COMMUNITIES ON-LINE:

COMMUNITY-BASED COMPUTER NETWORKS

by

Anne Beamish

B. Arch., Carleton University
Ottawa, Canada
June 1979

S.M.Arch.S., Massachusetts Institute of Technology
Cambridge, Massachusetts
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Signature of Author:
Anne Beamish, Department of Urban Studies and Planning
January 12, 1995

Certified by:
William J. Mitchell
Dean, School of Architecture and Planning
Professor of Architecture and Media Arts and Sciences
Thesis Supervisor

Accepted by:
Langley Keyes
Chairman, MCP Committee

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ABSTRACT

A community network is a network of computers and modems that are interconnected via telephone lines to a central computer. The system provides local information and a means for community residents to communicate electronically. Unlike the similarly named "on-line communities" and "virtual communities", community networks are located in and support a specific physical place.

Community-based computer networks have only recently appeared in North America. Their goals are to strengthen the community, increase democratic participation, and ensure that all members of the community have access to the "information highway".

Most community networks are rich in local information, ranging from job opportunities to minutes of the city council meetings. But, surprisingly, in spite of the intention to increase a sense of community and democratic participation, many community networks provide limited opportunity for public debate and discussion. In addition, most community networks do not provide electronic access to elected officials or municipal government staff.

It may be too soon to evaluate community networks on their long-term goals, but it is certainly appropriate to monitor their progress towards these goals. In the short-term, they must concentrate on finding workable and sustainable models.

If community networks are to fulfill their long-term goals, it is essential that more effort be placed on designing systems that encourage public discussion and debate. Further research, involvement of the business community, identification of successful models, improved software design, and a greater emphasis on ensuring access for a wide cross-section of the population, is also needed.

The future of community networks is not assured. However, if they continue to tap the energy of their users and volunteers, develop flexible and sustainable models, and stay focused on their long-term goals, they may make an important contribution to their communities.

Thesis Supervisor: William J. Mitchell
Title: Dean, School of Architecture and Planning

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This thesis is also available on the WWW at:

http://alberti.mit.edu/arch/4.207/anneb/thesis/toc.html

Preface

I first "discovered" community networks almost two years ago and immediately became intrigued by them.

Though my background is in design, planning, community and international development, I was actively interested in information and communication technology. Community networks seemed to combine all these interests, and provide the thread to tie the digital on-line world to the physical world of cities and streets. In addition, having recently moved to the U.S., they appeared to address the distances and divisions separating neighbors and neighborhoods that are so apparent to a newcomer.

Alan Shaw summarized it well when he said:

> in proximal communities, the relatively small distance between neighbors can often mask a lack of connectedness that can be far more consequential than the distance separating members of virtual communities. Many common concerns with devastating impact can plague the members of a proximal community, and yet it is often very difficult for local residents to pull together and address them. (Shaw 1994).

Community networks also seemed to be a particularly appropriate topic for an urban planning thesis because they involve so many planning issues: equity, economic development, community development, social responsibility, politics, governance, institution building, democracy, participation, and social issues. In short, community networks are about building communities, which is the purpose of planning.

The rhetoric of community networks is impressive. They are intended to strengthen communities, provide a wide range of local information, increase communication between government and residents and between residents, provide access to the "information highway" and increase democratic

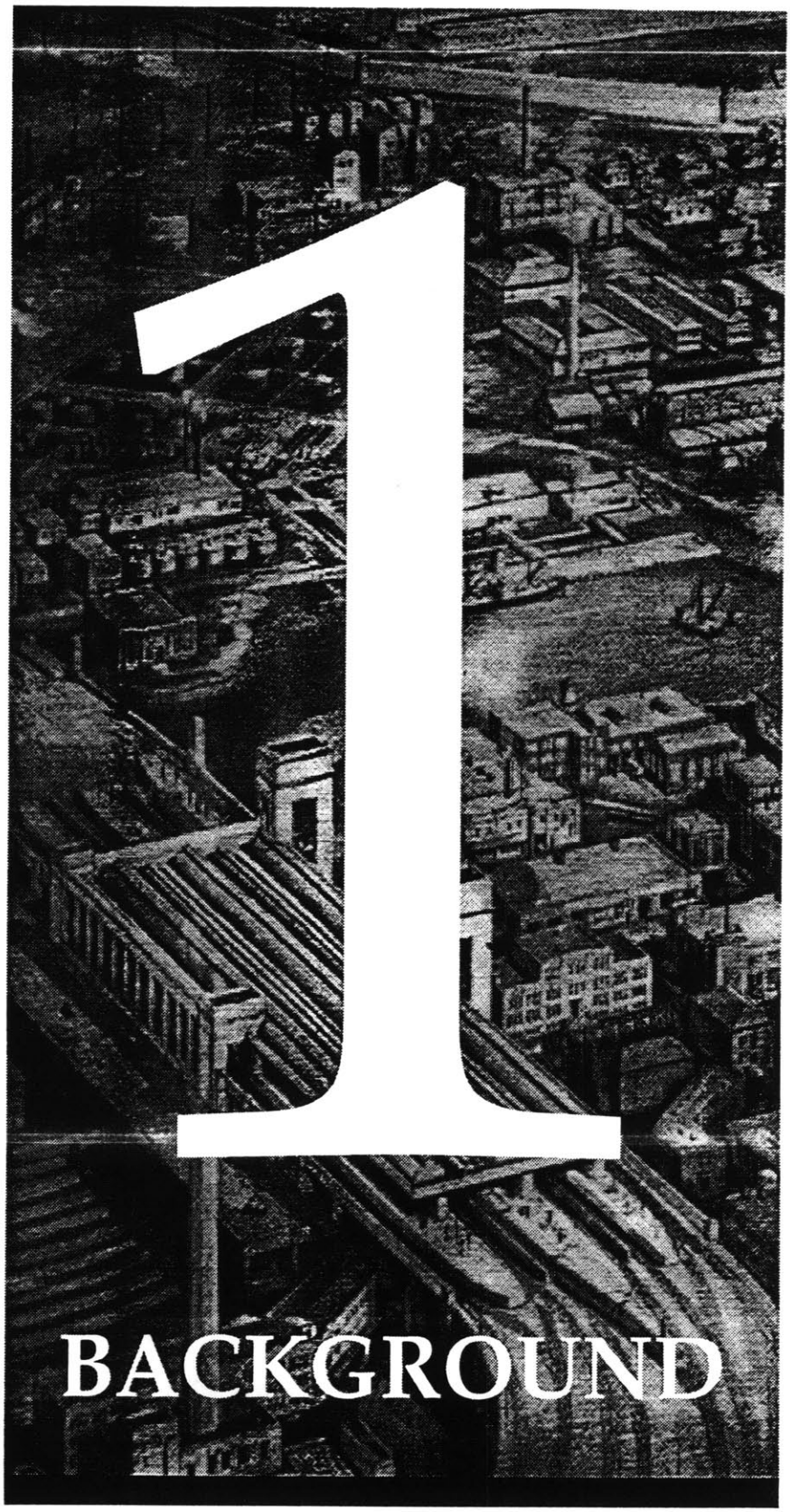
participation. My purpose in writing this thesis was to get a better understanding of community networks and to see if they could possibly live up to their expectations.

The thesis is divided into four chapters. The first outlines what community networks are and how they are different from commercial systems. The chapter also reviews the definitions of words that are frequently associated with community networks such as "community", "access" and "democracy".

The second chapter is a "tour" of some of the community networks that have been on-line for at least one year. The tour is not exhaustive by any means, but it does give a sense of what the systems are like. Particular attention was paid to aspects of pubic discussion and government participation. The community networks were divided into four main types – Free-Nets, neighborhood bulletin boards, government-sponsored networks and wired cities. There is also a brief review of some new community network models that are appearing as well as some commercial networks which emphasize public discussion.

The third section looks at monitoring and evaluation of community networks. It reviews how evaluation can be done, how it has been done in the past, and the criteria for long- and short-term goals.

Finally, the fourth chapter summarizes the findings of the thesis and makes some conclusions on the future of community networks.



1 BACKGROUND

Introduction

This chapter defines community networks and describes their distinguishing characteristics, goals, and history. It then goes on to describe more precisely words and concepts that are frequently associated with community networks such as community, access, and democratic participation.

Community Networks

Community networking is known by many names – community-based computer networks, community computing, community telecomputing, community bulletin boards, civic networking, telecommunity systems and community information systems (Morino 1994).

Though their names may differ, a community network is always a network of computers with modems that are interconnected via telephone lines to a central computer which provides:

- community information; and
- a means for the community to communicate electronically.

A resident of a town or city uses the system by dialing into a central computer with their personal computer and modem. A series of menus appears on the screen and the user selects the information or communication services they would like. They pick up information provided by city hall, a business or social service provider, participate in a public discussion on a local issue with others in the community, or communicate via e-mail with others in the community (Guthrie et al. 1990; NPTN 1994c).

Unlike the similarly named "on-line communities" or "virtual

[1] Virtual or on-line communities refer to groups of people who congregate (electronically) to discuss specific topics which range from academic research to hobbies. They are linked by a common interest or profession. There are no geographic boundaries to on-line communities and participants anywhere in the world can participate.

communities",[1] community networks are based in a physical place – what participants have in common are their cities and neighborhoods.

Community networks benefit many groups. They offer residents of the community and its schools access to information and communication services; governments can provide citizens with information; residents can communicate with elected officials quickly and inexpensively; small- and medium-sized businesses have access to information and communications that normally would only be available to large firms; the telecommunications industry can offer its services to a much larger demographic group; and community organizations and institutions can communicate with each other and their clients in the community (NPTN 1994c).

Distinguishing Characteristics

Although every community network is unique, they all share three characteristics (in addition to the basics of providing community information and a means to communicate electronically) that distinguish them other types of commercial networks and bulletin boards.

1. Local. The most distinguishing characteristic of community networks is their focus on local issues. They emphasize local culture, local relevance, local pride, and community ownership (Morino 1994).

Examples of the type of information and services that can be found on these systems are schedules for public transportation and adult education classes; job opportunities; city legislation; school lunch menus; calendar of events; homework help lines; advice from local professionals and tradespeople such as auto mechanics, lawyers, librarians and police; restaurant listings; tourist attractions; motor vehicle renewals; health information; indexes to local newspapers; social services information; and reports from members of Congress (Cisler, 1993). In addition to information services, community networks provide forums for residents to discuss local issues.

2. **Access.** The second feature that distinguishes community networks from commercial networks and bulletin boards is their concern and effort to ensure that the network reflect and include all members of the community and not just traditional computer and telecommunication users. This means that community networks are frequently involved in placing computer equipment in publicly accessible places such as community centers and libraries.

3. **Social Change/Community Development.** Community networks' third characteristic is the belief that the system with its communication and information can strengthen and vitalize existing communities. Community networks are frequently seen by their organizers as a tool - not very different from tools such as printers, photocopiers, telephones, radio or television that have been used for community organizing in the past. It is believed that community networks can be used by the local community to find and build solutions to their problems (FreeSpace 1994b; Guthrie et al. 1990; Morino 1994).

There are a number of commercial networks that share some similarities to community networks. However, they are still quite different in that they

Figure 1: Comparison of Commercial and Non-Commercial Networks

	Non-Profit Community Networks	**For-Profit Community Networks e.g. CitySource**	**Commercial BBSs e.g. ECHO, WELL, Channel 1**
Local Focus			
Information	♦♦♦	♦♦♦	♦♦
Discussion	♦♦♦	♦♦♦	♦♦
Public Access	♦♦♦	♦	o
Community Development	♦♦♦	♦♦	o
Self-financing	o	♦♦	♦♦♦

♦♦♦ always
♦♦ usually
♦ sometimes
o rarely/never

often have less local information and less discussion of local issues. They are rarely concerned with providing public access terminals and community development is not a priority. And, unlike community networks, they are entirely self-financing and do not rely on government or corporate sponsorship.

Goals of Community Networks

Because community networks are intended to serve the community, each will reflect the particular interests and needs of the individual place, but most networks have two principal functions:

- to increase communication between the residents, and between the residents and local government and institutions; and
- to facilitate the provision and exchange of local information.

The goals of individual civic networks are as varied as the networks themselves but three goals or expectations are common.

1. Strengthen Community. Increased communication and information will increase the sense of community, increase involvement in the community, and serve as a tool to solve some of the problems facing the community at a grass-roots level.

2. Improve Democracy. Community networks will "improve democratic governance and empower citizens to become more active and informed" (Media Access Project 1994).

3. Ensure Inclusion in the NII. Community networks can help ensure that the entire community, irrespective of income, is included in the evolving National Information Infrastructure.[2] This means using the network to support economic growth, education, and social services.

[2] In September 1993, the Clinton Administration announced an initiative to promote the development of a National Information Infrastructure (NII):"...that would create a seamless web of communications network, computers, databases, and consumer electronics that will put vast amounts of information at users' findertips. ..[That] can help unleash an information revolution that will change forever the way people live, work, and interact with each other. " — Information Infrastructure Task Force, The National Information Infrastructure: Agenda for Action, Sept. 15, 1993.

Assumptions

There are some fundamental assumptions behind the concept of community networks and their goals. One of the better summaries of these assumptions is quoted below. Though the following is referring to the concept of wired cities[3], the assumptions also hold true for community networks.

> There are fundamental assumptions about communications technology and society that underpin interest in the wired city concept. They are:
> 1) that the new communications technologies will be increasingly important to the economy and society of modern information societies.
> 2) that there are inherent biases in the newer electronic media that reinforce more democratic and decentralized modes of communications;
> 3) that new media provide the capability for telecommunications to reinforce face-to-face patterns of communication;
> 4) that telecommunications infrastructures are a public utility rather than a private commodity; and
> 5) that long-range, rational-comprehensive developments in communications remain practical and desirable despite rapidly changing technologies and policies.
>
> In these assumptions, we see that the wired cities concept is as prescriptive as it is predictive of the future of communications. It provides a perspective on how communications should be developed, not just a forecast of how it will be institutionalized.. (Dutton et al. 1987)

Brief History

During the mid-1970s, Community Memory, the first community network, was created in Berkeley, California to help strengthen the Berkeley community. Community Memory terminals were placed in public places such as libraries and laundromats but could not be reached via modem or from the Internet. Anything on the terminals could be read without charge but it cost $0.25 to post an opinion and $1.00 to start a new forum. Community Memory was unique in that anonymity was allowed, all

[3] The term "wired city" was first developed during Lydon Johnson's administration in the context of the "Great Society" and the promotion of telecommunications to improve city living and stimulate regional development.

messages were public, there was no central authority that made information available, and all of the material in the system was local (Felsenstein 1993; Schuler 1994).

In 1978, the first bulletin board service (BBS) was created in Chicago and in 1986 the first Free-Net in Cleveland was established, operating out of Case Western University. The momentum increased and Frank Odasz started Big Sky Telegraph in Montana in 1988 with the intention of linking the state's one- and two-room schoolhouses. In 1989 the PEN system in Santa Monica was established and the National Public Telecomputing Network (NPTN) started soon after. Since then the interest in community networks has surged, with new systems appearing every year.

Funding has also recently become available for community networks. In 1993 the Corporation for Public Broadcasting (CPB) made $1.4 million available to 12 communities for public education and information on-line services (Strait 1994). In 1994 , the National Telecommunication and Information Agency, Telecommunication and Information Infrastructure Assistance Program (NTIA TIIAP) grant program was established, making $26 million available to develop public telecommunication applications and services (NTIA 1994). This amount is expected to at least double for 1995.

Morino (1994) summarizes these developments in the following timeline.

1970: ARPANET created
1974: Community Memory created
1978: First BBS
1980: Old Colorado City - first community-oriented BBS
1984: "St. Silicon's Hospital" medical BBS
1986: Cleveland Free-Net
1988: Big Sky Telegraph
1989: NPTN founded
1989: Santa Monica PEN
1991: Gopher, WAIS released
1992: Internet Society, CCN founded
1992: World Wide Web created
1993: Mosaic released
1993: NII: Agenda For Action published
1994: CPB, NTIA awards announced

Criticism of Networking

Though proponents are enthusiastic about the potential of community networks and the general consensus is that community networks can make a positive contribution to people's lives at the city or neighborhood level, critics have raised important issues about these networks.

They question whether electronic communication will replace what little face-to-face contact there already is between people; they also see networks and communication technologies in general as a serious threat to society. They fear that these networks will only further isolate and distance us from our neighbors. They worry that Americans already spend an average of 3–4 hours a day watching television and fear that "as the recreational and social applications of the cyberspace increase, there will be a greater temptation to extend this time of relative isolation" with the result that there will be little need to venture out of the home (Paul & Gochenouer 1994).

There is also concern that the creation of community networks will create a division between those who can participate in the discussion of community and governance and those who have no access to the system. They question whether these networks will disenfranchise parts of the population even further and whether the word "community" only means traditional computer users who are usually upper-income, male, and young.

Frequent criticism also comes from commercial providers who object to community networks providing free or low-cost Internet access, thereby taking business away from the commercial providers (Freenets 1994).

Though it is useful to be aware of the propensity in our culture to rely on private entertainment in the privacy of our homes, these arguments ignore the fundamental purposes, characteristics, and goals of community networks. Unlike the usual forms of electronic entertainment, users of community networks are expected to be producers and contributors of

information and not passive consumers of movies and games. In addition, the goal of community networks is not to substitute physical communication but to reinforce it. Proponents believe that if residents have the opportunity to know their neighbors better, it will lead to increased face-to-face contact, increase their participation within the community and encourage them to take part in neighborhood activities. Community networks are seen by their organizers as tools for actively rebuilding community life, not destroying it.

The concern for those who may be excluded from community networks is very legitimate: of the few surveys conducted, the results indicate that the majority of the users of these systems are young and male.

Most designers and organizers of community networks are very much aware of these issues and concerns and actively try to create systems that will not isolate residents or inadvertently contribute to the deterioration of a community. However, though the intention and potential is positive, it remains to be seen whether community networks will actually succeed in rebuilding community life, including all residents in the system and reaching their potential.

Definitions

When discussing community networks, the words community, access and democracy are frequently used and can have a variety of meanings. This section reviews how these terms are used in relation to community computing and the issues related to these core concepts.

Community

There are the two common meanings to the word community.[4] The first is a physical place such as a town, city, or neighborhood. A group of people who live in that place are associated because they share physical proximity, and live under common rules and shared government. Often, but not always, they also share a common cultural and historical heritage.

The second meaning is a social group of any size that shares common interests, whether those be social, professional, occupational, or religious. These are the "virtual communities" or "on-line communities" that are often found on networks – they gather together electronically in newsgroups or mailing lists to discuss specific topics which range from academic research to hobbies. There are no geographic boundaries to on-line communities and participants can be located anywhere in the world. An individual can belong to a number of these "communities."

Similar to the dictionary definitions is the discussion of community in Melvin Webber's *"Urban Place and Nonplace Urban Realm"* (1964, p.108):

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[4] Community: 1.a. A group of people living in the same locality and under the same government. b. The district or locality in which such a group lives. 2. A group of people having common interests: *the scientific community; the international business community.* 3.a. Similarity or identify: *a community of interests.* b. Sharing, participation and fellowship. 4. Society as a whole; the public. 5. Ecology. a. A group of plants and animals living and interacting with one another in a speecific region under relatively similar environmental conditions. b. The region occupied by a group of interacting organisms. –The American Heritage Dictionary of the English Language. Third Edition. Boston: Houghton Mifflin Company. 1992.

> The idea of community has similarly been tied to the idea of place. Although other conditions are associated with the community – including a "sense of belonging", a body of shared values, a system of social organization, and interdependency – spatial proximity continues to be considered a necessary condition.

He goes on to discuss the idea that accessibility rather than proximity is becoming a more important aspect of "place." He says spatial proximity is less important than interaction and reminds the reader that "it is clearly no linguistic accident that 'community' and 'communication' share the Latin root communis, 'in common'. Communities comprise people with common interests who communicate with each other." Those who share the same neighborhood or city

> share an interest in lowering the social costs of doing so, and they share an interest in the quality of certain services and goods that can be supplied only locally. It is this thread of common interests in traffic flow on streets, garbage collection, facilities for child rearing, protection from miscreant neighbors and from the inhospitable elements, and the like, that furnishes the reason-for-being of municipal government. ...certain business firms and voluntary institutions. (p. 111)

In addition to these two common meanings of community, a third meaning is becoming more prominent. In this definition, community is a "feeling" of belonging or attachment and sharing something in common. It is not just that you *are* part of a community, you must *feel* and be conscious that you are part of a community and be responsible for it. This is not a new concept. In 1630 on a ship bound for New England, John Winthrop lectured that

> We must delight in each other, make each other's condition our own, rejoice together, mourn together, always having before our eyes our Communion and Community in the work, our Community as members of the same body. (Wilson, 1968, p.1)

The prominence of this social value has risen and fallen since Winthrop's time, but recently it has become more popular again. Over the past decade there has been a growing belief that the alienation and lack of connection felt by individuals in society can be relieved by returning to and

strengthening communities and community institutions. With this belief has grown the communitarian movement[5] (D'Antonio 1994) which looks to the concept of community and its ability to resolve social problems.

In the case of community-based computer networks, all three definitions are relevant. People who use the network live in a physical community, and discuss topics common to that particular community, with the belief that change or improvement of the community and/or individual will result from using the network.

Related to this is the common community network goal of strengthening community. This can mean the ability of the community to develop and attain its goals, but it can also refer to the attachment that residents feel towards the neighborhood or place where they live.

Attachment to Neighborhood as an Aspect of Community

To better understand the aspect of attachment to place[6] that a resident feels, it is useful to very briefly review some of the research from environment behavior literature on the variables that influence community attachment.

Attachment to neighborhood is considered to be a complex process and a significant amount of research has been done, particularly in showing the effects of population size, density, length of residence, age and status on whether the person feels a sense of belonging, whether he/she is interested in the community and whether he/she would be sorry to leave the community (Cook 1988; Kąsarda & Janowitz 1974). Some of the more interesting and recent research (Woolever 1992) has shown that attachment to a neighborhood results from the amount of interaction by the residents, which includes informal visiting with neighbors and formal participation

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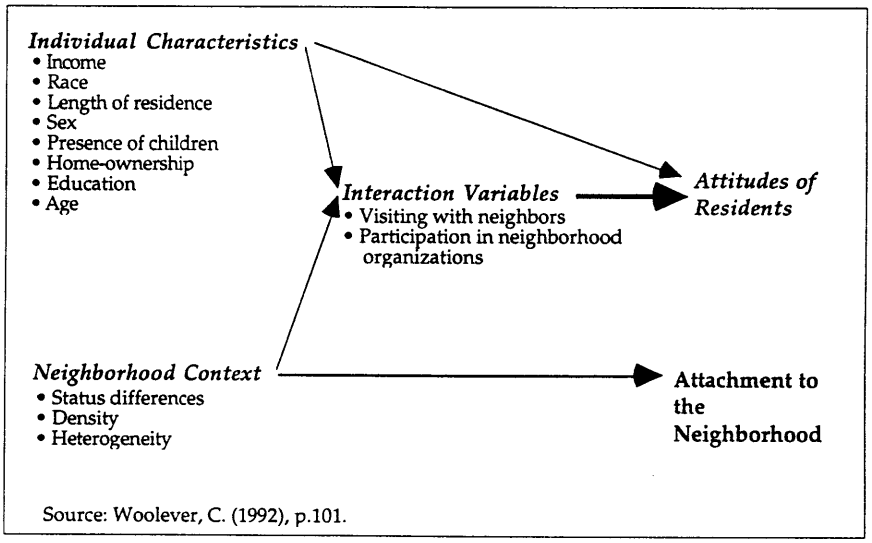
5 Communitarianism is a new movement let by Amitai Etzioni, a George Washington University sociology professor, and begun by a network of academics.

6 There are eleven different meanings of "place" found in the environmental-behavior literature (Childress, 1994) when discussing "place attachment." Here place is used in its simplest and most common form: a recognizable environment or locale.

in neighborhood organizations. However, predictors that influence the amount of participation include both individual characteristics (income, length of residence, sex, presence of children, home ownership, education and age) and the neighborhood context (status, density, and heterogeneity).

The figure below by Woolever shows the variables and issues that were found to influence the attitudes of residents and their attachment to the neighborhood. Personal attributes and neighborhood context are predictors of both social interaction and attachment to the neighborhood. The attachment to the neighborhood mostly comes from the formal and informal interaction and the physical context in which it occurs, while socio-demographic characteristics were less important.

Figure 2: Variables that influence attachment to the neighborhood



Source: Woolever, C. (1992), p.101.

According to the research, if one wants to increase the attachment of residents to their community, one way is to provide ways to increase informal interaction between residents and participation in community organizations.

Community networks are designed to increase interaction between residents and community institutions and organizations. Though this interaction is not face-to-face, many community networks use electronic discussions to reinforce face-to-face encounters.

Access

If, by definition, a community network is a reflection of the community, then all members of the community must be able to participate in the technology and the system. Access to the system/network consequently becomes a fundamental issue if community networks are to succeed. Unfortunately access is not a straightforward issue of handing out computers and modems to everyone in the community.

A more useful approach is to ask:

- Access for whom? and
- What are the barriers to access?

The process of answering these two questions begins to suggest ways of approaching and resolving the problem.

Access for Whom?

Who should we be worried about? Who in the community is in more danger of not participating and being left out of the technology and its benefits?

It is sometimes easier to say who we are less worried about. Until recently, the stereotypical computer user was white, English-speaking, middle-class, adolescent and male. Though this is a stereotype, there is some truth to it; this group has dominated the field and has had an overwhelming influence on computer networks.

The group or groups that have not been involved in the technology in the past and may continue to be excluded from it are:

- poor,
- non-English speakers,
- illiterate,
- disabled,

- older, and/or
- female.

The reasons why these groups have not participated in the past vary from group to group.

The Poor: People of color, non-English speakers, the disabled, women, and the elderly statistically tend to have lower incomes in this country and low-income households are far less likely to have computers in the home, schools, or workplace. The Bureau of Census has just recently started to collect statistics[7] on the use of computers in the home. The curve is smooth and upward sloping: the higher the household income, the higher the ownership and usage of computers and communication equipment.

Non-English Speakers: English is the predominant language used nationally and internationally on computer networks. The inability to speak English puts a person at an enormous disadvantage – both on-line and in everyday life. Those whose languages do not use the Roman alphabet are at an even greater disadvantage.

Illiteracy: Even those who speak English as their first language can be at an enormous disadvantage because without the ability to read and write fairly well, using computer and communication technology is impossible.

The Elderly: Older people, irrespective of income or education, often feel that the technology is the domain of the young and believe that people's ability to learn new things decrease with age.

Women: Our culture teaches and reinforces in subtle and not-so-subtle ways that science, mathematics, computers and technology in general are not suitable subjects for women and can actively discourage them from showing interest or ability in these subjects.

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[7] The Census Bureau started collecting this information in October of 1993.

Disabled: Those who are physically disabled can be at a disadvantage using computer technology unless the hardware and/or software is adapted to the individual's needs. In addition, the physically disabled may be less mobile and therefore have greater difficulty getting to public access centers.

The percentage of the population that falls into at least one of these categories is very high, and clearly any community network that does not address the specific needs of these groups cannot be representative of the community.

Why the groups cannot or do not participate in computer and communications technology is also tied to the barriers that the technology presents.

What are the Barriers to Access?

There are a number of potential barriers to using the technology. They include cost, physical access to public equipment, training, cultural attitudes, content, methods of communication and bandwidth.

• **Financial Access**

Financial access includes the amount it costs to buy the equipment (computer and modem) and software, as well as the cost of on-line connection time which can be quite high. For example, the price for a low-end computer and modem starts at $1,000. On-line charges for the commercial networks such as America On-line and CompuServe are approximately $9.00 per month for 5 hours of limited service. In urban areas, an Internet account can cost $20 per month for 20 to 30 hours, and the cost for a SLIP/PPP connection, which permits the use of WWW browsers, is approximately $25 per month for 40 hours, when available.

Even though the cost of the hardware, software, and connection time continues to fall every year, the cost will still be too high for many families. To compensate, neighborhood computing centers are springing up in many

cities. For a modest fee, a resident can come a center and use the equipment, as well as receiving training if desired. Funding for these centers comes from donations and user fees.

• **Physical Access**

If community or neighborhood centers are a partial answer to ensuring that low-income families have access to the technology, it is essential that these centers are convenient, safe and welcoming places, preferably open 24 hours a day. There should be people in the centers to help residents use the equipment and to supervise its use. Some cities have put public computer centers in laundromats, public libraries, community centers, churches and youth centers. Still another model is the electronic café; a number of commercial cafés have installed computers with Internet access so that patrons can "surf the net" while they drink coffee.

• **Technical Training**

Though the equipment and software may be getting easier to use, first-time users still need technical training and assistance.

• **Attitude/Culture**

Because women and older people can feel that their age or gender bar them from the technology, efforts must be made to ensure their participation. Training and supervisory staff of neighborhood centers should be diverse in age and gender and sensitive to the different approaches and needs of their users. Neighborhood centers should also be available at times that are convenient for their clients. Parents with children can be made more welcome by providing child-care services or activities for the children.

For those who do not speak English well, staff should be able to offer training in the primary language of this group.

• **Content**

The population that is less likely to participate in the technology often feels that there is nothing for them once they get on-line. This could be partly

true of some systems, but most community networks can offer a vast range of topics and it is easy for individuals to start their own interest group for like-minded people.

• **Methods of Communication**

Again, women and people from other cultures can feel excluded from the technology because of the way that information is communicated.[8] To overcome this problem, ways to cope with and/or avoid it should be part of any training, and organizers of community networks should make special efforts to design systems and policies which reduce hostile behavior to a minimum.

• **Bandwidth**

Bandwidth refers to the quantity of data and the speed at which a user can receive it. Over normal telephone copper wires, one can send and receive text quite easily. However, it is only with higher speeds and capacity that one can send and receive graphics and video.

This is an issue for low-income communities because presently there are no laws that govern how bandwidth capacity is allocated among communities. As a result, private companies decide who receives higher capacity lines and not unreasonably, they are more likely to install them in higher-income neighborhoods which they consider to be a better market.

It is important that low-income communities not be ignored and left out of infrastructure development, because their future economic development may depend on it.

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[8] Online communication is infamous for its flames – hostile messages sent to those who disagree. Many on-line discussions tend to be dominated by males who pontificate and lecture rather than discuss and women frequently complain of outright harrassement and threats by men who disagree with their position.

Universal Service and Open Access

Universal service, as we know it today, means ensuring that all households have basic voice-grade telephone service, commonly referred to as "plain old telephone service" (POTS) at an affordable price. Its objective has been to ensure that anyone could pick up the phone and speak with anyone else in the country at a reasonable cost.

Interestingly, today's definition of universal service is not the original one. Earlier in this century, universal service did not mean that everyone would have telephone service. Instead, it meant a unified, non-fragmented service (Mueller 1993) that would allow those who did have telephone service to be able to connect to each other. The policy was the result of a situation where Bell and the other independent telephone systems refused to interconnect, forcing businesses to subscribe to all the systems in order to reach their customers.

Universal service was funded through a rather complicated system of subsidies in a regulated monopoly of AT&T. Higher fees were charged for business and long-distance calls which subsidized the residential users and local calls, while urban users subsided the rural areas. In addition, lifeline programs, 911 services, and services for the hearing impaired were covered though the subsidies.

In spite of universal service, the U.S. has not attained universal coverage. It is estimated that 92.9% (Schement et al. 1993) of households in the U.S. have telephone service. In order to provide minimal service to the 7% without telephone service, over half the states have implemented a lifeline service for a minimal monthly charge.

To many, including the Clinton administration, it is important to extend the concept of universal service to include the National Information Infrastructure (NII) and the new information and communication

technologies. They state, "Updating our universal service goal would begin the process of giving all Americans who desire it easy, affordable access to advanced communications and information services, regardless of income, disability, or location" (NTIA 1994).

Open Access

While universal service concerns connection and affordablity, open access is a somewhat less precise concept and concerns how we use that connection to access the NII. Open access involves issues such as easy-to-use interfaces, interoperability, security, privacy and usability.

The issue of extending access beyond a connection is important because access must also include the cost of equipment (computer and modem), software, training, a high-quality reliable wire or cable, and the services that will be available. Without considering all these aspects, simple connection becomes meaningless.

Importance of Universal Service and Open Access

Universal service was developed because telephone service was considered essential for a person to participate fully in our economy and society. This same reasoning leads many to believe that universal service should be extended to include all of the new information and communication technologies. They argue that the technology and the NII, which promises improved health care, education and democratic participation, will become so important that a person without access will be seriously limited in terms of economic opportunity and participation in democratic society.

However, this vision is not shared by everyone. Many predict that the technology will not become so important and ubiquitous and therefore government needn't be involved. They do not see the service as central or essential and believe that it should be left entirely to the private sector, rather than the government.

Democracy and Democratic Participation

Much of the literature and many of the existing and planned community networks state that both the technology and the model of community networks can increase participation in the democratic process. But, in order to judge whether they are able to meet these goals, and in what way, it is useful to look at the meaning of democracy, democratic participation and the role of technology in governance.

One of the more useful overviews of democracy and the relationship of technology to it is *The Electronic Commonwealth* by Abramson, Arterton and Orren (1988). The authors state that there are three types of democracy: plebiscitary, communitarian, and pluralistic.

Types of Democracy

1. Plebiscitary Democracy

This type of democracy emphasizes the moral correctness of allowing as many people as possible to participate in governmental affairs. In this view individuals are empowered by being able to do more than simply electing representatives and should function as their own legislature by holding plebiscites and referenda.

The technology of computer networks allows direct participation in the democratic process more than ever before, especially through electronic voting. However, the speed and ease of voting can also be a threat because there is no deliberation or public discussion by the voter. The result reduces political participation to merely registering private opinions on a subject and democracy becomes the sum of private interests rather than public interests.

2. Communitarian Democracy

In communitarian democracy, it is believed that democratic politics should engage the individual in public debate and discussion. Through debate,

the interests of the individual are enlarged and individuals come to see themselves as part of a whole. Communitarian democracy does not allow the majority to ignore the needs of the minority but seeks to enhance what we have in common.

The technology of computer networks can enhance this version of democracy by providing a public space for debate and discussion to occur such as in an electronic version of a town meeting.

However, the negative side of communitarian democracy is that a community doesn't necessarily have positive values – a community could just as easily enforce its own values and close itself off from foreigners or outsiders. Ed Schwartz, of the Institute for the Study of Civic Values, remarked on this aspect.

> But, as J. Thomas Hennessy notes, just (because) we organize a neighborhood doesn't mean that we've advanced the cause of justice. A white neighborhood can organize to exclude African-Americans. A neighborhood of homeowners can work to zone the poor out of immediate existence. "Community" merely presumes that people will organize around shared goals, not that the goals themselves are uniformly noble. (Schwartz, 1994)

3. Pluralistic Democracy

Pluralistic democracy is based on the principle of free competition among groups. Individuals can join a group according to their interests and these groups compete in the democratic process. This type of democracy gives every group an incentive to bargain and negotiate with the majority opinion, thereby "taming" the political power of the majority.

Computer networks work very well in a pluralistic democracy because they make it easy to contact, address and organize wide variety of groups and interests.

The negative aspect of pluralistic democracy is that it ignores the fact that there are many in our society who are excluded from involvement in politics

because of poverty or prejudice. It also has the unfortunate aspect of turning politics into simply a game of winners and losers with little obligation on the part of the winners to consider the needs or wishes of the losers.

Thin and Strong Democracy

Still another useful book that describes various types of democracy is *Strong Democracy: Participatory Politics for a New Age* by Benjamin Barber (1984). The author divides democracies into two main types: strong democracy and thin democracy.

He asserts that strong democracy is a response to the dilemmas of the political condition and that "strong democracy in the participatory mode resolves conflict in the absence of an independent ground through a participatory process of ongoing, proximate self-legislation and the creation of a political community capable of transforming dependent private individuals into free citizens and partial and private interests into public goods." (p. 151). And unlike thin democracy which either eliminates, represses, or tolerates conflict, he feels that strong democracy transforms conflict.

Governance and Networks

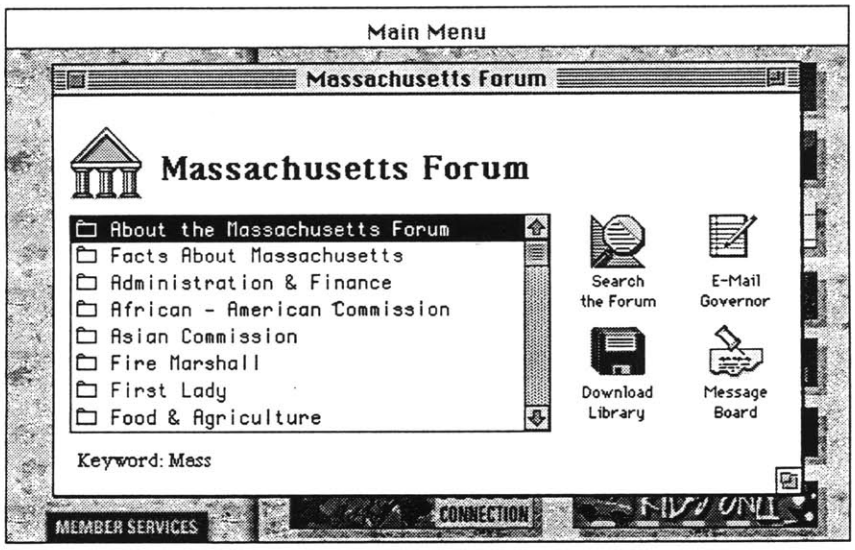
The political process continues long after the elections. Communication technology can be used for governance in a variety of ways. Again, the authors of *The Electronic Commonwealth* outline three ways that the technology is and can be used: citizen groups lobbying government, government mobilizing support for policies, and government officials communicating among themselves.

1. Citizen Groups Lobbying Government: There are several ways that citizen groups can use technology to put pressure on policy making. They can lobby directly by contacting decision makers and/or mobilize and educate their members and potential members in support or opposition to

policies. Volunteers can also "meet" and work from home. The technology is less useful for contacting the general public because of the nature of networks which generally is designed to appeal to small interest groups. "Spamming"[9] is very much frowned upon in networks in general and the Internet in particular.

2. Government Contacting Citizens: Public officials often need to contact the public to explain their policies, to negotiate with them, and to inform them of specific laws, rules, or policies. Citizens, in turn, often need to contact public officials on policy issues. Network technology can aid this process by making information available to the public on a network. This eliminates the need for government departments to repeatedly supply the same information to frequently asked questions. And e-mail, which is part of most networks, makes correspondence between the official and the individual very easy and straightforward. However there is always the potential for governments to misuse the network as a platform for electioneering rather than governing.

An example of government officials using network technology to contact the public is the Governor of Massachusetts' forum on America On-line, a



[9] Spamming is the indiscriminate sending of messages to as many people as possible without considering their potential interest in the message.

commercial on-line service.

3. Government to Government Contact: Public officials also need to contact each other. Since the American government has been designed to be highly decentralized, effective communication between levels of government with overlapping responsibility is essential. Network technology could be very useful for providing a place for officials to discuss issues and communicate with each other.

Electronic Voting

Computer and telecommunication technology has been held up by proponents of plebiscite democracy as the answer to democratic participation. They contend that the technology would allow government to easily poll voters on their attitudes on any issues.

Critics of electronic voting claim that experiments show that actual participation in electronic voting is even lower than voter turnout in elections. But more importantly, they are disturbed by the notion that voting and politics are construed to be a form of entertainment, little different from a video game. They feel that electronic voting simply degenerates into a system of polling individual opinions or prejudice with little civic education taking place. Even in formal debate situations, electronic voting can distract participants from the content of the discussion and focus on who is winning and who is losing. Some critics also point out that for those who fear the privatization of our culture and our increasing non-involvement in public life, electronic voting only seems to exacerbate the tendency. [10]

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[10] A commercially available program called eVote is available, which allows the user to design and conduct a vote on any subject. The system can have yes/no or numeric votes, single or grouped items, public or private items, changed votes until the vote closes and voters can watch the vote tally develop. Also embedded in eVote is a way for users to bring up issues on the topic.

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2 COMMUNITY NETWORKS

This chapter gives a tour of several community networks and the services they offer. It is not in any way an exhaustive or thorough look at any particular system[11] or all the community networks that exist. Rather, it's intended to give a sense of the structure, software, and kinds of information and services that are available. Particular attention is given to the areas of public discussion and government participation.

Introduction

Most community networks offer a variety of information and communication resources that are relevant to the local community. For example, they often support the placement of public-access terminals in public places; they provide access to social service agencies and professionals such as doctors, lawyers, and accountants; they offer the means to discuss civic issues publicly through electronic conferences or forums; and they offer e-mail to participants. Many also offer Internet access.

Some community networks are non-profit and free to users while others are non-profit but charge access fees. Few community networks are run for profit. Almost all these systems operate on low budgets (less than $100,000 a year) and rely heavily on corporate and government donations and volunteer labor. Volunteer labor is key to community networks since almost everything that appears on the network is put there by individuals or organizations in the community who contribute their time, effort, and expertise to provide the information and maintain the system (NPTN 1994c).

Four Types of Community Networks

Because every community network is a reflection of local culture, it is by definition unique. As the number of networks has grown, however, several

[11] A list of on-line addresses for community networks and city information systems can be found in the appendices.

models or types of networks have emerged and new models are appearing every year. I have divided non-profit community networks into four rough types:

- Free-Nets,
- bulletin boards,
- government-sponsored networks, and
- wired cities.

These categories can have overlapping characteristics. For example, the Wellington City Council Network in New Zealand [12] is a government-sponsored network but uses FreePort, the Free-Net software. In spite of occasional overlaps, I've created four groups based mainly on their focus and who initiated and maintains the network. Though new models are emerging every year, I focused on community networks that have been in operation for at least one year.

Figure 3: Four Models of Non-Profit Community Networks

	Free-Nets	Bulletin Boards	Government Networks	Wired Cities
Focus	• city-wide • community development • access	• neighborhood wide • community development • access	• city- or state-wide • city information	• city-wide • physical connection • business
Initiator/ Maintainer	• small group with institutional support	• small group with limited support	• city hall or state government	• private/public partnership

A Framework for Future Classification

In order to better understand non-profit community networks, it is useful to have a framework with which to compare and analyze them. A useful framework was developed by Kendall Guthrie and William Dutton (1992) to analyze four city-wide networks in southern California. In their research they classified networks by describing:

12 Wellington's City.Net can be found at: http://www.wcc.govt.nz /index.html

1. the design of the network (i.e. the technical and policy decisions made), and
2. the factors which led to that design.

Network Design

Though community networks often have similar goals, the technological choices made when designing the system have a strong influence on who uses the network, how they use it, and to what purpose. The choice made by designers is not neutral or value-free.

As Guthrie and Dutton state:

> ...one can view the adoption and design of a community information system as a process comparable to legislating public policy on citizen participation. In this case policy is imbedded in the technology–the arrangement of people, equipment, and technique–rather than in law or regulation. Like policy, technology is a social construction–the outcome of social and political choice. However, in the case of technology, these policy choices are too often obscured or overlooked because people focus only on decisions about the adoption or nonadoption of a technology rather than also attending to decisions about design and implementation of the technology that influence its use and impact. (Guthrie and Dutton 1992, p.574)

In their framework, Guthrie and Dutton contend that the most important technological and policy choices that shape a community network include:

- **System capacity** (memory and the number of simultaneous users it can support);
- **Accessibility** (number of public terminals and cost of private terminals);
- **Information content** (commercial vs. non-commercial);
- **Editorial control** (complete control vs. a common carrier system);
- **Ownership** (private, public, nonprofit, or a combination);
- **Financing** (public, commercial, subscription); and
- **Architecture of the communications channels** (one-to-one, broadcast, or one-to-many). There are four main types of systems or models.

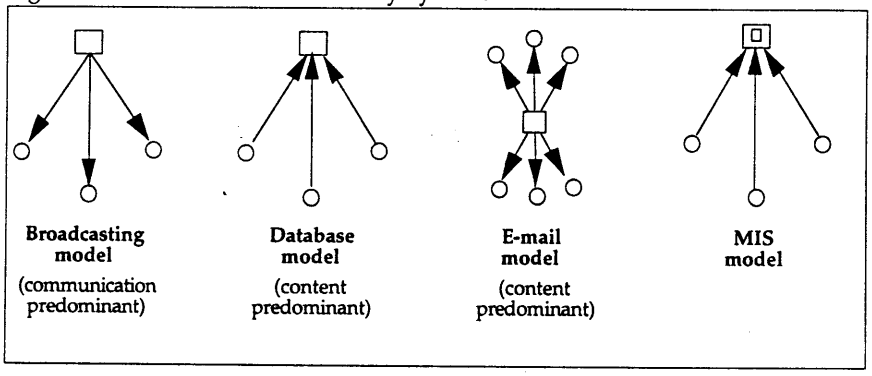
Electronic mail: maximizes communication among a community of users by making it easier to exchange information with minimal regard to real time, space, or social hierarchy. Also implicit in the model is the idea that the technology primarily consists of communication channels where the content is decided by the users and not by the system owner – in other words, the model of a common carrier.

Broadcasting: places greater emphasis on content rather than communication. From this perspective, the problem is how to allow one source to send the same information to the maximum number of dispersed people. Implicit in this model is the idea that the owners of the communication channel control information content and broadcast what is beneficial to them. It does not focus on feedback or communication among users.

Database: This model also places greater emphasis on content than communication. It defines the problem as how to make a particular body of information accessible to a specific group of users. It aims to make available the particular information that people want, at the time and place they want it. Emphasis is placed on the information that users want to receive rather than what information the channel owners would like to disseminate.

MIS: This model looks to computers to help better manage and process large quantities of information. For example, this model would consider allowing citizens to access a city's geographic-based information system so that residents could inquire about land use and other geographically-coded information.

Figure 4: Four Models of Community Systems



Factors That Influence System Design

Guthrie and Dutton also believe that there are five factors that strongly influence the technological and policy decisions. They are:

- **Technical History.** The choice of the type of technological model often comes directly from the model with which the designers are most familiar and is based on the background and professional training of the designers.
- **Political Culture.** Three of the most important aspects of the political culture are: the prevailing political ideology, citizens' expectations of local government, and the level of political participation. These aspects strongly influence who owns the system and how it is financed and managed.
- **Economic Factors.** The economic climate of the community plays an important role as well as the priority that the community places on economic considerations. Not surprisingly, economic factors are often strongly connected with the political culture.
- **Interest Group Politics.** Interest groups that can affect the design of the system include the business community, social service providers, the school district, the real estate industry, and the health industry.
- **Community Involvement.** The inclusion or exclusion of community involvement can also make a significant difference in how the network is designed and operated.

A Framework

Though the four models of community networks discussed earlier (Free-Nets, bulletin boards, government-sponsored networks, and wired cities) allow a general description of networks, the framework proposed by Guthrie and Dutton offers a much more solid base from which to compare and analyze community networks.

However, there are additional useful questions that should be added to the list, such as:

- Who were the individuals, organizations or institutions who started the network?
- What were their original goals or objectives?
- Where did their initial funding and support come from?
- How is the network staffed?
- How do they deal with issues of access, continuity of support, sources of information, paid versus volunteer staff, funding, etc. ?

Combining these questions with those posed by Guthrie and Dutton, a summary description of a community network would look like the following:

Description	
Year started	
Initiator	- individual - group - institution
No. of registered users	
Services offered	- conferences - e-mail - databases
Primary Goals	- - -
Staffing	- volunteer - paid professional - mix
Funding	- public - private - combination
Architecture	- e-mail - database - MIS - broadcast
System capacity	- no. of lines
Accessibility	- no. of public terminals - fees or charges - other efforts to expand user base

Information content	- non-commercial - commercial - combination
Editorial control	- from total to none
Ownership	- public - private - non-profit - mixed
Financing	- public - commercial - subscription - annual budget
Issues	- access - funding - staffing - sources of information
Factors Technical background	
Politics	- Democratic, Republican - citizens' expectations - level of political participation
Economics	- level of affluence - mean income - median income
Interest Groups	- business community, schools, real estate, social services, health
Community Involvement	- none to extensive

The field of research on community networks is still very young; this framework cannot be used until detailed case studies are undertaken on the many existing community systems. Once this information is gathered, this framework will be a very useful tool for analyzing and comparing community networks.

1. *Free-Nets[13] and the NPTN*

The word Free-Net is often used as a generic term for community networks but in fact, they are a very specific type of network. Free-Nets are members of the National Public Telecomputing Network (NPTN)[14] and follow their policies and procedures. They also frequently use the FreePort software developed at Case Western Reserve University for the Cleveland Free-Net.

As the NPTN defines them, Free-Nets are "loosely organized, community-based, volunteer-managed electronic network services. They provide local and global information sharing and discussion at no charge to the Free-Net user or patron" (Victoria Free-Net Association 1994).

Due to the efforts of the NPTN, Free-Nets are some of the most organized community systems and the Free-Net model is one of the most widespread.

The NPTN, which is a non-profit corporation, was established in 1989 to disseminate the software and methodology for establishing community networks. Since then, "the NPTN has evolved as the public lobbying group, national organizing committee, and policy representative for U.S.-based Free-Nets and contributes to the planning of world-wide Free-Nets" (Victoria Free-Net Association 1994).

The NPTN has three major objectives:

1. To help people in cities throughout the U.S. and the world to establish free, open access, community computer systems.
2. To link those systems together into a common network similar to National Public Radio or the Public Broadcasting Service.
3. To help supplement what the local systems are able to produce with high quality network-wide services and features called "cybercasts" (NPTN, 1994c, 1994d).

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13 The term Free-Net® is a registered servicemark of the National Public Telecomputing Network. The official spelling is "Free-Net" but the word is also frequently written as "FreeNet" and "freenet".

14 Additional information on the NPTN can be found at their ftp site: nptn.org Directory: pub.

The NPTN is governed by a seven-member board of directors and by an affiliate council which consists of one delegate from each NPTN system. The affiliate council advises the corporation on matters of policy and procedure and elects people to the board of directors.

Communities who are interested in establishing a city-wide network based on the NPTN model, join the organization and receive technical and management assistance, inter-system electronic mail handling, and a wide variety of news and information services and software.

There are several types of NPTN membership:

1. **Full Affiliate**: These members are operational community networks, can take advantage of all of the services offered by NPTN, and have a representative in the affiliate council.
2. **Educational Affiliate**: These members are part of the K-12 educational community, but do not have a vote on the affiliate council.
3. **Organizing Committees**: These are groups of people who have formally committed themselves to bringing a Free-Net to their community and have the exclusive rights to start a Free-Net system in their area (NPTN 1994c).
4. **Rural Information Networks (RIN)**: The NPTN has recently set up a new system[15] that addresses the needs of rural communities.

To start a Free-Net, an organizing committee is formed in the community, and an application is filed with NPTN. NPTN sends an agreement stating that the committee will make a good-faith effort to bring the system on-line within a year and that the system will be an NPTN affiliate for at least two years. The NPTN agrees to make a good-faith effort to help the committee and will not place another community network within the local

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15 RINs use a forward and store system rather than the on-line systems used in urban areas. The system uses FirstClass software developed by SoftArc, Inc. of Toronto and allows a community – no matter how small or how remote – to establish a multi-user computer system. Individual rural users can connect via local telephone calls. Each community computer connects to the Internet via periodic phone calls to the closest Internet node. It does not provide a full Internet connection – there is no telnet, gopher or ftp – but users do have full Internet electronic mail, listservs, and Usenet newsgroups (NPTN 1994a).

telephone calling radius of the system. In addition, the NPTN sends detailed information on how to establish the Free-Net.

The committee then starts to build the system and raise funds – the NPTN estimates that the annual budget needed for a medium-sized system is between $125,000 and $150,000.

When the system is ready to go on-line, the Free-Net becomes an affiliate of the NPTN and receives cybercasting services.[16] There are two types of affiliate memberships. One type pays the annual fee of $1,200[17] and in return receives all the NPTN services. The second type of membership entails offering the NPTN a quality information service which can be offered to other affiliates in exchange for the annual fee.

As of November 1994, the NPTN had 42 affiliates on-line (30 community systems, 8 educational systems, and 4 rural information networks) and 121 in the organizing stage. These affiliates and organizing committees are located in 42 states and 10 countries[18] (NPTN 1994b).

The NPTN is also in the proposal stage of creating a Corporation for Public Cybercasting (CPC) that would be responsible for developing free public access to computerized information and communication systems in cities and towns throughout the U.S., developing and delivering high-quality national information services to these community systems, and developing special training and other programs to introduce telecomputing to the general public, as well as to special populations such as K-12 schools, senior citizens, the handicapped, women and minorities. The CPC would receive core funding from the government, but it would be a free-standing nonprofit corporation. The cost of such a program would be borne by a series of 2:1 matching grants at the federal and state levels (Grundner 1994).

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16 The services offered by the NPTN ranges from academic programs to medical information, government information and news services from the *Washington Post*, *London Times*, *Moscow News*, *Forbes* and the *New Republic* (NPTN 1993).

17 Annual fee for 1993 - 1994.

18 A complete list of NPTN affiliates and organizing committees can be found in the appendices.

Criticism of Free-Nets

The overwhelming advantage of a community network becoming a Free-Net and affiliate of the NPTN is the assistance that it receives in the organizing stage as well as during its lifetime. The NPTN makes Free-Nets some of the most organized and focused of the community networks and thus contributes enormously to their success.

Free-Nets are not without their critics, however. The main complaint from some community network organizers is the FreePort software which was first developed in the late 1980s at Case Western Reserve University. They feel that the software, FreePort II, which costs $850 to lease for five years, is inefficient, and the interface is inadequate. Critics say that the software has not been upgraded to take advantage of new emerging technologies and that as a result, some networks are looking at other options for providing a graphical user interface (GUI), rather than the text-based interface of FreePort. Some suggest that an interface similar to Mosaic would be better and a group at the University of Guelph is working on a Remote Imaging Protocol (RIP) that makes it easier to use the Internet (Hughes 1994; Silvestrini 1994).

The second complaint from those outside of community networks is that Free-Nets and community networks in general compete unfairly with commercial access providers because they frequently provide free e-mail and Internet access to their users.

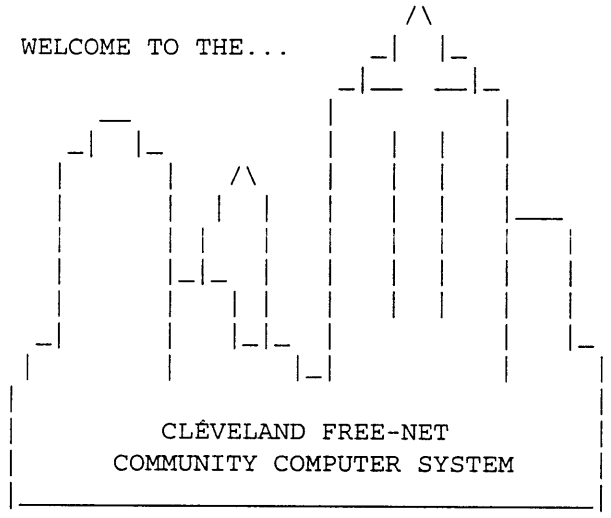
Tom Grundner, founder of NPTN, has stated that he sees no conflict of interest. Rather than competition with commercial providers, he believes that the effect of Free-Nets is "to increase the pool of telecomputing literate people to whom commercial services could eventually be sold" (Harter 1994). He compares community networks to the introduction of public libraries. Booksellers originally said that public libraries would put them out of business but this did not happen. Instead, libraries introduced books and reading to people who would not otherwise have been exposed, and

these people became customers of commercial bookstores. Grundner would prefer to see commercial companies funding local Free-Net systems as a way of developing a customer base (Harter 1994).

However, in spite of this position, some community networks have been threatened with legal action by commercial providers which NPTN has vowed to fight if necessary.

In order to give an overview of what Free-Nets are like and the kind of services that they offer, the following is a brief tour through a sample of Free-Nets which have been operating for over one year. All Free-Nets have a wide variety of information available to their users. This tour looks more closely at the areas available for public discussion and government participation.

Cleveland Free-Net,[19] *Cleveland, Ohio*



brought to you by

Case Western Reserve University
Community Telecomputing Laboratory

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[19] The telnet address for the Cleveland Free-Net is: freenet-in-a.cwru.edu; freenet-in-b.cwru.edu; or freenet-in-c.cwru.edu

The Cleveland Free-Net, founded by Dr. Tom Grundner in 1986, was the first community computer network. It grew out of an experimental bulletin board called "St. Silicon's Hospital and Information Dispensary" which tested the effectiveness of using telecomputing as a means of delivering health information to the public. A person could leave a medically-related question on the bulletin board and have it answered by a board-certified family physician within 24 hours. The project was so successful that AT&T, the Ohio Bell Telephone Company and the University Hospitals of Cleveland donated funds to expand and develop the concept.

The Cleveland Free-Net system began with 10 telephone lines and provided information in law, medicine, education, arts, sciences, and government, as well as free electronic mail. A second phase of the system opened in 1989 with larger memory and hard disk storage. The system now has over 35,000 registered users (NPTN 1994c).

The Free-Net is operated by Case Western Reserve University and is open 24 hours a day to anyone with a computer and modem. The services offered by the system range from free world-wide electronic mail to information in areas such as health, education, technology, government, arts, recreation and the law.

Cleveland Free-Net's main directory

```
<<< CLEVELAND FREE-NET DIRECTORY >>>
  1 The Administration Building
  2 The Post Office
  3 Public Square
  4 The Courthouse & Government Center
  5 The Arts Building
  6 Science and Technology Center
  7 The Medical Arts Building
  8 The Schoolhouse (Academy One)
  9 The Community Center & Recreation Area
 10 The Business and Industrial Park
 11 The Library
 12 University Circle
 13 The Teleport
 14 The Communications Center
 15 NPTN/USA TODAY HEADLINE NEWS
```

The Cleveland Free-Net uses the text-based FreePort software developed at Case Western. Similar to other Free-Net systems, the opening screen lists the "town buildings" that the user can "visit." Within each "building" are sub-directories of the topics offered by the Free-Net. The list is extensive and topics range from government documents to gardening to a singles partyline.

Public Discussion

The Cleveland Free-Net's public discussion is mainly held in the section called the "Public Square" where participants can discuss almost any topic.[20] All communication is asynchronous.

The Public Square is divided into twelve sub-areas. Three of them – The Kiosk, The Podium, and Boomer's Place – are for adults only. To join, users must send in a postcard stating that they are over 18 years of age. Permission to participate is given within a couple of weeks.

The Public Square screen

```
<<< PUBLIC SQUARE >>>
  1 About Public Square
  2 Announcements
  3 The Kiosk (aka "The Zone") (Open Board, Adults Only)
  4 The Cafe (Chat with other users)
  5 The Podium (Electronic Speeches, Adults Only)
  6 The Polling Place (All Voting Areas)
  7 The Kiosk Voting Booth (Kiosk Voting Area)
  8 The Speakeasy (General Discussion, Open)
  9 The Singles Partyline
  10 The Nonsexist SIG
  11 Boomers' Place
  12 The Mensa Forum
```

The following is the on-screen description of three discussion areas offered on the Free-Net.

20 "Public Square is an area of the electronic city which exists to serve as a general gathering place for citizens of all stripes. It's intended to be a place where anyone and everyone can gather and converse about just about anything."(from About Public Square)

"The Kiosk", often referred to as "The Zone", is an open, unmoderated bulletin board area; ongoing threads of conversation surface here about almost any topic imaginable, though intensely serious topics are sometimes discouraged by those who frequent the area. The messages are generally humorous and inane. Lots of good natured "ribbing" often occurs between users. On occasion, however, people do clash with one another and heated arguments and personal attacks may occur. So while any and all are welcome, if you are an individual who cannot endure the occasional arguments and attacks, you may want to consider avoiding the Kiosk. There are other areas such as the Speakeasy, for example, where the conversation is kinder and gentler. The Kiosk is known for the extraordinarily high volume of traffic and messages you can find there. Since the language used may be offensive to some and since arguments and attacks can get quite heated at times, this area is considered an ADULTS ONLY area open to those 18 years of age or older.

"The Cafe" is an area where one can chat electronically with other Freenet users directly. Two or more people may carry on an electronic conversation either publicly or privately. Read the "About the Cafe" file for more on this.

"The Podium" is an open, unmoderated bulletin board set aside for any Free-Net user to make a speech or express an opinion about any topic he or she feels to be important. The Podium is a place where users can debate one another about the issues. We do ask that you try to avoid offensive language. In addition, we request that this section be reserved for "speeches" and debates —in other words, expositions or arguments about topics of interest. If all you want to say is "Go Browns!", that's fine -but say it in the Kiosk or the Sports SIG and save the Podium for the electronic orators and debaters.

There is also a chat area where participants can discuss any topic, either as part of a two-person conversation ("table for two") or in larger groups.

Also in the public square is the Polling Place and a Kiosk Voting Booth. In this section, users can propose questions that the readers "vote" on, answering with either a yes/no or multiple choices. Most of the voting topics are intended to be humorous and entertaining rather than serious, though occasionally some do address policy issues.

Two examples of on-line voting

```
Title: Paper Hats and the likes...
 Submitted by:  aa707 (unknown)
Submittal Date: 22-Sep-91 at 1:53 PM
 Voting Period: 1000 day(s) - expires 18-Jun-94 at 1:53 PM
Display Period: 5794 day(s) - expires 4-Aug-7 at 4:27 AM
Issue Type:   Yes/No

Do you know how to make a paper hat?
Vote Options:
             1. Yes
             2. No
-------------
A total of 163 votes have been cast as follows:
             89 (54.6%)   No
             74 (45.4%)   Yes


 Title: Communism
 Votegroup:   freenet.pub-sq.kiosk (Issue #492)
 Submitted by:  aj923 (P. J. Remner)
Submittal Date: 29-May-92 at 3:14 PM
 Voting Period: 10000 day(s) - expires 15-Oct-19 at 3:14 PM
Display Period: 10000 day(s) - expires 15-Oct-19 at 3:14 PM
Issue Type:   Multiple Choice
Ain't it just great
Vote Options:
1. Yes, it's great!
-------------
      A total of 38 votes have been cast as follows:

      38 (100.0%)  Yes, it's great!
```

The Speakeasy is another area where users can discuss any issue. It is divided into Talk of the Town, Social Sciences and Social Arts, Open Invitations, and Roster of Patrons. With rare exceptions, most of the conversation and discussion is fairly inane.

Finally, the public square is rounded out with an area for singles, nonsexists, baby-boomers and members of Mensa.

Government

The Government Center is the area where information on federal, state, and local government is placed. In this section, users will find the Constitution and similar documents, and a list of the names and telephone numbers of representatives at federal and state levels as well

Examples of the message topics in Speakeasy

```
      2 Talk of the Town
First message is #12940, last message is #15304
** 12940. Mike Godwin of EFF looking for info on Rusty &
Edie's
15007. Re: What am I doing wrong here?
15008. Re: ->READ ME, BABY<-
15009. Here ya go.
15010. Re: ->READ ME, BABY<-
15011. yellow out there
15012. Re: yellow out there
15013. Re: ->READ ME, BABY<-
15014. Re: ->READ ME, BABY<-
15015. Re: ->READ ME, BABY<-
15016. Re: What am I doing wrong here?
15017. Meeting People
15018. Re: yellow out there

      3 Social Sciences and Social Arts
First message is #1460, last message is #1464
 **1460. Re: Post Office blues
1461. EUGENE POISSON.
1462. Halloween Bash ({Lakeland) OCT30
1463. Re: Halloween Bash ({Lakeland) OCT30

      4 Open Invitations
First message is #1, last message is #139
1. M1 - Wonderful SWPM, 23, Seeking Wonderful SF, 20-?
2. NOTICE:  Server glitches
5. F1 - Lonely in a Crowd
6. MISC - SWM looking for BAV
7. M3 - Lonely man
8. M4 - Looking for passion and romance
10. M5 - Have you seen her?
12. MISC - Penpals......
13. M7 - Looking for a Friend, lover...
15. M9 - Seeking female friend at Cincinnati
16. MISC - Music Majors Take Note!
17. Clarification on how to respond to ads.
18. M10 - A man of wealth, fame and power. . .
```

as county, city and suburban governments. Also included are government hotlines, weather reports, safety and health topics, the Institute for Democracy in Education (which focuses on teaching about democracy in the schools), the U.S. Budget, and information from the Internal Revenue Service.

The government area screen.

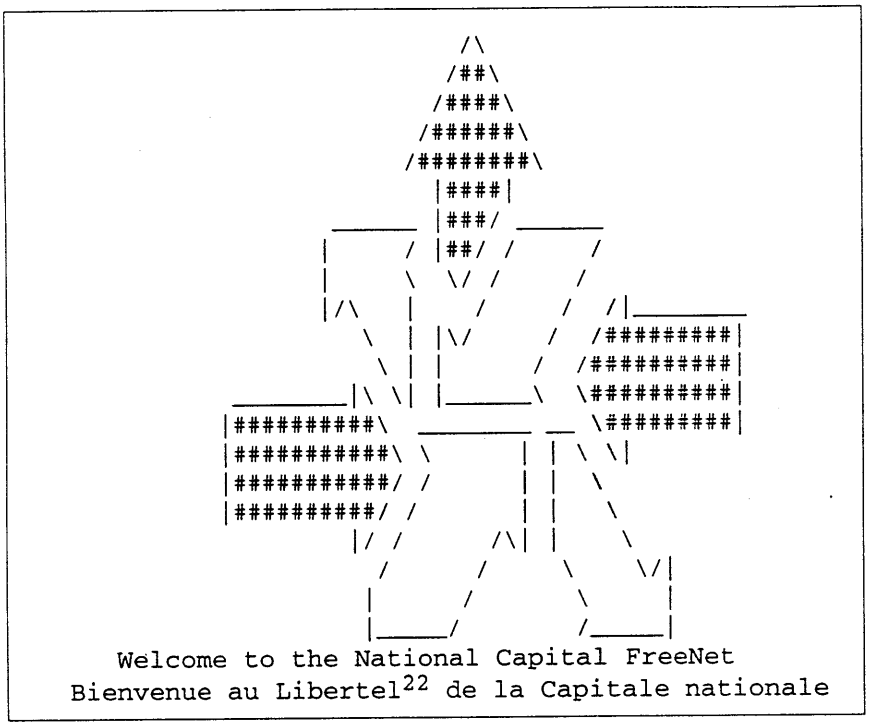
```
The Courthouse and Government Center

      1 About the Government Center
      2 The Courthouse (Legal Information)
      3 The Freedom Shrine (Historic Documents)
      4 Contact your Representatives
      5 Governmental (800) Hotlines
      6 U.S. National Weather Service
      7 The County Engineer's Office
      8 Safety and the Environment
      9 Institute for Democracy in Education
      10 1993 Budget of the United States
      11 Internal Revenue Services
```

There are no e-mail connections to any public official, though they intend to provide this service in the future. There is little opportunity to ask questions or discuss issues with any government official. The one exception is the county engineer's office which is responsible for constructing and maintaining bridges and roads in the county. To their credit, they have an active presence on the Free-Net. In their section, they have a place for bulletins and a question-and-answer area where residents can make comments or ask questions that are answered by the county engineer.

There used to be a section called Metro Connection. Within it was an area for the residents of Brecksville where true interaction between constituents and elected officials could be found (Wichers 1993). Unfortunately, it appears to no longer be on the system.

National Capital Free-Net[21] *Ottawa, Ontario*



The National Capital Free-Net (NCF)[23] was first established in 1991 by a small group of people at Carleton University in Ottawa, Canada. Similar to the Cleveland Free-Net, the NCF grew out of an already established public information system at the university.

The group chose to become a Free-Net and an affiliate of the NPTN because the Free-Net philosophy and software best matched their requirements. Two years were spent planning and organizing the system with public and community organizations and the system was formally opened in February, 1993. Since then the number of registered users has grown to over 20,000 and the number of telephone lines has increased to 174.

---

21 The telnet address for the NCF is: freenet.carleton.ca WWW: http://freenet.carleton.ca

22 It is interesting to note that in French the "free" of Free-Net has been interpreted to mean "liberated" as opposed to the "no-cost" English interpretation.

23 A more detailed description of the NCF can be found in the appendices.

The founders of the NCF believe that electronic communications can help "break down the barriers and build the bridges to greater understanding and cooperation" (NCF 1994a). They see the Free-Net as a way to encourage community organizations to communicate with the public and with other organizations, to offer new opportunities for citizens to be more involved with their community, and for institutions and governments to become more visible and accessible.

Public access is a priority and the system has 18 public terminals located mainly in public libraries in the city and surrounding area.

The system runs through the effort of volunteers and corporate and government sponsors. Funds also come from private donors and fund-raising activities.

The NCF uses the FreePort software and its opening screen resembles that of the Cleveland Free-Net, but the organization by building type is less rigid. It uses a building type to describe the contents where appropriate and otherwise uses a simple description.

The NCF Main Menu

```
<<< The National Capital FreeNet - Main Menu >>>
     1 About The National Capital FreeNet...
     2 Administration...
     3 Post Office...
     4 Public Discussion...
     5 Social Services, Health, & Environment Centre...
     6 Community Associations...
     7 The Government Centre...
     8 Science, Engineering and Technology Centre...
     9 Schools, Colleges and Universities...
    10 The Newsstand...
    11 Libraries...
    12 Special Interest Groups...
    13 The Communications Centre...
    14 Professional Associations...
    15 The Help Desk...
    16 Menu principal francais...
```

Public Discussion

The NCF's area for public discussion takes a different strategy from the Cleveland Free-Net. Rather than providing an area where users can say anything about anything, the theme of the NCF public discussion leans towards the running of Free-Net itself and related policy issues. They provide a place where users can ask questions about using the Free-Net and leave notes for the volunteers who work on the NCF. Users can discuss policy issues with the board of the NCF or with others about the state of information technology in the country.

The NCF's Public Discussion Menu

```
Public Discussion Menu
     1 About the Public Discussion Menu
     2 General Bulletin Board (ncf.general) >>>
     3 Babillard general francophone (ncf.francais) >>>
     4 Help Desk - Questions & Answers (ncf.admin) >>>
     5 A big thank-you to our volunteers
     6 Questions and Help with Modems and Communications...
     7 NCF Policy Discussions and Resolutions...
     8 Chat with Other Users...
     9 Public Advisory Council on the Cdn. Information Highway
     10 Ottawa Area Buy and Sell Postings (ott.forsale) >>>
     11 Ottawa Area Housing Postings (ott.housing) >>>
     12 Ottawa Area Events Postings (ott.events) >>>
     13 Ottawa Area Jobs Postings (ott.jobs) >>>
```

A place for real-time chat is available, but it is limited to the hours between 12 midnight and 10 am to reduce the demand on telephone lines.

Oddly enough, also in the public discussion area are messages about articles for sale, events and job postings. Presumably they are located here because the public discussion area was seen as the equivalent of the grocery store bulletin board.

The NCF's Public Discussion area actually has very little public discussion. It is useful, laudable, and circumspect but there are no places to make political statements or engage in public debate. To be fair, there is an incredibly wide choice of interests and topics in the special interest group

area[24] and several forums specifically for discussing politics and making public statements. Places for public discussion and debate do exist, but most are not located in or linked to the public discussion area.

Interestingly, unlike Cleveland, there are no "adult" areas restricted to users over 18. There is a singles area but it is placed with the special interest groups rather than the Public Square.

Voting

Like the Cleveland Free-Net, the NCF also has a section (located in the Communications Center) where users can both propose and vote on issues. Topics are usually not political in nature, but tend to be questions of what are the best novels, movies, modems, and outdoor equipment as well as some humorous votes such as Why will the Montreal Canadiens choke this year?

An example of the type of question in NCF's voting section

```
    Title:     Jean Chretien
  Votegroup:   ncf.general (Issue #350)
Submitted by:  bj033 (Andrew Costa)
Submittal Date: 26-Nov-94
Voting Period: 30 day(s) - expires 26-Dec-94
Display Period: 35 day(s) - expires 31-Dec-94
 Issue Type:   Multiple Choice

Why do we like him so much (70%+) ?

Vote Options:
   1. Integrity and honesty
   2. Experience
   3. Down to Earth
   4. He aint Brian Mulroney
   5. Head of the Liberal Party
   6. He is funny looking
   7. Beats the hell out of me
   8. We should have free form voting for things like this
```

[24] There are over 300 discussion groups called special interest groups that include a diverse range of subjects such as history, blue grass music, video production, management, computers, Star Trek, games, asthma, wild mushrooms, youth, Philippines, military brats, social science research, sports, yoga and home education.

Government

The NCF has an admirable collection of useful government information and active participation by all levels of government.

The Government Center Menu

```
The Government Centre
 1 About the Government Centre
 2 The Regional Municipality of Ottawa Carleton...
 3 The City of Ottawa...
 4 The City of Gloucester...
 5 The Police...
 6 Ontario East Municipalities/Community Profiles...
 7 The Rideau Valley Conservation Authority...
 8 Federal Government / le Gouvernement federal...
 9 Ontario Government Information Service...
10 Federal Politics...
11 Embassies of Other Countries...
12 Inter-Government Projects...
13 LobbyNet...
14 National Capital FreeNet Municipal Elections Project...
```

Governments are active in the sense that they have made extensive and detailed information available on-line. However, not all use the system as a direct means of communication and the telephone still seems to be the standard means of communication. Only the regional government and the police department have a system where users can ask questions and receive relies electronically. In other cases, the address and telephone number is usually supplied.

Because 1994 was an election year in the city, an area called the Municipal Elections Project was set up to discuss local issues and to make the candidates' platforms available to users.

Unfortunately, the discussion area (called a debate) seemed to be dominated by a few of the system's users, with limited participation by the candidates, and very little debate. Perhaps it would have been more helpful to have a moderator to create a more debate-like atmosphere.

In addition, one of the city newspapers, the *Ottawa Citizen*, ran an on-line discussion group so that users could raise issues they thought the

newspaper should cover, submit general questions they would like answered, and suggest story ideas.

There is also a section called LobbyNet; this is about the history, role, laws, and ethics of lobbying in Canadian politics rather than being an actual place to lobby.

The city police department has clearly understood the concept of community networks and has obviously put a great deal of effort into their section. The information is extensive and useful, and they also have an area where residents can ask questions and receive answers from the department.

The Police Department menu

```
The Police

 1 About the Ottawa Police
 2 Questions and Answers >>>
 3 The Annual Report/Report Annuel...
 4 Peat Marwick Stevenson and Kellogg initial report on
   the Ottawa Police
 5 Organisational Chart
 6 Community Services Section...
 7 Crimestoppers/Echec au Crime...
 8 Employment opportunities...
 9 Police Services Board...
10 Weekly Crime Statistics...
11 Public complaints procedure...
12 The Criminal Code...
13 Bias Crime...
14 Adult Pre-Charge Diversion Program
15 Ottawa Police policies and procedures...
```

Each of the city departments has a section which provides detailed information about what it does, the programs in which it is involved, and who to contact for more information. They also have a detailed list of municipal services available to the residents, such as how to go about holding a demonstration, parade or march, as well as lists of frequently called numbers.

The City Departments' menu

```
<<<City Departments>>>

 1  About the City's Departments
 2  Office of the Chief Administrative Officer
 3  Audit
 4  Corporate Services
 5  Economic Development
 6  Engineering and Works
 7  Fire
 8  Housing
 9  Planning and Development
10  Recreation and Culture
```

Provincial Government

The Ontario government is not represented on the NCF because they have their own bulletin board located in Toronto which residents can contact through an 800 number. The NCF only provides the contact information or a telnet connection. The current premier of the province, Bob Rae, has recently acquired an e-mail address[25] and is rumored to receive a large amount of correspondence each month.

Federal Government

The Federal Government has a variety of departments on-line, but there is no direct contact with any public official. Members of parliament are all supposed to receive e-mail addresses in 1995 so they will soon be accessible through the system.

The Federal Government menu

```
 1 The Senate of Canada...
 2 Canada Communication Group-Publishing/
 3 Canadian Human Rights Commission...
 4 Industry Canada...
 5 National Archives of Canada...
 6 Emergency Preparedness Canada...
 7 NRCan - Natural Resources Canada
 8 Statistics Canada...
 9 The Open Government Pilot Project...
10 Canadian Museum of Civilization...
11 Human Resources Development Canada...
12 Immigration and Refugee Board...
13 Public Service Commission of Canada...
14 Transport Canada...
15 National Capital Commission...
```

25 premier@gov.ont.ca

Also in the NCF's Government Center is a section on Federal Politics which has the Federal Election Meeting which was set up for users to propose questions and have candidates make their platforms known.

On-line invitation to the candidates running for office in the federal election

Letter to Federal Election Candidates

To the leaders of the federal political parties: The National Capital FreeNet and the Victoria Freenet would like to invite you to participate in "electronically enhanced democracy".

The Freenets are non-profit organizations with the goal of providing free computer networking, community information and communication to the public. Anyone can use the FreeNet through easily accessible terminals in public libraries, or from home using a computer with a modem. Via our links with the international "Internet", thousands of people across Canada (and millions around the world) are linked together and can share ideas and information.

During this year's federal election, the National Capital FreeNet and the Victoria Freenet will be running on-line All Candidates' Meetings. Many candidates in Eastern Ontario, West Quebec and Victoria ridings are becoming registered users of the Freenets and are beginning to post information about themselves on the Freenet computers. Voters are already raising questions and concerns they would like their candidates to address. The debate will run continuously throughout the election campaign. Please join in. You are welcome to become a Freenet user. An area has been set aside for you and your campaign staff to post your policies, platforms, speeches, or whatever information you want the Canadian public to know. As a Freenet user, you can join in the debate at your convenience. We have enclosed information about the National Capital FreeNet and the Victoria Freenet, plus a registration form.

Freenets are an inexpensive and powerful way for you to communicate with voters. There are already over 11,000 registered users of the National Capital FreeNet and the Victoria Freenet, and hundreds of other people across Canada sign onto the Freenets via Internet. These voters expect to find information about the candidates, the political parties and the leaders. They also expect to be able to reply by posting messages in debate areas or by direct electronic mail. They are active, concerned citizens who are using the latest technology to create a new kind of community.

Unlike the televised debates, the Freenet All Candidates' Meeting is a debate where substance is more important

than image. Personal appearance, accent and most mannerisms are hidden - ideas and content come to the forefront. If you believe that your platform and policies can stand up to careful reading and comparison with those of the other political parties, then Freenet is the place where they will get the fairest and most complete exposure. No editor or reporter will select, change or summarize your words. You have a direct line to the voters. And the voters have a direct line to you. By joining a Freenet, you will be given an electronic mail address where anyone with Freenet or Internet access can send you messages. Please fill out the enclosed registration form, and become part of this exciting new development in communications. Freenets are dedicated to being a free service to the public - your donation would help us to continue to provide this service without having to ask for registration fees. To increase accessibility, a donation of $700 would sponsor another phone line into the Freenet. Such sponsorship is prominently acknowledged. Thank you.

Richard P. Taylor
Board Member, National Capital FreeNet
aa333@freenet.carleton.ca

Public Discussion and Government on Other Free-Nets

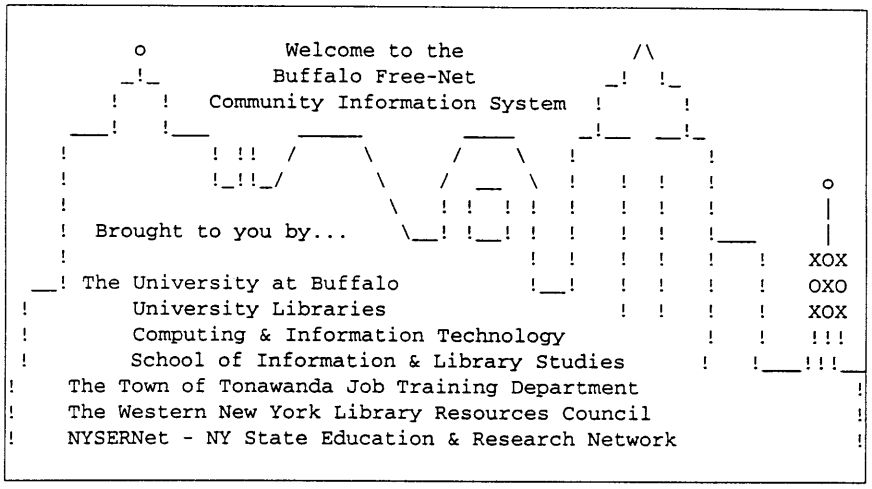
Most other Free-Nets are fairly similar to the Cleveland Free-Net and the National Capital Free-Net.

For example, the Buffalo Free-Net[26] in Buffalo, New York has a general, unmoderated public discussion area, a "chat" area and an area for voting.

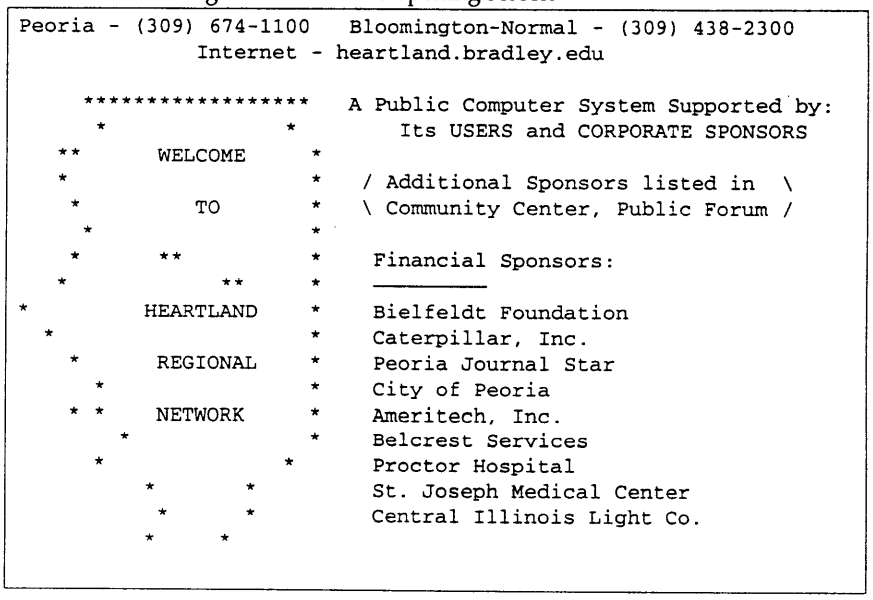
The Heartland Regional Network[27] in Peoria and Bloomington, Illinois has made an effort to create places for public discussion. Located in the "Community Center" is the Public Forum and within this forum is an area for general discussion which like most is varied, but frequently banal. They also have an area for the discussion of politics and an area for the Union of Auto Workers called CAT-UAW that is meant to discuss Caterpillar employees' issues .

26 The Buffalo Free-Net's telnet address is: freenet.buffalo.edu; (login: freeport)
27 The Heartland's telnet address is: heartland.bradley.edu; (login: bbguest; password: press return)

Buffalo Free-Net's opening screen



The Heartland Regional Network's opening screen



Also in this area is a section where users can send their opinion to the *Journal Star* editorial page. Users can send e-mail to their local radio station but there is no e-mail access to government employees.

Like other community networks the level of discussion can be fairly banal and repetitive.

An example of the type of messages found in the public discussion area.

```
Open Forum
First message is #10700, last message is #11009

** 10700. Re: The right of men to bare their kneecaps
   10701. Re: The right of women to bare their breasts...
   10702. Re: Welcome to Heartland Regional Network
   10703. Re: PJS radio favoritism
   10704. Re: The right of women to bare their breasts...
   10705. Re: I'm Not Human (Warning!  A chwolfe post!)
   10706. Re: any manics out there?
   10707. Re: The right of men to bare their kneecaps
   10708. Re: any manics out there?
   10709. Re: The right of men to bare their kneecaps
   10710. Re: The right of women to bare their breasts...
   10711. Re: I'm Not Human (Warning!  A chwolfe post!)
   10712. Re: any manics out there?

   10904. Re: Board Members (or someone) Abusing Their Privelege
   10905. Re: Board Members (or someone) Abusing Their Privelege
   10906. Re: Board Members (or someone) Abusing Their Privelege

Politics Forum...

First message is #2800, last message is #3131

    3094. Joycelyn Elders canned:  It's about time
    3095. Re: Government workers
    3096. Re: Bill Clinton Changes Parties, becomes a Republican
    3097. Re: Joycelyn Elders canned:  It's about time
    3098. Re: Joycelyn Elders canned:  It's about time
    3099. Re: Joycelyn Elders canned:  It's about time
**R 3100. Re: Joycelyn Elders canned:  It's about time
    3101. Re: Joycelyn Elders canned:  It's about time
    3102. Re: Government workers
    3103. Re: Joycelyn Elders canned:  It's about time
    3104. Re: Bill Clinton Changes Parties, becomes a Republican
    3105. Re: Government workers
    3106. Re: Joycelyn Elders canned:  It's about time

    3119. TAX CUT
    3120. Re: TAX CUT
    3121. Re: TAX CUT
    3122. Re: Elders.....Gone
    3123. Re: TAX CUT
    3124. Re: TAX CUT
    3125. Re: TAX CUT
    3126. Re: TAX CUT
```

One Free-Net that has done a very good job in public discussion is CapAccess[28] in Washington, DC. In their Public Forum, they provide a wide range of topics to choose from, and the level of discussion seems to be much higher than that found on other networks.

28 CapAccess is available by telnet: capaccess.org (login: guest; password: visitor)

The range of topics in Cap Access' Public Forums

```
        The National Capital Area Public Access Network

         <<< CapAccess Public Forums >>>
 1 About the Public Forums                    (go discuss)
 2 Discuss CapAccess
 3 Discuss the Internet
 4 Discuss Public Opinion
 5 Discuss Media
 6 Discuss Government
 7 Discuss Education
 8 Discuss Social Services
 9 Discuss Libraries
10 Discuss Health
11 Discuss Communities
12 Discuss Sports and Recreation
13 Discuss Arts and Entertainment
14 Discuss Business and the Professions
15 Discuss Science and Technology
16 Discuss Public Policy
17 MGNR Temporary Gateway to ALL CapAccess Groups
```

CapAccess still only has limited direct connection with government representatives. There is an experimental project where users can send e-mail to a few members of the House of Representatives and by the end of 1995, the others should also be on-line. In the meantime phone and fax numbers are available for those in the House and Senate.

Menu for communicating with federal officials

```
<<< Communicating with Federal Officials Menu >>>

 1 Sending E-Mail to the White House
 2 Electronic Access to White House Publications
 3 U.S. Senate, Phone/Fax Numbers
 4 U.S. House of Representatives, Phone/Fax Numbers
 5 Sending E-Mail to the U.S. House of Representatives
 6 FedWorld
```

This section on Free-Nets has been particularly long because there are more Free-Nets than any other type of community network. Each of the Free-Nets have their own particular style for organizing public discussion and access to government officials. There are exceptions, but in general, there seems to be less attention paid to promoting public discussion and government participation than to providing local information.

2. *Neighborhood Bulletin Boards*

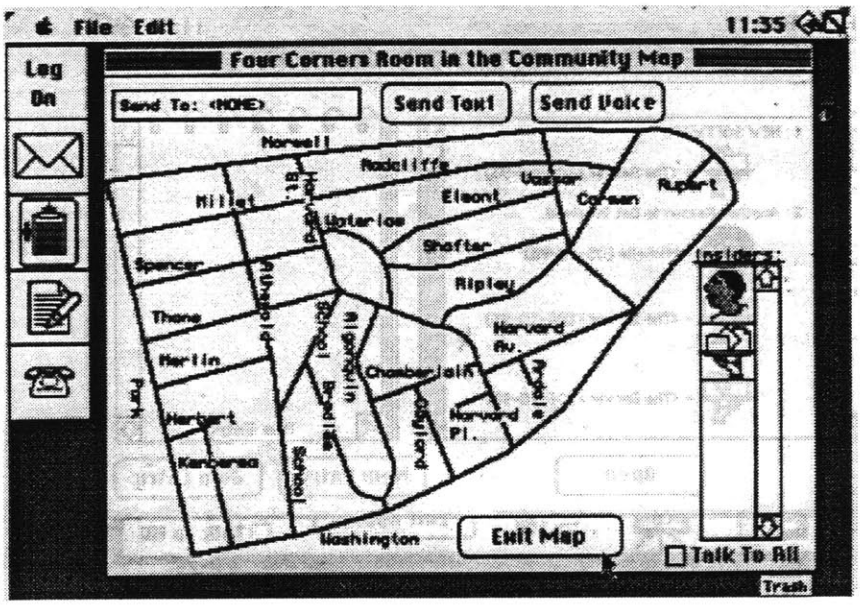
A second model for community networks, of which there are few examples, is the small-scale bulletin board which usually focuses on a particular neighborhood rather than a city. These bulletin board systems (BBSs) are frequently scaled-down versions of city networks and can either be stand-alone systems or parts of larger city-wide networks. They are usually established by an individual who runs the system from their home with a modest investment in hardware and software, or they can be run by a small group of community activists. Neighborhood BBSs focus on an even more local level of information and discussion and emphasize community development; they have the advantage that participants often know each other personally. Their disadvantage is that the system's existence often depends on a single individual.

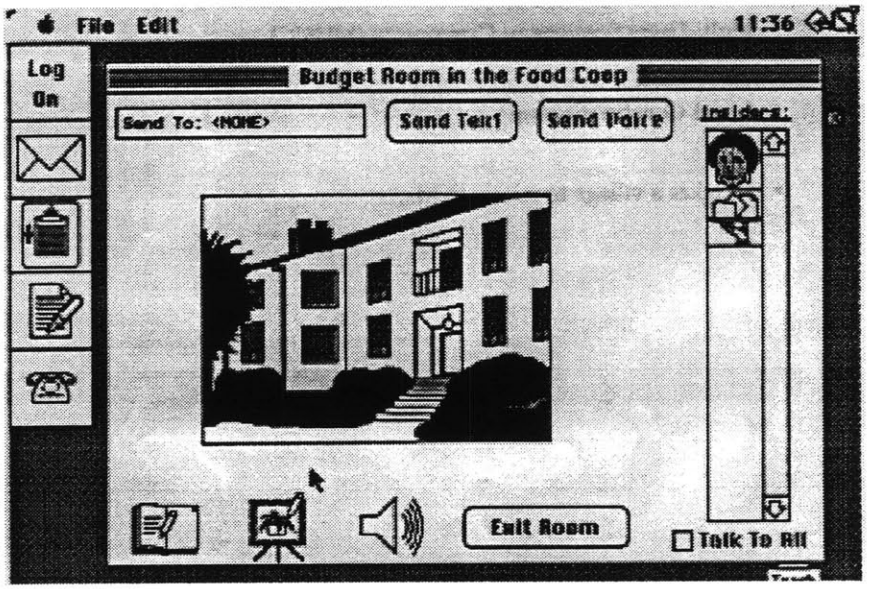
MUSIC

Boston, Massachusetts

An example of this type of community network is MUSIC (Multi-User Sessions in Community), a computer network and shared database developed and run by Alan and Michelle Shaw in Four Corners, Dorchester, a neighborhood of Boston.

At present 20 people are connected to MUSIC; the system is used to facilitate community organizing and neighborhood development. The network focuses on neighborhood issues such as crime watches, the food cooperative, block festivals, and potluck dinners and one section has all the articles relating to the neighborhood from the *Boston Globe* (Delgado & Buse 1993; DiChristina 1994; Radsken 1993; Ross 1994; Shaw 1994).





Though the system is very small, this type of network can actually offer more scope for debate and discussion, primarily because users would all know each other personally. And because it is so small, information and discussion topics can focus more directly on the precise needs of the community.

Government-Sponsored Networks[29]

A third type of community network is the city-wide network sponsored by state or local government. The primary purpose of these systems is to make city records and municipal information available to residents.

Public Electronic Network (PEN) [30]

Santa Monica, California

One of the first electronic systems sponsored by a city government was Santa Monica's Public Electronic Network (PEN)[31]. It started in 1989 and is only open to those who live and work in Santa Monica.

Welcome screen on PEN

```
Welcome to the City of Santa Monica Public Electronic Network

  /PENPENPENPEN       /PENPENPENPENPEN     /PENPE       /PENPE
  /PENPENPENPENP      /PENPENPENPENPEN     /PENPE       /PENPE
  /PENPE////PENPE     /PENPE/////////      /PENPEN      /PENPE
  /PENPE     PENPEN   /PENPE               /PENPENP     /PENPE
  /PENPE     PENPEN   /PENPE               /PENPENP     /PENPE
  /PENPE     PENPEN   /PENPENPENPE         /PENPE/PE    /PENPE
  /PENPE     PENPE    /PENPENPENPE         /PENPE /PE   /PENPE
  /PENPENPENPENP      /PENPE//////         /PENPE  /PE /PENPE
  /PENPE//////        /PENPE               /PENPE   /PENPENPE
  /PENPE              /PENPE               /PENPE    /ENPENPE
  /PENPE              /PENPE               /PENPE    /ENPENPE
  /PENPE              /PENPENPENPENPEN     /PENPE     /NPENPE
  /PENPE              /PENPENPENPENPEN     /PENPE      /PENPE
  //////              ////////////////     //////      //////
```

The purpose of PEN is to provide electronic access to public information, offer an alternative means of communication to convey their needs, preferences, and intentions to the city government, provide electronic forums to enhance the sense of community, and help city residents learn about computers and communication technology (Kirschner 1994).

---

[29] A directory of city governments on the Web can be found at: http://rohan.sdsu.edu/infosandiego/examples/citygov/index.html

[30] More detailed information on the PEN system is available in the appendices.

[31] The PEN system is not accessible through the Internet. The Information Systems Office can be reached at The City of Santa Monica, 1685 Main Street, Santa Monica CA 90401 Telephone: 310-458-8383.

Residents can access the system through read-only boards with information provided by city government, private e-mail between residents or between city hall and residents, or public postings in conferences on a wide range of topics.

As one of the older systems, PEN has faced a number of issues during its development. One of the greatest problems has been to create a system that people would value and use. Another difficulty was the internal resistance of several departments in the municipal government that did not want to be easily accessible to the public.

The PEN system did, however, have important support from the city librarian, the police chief, and a number of council members which resulted in the successful development of the system (Kirschner, 1994).

Public Discussion

PEN has quite an extensive range of conferences that users can join. There are 10 main conferences which are subdivided into topics. For example, in the City Conference, there are another 19 topics covering homelessness, transportation, youth, public art, earthquakes, and crime. In the Ideas Conference, there are over 200 topics ranging from poetry to photography to gangs.

Unlike most other community networks, the PEN system is not linked to the Internet. This means that all the conferences are initiated and maintained by Santa Monica residents, rather than depending on outside Usenet newsgroups.

Government

The local government has major presence on the system. Most city departments have made a large amount of information available to residents. In addition, they have e-mail service to most departments and staff. PEN also provides a number of electronic forms for reports, requests and complaints that residents can use and send to the appropriate department.

PEN's main menu

```
                City of Santa Monica
              Public Electronic Network

                     MAIN MENU

              1.  CITY HALL
              2.  COMMUNITY CENTER
              3.  MAILROOM
              4.  CONFERENCES
              5.  ON-LINE FORMS
              6.  CURRENT EVENTS
              7.  ON-LINE MUNICIPAL CODE
              8.  LOCAL ELECTION INFORMATION

              Bye  Type bye to exit PEN
```

PEN's Conferences

```
List of Conferences:
--------------

CALIFORNIA Conference - California topics
CITY Conference - City of Santa Monica topics
EDUCATION Conference - education and local schools topics
IDEAS Conference - wide-ranging topics from PEN community
JAPAN Conference - messages exchanged with a network in Japan
KIDS93 Conference - messages exchanged with kids around the world
LEISURE Conference - movies, music, books, restaurants, pets etc
NATION Conference - Today's News, gun control, politics, abortion
SCIENCE Conference - science, space, computers, health etc
YOUTH Conference - wide-ranging topics from PEN youth community
```

List of topics in the city conference

```
ITEM #    RESPONSES   ITEM TITLE
------    ---     ------------------------

Item   1    (128)     City Council Watch
Item   2    (100)     Growth and Development
Item   3    (107)     Homelessness
Item   4    ( 21)     Rent Control
Item   5    ( 61)     Recreation and Parks
Item   6    (103)     Environment
Item   7    (220)     Crimewatch
Item   8    (115)     City Library
Item   9    ( 34)     Public Art
Item  10    (761)     PEN
Item  11    ( 33)     Cable TV
Item  12    (  9)     Airport
Item  13    (  8)     Youth Concerns
Item  14    (107)     Transportation
Item  15    ( 75)     Community Events
Item  16    ( 13)     Commission on the Status of Women
Item  17    ( 39)     The Northridge Earthquake in Santa Monica
Item  18    (  3)     Propositions D & E
Item  19    (133)     Election 1994! Local Issues and Candidates
```

PEN's on-line forms

City of Santa Monica
Public Electronic Network
ON-LINE FORMS & TRANSACTIONS

1. Job Interest Form
2. Petty Theft Report
3. Recreation Class Registration
4. Library Card Registration
5. Volunteer Application
6. Board, Commission, Committee and Citizen Task Force Application
7. Big Blue Bus Trip Itinerary Request
8. Business License Renewal
9. First Business License Renewal
10. Graffiti Removal Request
11. City Complaint (General)
12. Consumer Complaint
13. AIDS/Sexual Orientation Discrimination Complaint
14. Report of Traffic Conditions

When PEN was initiated, the city departments tensed for a flood of e-mail messages which never occurred. They found that the vast majority of communication on the system was between residents rather than between residents and city hall. And, to their surprise, they found that the messages were not all complaints – many were even complementary.

Ken Phillips, the architect of the PEN system, has pointed out some inherent problems of government providing networks (Kirschner 1994). One is free speech: a government system cannot delete people's messages (e.g. in a moderated discussion group) because of the appearance of censorship. Another awkward issue is freedom of information. Questions are raised about whether a government has the legal authority to disclose e-mail that is stored in its computer even if the individual is not a government employee. Another issue revolves around whether government should be in competition with private-sector companies that provide e-mail. Still other questions include: Can the private sector use these systems for commercial purposes? Who decides who has access to various forums? Can a moderator exclude people who are being disruptive?

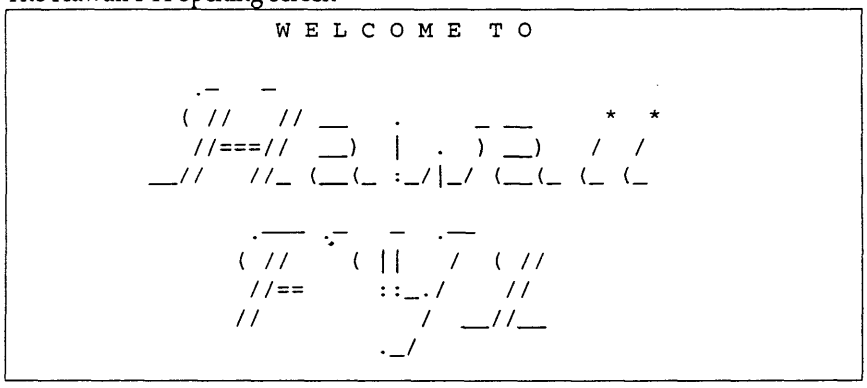
Public Discussion and Government on Other Government-Sponsored Networks

A number of state and city governments have started to appear on-line during the past year. Two of the older systems are Hawaii FYI and the Wellington City Council's system in New Zealand.

Hawaii

The state-sponsored Hawaii FYI[32] is a fairly extensive community computing system covering subjects ranging from agriculture to state government activities. A wide variety of government information is available such as information on the legislative process, documents, bills, resolutions, committee reports and hearing notices. Despite the plentiful information, there is quite limited opportunity to discuss or debate issues. Although information about the 1994 elections was provided, there appeared to be only one forum where users could ask the candidates for Governor and Mayor of Honolulu "questions related to the Information Superhighway, Hawaii's Information Infrastructure, and their impacts on the State" (from the Hawaii FYI menu)

The Hawaii FYI opening screen



A bulletin board called Yo! Kids is available for students under 13 years of age. There is also a service with a monthly subscription called "Interact"

[32] The Hawaii FYI is available by telnet: fyi.uhcc.hawaii.edu (return twice to enter as guest)

which focuses on "the latest in interactive games and entertainment."

The network has a mix of billing practices – many of the services are available free of charge, but for others there is a fee.

Sample screens from Hawaii FYI

```
                        HAWAII FYI
Service Listings - Categories

   1 Business and Finance
   2 Community Services
   3 Current Events
   4 Education and Reference
   5 Entertainment and Leisure
   6 Food
   7 Government
   8 Health/Social Services
   9 Messaging and Communications
```

```
                        HAWAII FYI
Service Listings - Government

    1   LEGISLATIVE INFO SERVICES      %ACCESS
    2   ANIMAL QUARANTINE              %AGAQS
    3   BOARDS AND COMMISSIONS         %BRDCOMM
    4   CAMPAIGN SPENDING DATA         %CAMPAIGN
    5   CAPITOL DIRECTORY              %CAPDIR
    6   CITY & COUNTY JOB INFO         %CITYJOBS
    7   HNL CITY COUNCIL INFO          %COUNCIL
    8   DBED BBS                       %DBED
    9   STATE DBED ANNUAL RPRT 1989    %DBEDAR

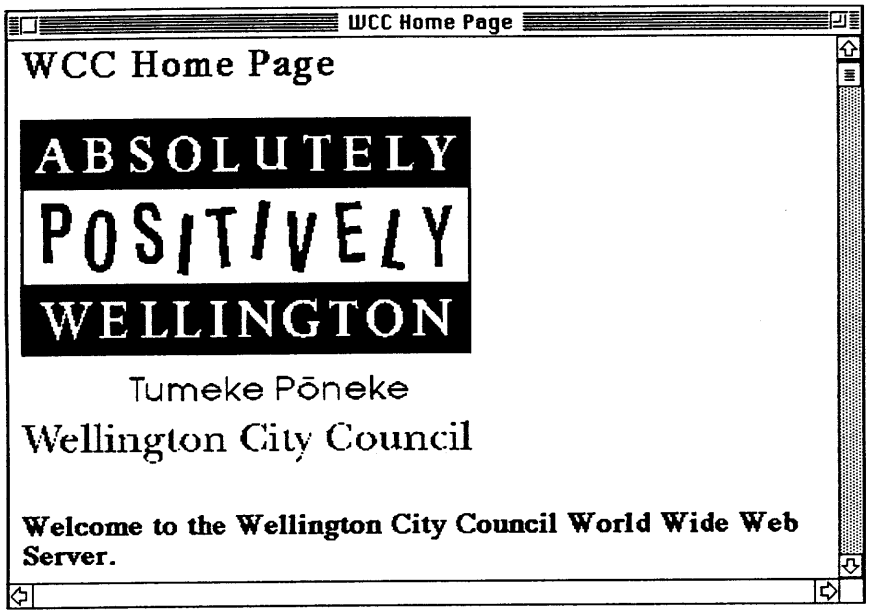
    1   CONSUMER DIAL                  %DCCADIAL
    2   DLIR INFO SERVICE              %DLIRINFO
    3   ELECTION RESULTS               %ELECT94
    4   ELECTION                       %ELECTION
    5   HI. DBED ENERGY DIV.           %ENERDIV
    6   GOVT FORUMS 1994               %GFORUM
    7   NEWS FROM THE GOVERNOR         %GOVNEWS
    8   HOUSING INFO SYSTEM            %HFDC
    9   LANDLORD-TENANT CODE           %LANTENCD
```

City Net[32]*, Wellington, New Zealand*

City Net is the name of the computer system owned and operated by the Wellington City Council. It primarily provides services to Council staff but it is also part of a network that provides information to the public.

In addition to information, the system provides Internet services such as telnet, ftp, newsgroups, e-mail, gopher, IRC, archie, and WWW.

The Wellington City Council's home page on the WWW



City Net has approximately 3,000 users and 11 public dial-in lines. As of December 1994, the city planned to install terminals in their central library to allow public access to their system as well as on-line library catalogues and city mapping.

When City Net was first introduced, organizers made an effort to meet with the owners of the existing bulletin boards in the city so they would not feel threatened by the new system and to assure them that they would not lose business because of City Net. This gesture seems to have helped to popularize and legitimize the BBSs.

---

33 Wellington's City Net is available through telnet: ix.wcc.govt.nz; gopher: gopher.wcc.govt.nz and WWW: http://www.wcc.govt.nz/index.html

As part of City Net, a gopher client was established in 1992 that provided city by-laws, minutes of committees and council meetings. Also available is information in text, graphic and video form about the city (Naylor 1994).

Unlike the PEN system in Santa Monica, there appears to be no extensive public discussion on the system.

4. Wired Cities

The final model is that of the wired city.[34] The term wired city is used in the literature in two ways. One is the view of a future community in which all kinds of electronic communication services are available to households and businesses. The second meaning refers to any experiment or project that involves providing information and communication technology services to households and businesses (Dutton et al. 1987).

One of the very few examples of this type is the Blacksburg Electronic Village in Blacksburg, Virginia.

Blacksburg Electronic Village,[35] Blacksburg, Virginia

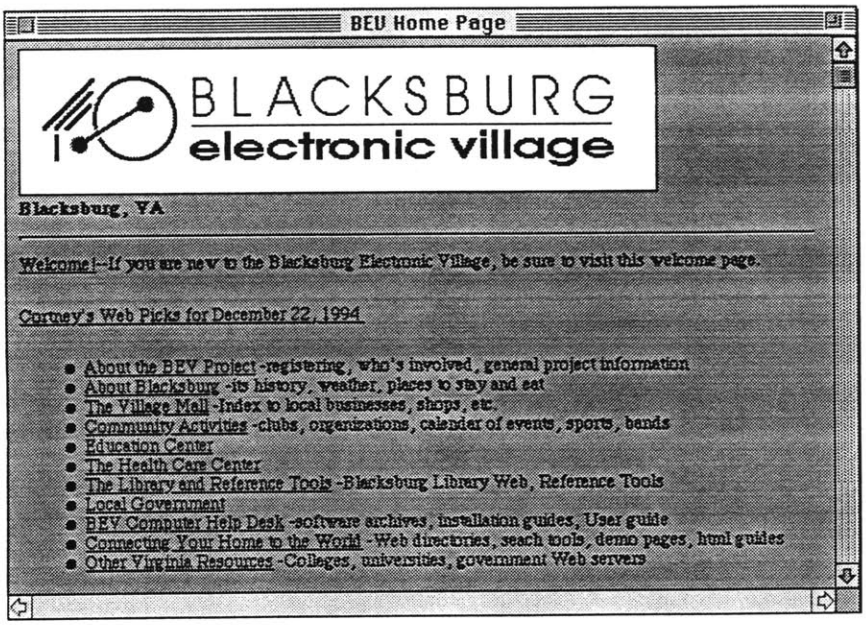
The Blacksburg Electronic Village (BEV),[36] located in southwest Virginia, is unique in that it is one of the first community networks that has approached the issue of access by aiming for a network connection in every home, business and classroom.

---

[34] The term "wired city" was first developed during Lyndon Johnson's administration in the context of the "Great Society" and the promotion of telecommunications to improve city living and stimulate regional development. For more information, see Dutton's chapter "Continuity and Change in Conceptions of the Wired City" in *Wired Cities: Shaping the Future of Communications*, Eds. W. H. Dutton, J. G. Blumler and K. L. Kraemer. Boston: G. K. Hall and Co. (1987).

[35] Blacksburg Electronic Village is located on WWW at: http://www.bev.net/.

[36] More information on BEV is available in the appendices.



It is also different from other community networks in that is a public/private partnership between the Town of Blacksburg, Virginia Tech, and Bell Atlantic Southwest (a subsidiary of Bell Atlantic).

Furthermore, unlike other community networks, BEV organizers see the project as an opportunity for businesses to test new products and delivery mechanisms to the residents of Blacksburg.

The system is still quite new, but to date, it is almost exclusively a supplier of information about Blacksburg, area businesses, clubs, events, education, health services and the library. The section on local government supplies the phone number of local city departments.

Unfortunately, there is so far no place for public discussion or public debate. The communication side connects the user to the Internet, but there are no groups for discussing local issues. The literature on BEV, however, does indicate that this will be incorporated into the system in the future. They state that the Blacksburg Electronic Village

> can serve as a foundation of an ongoing "Electronic Town Hall" in which people communicate with each other and with town leaders informally by electronic mail to facilitate

civic service and community improvement projects. Electronic bulletin boards and electronic conferences can be constructed to inform citizens about current and future town events, town improvement plans, and ideas for future activities, and to allow each citizen a voice in discussing the relative merits of particular ideas and approaches (BEV 1994).

New Models for Community Networks

A variety of new models and organizations are appearing in an effort to address the shortcomings of existing community networks. Most of the newer models have improved interfaces and alternate methods for financing and organizing the system. Examples of these new models are FreeSpace, Plugged In, CitySource, and City.Net.

FreeSpace[37]

A new model for community networks is being developed by the Telecommons Development Group (TDG), a worker cooperative, at the University of Guelph in southwestern Ontario. They are developing a system which offers the grassroots accessibility of a Free-Net and the sustainability of a commercial service.

FreeSpace was developed in response to the existing models. Its developers admired Free-Net's focus on community information, access and communication, but felt that depending on infrequent donations and government grants would lead to financial trouble. They were also critical of Free-Net's "outdated and inadequate interface" (FreeSpace, 1994a) which does not take advantage of advances in graphical user interfaces.

Financially, FreeSpace will encourage a wide range of revenue sources for the network, including both volunteer action and for-profit service. They

37 More information on FreeSpace is available on the WWW at: http://tdg.uoguelph.ca/tdg/archive/switchboard

envision four ways of generating revenue: "the involvement of business through customer service bulletin boards, forums, discreet advertising and virtual transaction; through value-added services such as newsfeeds and on-line arcades; through consultation and professional Internet workshops; and through fees for extended user access (FreeSpace 1994a)."

There will also be some level of user fees. Services will include free daily access of one or 1.5 hours, flat fee unlimited access, full Internet access at all levels, graphics, interface, audio and subsidized equitable access for rural areas.

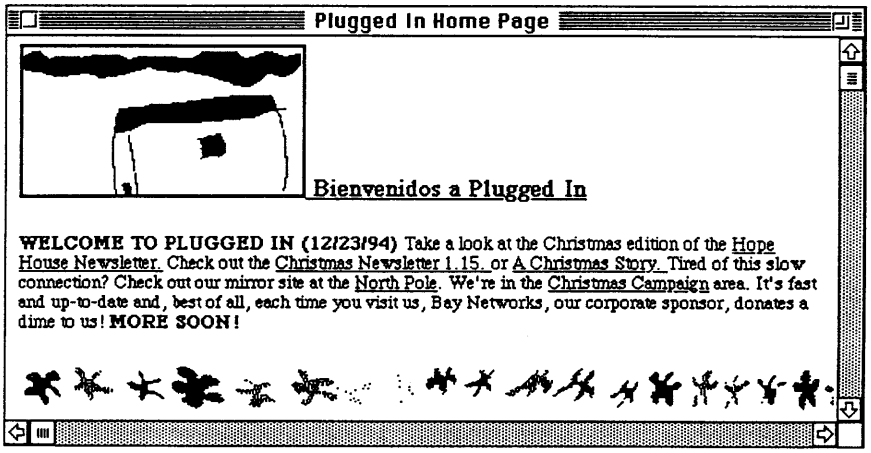
Technically, FreeSpace uses software with graphical user interfaces called RIP (remote imaging protocol) which allows point-and-click control. RIP uses a special client program which resides on the user's personal computer and supports object-oriented graphics and digital sound which can be delivered to most IBM or Macintosh computers at 1200 baud and up.

Organizationally, FreeSpace will be a two-level system. The first is the local community FreeSpace cooperative that provides information. Each electronic community will be responsible for organizing, financing, and running their own system. The second level is the for-profit cooperative service provider in the region which may be a group of paid employees who provide consultation and training, hardware and Internet connectivity to each local community FreeSpace cooperative. Government, business and non-government organizations (NGOs) will connect to the network through the service provider. Unlike Free-Nets, the centralized computer facility will not maintained by volunteers, but by professional consultants and developers (FreeSpace 1994a; FreeSpace 1994b; MacDonald 1994).

Plugged In,[38] *East Palo Alto, California*

Plugged In was created in 1992 to bring the technological resources available in the Silicon Valley to low-income youth in nearby communities.

Plugged In's Opening Screen on the web



The system provides technology-based learning activities to children in East Palo Alto, as well as to Boys and Girls Club facilities in Menlo Park and Redwood City. The technology is used to develop collaborative projects including computer programming classes, cartoon animations, multimedia self-portraits, slideshows and interactive newsletters.

Through these projects, students learn teamwork, process skills and leadership abilities, and become proficient in using the latest means of communication. All of Plugged In's projects take place during after-school hours.

They also make their finished projects available to community workers and educators nationwide through the Internet. Recently, the system received funding from the National Telecommunication and Information Administration to help develop a national network of youth agencies on the Internet.

38 Plugged In's URL is: http://www.pluggedin.org/. To contact Plugged In, send e-mail to webmaster@pluggedin.org, call 415-322-6147 or write to: 1923 University Avenue, East Palo Alto, CA, 94303.

CitySource, Cambridge, Massachusetts

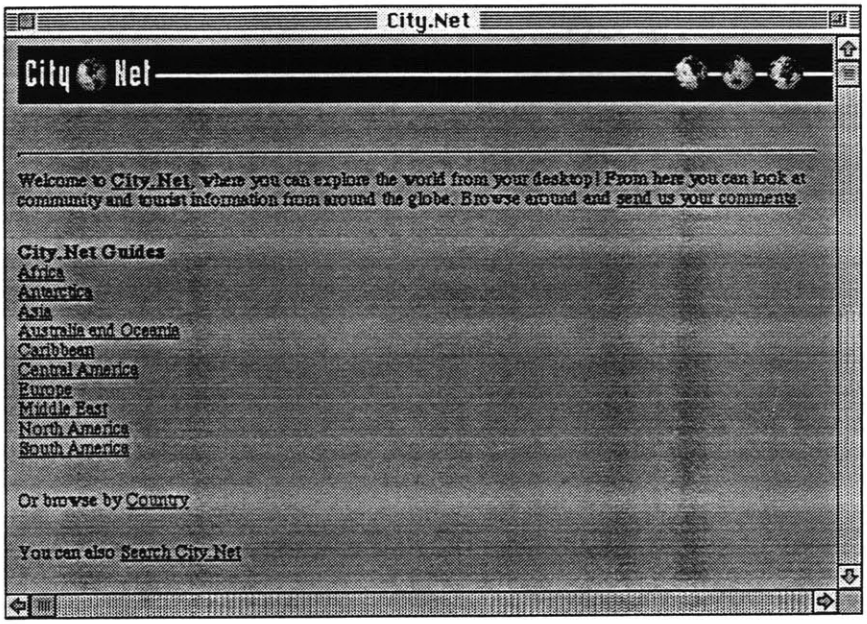
Another model being developed in Cambridge, Massachusetts is very interesting because it keeps the aspect of local community but opens the system to local businesses. This gives it the potential for being more sustainable than many community networks since it does not depend on grants or donations.

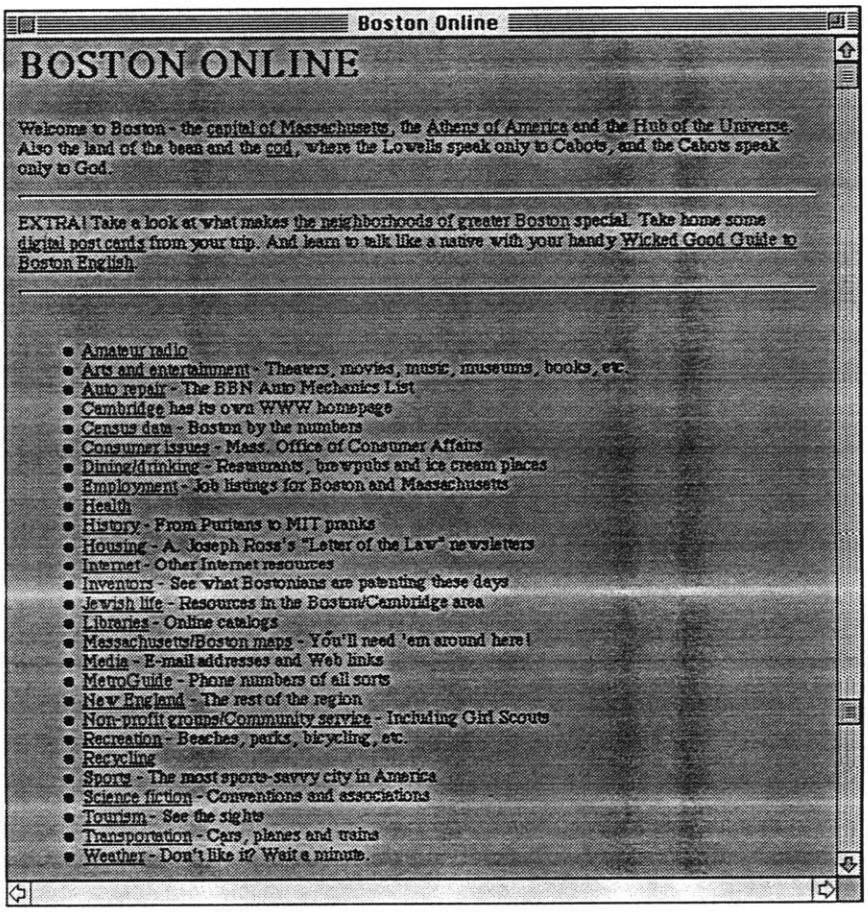
The opening screen shows part of a city street. On one side are community buildings, on the other side are "businesses" and in the middle is the post office. Residents can dial in for free and visit any part of the system. They can leave e-mail for others living in Cambridge for free and can purchase Internet access if desired. They can visit the business section where merchants, store owners, movie theaters, and restaurant owners will pay a fee to make information about their business available on-line. Users can also visit the community side where community groups who wish to make information about their services available, can do so for free.

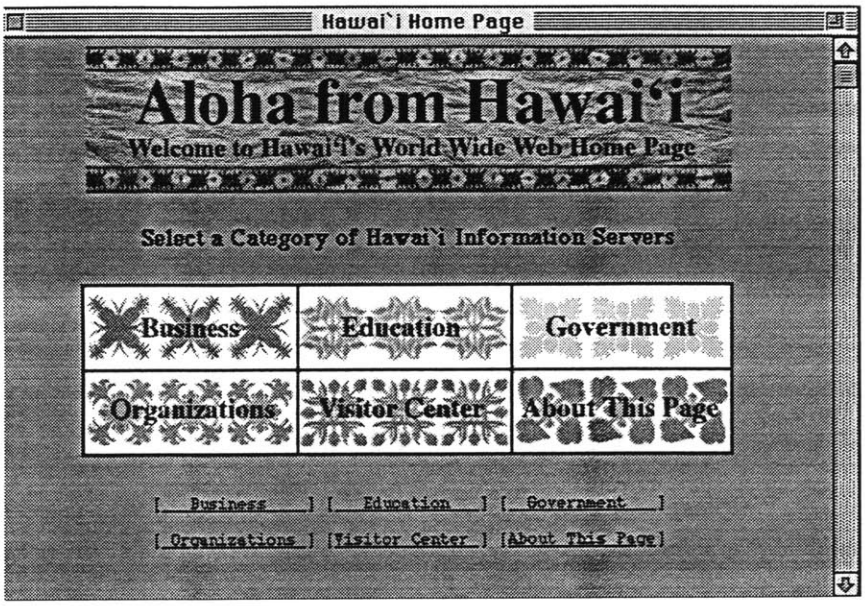
City.Net[39]

A number of cities around the country have appeared on-line in the past several months and many more will follow in the years ahead. These cities are linked to City.Net, an international guide to communities around the world. Their focus is almost exclusively on supplying information about their city (travel, entertainment, tourism, real estate, etc.) to those outside the community. These sites provide useful information, but they are not community networks as defined in this thesis, even though they frequently call themselves by that name. They are not designed with the local audience in mind and there is no intention to use the technology to improve or develop the local community.

[39] City.Net is on the WWW at: http://www.city.net/.
Other sources of city home pages are: http://www.ic.mankato.mn.us/reg9 / cities.html and http://rohan.sdsu.edu/infosandiego/examples/citygov / index.html.


City.Net
City Net
Welcome to City.Net, where you can explore the world from your desktop! From here you can look at community and tourist information from around the globe. Browse around and send us your comments.
City.Net Guides
Africa
Antarctica
Asia
Australia and Oceania
Caribbean
Central America
Europe
Middle East
North America
South America
Or browse by Country
You can also Search City.Net


Boston Online
BOSTON ONLINE
Welcome to Boston - the capital of Massachusetts, the Athens of America and the Hub of the Universe. Also the land of the bean and the cod, where the Lowells speak only to Cabots, and the Cabots speak only to God.
EXTRA! Take a look at what makes the neighborhoods of greater Boston special. Take home some digital post cards from your trip. And learn to talk like a native with your handy Wicked Good Guide to Boston English.
Amateur radio
Arts and entertainment - Theaters, movies, music, museums, books, etc.
Auto repair - The BBN Auto Mechanics List
Cambridge has its own WWW homepage
Census data - Boston by the numbers
Consumer issues - Mass. Office of Consumer Affairs
Dining/drinking - Restaurants, brewpubs and ice cream places
Employment - Job listings for Boston and Massachusetts
Health
History - From Puritans to MIT pranks
Housing - A. Joseph Ross's "Letter of the Law" newsletters
Internet - Other Internet resources
Inventors - See what Bostonians are patenting these days
Jewish life - Resources in the Boston/Cambridge area
Libraries - Online catalogs
Massachusetts/Boston maps - You'll need 'em around here!
Media - E-mail addresses and Web links
MetroGuide - Phone numbers of all sorts
New England - The rest of the region
Non-profit groups/Community service - Including Girl Scouts
Recreation - Beaches, parks, bicycling, etc.
Recycling
Sports - The most sports-savvy city in America
Science fiction - Conventions and associations
Tourism - See the sights
Transportation - Cars, planes and trains
Weather - Don't like it? Wait a minute.



Commercial Networks and Public Discussion

A number of commercial networks begin to approach the definition of community networks and are well worth considering here. Examples include ECHO in New York City, the WELL in San Francisco, and city bulletin boards such as Channel One in Boston.

Commercial networks differ from non-profit community networks in that they often have less local information and less discussion of local issues. They are rarely concerned with ensuring that public access terminals are provided and community development is not a priority. However, it is still worth looking at some aspects of the commercial providers because unlike the non-profit networks they are entirely self-financing and do not rely on government or corporate sponsorship. Moreover, they are very strong on public discussion.

These networks are often home to "virtual on-line communities" and some have been quite successful at creating and maintaining a sense of community among their members. They do this through communication rather than the supply of information.

ECHO,[40] New York City, NY

The East Coast Hang Out (ECHO) was started by Stacy Horn in New York City. The majority (80%) of users are New Yorkers who like to know and talk about topics such as films, performance art, books, music, and experimental theater. They also organize a bi-monthly face-to-face meeting for participants (Halpern 1993).

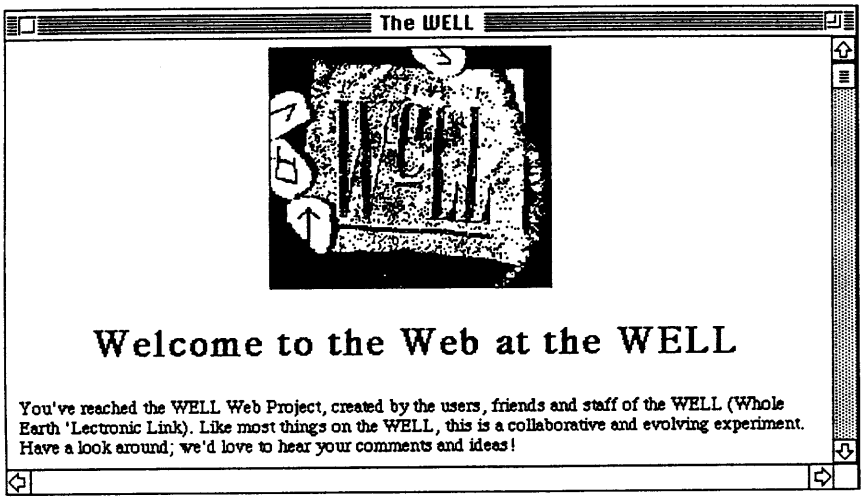
ECHO is unusual in that it has a far higher female participation than any other on-line community. Approximately 37% are women compared with 10% on other systems. Horn maintains that the interface and style of conversation usually keep women away from on-line communities; therefore she has made an effort to make women comfortable by having half of the conferences hosted by women and by responding to complaints of harassment (Katz 1993).

40 ECHO's URL is: http://www.echonyc.com/

The WELL,[41] *San Francisco, California*

The Whole Earth Electronic Link (WELL) was created in the mid-80s and since 1992 has been accessible through the Internet. The system has 9,000 registered users who pay fees.

The WELL's home page on the web.



The WELL is well-known for its small-town feeling and sense of community. Its specialty is talk – there are hardly any databases of imported information or libraries and very few third-party services such as stock-trading news, wire services, and airline reservation access (Figallo 1993).

Like ECHO, the WELL also organizes face-to-face get togethers every month.

41 The WELL's URL is: http://www.well.com/

Channel One,[42] *Cambridge, Massachusetts*

Most cities also have a number of bulletin boards like Channel One. Though it is locally-based, it focuses on virtual community rather than physical community, but their conferences are lively and varied.

Some of Channel One's conferences

```
                    C H A N N E L  1   C O N F E R E N C E S
                                0 Main Conference
     1 MailBox             *14 Science               *27 AmigaNAT
     2 TeX (with files)     15 Grapevine (&Jobs)     *28 Forum
    *3 CAD                  16 MassModemTax          *29 Ads
     4 Amiga (with files)  *17 Online (Services)     *30 Music (Pop)
     5 Free (Help/Files)   *18 Mac (w/ files)        *31 SciFi
     6 MS (Microsoft files)*19 Desktop (Publishing)   32 Genealogy
     7 Store               %20 Teens                  33 Weather
    *8 ANSI (pictures)     *21 Reviews (Software)    *34 NovUser
     9 Programs            *22 HardDisk              *35 WordStar-R
    %10 Movies-S           +23 LAN (&Networks)       +36 Clipper
    *11 Relate             +24 Virus (Info)          *37 AIDS-HIV
    >12 Adult (files)      *25 Unixnet               *38 Biology
     13 Games (DOORs)      *26 Lang (Programming)    *39 Fractals-R
     > Members         * RIME              + ILink         = Private
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                    C H A N N E L  1   C O N F E R E N C E S
                >>  J oin conferences from the main prompt   <<
    *40 Common (pvt msgs )  +53 Business              +66 DSZ
    *41 Doors               +54 Stocks                *67 Handicap
    +42 Beyond              *55 Com_Echo              +68 Qmodem
    *43 Medical             +56 Francais              %69 Hayes
    *44 Spanish             *57 XYWrite               +70 C-Lang
    *45 OOPS                %58 LegalNet              +71 Pascal
    *46 RlyUsers            *59 Deadhead              +72 QBasic
    *47 Telix-R             *60 Windows               +73 AI
    *48 USR\HST             *61 Robocomm              +74 Aquarium-I
    +49 PKware              *62 Cuisine               +75 Astronomy
    %50 Desqview            *63 UpLink                *76 Engineers
    *51 Comp_Gen            +64 Qmail                 +77 Writers
    *52 Finance             +65 Database              +78 Gateway-I
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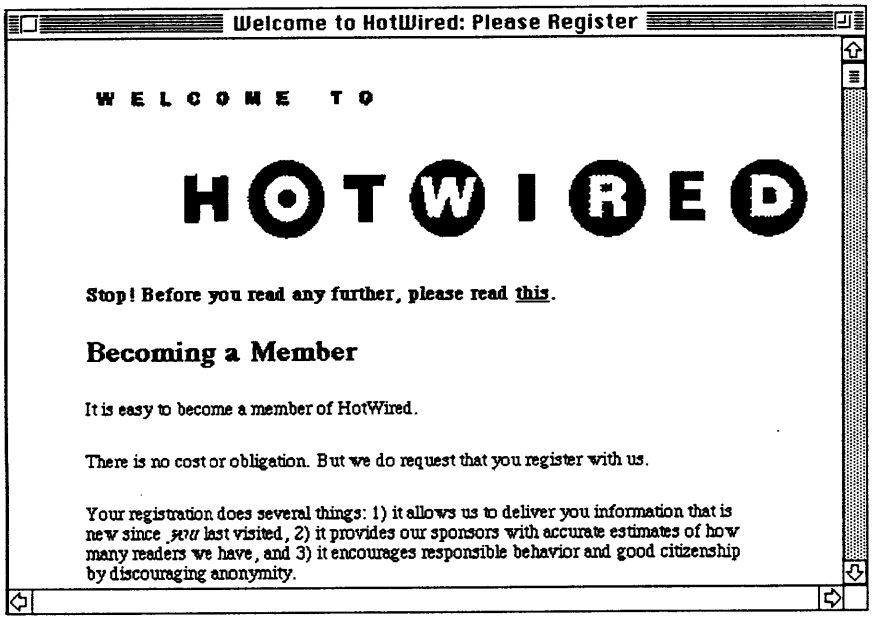
42 Channel One's 14.4k public access number is: 617-354-3230

HotWired[43]

Still another type of place where discussion occurs is HotWired. HotWired is the new digital salon of *Wired* magazine where readers chat with each other and primarily discuss topics of interest to *Wired*'s readership.

HotWired's opening screen on the web.



Summary

This chapter has reviewed the wide variety of approaches that community networks can take. All have their advantages: Free-Nets focus on access and community development; the government-sponsored systems have a particularly high level of participation by government officials and departments; neighborhood bulletin boards have an intimacy that the larger systems cannot offer; and the wired city model offers a very practical solution to the issue of access by ensuring that every home, business and classroom has some type of connection. The commercial systems like the WELL and ECHO may offer less local information, but they have lively conversation and generate strong feelings of loyalty from their users.

[43] HotWired is on WWW at: http://www.hotwired.com/

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3
MONITORING
PROGRESS

Introduction

Community networks are a fairly recent phenomenon with broad and far-reaching goals and have the potential for being important contributors to communities.

If they have this potential, community networks need to be evaluated to see how well they are succeeding. They need to be measured against their goals, but it is not yet time to hold them accountable for fully achieving their long-term goals. Judging them at this stage would be similar to giving a verdict on the impact of the telephone five years after it was introduced. At that time, it was still not clear how it would be used in everyday life or how the use of telephones would evolve (Fischer 1992).

However, this is not to say that no measuring or monitoring of networks is necessary. To the contrary, it is essential that community networks be measured against the direction and speed of moving toward their goals, rather than the goal itself. Since planning should be an ongoing process, monitoring and evaluation is essential.

This chapter looks at the role monitoring can play in community networks, some common reasons for similar projects to fail, how assessment of community networks has been done, the short- and long-term goals that networks should reach for, and who benefits from the evaluation process.

Role of Monitoring

Regular evaluation indicates whether a project is going in the right direction; it notes what was successful and what was not; and it points to changes in direction that may be needed to attain the overall goals of the project (Sylvia, Meier & Gunn 1985; Waller, Kemp & Scanlon 1976).

In other words, the purpose of evaluation or monitoring is to learn what went well and why, what went poorly and why, and how future efforts can be improved.

There are two types of information gathered during an evaluation: quantitative and qualitative. Quantitative information looks at the "hard" numbers of the network, such as the number of people using the system, how often they logon, and what type of information or service they access the most. These numbers are useful, but one is still left with questions: Is that good? How many users does it take for a system to be successful? Quantitative information allows managers to understand how the system is being used, how to better address the needs of the community, and to help identify barriers to access. However, these numbers clearly do not tell the whole story.

Qualitative information, often considered "soft" information, is also essential to understanding how the network is being used. These are the stories that people tell about the effect that community networks have on their lives.

Quantitative and qualitative information are also distinct in how they are collected and analyzed. Quantitative information is most often gathered through questionnaires and surveys which then are analyzed using statistics or mathematics. It is most useful for comparisons, but is weak on context. On the other hand, qualitative information, which is often, but not always, gathered through some type of story-telling, emphasizes the situation or context (Strauss 1987).

A common type of project evaluation is cost-benefit analysis, but this would be inappropriate for community networks, especially at this stage. Cost-benefit analysis is used when the effects can be predicted, when results can be measured with a fair amount of accuracy, and when one can put a price or value on the outcome. None of these conditions currently exist for community networks.

Steve Miller (1994) has written about the need to evaluate the NII and to build in a method of evaluating it so that we can make course corrections before things drift too far from desired goals. This is equally true of community networks. He points out that measuring and evaluating are common in the business and commercial world as a way to make things visible and the center of attention and there is every reason for the public sector to take the same approach.

The things that Miller believes we need to know about the NII are also true for community networks. Issues include: breadth of penetration of the technology, the extent of training and skill readiness of users, how users evaluate the system, how it has changed the user's quality of life, and uses or characteristics that users would like to see implemented.

Both quantitative and qualitative information are necessary and important to collect. Collecting the information is not an end in itself, however, and should only be used as a tool. Armed with this data, network organizers need to use this knowledge to clarify their goals and make decisions about the strategies for reaching them.

Reasons for Failure

Though community networks have a short history and have not yet built up their own body of knowledge, they are not isolated or completely unique. Much can be learned from the long history of domestic and international community development projects, the difficulties they typically face and how those difficulties have been overcome.

A good overview of the problems faced by development projects is contained in the chapter "Sustaining Project Benefits" in *Implementing Rural Development Projects* (Morss, Gow & Nortlinger 1985). Though the authors are specifically discussing rural development projects, much is applicable to community networks. They state that the reasons why projects fail are

complicated and interwoven, but they see three broad factors: financial, political and economic, and institutional.

The authors state that financial problems occur when revenue generation does not cover financial needs and when there are excessive costs, often caused by overly complicated donated equipment and systems. Political and economic factors include the economic environment in which the project is set and the degree of political support that the project receives. Finally, institutional factors include inadequate organizational and individual capacity to carry out project activities, lack of appropriate incentives to elicit the support of individuals and organizations, and underestimating the time needed to initiate a sustainable project.

The authors also suggest how to alleviate some of the factors that can lead to failure.

When dealing with financial factors, they believe that it is important to limit costs and to set up a sustainable method of revenue generation which can be a combination of government funding, donations, and user charges. If user charges may lead to withholding benefits to those who need them most but are least able to pay, one response may be to structure charges for differing payment abilities. It is also advantageous to use local resources such as voluntary labor to reduce costs and to involve the private sector whenever possible.

Political and economic problems are much more difficult for managers and organizers to alleviate. The choices are to ignore them, to overcome the problem by influencing key decision makers, or to change the project strategy to circumvent the constraints.

At an institutional level, the authors also believe that projects should involve multiple groups of people to share risk and collaborate. The importance of timely and adequate support cannot be overemphasized. Evaluating should be used as a planning tool and used to support redesign or adjustments of

the project. And finally, it is wise to remember that sustainability will take much longer to achieve than anyone expects.

How Assessment Has Been Done

Perhaps not too surprisingly, there appears to have been little formal evaluation or monitoring of community networks to date because these networks are still young and there is no generally accepted method for evaluating them.

The National Capital FreeNet (NCF) in Ottawa conducted a survey between January and July 1994 of the frequency of use of the "go" command. Results showed that Usenet was the most frequent command, followed by gopher; this suggested that the system was used to access external services and a world-wide community rather than the local community (Black, Patrick & Whalen 1994a).

A much more thorough and potentially very useful survey is being undertaken on the NCF[44] and the users of the system, what they use the most, and how the NCF has affected or been important to them. The results will be available in the spring of 1995 (Black, Patrick & Whalen 1994b; Revoy 1994).

Many of the Free-Nets also gather statistics on the number of users, when they logon, and what areas they frequently use, but very few are at the stage of the NCF and asking the type of questions that can help shape the future direction of the network.

For example, Digital City[45] in Amsterdam undertook a survey (Schalken

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[44] The National Capital Free-Net survey can be found at: http://debra.dgbt.doc.ca/~andrew/survey.html

[45] Digital City is a community network in Amsterdam that started in January 1994. It was originally intended to run for a 10-week period but the system was so successful that it was extended until the end of the year. They system has approximately 13,000 registered users (called "inhabitants") and is accessed an average of 1,700 times per day.

& Tops 1994) to learn who was using the system. The network was very popular and the lines were always busy. From sheer numbers, it appeared that the network was wildly successful. But the survey found that the overwhelming majority of users were young middle-class males. From the point of view of quantity, it may be successful, but if the system is supposed to serve and reflect all of the community, how successful is it? On the other hand, its use by young males certainly does not mean that it is a failure.

This type of survey is important because it allows organizers to reflect on the meaning of success for their system. If it is important that the system reflect the diversity of the community, what action will the organizers take to improve it?

Stories are also beginning to be collected about how networks affect the lives of individuals. For example, the Federation of American Research Networks (FARNET) published accounts of how and why people use the Internet (FARNET 1993). The range of subjects was wide and included examples of creating successful commercial enterprises, teachers communicating with teachers, creating a forum for clarinet players, reducing dental costs, career counseling and speech synthesis. The reports are significant because they focused not on the network, but on what the individual or a group was able to accomplish using the technology that they would not have been able to do otherwise.

These stories indicate that one measure of success for a community network is the number and type of projects or actions that resulted or were facilitated because of the network that otherwise would not have occurred.

Short-Term Goals

In order for community networks to be judged against their long-term goals, I believe that there are two basic things that they must do in the short term. They must survive and grow.

Community networks must be measured against these two criteria because if they do not survive and grow, they will never be able to reach their long-term goals.

Sustainability

To survive, the network must become institutionalized and self-sustaining in terms of funding, staffing and management. It is especially important that community networks survive the departure of the original initiators, volunteers and donors.

Sustainability, especially financial sustainability, is a constant concern for community networks. Financial difficulties are compounded because many, but not all, community networks are adamant about providing free services to all members of the community. The problem is further complicated because charging fees could endanger an organization's non-profit/charity status. Related to funding is the difficulty of maintaining the necessary level of fund raising and possible burnout of volunteers.

Good management is essential for a community network to survive. The management must evolve as needs change and networks face some of their toughest problems moving from the founding individuals to a professionally-run organization. It is particularly important that management have a proactive rather than a reactive approach (Huckerby 1994).

Suggestions for how to ensure community network survival (Huckerby, 1994) include being very clear on what the network is trying to achieve, setting realistic goals, letting the community participate rather than relying on the efforts of a few individuals, and developing a structure which lets all participants work together.

Growth

Growth means not just increasing the number of users of the network but also expanding the services offered. Growth is a sign of success because it

means the network is fulfilling a need in the community. This is particularly important since a community network can only begin to be measured against its long-term goals when it and the technology become ubiquitous.

Long-Term Goals

I believe that a community network should ultimately be judged on:

- access;
- public discussion and democratic participation; and
- how it aids community development.

Access

As mentioned previously, several community networks have undertaken surveys to assess who is using the network and how. Results vary. Digital City in Amsterdam (Schalken & Tops 1994) found that the network was inhabited by young educated men (91% of users were male) with interests and skills in the use of information and communication technology. Women, older people, and less educated people were very poorly represented on the network. The PEN system in Santa Monica found that 65% of their users were male (Guthrie 1990).

The fact that more men than women use the system is not especially surprising. The more interesting question is how the network administrators react to the results of a survey. If they discover that the users are not representative of the community, how will they respond? How will they resolve the problem? How will they promote fuller participation?

Democratic Participation

The promotion of public debate and democratic participation is one of the most important objectives in the design of community networks. How well do they succeed? The results are varied. Some community networks have made admirable efforts to include useful public discussion of local issues while others rely on Usenet newsgroups for discussion.

It is interesting to note that in Digital City's survey, communication was more popular than information retrieval. The most used facilities were the Internet, electronic mail, and IRC (cafés). The least used were municipal and district office databases (Schalken & Tops 1994).

As more city councils and departments get e-mail and are linked to publicly accessible networks, the lack of direct communication between them and the public should be less of a problem. However, elected officials and public servants may still be reluctant to take part, in which case community networks should be prepared to assist or suggest ways to improve the situation.

Community Development

Trying to assess how a network strengthens the community and improves the lives of its residents is one of the more difficult tasks. Initial efforts can be made in terms of requesting accounts from users on how the network made a difference in their lives, but also important is keeping track of what projects or actions were a direct result of the network.

Who Benefits from Evaluation?

Who benefits from evaluating community networks against both short-term and long-term goals? The organizers themselves are helped because they receive feedback on their efforts which helps identify what works and what does not. This information helps new community networks that are starting up because they can build on the experience of others. It is also useful for donors or funders of community networks; with a clearer idea of what has been successful, they can direct their funds in a more effective manner. And, evaluation can help the users of the networks – with their input, they can affect the direction of the network and have it become a truer reflection of their needs and interests.

Summary

Monitoring the progress of community networks is an essential step in establishing successful systems that meet their goals and make a contributution to the community. The process has already started with surveys and the collection of user profiles. These efforts must be continued and extended. The results should also be published and discussed so that network organizers can take action if necessary and community systems can learn from each other.

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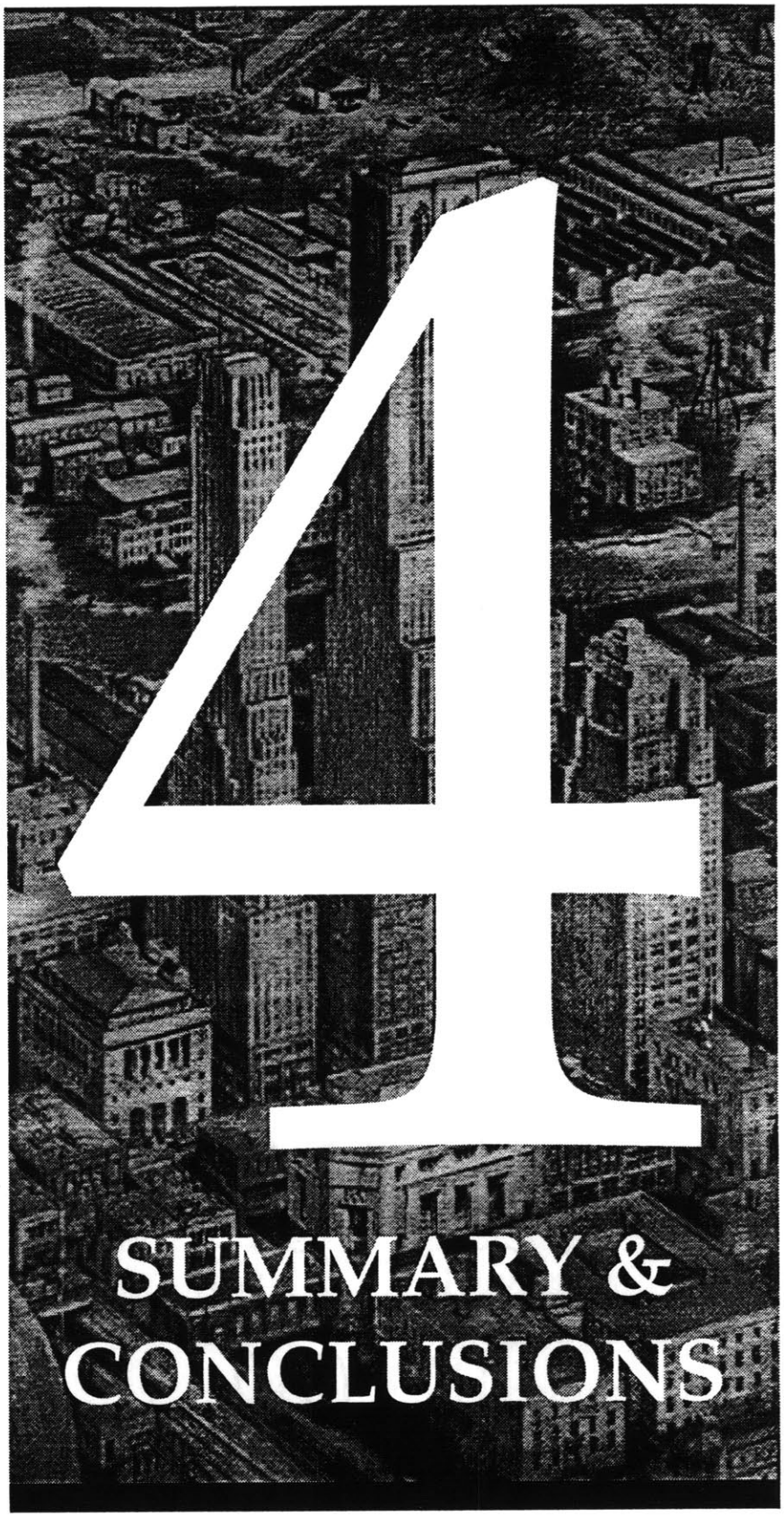
4
SUMMARY &
CONCLUSIONS

This chapter summarizes how community networks have met their goals to date, suggests how they can meet some of the challenges they face, recommends directions for future research and makes conclusions on the future of community networks.

Meeting Goals

If community networks' long-term goals are to strengthen the community, improve democracy and ensure inclusion in the NII, then we must judge them from the perspective of these three goals.

1. Community and Interaction

Community networks will never and should never substitute for face-to-face contact with neighbors and fellow residents. They can, however, become electronic "third places",[46] providing additional environments where people can get together, meet and talk and arrange for meeting face-to-face.

If what sociologists claim is true – that attachment to neighborhood partially depends on the amount of interaction that the resident has with his/her neighbors, then community networks can be important tools to encourage interaction both electronically and in the real world. Every community network has examples of people who have "met" on-line and have taken their discussion off-line. There are examples of community projects like SWASHLOCK in Santa Monica that succeeded in opening public showers

[46] Ray Oldenburg, in his book *The Great Good Place,* contends that the problem with American society and urban life is that it lacks "third places". Third places are neither home nor work, but are places where an informal public life can take place.

Third places around the world share common and essential features. They are neutral ground. They allow people to converse but not become entangled in one another's lives. They are levelers. The differences of the participants in class, wealth, etc. are eliminated or greatly reduced. It is inclusive rather than exclusive. Third places expand social possibilities. Conversation is the main activity in a third place. They are accessible at almost any time of the day or evening. Third places are frequented by "regulars". Physically, a third place is typically plain. The mood is playful. A third place is a home away from home.

and lockers for the city's homeless. This project was a direct result of the city's network. The volunteers who work in community networks have met dozens of new people in their work and community groups have used the system to meet, work together, and form coalitions with other community groups.

Community networks can increase interaction which in turn can strengthen the community. Unfortunately, most community systems have not given this the attention it needs or deserves. Admittedly, providing an environment for discussion and interaction is an even more difficult task than providing a rich variety of local information. But, if creating places to talk and interact can help reach the broad but fundamental goal of increasing a sense of attachment and community, then this must be a high priority for community networks.

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2. Public Discussion, Democratic Participation and Government

In spite of the rhetoric about increasing public discussion, democratic participation and access to government officials, it is surprising how often this is ignored by community networks. On-line communication is one of the most significant and valuable uses of the technology, yet it seems to take a backseat on many systems.

Government Participation in Community Networks

Too often government participation is interpreted to mean providing city information such as bus schedules and telephone numbers, which, though useful, does not begin to approach meaningful communication or participation. As a result, access to or active participation by government officials is rare on most networks. Understandably, government officials may be reluctant because of the potential for increased work for themselves and their staff, and/or the simple lack of e-mail in their offices, but if community networks are serious about increasing communication, they will have to look much harder at this issue.

At its simplest level, every city hall and department should have a place

on the network for frequently asked questions, where residents can ask questions and have them answered, either publicly or privately.

No doubt, as more elected officials and city departments come on-line and get an electronic address, access will increase. However, cities with on-line experience have found that it is necessary to plan and prepare for this access. It is not enough to simply go on-line – staff may need to be increased or at least specifically assigned to receive and respond to the questions and requests.

Discussion and Debate

Some level of discussion occurs on most community networks but again this is an area that rarely receives a great deal of attention. Discussion frequently means subscribing to newsgroups, and to be fair, some systems have hundreds of newsgroups which provide an enormous range of topics. But on many systems, organized discussions about local issues or public policy are rare.

This need not be the case, especially since the technology provides the opportunity for 2-way communication which we can use for discussion and debate. The technology, however, also has its constraints: without the cues or social pressure of the real world, conversation is too easily dominated by a small but vocal group. These perfectly legal, but often perfectly annoying, people can monopolize conversation, frequently driving away the more reasonable participants in exasperation.

This is not to say there is no place for unmoderated discussion. There is, and it plays an important role. But there is also a place for moderated discussion. Many successful discussion groups have a host or moderator who generates conversation when things get slow, redirects the thread when it becomes aimless, calms things down when conversation gets too heated, and encourages the many lurkers[47] to participate.

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[47] Lurkers are participants of discussion groups who read the public postings but rarely contribute themselves.

The need for an electronic version of Robert's Rules of Order has been frequently pointed out, but I would suggest that there is also a place for some form of formalized debate. A topic could be proposed and participants (perhaps a limited number) could debate the issue, with a limited number of words/time as in a real-world debate. Admittedly, this idea of limiting the number of words is contrary to the general principles of encouraging community[48] (Godwin 1994), but since it is not intended as a substitute or replacement for any existing forum, it would be worth the experiment.

Care must be taken, irrespective of the form that public discussion takes on community networks, not to turn it into a caricature of public participation, which can easily happen if the participants are not included in the setting of the agenda, questions or panel.

It is also important to look at how the more successful discussion areas work on other systems. A number of commercial services such as the WELL and ECHO are well known for their varied, lively and apparently very successful conversation. Community networks should look to them for ideas on how to structure their own version.

Electronic Voting

Several of the Free-Nets use voting software that allows participants to pose questions that are usually entertaining and humorous. However, it is not a particularly good vehicle for more serious discussion because it provides no background or description of the issues behind the question and because the answers are limited to those of the pollster.

I am particularly unhappy with the term "voting" when used in this context, because it trivializes what happens in the voting booth. Voting implies a decision with an action resulting from that decision. Voting is not and should not mean a survey of personal opinion.

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48 Mike Godwin (1994) in an article about the nine principles for encouraging community, states that one principle is not to limit the space or number of words that a member can send.

3. Access and Inclusion in the NII

Access also appears to be a problem with many community networks. It is not that networks prohibit anyone from joining – to the contrary, they strongly encourage everyone to join. But, from the limited number of surveys taken so far, it is clear that a broad cross-section of the community is not participating.

It is crucial that each community network reflect the make-up of the local community in which it is located. In order to address this issue, community networks need to:

1) Find out who is using their system. Few community networks seem to know who exactly are their users, but those who do have found that the majority of users tend to be young and male.

2) Learn why the others are not using the system. If community networks are to be a reflection of the population, they need to seriously consider why women, older people, and low-income groups do not use them. The reasons will likely be quite varied. Much can be learned from other systems such as ECHO, Plugged-In, and SeniorNet which have had considerable success in increasing the on-line participation of these groups.

3) Devise a strategy for correcting the problem. Though this may seem obvious, it is not always done. Once community networks learn about who is not using the system and why, they are obliged to try and rectify the situation. It may be expensive, it will be difficult, and they may have to completely rethink their organization and operation, but it is essential if they wish to avoid increasing the distance between the informational haves and have-nots.

Software Design

The choice of software is crucial to the success of a community network because it is the vehicle through which users interact with the network. It is the software that creates the space and encourages debate, discussion and accessibility.

Community networks use a variety of software including SoftArc's FirstClass, World Wide Web, or text-based software such as TBBS, and the University of Minnesota's Gopher (Cisler 1994). FreePort software is most often used by the older, more established Free-Nets.

None of the existing software is perfect The text-based programs may be visually unattractive, but they specialize in text-based communication, and are usable on almost any known computer and modem.

The more graphic programs such as the WWW are far more attractive visually but tend to emphasize providing information rather than communication which clearly limits their usefulness to a community network. But this situation is rapidly changing and a number of networks are switching over to the WWW. Discussion is also now being incorporated into Web pages[49] and a new program called HyperMail[50] is available which reads e-mail sent to the discussion group, organizes it according to the date, author or subject, and displays it on the web page. Formal debates are also appearing on-line.[51] The main limitation of using WWW is that users need to have a SLIP/PPP connection to take advantage of the graphics. SLIP/PPP is not available in all communities and can be more expensive than standard text-based access. However, there are text-based programs such as Lynx which can access Web pages and lets the user see the page minus the graphic images.

Community network software will change and adapt with the technology, and community networks will have to weigh the advantages and disadvantages of the new programs as they appear. Network organizers will have to try to satisfy their need for specialized information and communication services using the broad range of technologies that users own. In the short-term, they will probably resort to a combination of programs to meet their needs.

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49 An example is the discussion groups run by Time-Warner at: http://www.timeinc.com

50 Available from: http://www.eit.com/software/hypermail/hypermail.html

51 Online debates were held at: http://info.cs.vt.edu:8000/debates/html / Debates.html

Sustainability

It is difficult to imagine community networks continuing in their present form because of the difficult circumstances under which they operate. Demand for their services exceeds their capacity and yet they are limited to depending on corporate and private donations and volunteer labor. Increased funding would help enormously but many feel that charging a fee would compromise their mandate of providing free access.

Ways to ensure a healthy future for community networks include: finding reliable revenue sources, involving the business community, articulating goals, learning from others, developing an umbrella structure or organization, and continual reinvention.

Funding

In order to survive, community networks will have to find new and creative ways of finding reliable sources of revenue because without it, long-term planning cannot take place. Because each community is unique, each will have to come up with its own way of solving this problem.

Each network will have to reevaluate its policy of free access. Charging an annual fee is certainly one option to consider, as is a policy of charging for some services but not others, or a sliding-scale pricing structure.

It may be unwise for some community networks to depend on universities or other institutions to run their systems. This is because, as valuable as community network are, they are not central to most universities' or institutions' mandates and community networks would be one of the most likely candidates for budget cuts. There are, of course, exceptions, and there is no reason not to accept donations and support from them. Their assistance should be welcome, but it is dangerous to depend too completely on any institution which does not see community networks as an essential part of its work.

The Business Community

Unfortunately, in the past, community networks have largely shunned the business and commercial community because their presence has been seen as vaguely incompatible with the building of community networks. To the contrary, businesses and commercial establishments should be an integral and important part of community networks, as they are in any physical neighborhood.

Part of the reluctance to involve business is the fear that their presence would mean forced viewing of on-screen advertising, similar to the situation on Prodigy. Fortunately, this is not necessarily the case – business can be a source of revenue without imposed advertising. A very sensible approach is that taken by CitySource, a new network starting in Cambridge, Massachusetts. As you "arrive," you see that the system has several parts, one which is community and one which is commercial. If you are interested in movie reviews, restaurant menus or where to buy art supplies, for example, you would go to the commercial side. If you are interested in the recent events in a particular neighborhood, you would go to that site where the community group has put up information on their activities. The businesses pay to put their information on the system; community groups do not. In either case, it is free to the user.

Community networks can learn from physical cities in this respect. A lively city is one that has a wide variety of activities and services. An engaging city is not exclusively made up of social services, no matter how important they may be. Commercial establishments can make a city come alive with cafés, clubs, flower shops and movie theaters. As a vital part of our cities, the business community should be an equally important part of the digital world.

Goals

It appears that many community networks do not have articulated goals or objectives, or perhaps, they just do not make them available on-line. In any case, without clear goals, a community network will flounder.

Objectives and goals are necessary to help direct the project, to monitor how well it is succeeding, and to help focus on priorities.

There are hundreds of goals that are appropriate for community networks but the most important and broadest ones that will help guide them into the future are ensuring access and participation by all members of the community, maximizing public discussion and participation, and using the system to aid community development and local initiatives.

Umbrella Organization

The community network movement needs some form of organization that would support, assist, and coordinate community networks, similar to the role that the NPTN plays for Free-Nets, except that it would represent all types of community-based networks. An example of this type of organization, Telecommunities Canada,[52] is already being formed in Canada. This umbrella organization could have several roles. It would:

- advocate and represent community networks at the state/provincial and national level;
- assist in the areas of policies, software and regulatory issues;
- help with funding and sponsors;
- maintain a code of conduct;
- maintain a community network "toolkit" and assist new community networks in starting up;
- monitor community networks' progress;
- resolve issues/conflicts that cross community network boundaries;
- undertake and support research and demonstration projects; and
- disseminate the lessons learned and results of the research.

(Telecommunities Canada 1994)

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[52] In Canada, an umbrella group of community networks is being developed called "Telecommunities Canada". It would be somewhat similar to the NPTN in that it would assist new community networks with advice, information, and contacts. It would also be the voice for community networks in the country. It would differ from NPTN in that it would not be restricted to Free-Nets, but would include all community networks that are community-based and have community development as a stated purpose.

Reinventing Community Networks

Community networks are still very young. As the technology and circumstances change, community networks must also constantly change and reinvent themselves if they are to be long-term viable organizations.

To survive in a climate of change, community networks must be especially flexible. One way of doing this is not to do all things for all people. Instead, a community network could envision itself as the designer of a "space" or framework and they then encourage others to rent or use this space to supply information and places to chat and discuss local issues. Similar to developers in the physical world, they would create the conditions for others to offer their contributions to the community.

Further Research

Because community networks are so new, there is a need for much more research, experimentation, and demonstration. Some very important questions need to be answered:

- What works, what doesn't work, and under what conditions?
- What new models are emerging and what are their characteristics, advantages and disadvantages?
- Which conditions were most helpful for establishing and sustaining a community network?
- How can community networks effectively monitor their progress?
- What is the impact of community networks on the community?
- Do they really increase participation and interaction in the community?
- How can public discussion and debate be enhanced in community networks? and
- How can community networks be more accessible to a wider range of the population?

With the increase of community networks during the past couple of years, there is sufficient activity and experience for researchers to begin to test

hypotheses on each question.

Statistics and Surveys

At the most basic level, we need to know how many people are using the networks, who they are, how long they access the system, what services they use, and how important it is to them.

Some systems, such as the Cleveland Free-Net, generate and keep quite detailed usage statistics.[53] They also list statistics for the most accessed newsgroups in the system. This is useful for reflecting the popularity of the newsgroups, but, as they point out, this does not necessarily reflect where the users go on the system.

Few surveys, with the exception of those by PEN, Digital City and the NCF,[54] have gone beyond sheer number of users and times that a service has been accessed. We need to expand these basic statistics to include age, gender, occupation, and income in order to help community networks become more usable, useful, and accessible.

More Theses

While working on this thesis, it became clear that collecting enough information to do a detailed analysis and comparison of community networks was a far greater task than anticipated. Most community networks have very little written about them, and what is written is largely limited to facts, figures and dates. There is a need for face-to-face discussion and observation over time so that opinions and impressions can be gained from all participants in the network including the board, staff, volunteers and users. It is clear that every community network needs and deserves to be the subject of a thesis. Once a more solid foundation of knowledge is built, then it will be possible to analyze and compare community networks using the expanded framework discussed in chapter one.

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[53] Found in 1. The Administrative Building/6. What's New in the Electronic City/ 6. Weekly Freenet Usage Statistics

[54] The survey that was undertaken is available at: http://debra.dgbt.doc.ca /~andrew/survey.html The results of the survey will be available in the spring of 1995.

Making It More Like Community

Because communication and community is such an essential part of community networks, we need to look more closely at what aspects reinforce or enhance a sense of community on-line and then incorporate these characteristics into the system. A few writers have started to look at this issue (Godwin 1994; Smith 1992), but we need to look further and devise practical means for accomplishing this.

A Place to Keep the Information

When research is done and the reports and theses are written on community networks, it would be very helpful to future researchers if copies were kept by an organization and made available (electronically or otherwise) to the public. They could also publish strategic reports or papers. A community network umbrella organization or an organization such as the Morino Institute[55] which has already begun the process, would be an appropriate place to act as a collection and publishing point for the research.

Models of Community Networks

Which is the best model for a community network? None are ideal by themselves and all have advantages and disadvantages. The best model would combine the best aspects of each: the access and community development focus of Free-Nets, the high level of participation by city government in government-sponsored systems, the intimacy of neighborhood bulletin boards, and the wired city's practical focus of ensuring a connection for all homes, classrooms and businesses plus the liveliness, and sustainability of the commercial bulletin board systems like ECHO and the WELL.

55 Morino Institute, 1801 Robert Fulton Parkway, Suite 500, Reston, VA 22091 voice: 703-620-8971; fax: 703-620-4102; Internet: info@morino.org

Conclusions

If one looks at community networks in the harshest and most pessimistic light, they are primitive, rather crude, and barely begin to address the ambitious goals that they have set out for themselves. They are underfunded good intentions that will lose. They will collapse from the exhaustion of their volunteers and staff struggling with a lack of revenue, donated equipment, escalating demands of their users, and ambition that can't be satisfied with their resources.

However, in a more positive light, that crudeness can also be seen as an indication of youth. Community networks may now be at the stage of barely being able to walk but there is every expectation that they will learn to run.

During the process of reading about and listening to participants and visiting various community networks during the research for this thesis, I've repeatedly been struck by community networks' ability to satisfy an apparently very real and deeply felt need for both information and a way of communicating in our neighborhoods and cities.

Most impressive has been their ability to spark and tap an extraordinary amount of energy and enthusiasm in their communities. Though community networks can quite rightly be judged as rather primitive, it took enormous effort and dedication to get them to this stage. It is the ability to generate this dedication and perseverance that has been the key and, I believe, will continue to be the key to their future success.

Community networks have shown that people care about their cities and are looking for ways to participate more fully in them. I suspect that community networks' role as providers of information and communication may be secondary to their role as animators for creating a stronger sense of place and community.

Will community networks succeed in meeting their goals of creating a greater sense of community, increasing democratic participation, and ensuring access for all to the "information highway"? The jury is still out. It may be possible but it is certainly not guaranteed. They have been able to accomplish an extraordinary amount under very difficult conditions already and if they continue to tap this energy, be flexible, and keep their eyes on their goals, they may succeed.

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APPENDICES

Blacksburg Electronic Village, Blacksburg, Virginia

Blacksburg is located in southwest Virginia. The town has a population of 34,000 residents of whom 22,000 are students at Virginia Tech. In the past the town's economy was based on natural resource industries and heavy manufacturing but these have been in decline. The town believes that technology and communications will be the driver of future economic growth in the region and consequently want an extensive high-speed, two-way information network in Blacksburg. They believe that a network accessible by the entire community is a core to an information society.

The project, Blacksburg Electronic Village (BEV), started in October 1993 and as of February 1994 had over 600 users on-line.

The project is unique in that it is one of the first community networks that has approached the issue of access by insisting that a network connection be provided to every home, business and classroom in the town. This connection will provide:

- electronic mail,
- gopher servers,
- World Wide Web servers,
- bulletin boards (Usenet),
- electronic conferences (mailing lists),
- virtual terminal access, and
- switched video.

The project also differs from most other community networks because it is a public/private partnership with the Town of Blacksburg, Virginia Tech, and Bell Atlantic Southwest (a subsidiary of Bell Atlantic).

And unlike other community networks, the BEV organizers feel that it is important for all residents of the community to be on-line in order to have a "critical mass" which would be attractive to commercial users for testing

new products and delivery mechanisms. The organizers believe that network services have been a "chicken and egg" situation – the availability of many services only become practical when there is a large number of users – yet users won't use the network until there is sufficient number of services.

Organizers believe that the network will revolutionize residential and business life in the town. They expect that residential users will find their own uses for the technology but in general envisage that its main uses will be educational (e.g. student projects, curriculum development support, home instruction, access library services, special program, and monitoring by parents), business and professional (e.g. databases, medical, home financial services, distribution of information for retail and service business, general office use, telecommuting), civic (e.g. informal communication with town leaders, conferences for information and discussion, distribution of civic information), and quality of life (e.g. social, cultural, recreational and entertainment uses).

Blacksburg's small size is felt to be an asset because of the smaller number of people that need to be onnected. Because of Virginia Tech, the town also has the advantage of having a high technological literacy rate with a very high per-capita usage rate of computers.

The Virginia Tech campus itself has 3,000 Ethernet ports at 10,000,000 bps, and over 10,000 direct serial data connections at 19,200 bps (including a connection in each of the 4,500 dormitory rooms). Each campus connection is linked to the Internet backbone through a T1 (1.5 megabit) connection.

The work of connecting every home has already begun. Bell Atlantic has connected 400 apartment units to the Internet with Ethernet/10Base-T services. 300 more apartments will be connected by the summer of 1994 and within 2 years Bell Atlantic expects to have 75% of the apartment units in town wired for Ethernet.

The BEV project has three core partners:

• Bell Atlantic of Virginia has built and is operating the transport system. Their role is to "demonstrate leadership" in the deployment of the technology.

• The Town of Blacksburg and affiliated community groups' role is to inform educators, business people, and other citizens about the uses and advantages of networking, organizing user services, and assisting in the development and management of information sources.

• Virginia Tech is acting as local project manager with particular attention to the development and utilization of information sources and assessing technical alternatives for the desired services .

Other partners include Advanced Network & Services Inc. (ANS), Checkfree, Digital Technology Inc., Faxon Research Services, IBM, nView Corporation, Online Computer Library Center Inc. (OCLC), Quyen Systems Inc., and the Chronicle of Higher Education.

In addition, BEV has a "progressive, forward-thinking" representative in the U.S. Congress. Rich Boucher is very interested in telecommunications issues and has been instrumental in establishing the project.

The project is designed to provide long-term financial benefit to all participants which means that the core partners will have to establish a fair and sustainable financing package.

The system will have 4 tiers.

Tier A provides basic data service to everyone in the community. High-speed modems with a basic rate of 14.400 bits per second with compression capabilities up to 57,600 bits per second, work with existing telephone lines. Other options in certain areas are ISDN with rates between 19,200 and 128,000 bits per second.

Tier B provides high-speed data transmission for a subset of the community using Ethernet (10 megabits per second).

Tier C provides very high-speed transmission for a subset of the community. Fiber Distributed Data Interface (FDDI, 100 megabits per second) and gigabit per second networks are currently under development as part the National Research and Education Network (NREN) project and could potentially provide this service.

Tier D provides switched video service optionally to a subset of the community. Incoming video service would be included for the entire subset, and outgoing video services would be possible for at least some of the subset.

After about 3 years, the long-term future of the Blacksburg Electronic Village will be planned. The priority will be to include the most successful aspects of the network into the community as a permanent utility. And, at the end of the first three years, they hope to be financially self-sufficient.

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Cleveland Free-Net Directory

1 The Administration Building
1 What is the Cleveland Free-Net?
2 About the Free-Net Computers...
3 User Services
4 Administration Q & A
5 Administration Policy
6 What's New in the Electronic City
7 Free-Net Menu Outline(abbreviated)
8 Free-Net Menu Outline (quite long)
9 The Cleveland Free-Net Release Form
10 Print out the Cleveland Free-Net Release Form
11 Certification for Access to Open Speech Areas
12 The Free-Net Sysops...
13 Submitting a Proposal to Free-Net
14 Obtaining the Free-Net Software
15 The City Plaque (Thank you for your support)

2 The Post Office
1 About the Post Office
2 Check Mail
3 Send Mail
4 Check the size of your mailbox
5 See who your new mail is from
6 Edit your signature file
7 Mail Aliases
8 Have your mail forwarded
9 Directory Services
10 Filter Your Mail

3 Public Square
1 About Public Square
2 Announcements
3 The Kiosk (aka "The Zone") (Open Board, Adults Only)
4 The Cafe (Chat with other users)
5 The Podium (Electronic Speeches, Adults Only)
6 The Polling Place (All Voting Areas)
7 The Kiosk Voting Booth (Kiosk Voting Area)
8 The Speakeasy (General Discussion, Open)
9 The Singles Partyline
10 The Nonsexist SIG
11 Boomers' Place
12 The Mensa Forum

4 The Courthouse & Government Center
1 About the Government Center
2 The Courthouse (Legal Information)
3 The Freedom Shrine (Historic Documents)
4 Contact your Representatives
5 Governmental (800) Hotlines
6 U.S. National Weather Service
7 The County Engineer's Office
8 Safety and the Environment
9 Institute for Democracy in Education
10 1993 Budget of the United States
11 Internal Revenue Services

5 The Arts Building
1 About the Arts Building
2 Video Arts Department
3 Culinary Arts
4 Literary Arts
5 Theatre Arts
6 Photographic SIG
7 Visual Arts
8 MIDI/Electronic Music
9 The Music SIG
10 The Creative Writing SIG
11 The Audio Arts SIG
12 It's A Mystery — The Mystery Literature Group
13 The Antic Arts
14 The Chinese Advocate
15 Cleveland Institute of Music

6 Science and Technology Center
1 About the Science and Technology Ctr.
2 USA TODAY: Science and Technology News
3 The Museum of Natural History
4 NASA Air and Space SIG
5 The Computer Corner
6 The Skeptics SIG
7 IEEE (Institute of Electrical & Electronic Engineers)
8 Solid waste SIG
9 American Statistical Association SIG
10 Environmental Discussion
11 Home,Yard,and Garden
12 Functional MRI SIG

7 The Medical Arts Building
1 About the Medical Arts Building
2 USA TODAY: Health Headline News
3 St. Silicon's Hospital
4 The Handicap Center
5 Alzheimer's Disease

Source: Cleveland Free-Net. Available telnet: freenet-in-a.cwru.edu

tional Health
9 Substance Abuse Education
10 The Pediatric Information Resource Center
11 Safety and the Environment
12 Bioethics Network of Ohio
13 Nursing Network of Northeast Ohio

8 The Schoolhouse (Academy One)
1 About Academy One
2 The Academy One Project
3 Academy One Net Etiquette
4 Academy One Frequently Asked Questions(FAQ)
5 Academy One Schools
6 Academy One Projects Underway
7 Academy One Partners Wanted
8 Daily Report Card (Newsletter)
9 Teacher/Administrator Lounge
10 The Student Lounge
11 The Academy One Library
12 The Academy Bulletin Board
13 The National Middle School Network
14 Directory of Academy One Users
15 The Schoolhouse(School SIGS)

9 The Community Center & Recreation Area
1 About the Community Center
2 The Recreation Center
3 Community Services
4 Forum (Discussions)

10 The Business and Industrial Park
1 About the Business and Industrial Park
2 USA TODAY: Headline Business News
3 Latest Economic Info: U.S. Dept. of Commerce
4 The Personnel Office
5 The Travel Agent
6 The Computer Room
7 Integral Users Group
8 Starting Smart
9 EDPAA (EDP Auditors Association)
10 Tax Advisor
11 Insurance
12 Legal Information Systems
13 Sun Newspapers

11 The Library
1 About the Library
2 The Freedom Shrine (Historic Documents)
3 The Electronic Bookshelf
4 The CAMLS Library
5 CWRU Libraries
6 The Cleveland Public Library
7 The Special Libraries Association
8 Connect to Libraries Around the Nation
9 Government Documents Roundtable

12 University Circle
1 About University Circle
2 Case Western Reserve University
3 Museum of Natural History
4 Cleveland Children's Museum
5 Ohio Prospect Research Network
6 CSU College of Education
7 Cleveland Institute of Music

13 The Teleport
1 About the Teleport
2 The Packet Express (Send electronic mail to other systems)
3 The Terminal Tower (Connect to other systems)
4 Usenet News

14 The Communications Center
1 About the Communications Center
2 Chat with other users
3 Directory Services
4 File Transfer Services
5 User Services
6 The Post Office
7 The Teleport
8 Sysop Administration Area
9 Wide Area Information Servers

15 NPTN/USA TODAY HEADLINE NEWS
USA Today
Washington Post
Washington Times
London Times
Jerusalem Post
Moscow News
Highlights For Children
Foreign Policy
National Review
Investor & Business Daily
The Brookings Review
AP Financial
Forbes Magazine
Insight Magazine
The New Republic
California Management Review Mechanical Engineering

National Capital Free-Net, Ottawa, Ontario

The National Capital Free-Net (NCF) which was first established in 1991, serves the city of Ottawa as well as the surrounding region, including Hull, Gatineau, Kanata, Nepean, Cumberland, and Gloucester. It is free to anyone in the community and does not charge or pay for any information provided on the system. Its funding comes from public and private grants and donations and through other fund-raising methods. As of 1994, the system had 176 telephone lines.

History

The NCF project was first initiated in 1991 by George Frajkor and Jay Weston from the Carleton University School of Journalism and Dave Sutherland, Director of Carleton's Computing and Communication Services. The system grew out of the public information system that the university had been running (with information on the university) because the number of users had increased and several organizations off-campus began requesting space on the system to provide their own information to the public.

In their vision, the group saw a community information system that would provide information supplied by the community to the community; be available to anyone free of charge; be simple to learn; provide for two-way and multi-way communication; have low operating cost, and with access available at public institutions. They found that the Free-Net philosophy and the FreePort software best matched their requirements, so became an Free-Net Organizing Committee.

In March of 1992, the first public meeting was held with 100 people from 50 organizations. The response was enthusiastic and within four months, there were 200 organizations represented. More planning meetings took place and on February 1, 1993, the system formally opened (NCF 1994a).

Goals

At the heart of the NCF is the belief in that communications will "break down the barriers and build the bridges to greater understanding and cooperation" and build a stronger nation (NCF 1994a).

In addition to communication, the intention is to use the Free-Net as a way to encourage community organizations to communicate with the public in a dialogue rather than a monologue; to provide a way for community organizations to communicate and coordinate with each other, to avoid service duplication or leave gaps in services; and as a way of reducing costs for community organizations because they wouldn't need to develop and maintain their own stand-alone system.

The community Free-Net is thought to encourage and revitalize community involvement because it offers new opportunities for citizens to be more involved in their community and for groups, institutions and governments to become more visible and accessible.

It's also seen as a way to promote openness and can be a vehicle through which institutions can better respond to the public's questions and issues. They permit elected representatives at the municipal, regional, and provincial and federal levels a direct method of interacting with constituents. It provides a channel through which elective representatives both listen and talk to the electorate about their individual concerns and issues of the day. The polling and voting features of a Free-Net allow elected representatives and citizens to collect information about the nature and strength of public opinion. A Free-Net can accelerate and diversify the exchange of information that is critical to an open and democratic society (NCF 1994).

Public Access

Like other community networks, the NCF believes that public access terminals are a key objective so that anyone, including those who do not own a computer and modem at home, will be able to participate in the Free-Net.

Because they have a limited number of donated terminals, modems, and lines, they prioritize allocation to those locations or organizations with similar objectives and that can offer enthusiasm and support.

On this basis, their priorities are:

- public libraries,
- local government offices and city halls,
- educational centers that are accessible to the public,
- hospitals, when terminals are located in the main lobby,
- community health and resource centers,
- community recreational facilities, community centers and seniors' centers, and
- non-profit organizations that serve the community.

In addition, the NCF encourages other organizations to make terminals available to the public at their own expense in locations such as schools, shopping malls, airport, train station, bus terminal, federal government departments, hotel lobbies, senior's residences, community police stations, small retail outlets, arcades, banks, cinema lobbies, and food stores.

Currently there are 18 public access terminals in the city and surrounding area, located primarily in public libraries, but with a few in city hall and other government offices (NCF 1994b).

Sponsors & Funding

The system runs and is funded largely through the efforts of volunteers and corporate and government sponsors such as the Board of Education, Carleton University, The City of Ottawa, federal government departments, provincial government, Gandalf Canada Ltd. and Sun Microsystems of Canada. Private donors and fund-raising activities (e.g. the NCF Boutique, and the Free-Net On-Line Auction) also provide financial support.
It has an annual budget of $300,000. It is dependent on a three-year Ontario Network Infrastructure Program grant; it received $60,000 in 93, $50,000 in

1994 and will get $30,000 in 1995. After 1995, the funding will stop. The NCF continues seek donations, even hiring a full-time fund-raiser, but they are discussing ways being more financially independent (Kainz 1994).

Technical Information

The system runs on three Sun Sparc Station machines with 97 low speed modems and 64 high-speed (14.4) modems. There are 96 low-speed, 64 high-speed, and 14 dedicated telephone lines to government, city hall, and libraries.

Survey

The Network Technology Research group at the Communication Research Centre has undertaken a survey of the NCF in order to document and understand the success of the system. They were interested in understanding what makes a successful on-line system: What do the users use and not use? and What do they like or not like? A preliminary survey on the frequency of the "go" command was undertaken between January 4 and July 7, 1994. (The FreePort software has the option of recording the use of all go commands on the system.) The results of the survey showed that Usenet was the most frequent command, followed by Gopher. "These results suggest that the NCF is frequently being used for access to external services, and this may be a concern for the administration. If the focus on the NCF is local services for the local community and yet the most frequent commands are accessing external services and a world-wide community, there may be some conflict in goals and expectations" (Black et al. 1994). However, some of the specialized local services were accessed a great deal. For example, the Star Trek, public and youth discussion areas had high rankings. The results also showed that communication services were used very frequently and reflect the role and importance of interpersonal communication in the system.

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NCF. 1994a. *"The Context of Public Access Community Networks."* Available: telnet: freenet.carleton.ca Directory: /9/4/1/1/.

NCF. 1994b. *"Priorities for Locations of Public Access Terminals."* Available telnet: freenet.carleton.ca Directory: /9/6.

National Capital Free-Net Directories

1 About The National Capital FreeNet...
1 About the National Capital FreeNet
2 NCF Announcements...
3 Volunteering with the NCF...
4 FreeNet Committees...
5 NCF Contributing Sponsors
6 NCF List of Contacts
7 NCF Board Business...
8 NCF February 1994 Online AGM and Board Election...
9 NCF Position Papers, By-Laws, History, Proposals...
10 What Next? Discussing the future of FreeNets in Canada...
11 August 1994 Community Networking Conference...
12 NPTN Affiliated Community Computer Systems...
13 NCF Hardware/ Equipment
14 NCF Public Access Sites...
15 The FreeNet Boutique...

2 Administration...
1 About FreeNet Administration
2 Help Desk - Questions & Answers (ncf.admin) >>>
3 User Services...
4 Getting a FreeNet Account: Online Registration...
5 Test Area (including NCF ToolBox) ("Caution")...
6 Information Providers' Forum...

3 Post Office...
1 About the Post Office
2 Check Your Mail
3 Send Mail
4 Check the size of your mailbox
5 See who your new mail is from
6 Edit your signature file (4 80-character lines max)
7 Edit your personal aliases file
8 Have your mail forwarded...
9 Directory Services...
10 Kill currently running (possibly hung) mail sessions
11 Kill currently running (possibly hung) elm sessions
12 Send a FAX via E-Mail...
13 Edit your automatic Blind Carbon Copy "Bcc:" address list (1 line)
14 Show your automatic Blind Carbon Copy "Bcc:" address list
15 Delete your automatic Blind Carbon Copy "Bcc:" address list
16 The Help Desk's Help With Mail...

4 Public Discussion...
1 About the Public Discussion Menu
2 General Bulletin Board (ncf.general)
3 Babillard general francophone (ncf.francais)
4 Help Desk - Questions & Answers
5 A big thank-you to our volunteers
6 Questions and Help with Modems and Communications...
7 NCF Policy Discussions and Resolutions...
8 Chat with Other Users...
9 Public Advisory Council on the Information Highway
10 Ottawa Area Buy and Sell Postings (ott.forsale)
11 Ottawa Area Housing Postings (ott.housing)
12 Ottawa Area Events Postings (ott.events)
13 Ottawa Area Jobs Postings (ott.jobs)

5 Social Services, Health, & Environment Centre...
1 The Environment...
2 Immigrant and Refugee Services...
3 Epilepsy Ottawa-Carleton...
4 Ottawa Chinese Community Service Centre...
5 Chronic Fatigue Syndrome Electronic Information Resource...
6 Amnesty International...
7 Canadian Global Change Programme of the Royal Society of Canada...
8 Special Needs Employment Services (Line 1000)...
9 Alzheimer Society of Ottawa-Carleton...
10 AIDS Committee of Ottawa...
11 La Leche League (breastfeeding info)...
12 Advisory Council on Aging for Lanark,

Source: National Capital Free-Net. Available telnet: freenet.carleton.ca

Leeds-Grenville...
13 Coronary Health Improvement Programme...
14 Multiple Sclerosis Society...
15 Menu Part 2...
16 Schizophrenia Society of Canada...
17 Ottawa Psychiatric Survivors Alliance...
18 Cultural Interpretation Services of Ottawa-Carleton...
19 Canadian Council on Social Development...
20 Childbirth Education Association...
21 Community Information Centre of Ottawa-Carleton...
22 Planned Parenthood Ottawa...
23 Right to Die Society of Canada...
24 Cancer Information and Support...
25 Parkinson's Society of Ottawa-Carleton...
26 Canadian Diabetes Association...

6 Community Associations...

1 About the Community Associations Section
2 Community Associations Discussion Group
3 Arts, Music and Culture Associations...
4 Manordale-Woodvale / the Estates of Arlington Woods...
5 The Carlington "Summit"...
6 Citizens for Safe Cycling...
7 Ottawa South Community Association...
8 Scouts Canada, National Capital Region...
9 Humanist Association of Ottawa...
10 Co-operative Housing federation of Eastern Ontario...
11 Hostelling International - Ontario East...
12 Volunteer Centre of Ottawa-Carleton...
13 Ottawa Naturists/ Naturistes de l'Outaouais...
14 To Menu Part 2...
15 Schizophrenia Society of Canada...
16 Ottawa Psychiatric Survivors Alliance...
17 Cultural Interpretation Services of Ottawa-Carleton...
18 Canadian Council on Social Development...
19 Childbirth Education Association...
20 Community Information Centre of Ottawa-Carleton...
21 Planned Parenthood Ottawa...
22 Right to Die Society of Canada...
23 Cancer Information and Support...
24 Parkinson's Society of Ottawa-Carleton...
25 Canadian Diabetes Association...

7 The Government Centre...

1 About the Government Centre
2 The Regional Municipality of Ottawa Carleton...
3 The City of Ottawa...
4 The City of Gloucester...
5 The Police...
6 Ontario East Municipalities/Community Profiles...
7 The Rideau Valley Conservation Authority...
8 Federal Government / le Gouvernement federal...
9 Ontario Government Information Service...
10 Federal Politics...
11 Embassies of Other Countries...
12 Inter-Government Projects...
13 LobbyNet...
14 National Capital FreeNet Municipal Elections Project...

8 Science, Engineering and Technology Centre...

1 About the Science, Engineering & Technology Centre
2 Science, Engineering & Technology Centre ...
3 Geological Survey of Canada...
4 DesignFORUM...

9 Schools, Colleges and Universities...

1 School Boards...
2 Universities...
3 Academy One...
4 SchoolNet...
5 Canadian Education Association Newsletter...
6 The American Political Network Daily Education Report Card >>>
7 Using Internet Resources in the Classroom>>>
8 Teaching Resources...
9 Forum on Responsible Education...
10 Global Education...
11 Association for Choices in Learning...
12 NCF Teacher Net working Support Group...
13 Teacher Associations...
14 Association for Bright Children of Ontario...
15 Virtual Ventures Day Camp via Gopher
16 Local schools on-line

10 The Newsstand...
1 The Ottawa Citizen...
2 LeDroit...
3 The Hill Times...
4 The Ottawa X Press...
5 Capital Xtra!...
6 Hunt Club-Gloucester Star & Orleans Star...
7 CJOH TV...
8 Canadian Broadcasting Corporation...
9 Maclean Hunter
10 Bulletin Amerique...
11 Avec Fierte
12 Statistics Canada Daily Newsreleases...
13 News from Selected Internet Sources...
14 Daily Weather Forecast...
15 La presse de France / News from France (via Ambassade de France)...
16 The Carlington Summit...
17 Tour 'n Travel Guide from EOTA...

11 Libraries...
1 Gloucester Public Lib.
2 Kanata Public Lib.
3 Ottawa Public Library
4 Nepean Public Library
5 Canada Centre for Mineral & Energy Technology...
6 Carleton University Library ...
7 American Library Association Electronic Newsletter
8 Canada Institute for Scientific and Technical Information...
9 Librarians and Information Professionals SIG...
10 Gopher Electronic Library Service (English)...

12 Special Interest Groups...
1 About Special Interest Groups, and how to start a SIG
2 Arts, Literature, Music, History SIGs...
3 Business SIGs...
4 Computer Related SIGs...
5 Futurist, Space, UFO SIGs...
6 Games SIGs...
7 Health Related SIGs...
8 Hobbies SIGs...
9 Lifestyles, Gender Issues and Relationships SIGs...
10 Miscellaneous SIGs...
11 Nostalgia SIGs...
12 Professional SIGs...
13 Radio, Television, Media SIGs...
14 Religion and Spirituality SIGs...
15 Sports and Outdoor Recreation SIGs...
16 Teaching and Learning SIGs...
17 Index of Special Interest Groups...

13 The Communications Centre...
1 About the Communications Centre
2 FavList: How to specify favourite groups ...
3 Your favourite discussion groups (newsgroups)
4 Usenet: About Usenet, and an index of newsgroups ...
5 Selected Usenet newsgroups ...
6 NCF and Usenet newsgroups
7 Chat with other users...
8 Directory Services...
9 File Transfer Services...
10 Connect to Other FreeNet Systems...
11 User Services...
12 The Post Office...
13 The User Voting System...
14 The Network Professionals Directory...
15 Post an article to a newsgroup

14 Professional Associations...
1 Canadian Association of Journalists...
2 Canadian Library Association...
3 Canadian Operations Research Society...
4 Canadian Science Writers' Association...
5 Canadian Teachers' Federation / Federation Canadienne des Enseignantes...
6 Information Resource Management Association of Canada...
7 Ontario Society for Training & Development...
8 SCOAP...

15 The Help Desk...
and Communications...

16 Menu principal francais...

Public Electronic Network (PEN), Santa Monica, CA

Introduction

Of the city government-sponsored networks, Santa Monica's PEN system was one of the first. Other communities had experimented with public computer networks but this usually meant a multimedia kiosk in a shopping mall with videotaped messages, or providing dial up land-use records from the city computer. The Santa Monica system was the first to make a variety of city records available by personal computer, and it was the first city to create a new type of public meeting ground where citizens could talk to public officials and civil servants, and where people could chat together about local issues.

History

The system was first introduced in 1989 by Ken Phillips[56], the director of the Information Systems Department in Santa Monica City Hall. The city already had a history of using digital technology since an electronic mail system had first been introduced in 1984 for 600 of the 1,500 City Hall employees. The seven city council members also received laptop computers at the same time (Varley 1991).

In 1984, the idea of expanding the system to include residents was proposed, but there was some reluctance on the part of the Information Systems Department because of the amount of sensitive information on the City's system. But, when a separate computer that contained only public information was proposed, the staff became more enthusiastic. In 1987 they conducted a survey that showed that a third of the city's residents already owned a computer and three-quarters of these owned modems.

The city persuaded Hewlett-Packard to donate $350,000 worth of equipment

56 Ken Phillips is now with the Marion Salem Information Services, in Salem, Oregon.

and Metasystems Design Group to contribute $200,000 worth of software. Santa Monica City Hall provided salaries, programming, and office space.

Purpose of the System

The purpose of the system was primarily to:

- provide access to public information;
- make city services more accessible to the public;
- provide an alternative form of communication for residents;
- provide electronic forums to enhance the sense of community in Santa Monica; and
- facilitate knowledge of computers and new communication technology by all city residents.

The system is free of charge for residents who register with the city. Over 20 public terminals are available in schools, libraries, community centers, elderly housing complexes, recreational centers, and city buildings throughout the city so that ownership of the equipment is not a prerequisite for access. Residents can participate in three ways. They can use:

1. **Read-only boards** which post city information ranging from staff reports to city jobs, tips on recycling to information on how to obtain a variety of municipal and social services. The database also includes a search capability. Users can also dial a separate number to access the public library's on-line card catalogue.

2. **Private e-mail** between citizens or between city hall and citizens. City departments are instructed to respond to PEN inquiries within 24 hours.

3. **Public postings** in the conferences or forums on a range of topics. Some are initiated by city staff, some by residents. Conferences include Crimewatch (run by the police department), PENhelp (on-line help for using the system), Planning (a forum about land use, zoning, and

development), Environment (air quality, water pollution, and recycling), Santa Monica (rent control, neighborhood organizing, community events and new boards and commissions), and Social Issues (nuclear weapons, drinking and driving, the media, abortion, gun control, foreign policy, AIDS, human rights, sexism and racism) (Guthrie et al. 1990; Wittig 1991).

Survey

A survey was undertaken in 1990 (Guthrie et al. 1990) one year after the system started; questionnaires were sent to both PEN and non-PEN users.

The survey showed that 55% of the respondent's occupation was professional or managerial, and 55% had incomes over $55,000. These figure matched the community average[57]. However, the PEN users did differ from the general population in two significant ways. 65% of the users were male and about 65% had completed at least 4 years of college compared to 34% of the entire Santa Monica population (Guthrie et al., 1990).

City staff also made extensive use of PEN but use among the City Council members varied widely. Those who registered with PEN were more familiar with computers and using them for communication than the general population. 30% of the PEN registrants and 58% of heavy users also said that they were interested in politics compared to 15% of non-registrants. Not surprisingly, registrants were also more active politically.

The survey also indicated that the public terminals were active; roughly 20% of the people logging into the system did so through the public terminals.

The survey indicated that people found the interactive communications

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57 In 1990 the average household income was $45,100 Median income was $31,069.

services to be the most helpful. The planners had expected the heaviest use of PEN to come from residents seeking information from one of the city's databases, but 41% of accesses were to public conferences, 25% to the mail room, and 31% to the read-only bulletin boards (Varley, 1991).

The average PEN user logged into the system 5.5. times per month. Half the respondents reported either no or 1 log-ins per month while the top 10% reported from 30 to 70 log-ins per month. Surprisingly, 33% of the registrants had never tried PEN, even those users who had a computer and modem at home. The average length of session was 25 minutes; the median was 15.

Conferences were the most frequently accessed service of PEN, accounting for 41% of the system's use. Numbers suggest that relatively few people were contributing a disproportionately large portion of the content, while most participants chose to read the discussion. Another surprise was that the traditional socio-economic characteristics that predicted computer usage in the past (e.g. age, income, and education), were not predictors in the PEN system.

Community Organizing

An often-repeated success story (Varley 1991; Wittig 1991) of community organizing from the PEN system is the SWASHLOCK Project. The Project was initiated by the PEN Action Group which meets on-line as well as in face-to-face at monthly meetings. The group discovered that the only public showers available for the homeless before noon were outdoor cold-water showers on the beach. Hot showers in public parks were not open until noon, making it difficult to shower before going to or seeking work. There was only one free laundry service. No lockers were available. The group, which included homeless people, were able to start a laundry program, install 30 lockers, convince the city to install lockers and showers in restroom facilities and open other public showers at 6:00 a.m. In addition, they started a cooperative job bank.

Issues and Problems

Early on in the system, the staff at City Hall were concerned that they might be liable for obscene or slanderous comments made on-line. Because it was a new technology and a new system, they had no legal precedent and did not know if they would be treated as a broadcast medium or a common carrier (Varley 1991.)

Another question that was debated was whether the residents would be required to log on under their own names. Some of the staff was worried that residents would feel inhibited to use their own names in public debates, but in the end, they chose real names (Varley 1991).

PEN's egalitarianism and lack of censorship also created some problems. Participants had to contend with people who felt that they were entitled to hector those with whom they disagreed. Women especially had problems with harassment which included badgering, disparaging remarks, innuendoes, and violent threats. In addition, a relatively small group dominated the conferences, which often degenerated into mean-spirited verbal fights. The system also suffers from a lack of participation by most local officials. Still another problem has been the one or two PENers who "go off thread", straying from the conference topic into personal reverie or chitchat (Varley, 1991).

Many of the problems were resolved by increasing the number of women on-line, introducing private conferences, and sending e-mail to those who were off track or breaching etiquette.

The biggest disappointment for the system organizers has been the domination of its conferences by a small number of users. More than 3,000 people are signed up for PEN, but only 500-600 log on each month and most never add any comments to the discussions (Varley 1991).

Elected officials have also been reluctant to participate in the system because

of the verbal attacks and because they perceive it as a time sink. For example, a Santa Monica congressman sponsored several on-line discussions; his office monitored the conferences and either answered them or sent them to Washington for research and reply. PEN users greatly resented the time lag between their questions and answers and the fact that the congressman did not personally reply to them. The staff were frustrated at the increased workload for a small number of constituents who then criticized them for not doing more.

Chapter Bibliography

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Kirschner, Bruce. 1994. "PEN Lessons: An Interview With Ken Phillips." *Public Managment.* (December 1994): 13-18.

Pitta, Julie. 1990. "Electronic Democracy." *Forbes.* 146 (October 1, 1990): 132.

Varley, Pamela. 1991. "Electronic Democracy." *Technology Review.* 94 (November 1991): 42-51.

Wittig, Michele. 1991. "Electronic City Hall." *Whole Earth Review.* 71, (Summer 1991): 24-27.

NPTN Affiliate Systems & Organizing Committees

(as of November 14, 1994)

Number Of Affiliates Online:	**42**
Community Systems:	30
Educational Systems:	8
RINs:	4
Number Of Organizing Committees:	**121**
Community Systems:	119
RINs:	2
Number Of U.S. States:	42
Number Of Countries:	10

Affiliates
AzTeC - Tempe AZ
Los Angeles Free-Net - Los Angeles CA
SLONET - San Luis Obispo CA
Denver Free-Net - Denver CO
SEFLIN Free-Net - Broward County FL
Alachua Free-Net - Gainesville FL
Tallahassee Free-Net - Tallahassee FL
Prairienet - Champaign-Urbana IL
Greater Detroit Free-Net - Detroit MI
Columbia Online Information Network (COIN) - Columbia Missouri
ORION - Springfield Missouri
Big Sky Telegraph - Dillon Montana
Buffalo Free-Net - Buffalo NY
Tristate Online - Cincinnati OH
Cleveland Free-Net - Cleveland OH
Greater Columbus Free-Net - Columbus
Dayton Free-Net - Dayton OH
Lorain County Free-Net - Elyria OH
Youngstown Free-Net - Youngstown OH
Ocean State Free-Net - Providence RI
Jackson Area Free-Net - Jackson TN
Rio Grande Free-Net - El Paso TX
Central Virginia's Free-Net - Richmond
Seattle Community Network - Seattle WA
Tri-Cities Free-Net - Tri-Cities WA
CIAO! Free-Net - Trail BC
Victoria Free-Net - Victoria BC
National Capital Free-Net - Ottawa ON
Free-Net Erlangen-Nuernburg - Erlangen Germany
Wellington Citynet - Wellington New Zealand

Educational Affiliates
CORE - Seal Beach CA
UMASSK12 - Amherst MA
Education Central - Mount Pleasant MI
SENDIT - Fargo ND
SEORF - Athens OH
Learning Village Cleveland - Cleveland
VaPEN - Richmond VA
Finland Free-Net - Helsinki Finland

Rural Information Networks
Redwood Free-Net - Ukiah CA
Worth County-Sylvester Ga. Free-Net - Sylvester GA
Almont Expression - Almont MI
Great Lakes Free-Net - Battle Creek MI
Medina County Free-Net - Medina OH

Organizing Committees
Huntsville AL
Mobile AL
Tuscaloosa AL
Anchorage AK
Fairbanks AK
Little Rock AR
Chico CA
Davis CA
Orange County CA

NPTN (1994). *"National Public Telecomputing Network Affiliate Systems & Organizing Committees."* (October 14, 1996). anonymous ftp: nptn.org /pub/nptn/nptn.affil-organ.list.

Sacramento CA
San Jose CA
Santa Barbara CA
Danbury CT
Hartford CT
Miami FL
Naples FL
Orlando FL
Palm Beach FL
Sarasota FL
Stuart FL
Tampa Bay FL
Atlanta GA
Honolulu Hawaii
Maui Hawaii
Sandpoint Idaho
Carbondale IL
Edgemont IL
Granger IN
Cedar Falls IO
Des Moines IO
Fairfield IO
Hopkinsville Kentucky
Owensboro Kentucky
Baton Rouge LA
Acadiana Free-Net - Lafayette LA
New Orleans LA
Freeport ME
Baltimore MD
Easton MD
McHenry MD
Ann Arbor MI
Flint MI
Grand Rapids MI
Holland MI
Lansing MI
Minneapolis MN
Northfield MN
Jackson Miss
Meridian Miss
Cape Girardeau Missouri
Kansas City Missouri
Omaha Nebraska
Las Vegas NV
Manchester NH
Albuquerque NM
Santa Fe NM
Albany NY
Corning NY
Endicott NY
Rochester NY
Asheville NC
Chapel Hill NC
Charlotte's Web - Charlotte NC
Winston-Salem NC
Akron OH
Canton OH
Lima OH
Mansfield OH
Ponca City Oklahoma
Bethlehem Penn
Erie Penn
Pittsburgh Penn
Sharon Penn
West Chester Penn
Columbia SC
Greenville SC
Greenwood SC
Knoxville TN
Abilene TX
Austin TX
Dallas TX
Fort Worth TX
Houston TX
San Angelo TX
San Antonio TX
Morrisville VT
Newport News VA
Roanoke VA
Bremerton WA
Port Angeles WA
Spokane WA
Vancouver WA
Eau Claire Wisconsin
Melbourne Australia
Calgary AB
Edmonton AB
Medicine Hat AB
Campbell River BC
Prince George BC
Vancouver BC
Pinawa Manitoba
Sprague Manitoba
Winnipeg Manitoba
Fredericton NB
St. John's Newfoundland
Cape Breton Nova Scotia
Halifax Nova Scotia
Elliot Lake ON
Oshawa ON
St. Catharines ON
Thunder Bay ON
Toronto ON
Montreal PQ
Moose Jaw Saskatchewan
Regina Sask
Saskatoon Sask
Bayreuth Germany
Dublin Ireland
Venice Italy
Quezon City Philippines
Norrkoping Sweden

On-line Resources & Contact Information

This list is made up of the addresses of the sites I referred to in the thesis as well as the addresses of community networks that I've collected over the past year or so. I've also added some missing ones from Peter Scott's and Judy Hallman's very useful lists. (See address below.)

This list is also available on-line at:
http://alberti.mit.edu/arch/4.207/anneb/thesis/addresses.html

Lists of Community Networks

Judy Hallman's list of Community Information Systems

gopher: info.unc.edu Directory: Other info systems/Community info systems
ftp: sunsite.unc.edu; Directory: pub/docs/about-the-net/cwis/communets

Peter Scott's list of Community Information Systems

www: http://www.usask.ca/~scottp/free.html

Note: Those sites marked with an asterisk were mentioned in the thesis.

Commercial Bulletin Boards

***Channel One Bulletin Board**

617-354-3230

***ECHO**

www: http://www.echonyc.com/

***HotWired**

www: http://www.hotwired.com/

***WELL**

www: http://www.well.com/
gopher: gopher.well.sf.ca.us
telnet: well.sf.ca.us; login: guest

Miscellaneous

***Time-Warner Discussion groups**

www: http://www.timeinc.com

***Online debates**

www: http://info.cs.vt.edu:8000/debates/html /Debates.html

***NCF Survey**

www: http://debra.dgbt.doc.ca /~andrew/survey.html

Non-Profits On-line:

www: http://www.ai.mit.edu/people/ellens/non.html

Programs

*** eVote: Frontier Systems**

3790 El Camino Real, #147, Palo Alto, CA 94306, (415) 493-3631
e-mail: eVote@netcom.com

***FirstClass software developed by SoftArc, Inc.**

100 Allstate Parkway, Markham Ontario;
tel: 905-415-7000;
e-mail: sales@softarc.com

***HyperMail**

www: http://www.eit.com/software/hypermail/hypermail.html

Organizations

Alliance for Public Technology

www: http://apt.org/apt.html
gopher: apt.org:1600

Center for Civic Networking

www: http://www.civic.net:2401

***FreeSpace**

www: http://tdg.uoguelph.ca/tdg

***Morino Institute**

1801 Robert Fulton Parkway, Suite 500, Reston, VA 22091
voice: 703-620-8971; fax: 703-620-4102;
e-mail: info@morino.org

***NPTN - National Public Telecomputing Network**

ftp: nptn.org Directory: pub
email: info@nptn.org

NTIA

www: http://ntiaunix1.ntia.doc.gov:70/0/press/

***NTIA TIIAP**

ftp: ntiabbs.ntia.doc.gov
e-mail: tiiap@ntia.doc.gov

City Information Sites

***A directory of cities' home pages on the Web:**

http://rohan.sdsu.edu/infosandiego/examples/citygov/index.html

***CityNet**
www: http://www.city.net/

***City home pages**
www: http://www.ic.mankato.mn.us/reg9 /cities.html
www: http://rohan.sdsu.edu/infosandiego/examples/citygov / index.html

USA City Link Project
www: http://www.neosoft.com/citylink

Virtual Tourist
www: http://wings.buffalo.edu/world

Amherst Massachusetts, USA
www: http://www-astro.phast.umass.edu/guest/amherst/html

Boston, Massachusetts, USA
www: http://www.std.com/NE/boston.html

Cambridge, Massachusetts, USA
www: http://www.ai.mit.edu/projects/iiip/Cambridge/ city.hall.html

Chicago, Illinois, USA
www: http://tezcat.com/

Hawaii
www: http://hawaii.net/

Nova Scotia, Canada
www: http://ttg.sba.dal.ca/nstour

Community Networks

Akron Regional Free-Net Demo , Ohio, USA
gopher: gopher.neoucom.edu 1070

Alachua Free-Net, Alachua County, Florida, USA
www: http://freenet.ufl.edu/
telnet: freenet.ufl.edu; login: visitor

Amsterdam, Netherlands
(see Digital City)

Atlanta, 404Free-Net, Georgia, USA
gopher: sol1.solinet.net Directory: /11/SOLINET Bulletin Boards/ 404Free-Net Information

Austin Public Network, Texas, USA
gopher: bongo.cc.utexas.edu:3003 Director: /1pub/output/ Austin_Public_Net

AzTeC Computing - Tempe, Arizona, USA
telnet: aztec.asu.edu; login: guest; password: visitor)

Big Sky Telegraph - Dillon, Montana, USA
telnet: bigsky.bigsky.dillon.mt.us; login: bbs

***Blacksburg Electronic Village, Virginia, USA**
www: http://crusher.bev.net/index.html
gopher: morse.cns.vt.edu

Blue Sky Free-Net Of Manitoba - Winnipeg, Manitoba, Canada
telnet: winnie.freenet.mb.ca; login: guest; password: guest

Boston, Massachusetts, USA
(see Metropolitan Boston CWEIS, Boston)

Boulder Community Network, Boulder, Colorado, USA
www: http://bcn.boulder.co.us
telnet: bcn.boulder.co.us

***Buffalo Free-Net - Buffalo, New York, USA**
telnet: freenet.buffalo.edu; login: freeport

Calgary Free-Net, Calgary, Alberta, Canada
www: http://freenet.calgary.ab.ca
telnet: freenet.calgary.ab.ca

Cambridge Civic Network, Massachusetts, USA
www: http://www.civic.net:2401/cambridge_civic_network/cambridge_civic_network.html

***CapAccess: The National Capital Area Public Access Network, Washington DC**
telnet: capaccess.org; login: guests; password: visitor

Central Virginia's Free-Net - Richmond, USA
www: http://freenet.vcu.edu/cvanet.html
telnet: freenet.vcu.edu; login:guest; password: visitor

Champaign-Urbana, Illinois, USA
(see Prairienet)

Chebucto FreeNet, Halifax, Nova Scotia, Canada
www: http://www.cfn.cs.dal.ca/
www: http://www.cs.dal.ca/mcnp/Home.html
telnet: cfn.cs.dal.ca; login: guest

Chesapeake Free-Net
telnet: cfn.bluecrab.org

CIAO! Free-Net - Trail, British Columbia, Canada
gopher:ciao.trail.bc.ca
telnet: ciao.trail.bc.ca; login: guest

Cincinnati, Ohio, USA
(see Tri-State Online)

***Cleveland Free-Net**
telnet: freenet-in-a.cwru.edu; login: visitor
freenet-in-b.cwru.edu;
freenet-in-c.cwru.edu

COIN - Columbia, Missouri, USA
telnet: bigcat.missouri.edu; login: guest
gopher: bigcat.missouri.edu

Corvallis Metronet
gopher: gopher.csos.orst.edu; Directory: /11/csos/Metronet

CNY Net, Central New York, NY, USA
www: http://199.171.5.200/

Dallas, Texas, USA
(see North Texas Free-Net)

Davis Community Network, Davis, California, USA
www: http://www.dcn.davis.ca.us

Dayton Free-Net, Ohio, USA
telnet: dayton.wright.edu; login: vistor
gopher: dayton.wright.edu:7002; Directory: /11/dayton

Denver Free-Net - Denver, Colorado, USA
telnet: freenet.hsc.colorado.edu; login: guest
gopher: freenet.hsc.colorado.edu

Detroit, Michigan, USA
(see Greater Detroit Free-Net)

***Digital City, Amsterdam, the Netherlands**
telnet: dds.hacktic.nl; login: gast or guest
www: http://www.dds.nl

Edinburgh - Scotland's Capital, Edinburgh, Scotland
www: http://www.efr.hw.ac.uk/EDC/Edinburgh.html

Edmonton FreeNet, Alberta, Canada
telnet: freenet.edmonton.ab.ca; login: guest
gopher: chinchaga.ucs.ualberta.ca; Directory: 11/Libraries on the Network/Edmonton Free-Net

Elyria, Ohio, USA
(see Lorain County Free-Net)

Erlangen, Germany
(see Free-Net Erlangen Nuernberg)

Eugene Free Net, USA
telnet: efn.efn.org; login: guest; password: press return
www: http://www.efn.org

Fort Net, Fort Collins, CO
www: http://www.fortnet.org

Free-Net Erlangen Nuernberg - Erlangen, Germany
telnet: 131.188.192.11; login: guest
telnet: freenet-a.fim.uni-erlangen.de; login: gast

Freenet Finland, Helsinki, Finland
telnet: freenet.hut.fi; login:visitor; password:press RETURN
gopher: freenet.hut.fi; Directory: /11/freenet

***FreeSpace**
www: http://tdg.uoguelph.ca/tdg/archive/switchboard

Grand Rapids Free-Net, USA
www: http://www.grfn.org/
telnet: grfn.org; login: visitor

Greater Columbus Free-Net
gopher : gopher.freenet.columbus.oh.us

Greater Detroit Free-Net, USA
www: http://http2.sils.umich.edu/~pegjones/HomePage.html
telnet: detroit.freenet.org; login: visitor

Halifax, Nova Scotia, Canada
(see Chebucto FreeNet)

Halton Community Network, Ontario, Canada
telnet: halinet.sheridanc.on.ca; login: guest

***Hawaii FYI**
telnet: fyi.uhcc.hawaii.edu (return twice to enter as guest)

***Heartland Free-Net - Peoria and Bloomington, USA**
telnet: heartland.bradley.edu; login: bbguest; password: press RETURN

Helsinki, Finland
(see Freenet Finland)

HOMEtown Community Network, London, Ontario, Canada
gopher.uwo.ca; Directory: 11/.services/its/coop/home

Huron Vally
www: http://www.mpcc.org/
gopher: mpcc.org

Ithaca Free-Net, New York, USA
gopher: gopher-hole.cit.cornell.edu:7070; Directory: /00/.cit_files/MTFNT

Ipswich City Council, Queensland, Australia
www: iccu6.ipswchcity.qld.gov.au

LA Free-Net, Los Angeles, USA
telnet: lafn.org; login: 2 for visitor

La Plaza de Taos, New Mexico, USA
gopher: nkosi.well.sf.ca.us Directory: /11/Community/communets/laplaza

LibertyNet, Philadelphia, Pennsylvania, USA
www: http://libertynet.org/

London, Ontario, Canada
(see HOMEtown Community Network)

Lorain County Free-Net - Elyria, Ohio, USA
telnet: freenet.lorain.oberlin.edu; login: guest

Melbourne Free-Net, Australia
www: http://ghmac.lib.rmit.edu.au/mfn.html

Metropolitan Boston CWEIS, Boston
www: http://www.nda.com/mbcweis-homepage.html

Metropolitan Tuscon Electronic Communications Network, Arizona
gopher: econ.tucson.az.us

Michiana Free-Net, Indiana, USA
www: http://sjcpl.lib.in.us/MFNet/MFNetMainMenu.html

Milwaukee Omnifest
telnet: omnifest.uwm.edu; login: visitor

Montreal, Quebec, Canada
(see REMM - Reseau Electronique du Montreal Metropolitaine)

***National Capital Free-Net, Ottawa, Canada**
telnet: freenet.carleton.ca
www: http://freenet.carleton.ca
gopher: freenet.carleton.ca

Newfoundland Free-Net, Canada
gopher: cwis.ucs.mun.ca Directory: /11/Venturing into the Internet/ Freenets

New York City, NY, USA
gopher: gopher.panix.com; Directory: /11/NYC

North Texas Free-Net - Dallas, Texas, USA/
gopher:metronet.com; Directory: /11/North-Texas-Free-Net

Ocean State Free-Net, Providence, RI, USA
telnet: 192.207.24.10
gopher: osfn.rhilinet.gov

Ottawa, Ontario, Canada
(see National Capital Free-Net)

Ozarks Regional Information On-Line Network, Springfield, MO
telnet: ozarks.sgcl.lib.mo.us; login: guest
gopher: ozarks.sgcl.lib.mo.us

Palo Alto, California, USA
http://www.city.palo-alto.ca.us/home.html

***PEN, Santa Monica, California, USA**
The Information Systems Office can be reached at The City of Santa Monica, 1685 Main Street, Santa Monica CA 90401 Telephone: 310-458-8383.

Peoria and Bloomington, Illinois, USA
(see Heartland Free-Net)

Philadelphia, Pennsylvania, USA
(see LibertyNet)

***Plugged In**
1923 University Avenue, East Palo Alto, CA, 94303c (415) 322-6147
www: http://www.pluggedin.org/
e-mail to webmaster@pluggedin.org,

Prairienet - Champaign-Urbana, USA
www: http://www.prairienet.org/
telnet: prairienet.org; login: visitor;password: visitor
gopher: gopher.prairienet.org

Prince George Free-Net, Canada
telnet: freenet.unbc.edu; login: guest

Providence, Rhode Island, USA
(see Ocean State Free-Net)

RAIN (Rural Area Information Network)
telnet: rain.gen.mo.us; login: visitor
gopher: gopher.psg.com

Richmond, Virginia, USA (see Central Virginia's Free-Net)

REMM (Reseau Electronique du Montreal Metropolitaine), Canada Le Free-Net de Montreal
www: http://thym.remm.uqam.ca/

Rio Grande Free-Net - El Paso, Texas, USA
telnet: rgfn.epcc.edu; login: visitor

San Carlos, California, USA
www: http://198.31.87.5/abag/local_gov/city/san_carlos/schome.html

San Diego, California, USA
www: http://white.nosc.mil/sandiego.html

San Diego Freenet Initiative, California, USA
gopher: valhalla.acusd.edu; Directory: /1

Santa Monica, California, USA
(see PEN)

Saskatoon Free-Net, Saskatchewan, Canada
www: http://willow.usask.ca/freenet/freenet.html
gopher: willow.usask.ca:71

Sea to Sky Free-Net, British Columbia, Canada
www: /sea-to-sky-freenet.bc.ca; login: guest

Seattle Community Network, Washington, USA
telnet: scn.org; login: visitor
gopher: riceinfo.rice.edu; Directory: /1ftp 3aatlas.ce.washington.edu 40/pub/seattle-community-network/scn-documents

SEFLIN FREE-NET - Southeast Florida, USA
telnet: bcfreenet.seflin.lib.fl.us; login: visitor

SENDIT, North Dakota, USA
telnet: sendit.nodak.edu; login:bbs,sendit2me,visitor

SEORF - SouthEastern Ohio Regional Free-Net, USA
telnet: seorf.ohiou.edu; login: visitor
gopher: seorf.ohiou.edu:2001

Silicon Valley Public Access Link - USA
www: http://www.svpal.org/
gopher: svpal.org; Directory: /1

Singapore
(see Techmet)

SLONET - San Luis Obispo, USA/
gopher:slonet.org

Springfield, MO, USA
(see Ozarks Regional Information On-Line Network)

St. Petersburg, Russia
www: http://www.arcom.spb.su/lifestyl/index.html

Syracuse, NY, USA
(see CNY Net)

Taos, New Mexico, USA
(see La Plaza de Taos)

Talawanda Learning Community, Ohio, USA
telnet: tlcnet.muohio.edu; login: visitor

Tallahassee Free-Net - Tallahassee, Florida, US
www: http://freenet3.scri.fsu.edu:81/
telnet: freenet.fsu.edu; login: visitor

Techmet, Singapore
gopher: solomon.technet.sg; Directory: /11

Tempe, Arizona, USA
(see AzTeC Computing)

Texan Metronet,
www: http://feenix.metronet.com/
gopher: feenix.metronet.com; Directory: /1

Thunder Bay Freenet, Ontario, Canada
gopher: freenet.lakeheadu.ca

Toledo Free-Net, Toledo, Ohio, USA
telnet: fnet.cc.utoledo.edu; login: visitor ; password: visitor

Toronto Free-Net, Ontario, Canada
telnet: freenet.toronto.on.ca; login: guest
gopher: gopher.yorku.ca; Diretory: /11/info_services/Community

Trail, British Columbia, Canada
(see CIAO! Free-Net)

Traverse City Freeport, Michigan, USA
telnet: leo.nmc.edu; login: visitor

Tri-State Online - Cincinnati, Ohio, USA
telnet: tso.uc.edu; login: visitor.

Triangle Free-Net - Research Triangle Park area of NC, USA
www: http://tfnet.ils.unc.edu/
gopher:tfnet.ils.unc.edu
gopher: gibbs.oit.unc.edu:7000; Directory: /11/events.d/lecsem.d/freenet.d
telnet: tfnet.ils.unc.edu; login: freenet

Tuscon , Arizona, USA
(see Metropolitan Tuscon Electronic Communications Network,)

Twin Cities Free-Net, USA
www: http://quality.ais.umn.edu
www: http://free-net.mpls-stpaul.mn.us/
telnet: free-net.mpls-stpaul.mn.us; login: guest

Vancouver Regional FreeNet, British Columbia, Canada
www: http://freenet.vancouver.bc.ca/
telnet: freenet.vancouver.bc.ca; login: guest
gopher: gopher.native-ed.bc.ca; Directory: /11/FreeNets/VRFA

Vaasa FreePort Bulletin Board, Finland
telnet: freeport.uwasa.fi; login: guest

VICNET, Victoria, Australia
www: http://ghmac.lib.rmit.edu.au/vicnet.html

Victoria Free-Net - Victoria, British Columbia, Canada
www: http://freenet.victoria.bc.ca/vifa.html
gopher:freenet.victoria.bc.ca
telnet: freenet.victoria.bc.ca; login: guest

***Wellington Citynet - Wellington, New Zealand**
gopher: gopher.wcc.govt.nz
telnet: kosmos.wcc.govt.nz, login: NEW
telnet: ix.wcc.govt.nz
www: http://www.wcc.govt.nz /index.html

Windsor Regional Free Access Network, Ontario, Canada
gopher: turner.lamf.uwindsor.ca; Directory: /11/fan

Winnipeg, Manitoba, Canada
(see Blue Sky Free-Net)

Youngstown Free-Net, Ohio, USA
gopher: yfn.ysu.edu
telnet: yfn2.ysu.edu; login: visitor

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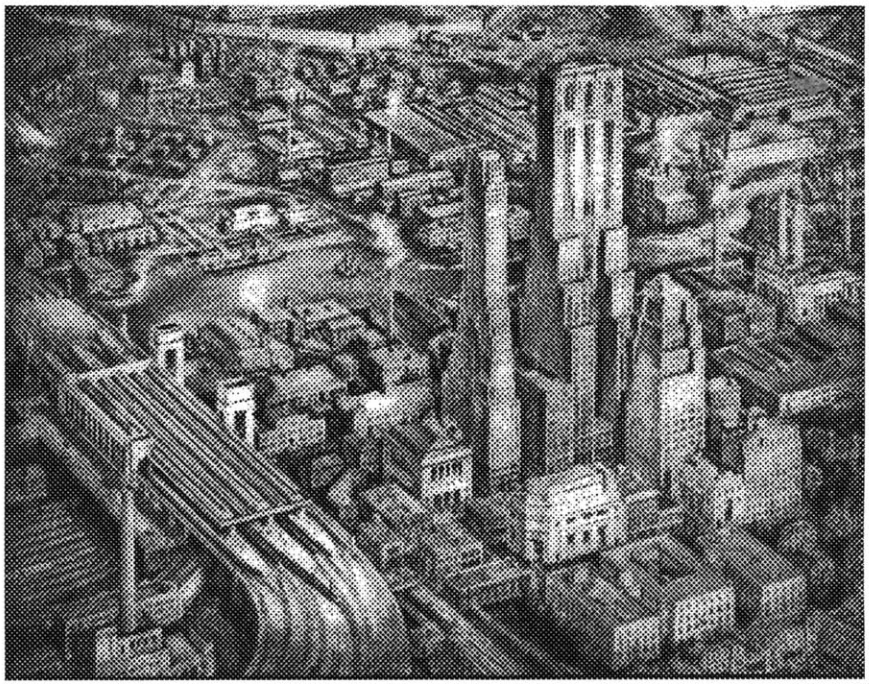

Work done in 1930

A "City" constructed in one year—

THIS imaginary city is a composite drawing of the work of this company in a single year—1930, the buildings and plants shown being completed or constructed in large part during the year.

The picture looks like a typical modern city because it contains so many essential features of a city: office buildings, banks, industrial plants and shops, subway, railroad terminal, hospitals, college buildings, residences, central power stations and gas plants with transmission and pipe lines, lock and dam, radio receiving and transmitting station, water works, airplane hangar, garages and even a penitentiary.

The industrial plants were constructed and in most cases designed by our organization; in several instances we built from the plans of our clients' engineering departments. The monumental structures were built from the plans of architects.

A folder identifying all the buildings in the picture will be forwarded upon request.

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