installs to support advanced telecommunications applications and 20% for customer premises equipment and associated training.

The program decided to use a competitive request for proposals (RFP) process to solicit proposals from eligible consortia of public sector institutions (city and county government agencies, K-12 schools and higher educational institutions), community-based organizations, healthcare and human service agencies and small business entities. Community coalitions had to apply and go through competitions. A program committee member said “(the reason of competitive process) was an attempt to try and get more...we could not have gone to every individual municipalities. I needed a comprehensive system....we are going to include everybody.” He also added “writing proposal itself brings community together.”

Two rounds of funds were awarded until 2000. A total of 344 rural and urban consortia<sup>2</sup> submitted proposals through two rounds of grants. The program committee received 108 applications in the first round (1995-1997?) and selected 14 for funding; in the second and concluding round (1997?-2000), nine projects were selected from 226 proposals. The projects selected in the first round were awarded a total of \$24 million; in the second round were awarded \$26 million. The 14 approved projects were allocated around \$24 million in funding in the first round. In the round two, nine projects were allocated the remaining \$26 million in fund.

The explicit aim of the program was to bring “advanced telecommunications services to economically disadvantaged areas of New York State that would not be available in the near future on account of limitations in the advanced telecommunications infrastructure and related equipment marketplace” (Evaluation Report, 2001, citing program documents). The implicit aim of the program may be inferred as to strengthen community, increase social connection, and develop common ground of community. That is, it was conceived as a community empowerment tool to provide rural and inner-city residents with the catalyst to revitalize their communities and create new economic opportunities in those areas.

The specific local community in focus is the economically disadvantaged areas in New York State. The Public Utilities Commissions defined economically disadvantaged areas by six zip codes in the Verizon’s service area. The program committee made comprehensive list of criteria that were used to identify economically-depressed areas in the state for program purposes. The eligible economically disadvantaged areas meet the following criteria at the time of 1990 census data. Except the main criteria below, population (under 2,000) and unemployment rate (?) also were considered deciding disadvantaged areas.

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<sup>2</sup> New York City Region-155, Hudson/Mohawk region-62, Northern region-29, Central region-46, and Western region-52 Applications

1. The percentage of households without telephone service is at least 50% above the state average.
2. Average annual salary: under \$22,000 (the median household income was below 75% of the statewide median)
3. Poverty rate: at least 20%

The plan established a Diffusion Program Committee to solicit and evaluate proposals, and make awards. The Diffusion Committee consists of 13 representatives from the Verizon, the NYS Consumer Protection Board, the Public Utility Law Project of New York, the NYS Senate and Assembly, the NAACP (National Association for the Advancement of Colored People), the NYS Board of Regents, the Empire State Development Corporation, the NYS Departments of Health and State, and the NYS Office of the Advocate for Persons with Disabilities. The Verizon had three representatives on the committee and provided administration, planning and logistical coordination of the process. The Diffusion Program Committee solicited applications for project funding by issuing a RFP. The RFP was sent to over 8,500 organizations including every school district and library in NYS.

The proposal process was a two-tiered activity. In the first phase, eligible consortia responding to the RFP were required to provide a written description and rationale for how the grant would be used. The second phase was a pricing and details phase and kicked in when a proposal was selected for funding. The subsequent technical review was done by Verizon staff and other reviewers as needed. The final proposal must contain pricing estimates and specific time lines for installation of equipment and start of program activities. The joint developments of proposals across agency jurisdictions (e.g. K-12, postsecondary, libraries) and across sectors (e.g. education, health) were highly encouraged; preference was given to those types of proposals in the rating process. Project applicants were required to show: community support for the project, lasting benefit to the community, a carefully considered application and work plan, sensitivity to the needs of people with disabilities, and the cost-effectiveness, management capability of the project, control of the project, and whether or not the project could be undertaken without assistance from the Diffusion Program (State White Paper, 1996). Educational agencies (e.g. BOCES, colleges, libraries) not within the targeted areas may also be eligible if they serve as a resource to agencies in the underserved areas.

The Program designated the community committee (steering committee which was different from the Diffusion Committee of state) comprised of leaders from various state agencies, public interest groups, and Verizon. The committee provided local planning and implementation grant to 23 local consortia to promote to development of community and regional collaborations to deploy advanced telecommunication infrastructure as a way to support economic development, educational quality, health and human service delivery and labor workforce preparation.

### **Section III. Research process**

We describe our research process on two projects funded by the Program over two rounds of funding. Project names used are pseudonyms to protect confidentiality of project staff and participants.

Data collection procedures were two folds. One procedure was to identify social structures. The other was a content analysis on websites. The social structure parameters follow the combined views from Nelson et al. Our content analyses are based on the Aurigi and Graham's three typologies. Our six steps to describe social structures are as follows.

**Step 1:** We define geophysical boundary. This is the zip code areas defined and approved by the DP committee.

The first step was to identify all possible organizations eligible for the Diffusion Program in the area. We contacted Chambers of Commerce, mayoral offices and local government offices. The contact methods were email and fax. To increase responses, we sent formal letters in some cases. The responses and information we received were insignificant. Most of the authorities even were not aware of institutions under their jurisdictions. Only five responses were received.

However, web resources are more informative and updated and we could get a list of non-profit and public organizations within the eligible zip-code areas. The chair of the Diffusion Committee provided us with the underserved zip code list (See Appendices). The initial eligible organizations included non-profit, public, and small business organizations. But we excluded small business as eligible organizations, because their participation was almost minimal from development to subscription and usage. The table below shows the eligible organizations for the fund. Adirondack area is geographically larger than other sites having more eligible organizations within the area.

Urban-net	Rural-net
528 orgs	1130 orgs

Eligible organizations for the Diffusion Program

**Step 2:** We identify all eligible public institutions for the DP fund. We include local mass media, local government offices, and third groups (regional planning councils, economic development groups, and community development groups). We see these groups as socially relevant groups.

We asked four project sites for a list of institutions that participated in the development of the community network proposals. We defined participation as any kind of involvement, such as attending meetings, responding to surveys, or helping in proposal development. In the case of Rural-net, they keep scrapbook of media coverage, so we could track their detailed participations.

Urban-net	Rural-net
23 orgs	75 orgs

Institutions participated in the network proposal

**Step 3:** We investigate who were involved in the network development. What percentage and types of organization in the developmental groups gave answers.

We surveyed current subscribers of network. Obtaining a list of network subscribers was relatively easy. Three sites have their websites and posted current subscribers on their web for the publicity and advertising effect.

Urban-net	Rural-net
21 orgs	42 orgs

Institutions subscribing network

Based on these lists, we could get another two lists; those eligible institutions that did not participate in community network proposal development and those not subscribe the Diffusion Program networks.

Urban-net	Rural-net
500 orgs	900 orgs

Institutions that did not participate in network proposal

Urban-net	Rural-net
500 orgs	900 orgs

Institutions that are not subscribing network

**Step 4:** We trace the percentage and type of organizations that subscribe the network.

**Step 5:** We survey random sample of (1) organizations who did not participated in the development and (2) organizations who are not subscribers.

We selected a stratified random sample of 10 organizations considering balanced sector, health care, education, non-profit, and government agencies. In many cases, non-initial participants and current non-subscribers are almost identical. After the Institutional Review Board approved our survey, we sent 73 surveys to selected organizations via postal mail. The survey asked their knowledge and participation of the Diffusion Program. Most responses we received that they did not aware of the project or participate in the project.

**Step 6:** We interview third groups (community planning groups) and DP project leaders.

We interviewed third groups of DP, which are community planning groups. In addition, we interviewed the Diffusion Program-involved people, that is, project leaders and directors.

	Urban-net	Rural-net
Project leaders	Mar 14-02'	Oct 11- 01'
Planning groups	Mar 14-02'	Mar 29-02'

Interview log

## Section IV. Findings

### 1. Case study on social structures

#### *- Embeddedness from structural diversity*

The embeddedness idea reflects social relations between community networks and other institutions in a geographically defined area. The idea is relational because the embeddedness we see is the product of social relations. Taking as the frame of reference relations between institutions located in the zip-code defined area, broadly embedded community networks are

linked to more such institutions and participate in more relations than narrowly-embedded community networks.

Narrowly-embedded networks are limited to a single sector (or at most two), while broadly-embedded CNs are linked to more. But it is a continuous variable, which means a CN that is linked to five sectors is more broadly embedded than one that is linked to two. Even though the Urban-net and Rural-net may be broadly embedded in number of subscribers, they are still quite narrow because they linked only limited sectors—primarily educational and health care sectors. The table below shows how the networks are structurally diversified.

Sector \ Networks	Rural-net	Urban-net
Public safety		
Arts/culture	X	
Government services		
Economic/business development		
Education (K-12, higher education)	X	X
Human services		X
Health services	X	
Workforce development		
# of sectors	3	2

Table. Embeddedness from structural diversity

The embeddedness should be measured not only number subscribers but also in terms of sectoral-inclusiveness which is diversity. How many sectors the networks are serving? In terms of multi-sector networking, the Rural-net is connecting various 3 sectors, whereas the Urban-net is linking only educational institutions. That is, the Rural-net is more broadly embedded and therefore highly institutionalized than the Urban-net which is narrowly embedded.

Overall, the two networks are quite narrow in the sense that they represent small parts of all possible relations between institutions located the eligible areas. Networks developments to current subscription of the networks reflected limited participations.

***-Embeddedness from number***

Besides sectoral-networking aspect, the degree of embeddedness only in terms of developments and subscriptions are as follow. The figures will be even lower if small business entities are included.

	Rural-net	Urban-net
Development	75/1130=6.6 %	23/528=4.3 %
Subscription	42/1130=3.7 %	21/528=3.9 %

## Embeddedness from number

### ***-Embeddedness & social structure***

Taken together of two criteria above, the degrees of embeddedness showed are very low. If we include small business entities, it will even become lower. The extent of meeting needs of community is matter of whether the network is serving the locality. The Rural-net has a low embeddedness due to wide geophysical areas, but they are serving for local communities with their exact and emergent local needs. Their technological development reflects the social needs and accompanying change in social structure. Thus, social and technological change: changing the trajectory of the community network toward progressive goals implies changing the social structure that produced the network. In some cases, on the other hand, there was a deep political barrier to evolve to broadly embedded network. The respondent said “professors or teachers didn’t want to change their teaching method because of political reasons.” By contrast, Urban-net is moving from educational network to general network making a change social structure with the cooperation with local government. The network director is himself on the city council and has committed to serve local needs.

### **2. Content analyses on websites**

We present analysis of the content of the three websites using Aurigi and Graham (2000) typologies of *informativeness*, *participativeness*, and *groundedness*.

#### 1) *Informativeness*

This typology refers to the capabilities of community networks in providing large quantity of up-to-date information and the provisioning of useful services which the citizens could take advantage of. For example useful services are online chats, bulletin boards, social services and many more. These services can play an important role in the economic development of a city as well as improving the relationships between citizens and local administrations.

#### 2) *Participativeness*

The second typology examines the participation and access towards new technologies. Current observation shows that elite social groups usually dominate the accessibility to computers and advance telecommunications. Due to this phenomenon, the needs for urban IT initiatives to guarantee a wider social participation and access from the other unfortunate social groups have to be encouraged. This brings up the “social inclusiveness” concept where users from all walks of life should be able to participate in the virtual city. Virtual cities need to stress the importance of having interactive services such as emails, and bulletin boards rather than just having passive information available on the website. These services in the long run would therefore help citizens, voluntary groups, and organizations to take an active part in the life of virtual city as if they were able to do in the real city life.

#### 3) *Groundedness*

This last typology looks at the degree to which community networks can illustrate the positive relationship with its host city or geared toward local users rather than merely operating as another Internet site which is geared for global users. One of the main ideas stemming from the entire community networks movement is the opportunity for social and economic revival in terms of local IT developments, and social interactions more meaningful which transcends the meaning of place. Some of the examples of groundedness exhibited are the discussions of local problems or topics through discussion forums and the choice of language to be use in the web site of the virtual city.

These typologies are the basis to observe the functionality and role of the web sites of the CNs. Particularly to understand whether the web sites are narrowly or broadly “embedded” to the community they represent. These typologies and the concept of “embeddedness” will be applied to our study, which examines community networks in the New York State Advanced Telecommunications Project (The Diffusion Program). There are three community networks that will be examined: 1) Rural-net and 2)Urban-net.

We began to examine systematically each CN websites, modifying the coding scheme as needed. In addition, we also combined and adopted categories from studies done from Aurigi and Graham (2000), Nunn and Rubleske (1997), and Rosenbaum (1998) to our coding scheme. The website coding scheme used for the analysis had categories such as structure of the website, design features of the website, local community network content, links, participation of local events, local government, social relationships and links to regional, states and national websites. Besides the coding scheme, we kept tracked of the community networks by the usage of logs when we visited and analyzed the web sites. Apart from that, we also kept tracked of whether the CNs was linked to or from other general community websites.

We attempted to subscribe to the CNs’ listserv and mailing list but it was only available for members or did not have the service at the websites. The reason we wanted to subscribe to the listserv or mailing list because we wanted to monitor the activities of the members of the community. It was hoped that this communication channel would be useful to us and would provide additional longitudinal data to this research.

We started analyzing the web sites from December 2001 through April 2002. The analysis was done in four stages: 1) December 2001, 2) February 2002, 3) April 2002, and 4) May 2002. We decided to analyze the websites in four stages because we wanted to observe whether there were any changes or updates done to the websites overtime. The analysis consisted of several tasks: 1) observed the structure of the website; 2) observed the content of the website; 3) observed for any materials added or updated in terms of structure and content; and 4) check the links whether it is functioning or not.

We had two coders for the content analysis of the CNs’ websites. The intercoder reliability (or level of agreement) between the coders is 0.85. The function of the intercoder reliability is that it examines the extent to which different coders using the same instrument or measure to get the same results.

## **2.1 Analysis of the Websites**

Content on many of the CNs’ websites is developed and maintained by members of the board. On all of the CNs there are active webmasters who help develop content and help users with website related problems. Having active webmasters to develop and maintain webpages has been one way to keep any unrelated or conflicting materials from being posted. Also, there is a mix type of services offered by CNs through their websites such as video conferencing, live webcast, chat rooms, and search engines. One CN website offer users to link and register their websites to the CN website so that it would be searchable through the CN website. Therefore materials and services that are posted are important to attract the users to participate in the community. As Rosenbaum and Gregson (1998) state that “the role of the CN is to help develop current and news worthy information about the communities serviced by the network. This is a theme that cut across many Boards, which are thinking about how to increase community involvement in their

CNs.” The analysis of the website will be divided and discussed in two parts; structure and content.

### 2.1.1 Structure

As we mentioned earlier, we decided to analyze three websites. To analyze the structure of these websites, a few elements were observed as listed in Table 1. All three of the websites have textual and graphical identification of the CN it represents. The three websites has links to the design companies/authors of the CN. Rural-net has logos of the design companies/authors on the first page while the Urban-net had the logos and text links to partners buried in the second level of their websites.

<b>Elements of Structure</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> Textual identification of the CN it represents</li><li><input type="checkbox"/> Graphical identification of the CN it represents</li><li><input type="checkbox"/> Link to design company/authors</li><li><input type="checkbox"/> Table of contents</li><li><input type="checkbox"/> Link to site map</li><li><input type="checkbox"/> Graphics</li><li><input type="checkbox"/> Multimedia</li><li><input type="checkbox"/> Frames</li><li><input type="checkbox"/> Interactive features</li><li><input type="checkbox"/> Local search engine</li><li><input type="checkbox"/> Other features</li></ul>

Table 1: The elements of structure used for CN websites analysis

All three have table of contents and have site maps. The websites make use of second-generation design features including tables, frames, and some basic interactivity, including forms using java scripts to get access to information such as request for services, past video programs and so on. The websites range from two to five levels in depth with all using frames. Rural-net and Urban-net had design the site map button on the left side running down while other had the site map running horizontally across the page on top. In addition, Rural-net had scroll-down sub menu to access the pages.

One interesting feature that we observed from two of the CN websites; the Rural-net has a welcoming page or greeting page to the users as they first access the websites. This helps to make the users feel at home. It lets users choose the type of platform that they will be using in order to avoid any inconvenience.

Other features include multimedia, search engines, and chat room. The Rural-net uses some elements of multimedia in their websites. A multimedia element is the availability of live and taped video streams. Users can access the websites and watch live video streams on events happening around the community. The Rural-net also has a local and global search engine facility in their websites. Users can use this facility to locate any information regarding the local content of the websites or anything related to it. In terms of chat rooms only the Urban-net offer users to

sit and chat with other users in the community. But it lacks of information on how to use it. This was observed during our analysis.

Last but not least, the color of the background for all three websites is white. But the color and font usage is different from one website to another for their text. For Rural-net, they use red and blue, while Urban-net uses gray respectively. In addition, element of graphics were also used to represent the CN but have limited interactivity.

## **2.1.2 Content**

The analysis for the content of the websites is divided into three typologies; informativeness, participativeness, and groundedness.

### **2.1.2.1 Rural-net**

*Rural-net was created to provide advanced telecommunications services such as distance learning, telemedicine, Internet connectivity and videoconferencing to geographically remote areas in the Adirondack Region of Upstate New York*

#### *2.1.2.1.1 Informativeness*

On the first level page of the website, it has textual and graphical identification of the community the CN represents, new articles in the scrapbook and public videos have been added to the website (has been increasing since the initial analysis). Apart from that, there is a link called scrapbook, which has many links to newspaper cuttings such as news on what's happening, a letter of gratitude from the AIDS Council, a letter of gratitude from the National Kidney Fund etc.

The website has video streams and search engines to connect to the outside world. Access to the video streams is limited. It is divided into public and members video streams. The video streams for public is very general such as meetings while for the members it is very specific type of video streams such as on medical topics. Every link on the site map provides a wide variety of information and services to the communities.

#### *2.1.2.1.2 Participativeness*

One of the functions of having a CN is to provide the surrounding community with information and encourage them to participate in the community activities. Therefore, a schedule of upcoming events and video calendar is important to have on the website. The website also has a list of past conferences and programs, and provide video conferencing services to the local community. The video conferencing services are open to all walks of life and are not limited to members only. But, in order for the community to access or use the services, the website provide online forms to be filled out. There is one link in the site map, which is solely for 'members' only. In order to use the resources and access the information under this link, user id and password is needed. This website lacks of information on local government.

#### *2.1.2.1.3 Groundedness*

This website provide rich information regarding the CN; its history, roles, partners, and the board of directors involved. It also has links for the local community such as link to Press Republican website, and links to multiple resources on the web (for medical personnel, teacher, students, technology, distance learning, etc.). Another important link, that is useful for local communities, is a link to Adirondack 2000 homepage – which has links to other local and social websites. The website also has links to regional, state and national organizations which provided plenty of

information for the community. Rural-net is broadly grounded which crosses many nodes in which the website is geared towards local users/community.

### **2.1.2.2 The Urban-net**

*Urban-net, a consortium of approximately 20 organizations, is working with regional and global agencies to enhance the educational and informational background of students, teachers, parents, and citizens within our community. This powerful communications network offers new possibilities for our community. Telecommunications technology has the potential to bridge geographic, political, and cultural boundaries in ways that allow critical programs and information to reach populations that are traditionally underserved, particularly in the depressed urban areas of New York State (Center for Applied Technologies in Education, 2002).*

#### *2.1.2.3.1 Informativeness*

The website is very simple. On the first level page of the website, it has textual and graphical identification and has very brief information of the community the CN represents. The website has links to the partners in the second level page under the link 'partners.' The partners are represented by their colorful logos.

One of the strength of this website is that it has a lot of resources on distance education and video conferencing. This is because distance education and video conferencing are their main service to the surrounding community they represent especially in the field of education.

#### *2.1.2.3.2 Participativeness*

As with the other two websites, this too has a schedule of upcoming events & news incorporated into the website. The website provide a wide variety of materials which could be accessed by the local community and general public by filling out online forms. One feature that was not available on the Rural-net websites is the 'FAQ' link. This link is useful and informative for first-time or novice users when using the website or getting to know about the CN. The CN also provide video conferencing services which could be used by members and the community.

#### *2.1.2.3.3 Groundedness*

This website provide rich information regarding the CN: roles, partners, board of directors etc. It has a link called 'Programming' which under it has a variety of links which the Urban-net has hosted a wide variety of video conferencing events happening around the region, the State, and beyond such as Western New York Distance Learning Network offerings, New York State Distance Learning Consortium offerings, and Virtual Field trips.

This website also has a link to the official City Hall of Buffalo website – which has plenty of information on local government such as its leadership, city services, tourist places, news, and calendars on the events happening in the City of Buffalo. Urban-net is narrowly grounded and geared toward local users/community.

### **Summary of content analyses**

The lack of content on the websites could demotivate users to participate in the CN. Therefore webmasters and other board of directors must participate in providing content and information on the website. Having certain board directors come up with the content will cause bottleneck. In

addition, local content is important to successful CN. All three websites have updated their content in term of 'what's happening,' 'scrapbook,' and 'news and events' during the analysis.

Both websites must have some sort of fee that is required when users want to use the services. For example, basic membership for Urban-net cost \$500. This is to ensure sustainability and self sufficient in order to survive.

In order to fully service the community, CN must have the full support and knowledge of the board members. The members have to learn about their communities; must be aware of what are people doing when they are logged on, the demographics and online behaviors of individual and corporate CN members. This is important because CN must identify what is lacking from their websites and try to overcome them by having better services and facilities by fulfilling the needs of the community.

To remain as successful websites, the CNs have to create social and cultural content, and services that will enable them to integrate their systems into the lives of their communities – developing local content and interactive services that will encourage ongoing and regular social interaction.

## **Section V. Conclusion**

Our survey reveals a different picture with the Diffusion Program's initial goal. At present, both community networks are relatively narrowly embedded, featuring resource-rich public institutions as subscribers. Non-profits and small business units are poorly represented due to resource constraints. The inter-institutional relations that appear to be the best developed are business relations between subscribers and the telephone company authorized by the program to implement the community network. The values that govern the network's developmental objectives are market-driven and not based on social considerations. The needs presently served by these networks are specific to the subscribers and appear to have no relation to broader community needs.

We argue that the narrowly embedded networks cannot well evolve into community-wide resources. These networks tend to continue to develop in a conservative direction, characterized by certain political-economic concerns, narrow relationship-specific structures. The participating institutions continue to be resistant that network expansions to include new members are hardly happen. These networks are having a tendency to stabilize the networks as closed networks. As a result, narrowly networks reflect only dominant political economic interests away from resource-poor people.

Our argument has its base on the fact that community network is a social artifact. Therefore, our analysis started from interpretive approach to be faithful to contextual analysis.

In the course of our literature reviews and data analyses, we conceptualize social structures in technology development. We found the significant role of social structure in community network development. Without a significant reference of social structure, community networks may develop in a deviated way from normative protocol. Embedded networks only can be realized with heavy consideration of social structure that networks place in. The development and stabilization of network are institutionalization processes to pre-existing social and technological infrastructure of communities. This point has been neglected by researchers and policy planners. We attribute the current failure of the project to this neglect.

The social structure of communities comprises institutions and relationships among the institutions. Some institutions have more authorities and resources than others. A political

economy surfaces from these inequalities and affect the interorganizational relations. Community networks aiming interorganizational linkages change within social power relations and interests of power holders. This point has a significant question on network ontology; whose networks are they and for what needs should be served. As we analyzed the present cases, these fundamental questions were coming up. As we found, such artifacts bias use and participation toward the resource-rich and the structurally powerful.

What we suggest is about institutionalization process. Bijker (1995) argues that an artifact attains a degree of stability when a dominant interpretation becomes widely accepted. We see the cases in this present study did not achieve a significant level of stability due to lack of institutionalization process. The institutionalization process is dependent upon the social and technological infrastructures. As to social infrastructure, the interpretations of technologies by relevant groups became fade away as political economy conflicts came up along the way of project. Stabilization and institutionalization processes may themselves be powerfully influenced by the nature of technology. Infrastructural elements and extensions usually exert more pressure for stabilization and institutionlization than do end-user applications, as we showed in the Urban-net case.

From our website content analyses, we confirm that a community website can play a role of open networks. Open community website effects the sustainable developments of community networks. Particularly, a website increase the horizontal connections directly among community residents. This would be necessary to form and mobilize social capital in the community for change. Such provisions must be part of a broader dialectical strategy aimed at resisting biased reproductive mechanisms – such as by-laws. Community websites have to create social and cultural content, and services that will enable them to integrate their systems into the lives of their communities – developing local content and interactive services that will encourage ongoing and regular social interaction. Then this can be a forum to widely publicize and recognizes pro-social practices and exemplary institutions in the community. This is one example of open network we argue.

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