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Public Spaces on the Information Highway: The Role of Community Networks

by

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ABSTRACT

This thesis explores the phenomenon of community networking in Canada, particularly as it impacts the issue of universal access to emerging broadband networks. The regulatory context of community networking is examined, and recent government efforts reviewed and critiqued. Through two case studies, an analysis of three potential benefits arising from community networking is developed. These three benefits are: increased participation in the democratic system, increased access to education, and community development. Several models for providing universal access, through community networks, are presented.

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DEDICATION

For V.

if we love each(shyly)
other,what clouds do or Silently
Flowers resembles beauty
less than our breathing

- e. e. cummings

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Chapter One - Introduction

It has become trivial to state that computers have had a profound effect on modern society; it is parallel to saying that transportation has had implications for civilization. These technologies have not only permeated society, in many ways they make our society possible. The possibilities arising from communication through computerzation are the focus of a relatively new area in communications: computer mediated communication (CMC). The present work falls into the area of CMC, but in many ways it reaches beyond the field's boundaries. For one, it looks closely at Free-Nets[1], community networks that have been studied very little by CMC researchers. As will be shown in the next chapter, community networks are quite different from traditional sites of CMC research. For another, it bridges the gap between empirical research and governance.

This thesis attempts to synthesize two levels of analysis, sociological and regulatory, to take a close look at public access to CMC technology and its implications. The majority of work dealing with CMC has been wildly enthusiastic, often to the point of naivetÈ. Hiltz and Turoff's (1993) groundbreaking work is a good example. While *The Network Nation* does acknowledge some of the less desirable effects of CMC, it reads like propaganda for the new technology, advocating its use for everything under the sun and suggesting that it is a cure for most of society's ills. Although a few commentators have become more savvy, there is still no end to the technological cheerleading (Civille, 1993; Wichers, 1992). This work is not infected by such an attitude. It does not begin with the assumption that public access to CMC is necessary, nor that it will accomplish all that its proponents claim (the revitalization of participatory democracy, for instance). Instead, it

[1]"Free-Net" is a registered trade mark of the National Public Telecomputing Network.

attempts to discover how the new community networks are being used, rather than relying on the rhetoric and hyperbole in much of the work published in this area.

This thesis asks a broad question: how should the public interest be defined in regards to public computer networks? "Public interest" here can mean any number of things, including regulated provision of universal service or universal access, public funding, or laissez-faire policies. It could even conceivably involve the active discouragement of technology adoption. In this sense the present work is exploratory. Without joining the extremes at either end of the spectrum, it attempts to discover what is actually happening in community networks, how they are used, and what this use could mean for local, regional, and national policies for the information infrastructure and community development. Community networks are chosen as the site of study as they:

1. provide many of the emerging network services that will be available ubiquitously in the future;
2. approximate universal service to a switched broadband network;
3. are as yet unregulated;
4. represent as many different models for access as there are community networks.

There is no doubt that there needs to be cohesive, intelligent policy formed towards the development of the information infrastructure; the question is, does public access (or any of the other related issues mentioned above) have a part in that policy? Access in this case, as with any communication technology, can mean many different things. It can imply affordable rates or free government-subsidized service, training in the use of information technologies, or merely support for private sector development of the information infrastructure, with reliance on private provision of service. Universal service, a hallmark of Canada's telecommunication policy, means that the service is

available at an affordable price. Universal access, on the other hand, is service for free (or at an extremely reduced price), such as health care.

One re-formulation of the question asked above, then, could be: is universal service in the public interest when it comes to computer networking services? To justify any governmental intervention in the provision of universal access to a new technology, either a solid economic argument must be developed, or (as has been the historical approach) a case for general "intangible benefits" must be made. In the case of broadcasting and telecommunications it has been argued that the development of national identity has been the primary social benefit of the technology. The proponents of community networking and public access to CMC have argued that similar intangible benefits may be derived from this new technology. If this is so, then a case may be made for regulation or (in the extreme) direct expenditure to ensure universal service. On the other hand, if benefits are marginal, and the cost of provision high, a case against governmental involvement could be made. In the extreme, if community networks prove to have negative side-effects (such as distortion of the service-provision market), a case for their discouragement is possible.

While many have postulated the possible benefits (and harmful effects) of widespread use of computer networks, there is little empirical work to support or refute these claims. This is most probably because there is really very little empirical evidence to gather; even now few people have access to CMC to any meaningful degree. There are, however, a few isolated instances of universal access (in theory at least) to computer networking. These are known as community networks, or Free-Nets, and at this time there are over twenty operating in Canada (see appendix E for a listing of community networks operating in Canada at the time this thesis was completed). They are, as their name implies, free to any user in their community, they offer a full range of network services

(including in many cases Internet access), and they are invariably run by grass-roots organizations which believe in their intangible benefits.

In this project, through a series of case studies, an attempt is made to evaluate the claims made by advocates of community networking. The claims have been divided into three categories: education, political participation, and community development. Education includes access to libraries and on-line teaching services, and is often cited as the primary reason for community networks supported by libraries and the k-12 school system. In both the US and Canada, massive government funding has been directed towards educational and research networks (the National Research and Education Network (NREN) and the Canadian Network for the Advancement of Research, Industry and Education (CANARIE) initiatives, for example), but this money has gone mostly to build and upgrade the network connections between institutions. The access to education claim is a new twist, and is aimed at promoting universal access rather than limited institutional access.

Political participation has become, increasingly, a justification for increased government involvement in networking, both as a source of funding and as a source of information. Governments at all levels have become major service providers, but whether this is a cost-efficient and appropriate method of providing information is debatable.

The third general claim, that networks stimulate "community development," is the most controversial. This is primarily because the concept of "community" is itself rather nebulous. Some of the specific benefits are clear: increased access to communication for the home-bound (people with disabilities or the elderly), access to an information dissemination system for non-profits and community groups, and a forum for public discussion on community-related topics. These networks, it can be argued, may also

provide access to strategic information regarding emergencies or environmental threats. Whether these examples of benefits add up to the intangible "community development" is another debatable point. The case studies have attempted to address these three areas and assess how valid each claim is.

Each case has been built from three sources of data: organizational documents, and interviews with system founders and general users. The cases begin with a short history of the community network involved, with attention paid to the goals and aspirations of its founders. The goals are divided along the lines indicated above. How well these goals have been met is assessed through interviews with various users and administrators. Finally, some empirical data gathered by other researchers are used to further assess how the Free-Nets are used.

As mentioned previously, very little work has been done on community networks. A large amount of research has been conducted in an organizational setting (Zuboff, 1988; Sproull and Keisler, etc), and there has been much academic interest in the phenomenon of "virtual community" (specifically MUDs, MOOs, and Usenet). Very few researchers have attempted to look specifically at a geographic community and its use of computer networking. For this reason this thesis (the case study research in particular), is of sociological interest, although its primary analysis is at the policy level.

Although relatively few Canadians have access to computer networking, or perhaps even the desire for that access, the policy issues involved are nonetheless timely and important. The next decade will be a crucial time in the development of networking in Canada, and indeed globally. Even relatively minor decisions about regulation, expenditure, access, and infrastructure development made now will have repercussions for years to come. There is no doubt that government must take a leading role in this process, but the

question is what role? Daniel Bell (1979) has argued that the development of the information infrastructure can be likened to previous network infrastructures: transportation channels (roads, rail, and so on) and energy utilities (gas, electricity). In most cases government has stepped in to ensure that the development of these networks was within the bounds of public interest. A debate has arisen about the development of the information infrastructure; those against direct government intervention have pointed to the many failures of past regulation (Janisch, 1994), while those advocating some kind of intervention (usually those searching for sources of funding) use the examples of past regulation's successes.

There is already substantial governmental involvement in the development of computer networks. The US government has already approved $2.9 billion over five years to upgrade the existing network, and efforts have been made to include another $1.15 billion to increase public access (Shade, 1994). The Canadian government has been involved in developing and supporting networks in Canada on several levels, most recently with the CANARIE initiative, which involves direct government expenditures matched by private funds. Networks are also massively subsidised with public funds from research institutions in both the US and Canada. Without attention to access, to use a tired metaphor, governments in North America are building the information highway with few on-ramps. For these reasons it is important to address the question of public interest, and its plethora of related issues (including funding, access, and training), and computer networking.

As community networks become increasingly common governments will have to deal with some specific issues. For instance, many small communities will not have the technical expertise nor the funds to support these kinds of initiatives, and so will be left behind in the development of a technology that could benefit them greatly. In larger

centres, governments at all levels will be deluged with requests for start-up capital and long-term funding commitments; a general policy framework could assist governments in dealing with these requests. Finally, as communication regulation in Canada is fundamentally re-structured, as the distinctions between content and carriage are blurred, as convergence becomes the operative trend, governments and industry need to know how to fit community networking into the mix.

Structure of the thesis:

This thesis begins with a literature review focusing on the broad sociological and theoretical literature necessary to ground the case studies. First, a basis for the categorical approach used in this study is sought in the existing literature on community networks. The categories, as outlined above, are democratic participation, access to education, and community development. Then, beginning with different approaches to technology and society, the review looks at traditions in sociology, economics, and communications history. The review then moves on to more specific conceptions of community, and work that has been done with alternative media and community development. This chapter contains, too, a look at the very recent work done in the area of public access networks and Free-Nets. There is brief coverage of the historical work that has been done in CMC to give this recent work some context. Throughout, the focus is on technology and social change, and at a more detailed level, communication technology and changing conceptions of community.

Chapter three covers the regulatory theory of public access and Canadian communication networks.. Beginning with the history of telecommunications, the review moves to more recent work on convergence and computer networks. This is followed by a brief look at other regulatory paradigms, particularly broadcasting, as well as public library and access to information policy, and their relevance to computer networks. Finally, an overview of

current information highway policy efforts is provided, including a critique of the very important recent CRTC hearings.

Chapter four covers the methodology used in the case studies, and then outlines the cases themselves. Each case includes the history of a Canadian public access network, empirical data regarding usage patterns from other studies and surveys, and observations garnered from documents and interviews conducted with users and administrators of that network. There is discussion of how these networks have been used by their communities, with special attention to the three focus areas, education, democratic participation, and community development.

The next chapter presents analysis of the cases and recommendations for information highway governance, by goverments and by grassroots organizations. Several models of public access provision are explored and critiqued.

Chapter six concludes the thesis with a review of findings. Areas that deserve future research are suggested, including further qualititative and quantitatives studies.

Chapter 2 - Literature Review

Introduction

The overarching policy question posed by this project leads to several subsidiary questions at the empirical level. These include: Are there non-economic benefits from community networks? What do users do with these networks? How do these networks affect community development, democratic participation, and education? The central question from which these all stem, therefore, is: "how does society change itself through the use of non-commercial information technology like community networks?" As will be argued, the term "changes itself through" is preferable to "is changed by" because the latter falls into the trap of technological determinism. This pitfall must be avoided for it dangerously simplifies the relationship between technology and social configurations.

In fact, as will be shown in the first section of this chapter, the current literature on community networking takes this concept very seriously. Most writers agree that these networks either are or have the potential to be important catalysts for those who use them. How theoretically sound is this claim? One can look to previous technologies, and previous examinations of technology and society to make that judgment.

The second section of this chapter surveys several traditions in the exploration of technology at the social level, including post-industrialism, modern sociology, and communications history. Through all these different forms of inquiry, it will be argued, runs the thread of social change as a result of technological change (either in the causal sense, as with the technological determinists, or in the catalyst sense). It is this theme that sheds light both on the empirical part of this study and on the later discussion of governance. In the case studies of community networks, the framework of change

through technology directs specific questions about primarily social benefits (such as new ways of delivering education and community services, and changing roles for governments in providing information and soliciting input). In terms of governance, it will be argued that policy and regulation decisions are choices that can guide technologically-catalyzed social change. Social change, it could be argued, is in fact the goal of much governmental action (if one subsumes economic growth under the umbrella of social benefits).

Throughout this second section, connections will be made between the macro-level of technology in general to communications technology in particular, and community networks specifically. Three arguments will be made: first, the "seamless web" model developed by Bijker et al (1987, p. 3) is the best explanation for the complex relationship between social relations and technology. Second, because of this, community networks are as much *social* as they are *technological* artifacts. And thirdly, communication and community are intricately tied, thus community networks could provide a needed bridge in community development. "Community" here is taken in the broadest sense, and is considered to include two areas mentioned previously, democratic participation and education.

While much of the literature in this section deals with technology and social change, it is the way *communication* technology reconfigures the construction of *community* that is ultimately the focus of this study. This thread will be pulled out of the broader sociological and sociotechnical literature.

The third section locates the intersection of literature dealing with the impact of technology on society and literature looking at community. At this junction is the work that deals with technology and community; it is often concerned with "community

media," or "alternative media," or even "community development through media." While many thinkers who deal with the sociology of technology or some other broadly theoretical area look at macro-level effects, those who are concerned with community and technology look at smaller groups, either geographically defined or delimited along lines of common interest transcending locality. This review will examine some of the work done in this area as it pertains to community networking. What is particularly interesting here is that many of the claims made for the social benefits of community networks have also been made for other forms of media, such as community cable channels, in the past.

In the final section, recent work dealing with computer mediated communication in general, and community networks specifically, will be surveyed. With this body of work it is important to note that CMC has traditionally been studied in organizations (usually corporations wealthy enough to adopt the technology), often by researchers with an organizational communication or experimental psychology point of view. It has only been within the past two years that a body of work dealing with CMC issues outside of an organizational or experimental setting has been developed (although a few examples of prescient work can be found much earlier). As with the areas examined earlier, the CMC literature is concerned with social change through technology, although primarily it looks at either interpersonal issues (such as "flaming" -- the exchange of insults), or organizational issues (such as managing the wired workplace). Both of these focus areas, despite their limitations, hold interesting insights for those exploring community networks, especially as this literature touches on the phenomenon of the "virtual community."

Community Networks: Claims and Criticisms

The term "community network" has several different connotations. Beamish (1995) identifies four types of community network: Free-Nets, bulletin boards, government-sponsored networks, and wired cities. To this list should be added commercial services, such as America Online. In Canada, it is really the first two categories that have become wide-spread, and the first is of most interest for policy reasons. This is primarily because Free-Nets are connected to the internet and thus are components of the emerging information highway. As well, Free-Nets have far greater capacities than most bulletin boards because they typically run on more powerful computers, and are therefore better test cases for "universal access" to the information highway.

The word Free-Net is trademarked by the National Public Telcomputing Network, an American advocacy group founded by Tom Grunder, who also founded the Cleveland Free-Net. Many Free-Nets, including several Canadian networks, use NPTN's Freeport software. More recently, however, community networks have opted for more flexible HTML-based software, and have named or re-named themselves community networks, information services, or a variation thereof. There have been some legal questions regarding NPTN's trademark as well (see chapter 4 for more discussion of this issue). For this reason, the phrase "community network" is used interchangeably with "Free-Net" in this thesis, and the former is preferred as a general term.

Cisler (1993) defines a community network as "one or more computers providing services to people using computers and terminals to gain access to those services and to each other. ... The information contained in such networks as well as the relationships that form between the participants make up what I call an electronic greenbelt to reinforce and add value to the community." Cisler claims that, as with previous

communication technologies, community networks promise "to reinforce communities, to invigorate the democratic process, and to redefine parts of society."

Schuler (1994) echoes these sentiments, and his claims form the basis of the three non-commercial benefits investigated by this project. He says, basing his discussion on principles developed by the Seattle Community Network, that these systems have the potential to support community cohesion, to provide access to education and training, and to produce informed citizens and strong democracy (1994, p. 43).

Democratic Participation:

The idea that community networks can improve democratic participation has its roots in the foundation of liberal democratic theory. An informed and literate citizenry, it is held, is a prerequisite for a healthy democracy. Doctor exemplifies this reasoning in his treatment of new information technologies when he writes:

> Information Democracy can be defined as a socio-political system in which all people are guaranteed meaningful opportunities to benefit from access to information resources ... It means giving people the information tools they need to participate in the decision-making structures that affect their daily lives (1994, p. 9).

The movement to an information society exacerbates the gap between rich and poor, he says, because the affluent can afford computers and have the education to use them. The solution is empowering the citizenry, and the tool to achieve this is a "computerized community information system" (p. 12), preferably managed through a national system.

Community networks can help to bridge that gap, some contend, although that gap is widening every day. "Today's youthful community networks are better than they have any right to be this soon," writes Jay Weston (1994), "and they are still our best hope, maybe our only hope, for a more participative, more self-representative democracy."

Guthrie & Dutton, on the other hand, argue that communities that already have fairly educated and informed citizens and liberal governments are more likely to adopt what they call "public information utilities" (1992, p. 593). They find that "government interest rather than citizen demands spurred the development of public information utilities in our case studies" (p. 591). In other words, those communities which might benefit most from more democratic participation were the least likely to adopt a community network to meet this need.

Education:

Community networks have the potential to be key sources of education in at least three ways, claim advocates. First, they are (or could be) training grounds for network and computer use in general, developing skills which will be crucial in an information economy. Second, they provide links to the world's libraries and research institutions, among other repositories of information, for users. In this respect education plays a political role, as discussed above. Third, they are (or could be) important connections between formal education institutions (such as high schools) and the world of on-line resources.

As a connection between educators at all levels, the information highway is already an important educational tool; CA*net and CANARIE already receive large government subsidies because of their perceived importance for education and research (Shade, 1994). The government is putting money into the SchoolNet initiative in an effort to provide Canadian school systems with internet connections.

As for training, Hughes & Johnston (1993) say that information infrastructure is only half of the cost, and the cost of educating users will be formidable. Clearly community networks can here play a role, and indeed are undertaking user education efforts.

Community Development:

Community development is perhaps the most often cited benefit of community networks, and it takes many forms. These range from encouragement of local non-profit organizations, improved delivery of social services, an enhanced "sense of community" through improved inter-personal communication, and provision of a central source of local information. This area is vague, and for that reason the most difficult to assess.

For many, the central issue in governance of the information highway is the tension between perceptions of new communication technologies as consumer products and as socially transformative tools. As Graham (1994) states, "There's much more at stake in cultural survival than the success of markets... if we don't make the idea of community our central purpose in developing the Canadian Information and Communications Infrastructure, we can certainly cause real communities to fail."

This feeling is reflected in the mission statements of just about every community network. As Walsh (1993, p. 45) explains of the Washington community network known as CapAccess, "we imagined CapAccess as a platform on which people could try new ways to help their organizations and themselves become more involved in community activities."

Although the economic impact of community networking is not within the scope of this thesis, it has been discussed in the literature. The economic literature has stressed access and training as an important component in consideration of computer networks in general, and community networks specifically. Some see training as making up, conceptually at least, half of the network itself, and this is a component that is generally ignored in consideration of policy and implementation costs: "It's as if the US had started

to build the Interstate Highway System before many Americans knew how to drive" (Hughs & Johnston, 1993, p. 1). Training is just one "economic" benefit to be had from access to information technology; Odsaz (1993) argues that ubiquitous access to networks (the internet specifically) can lead to a proliferation of small, information-based cottage industries (p. 5). In perhaps the most optimistic piece on community networking ever written, Civille argues that among other benefits, a National Information Infrastructure

> can revitalize the American economy and civic culture; it can become an aqueduct irrigating arid new land from which new enterprise and community life blossom and flourish by: revitalizing local economies; improving the delivery of governmental services, and reducing costs of government; ... reducing poverty and changing welfare as we know it; saving billions of health care dollars through prevention and early detection of disease and by streamlining health care administration; ... reducing the social costs of defense cutbacks, layoffs, and plant closings; reducing the costs of pollution, road maintenance, and child care (pp. 3-4).

There are costs to such a network, however, and these costs can be substantial. Still, some economists (e.g. Schinckele, 1993) argue that social and economic benefits are such that extensive subsidy of the network is necessary.

Technology and Change: Three Traditions

This section will delve into three traditions dealing with the rather broad topic of technology and social change.

It could be argued that the entire project of sociology was brought about by social change wrought by technology. In his review of the tradition of Sociology, Nesbit (1991, p. 21) claims that the very "unit ideas" of the discipline epitomize "the conflict between tradition and modernism, between the old order, made moribund by the industrial and democratic revolutions, and the new order, its outlines still unclear..." One presupposes, in this argument, that technology made the social conditions of the industrial and

democratic revolutions possible. Marx earlier recognized the impact of the industrial revolution (1963; Nickel, 1989, p. 163), as a development of capital interests, but also as a step towards progressive change. Sociology as a whole, of course, is concerned with much more than just technology, but the impact of technology has long been a central theme.

Theoretical studies of technology and society are concerned with the changes wrought by the adoption of new technologies, although different thinkers find the origins of change in very different places. The technological determinists believe technology itself necessitates or drives certain changes to the organization of social systems. Other commentators, often those approaching the subject from a structuralist or Marxist perspective, see technology as a tool used by forces (usually class or market interests) to reinforce the existing social status quo. In all these studies two levels of social change can be distinguished; the first is the most obvious, and often analysis of new technology takes only it into account. It is quantitative, or in philosopher Michael Heim's terms, ontic change.

Ontic change is merely a change in the way people use technological tools, which perhaps results in deeper social transformations. This analysis of technology as a tool looks only at surface change: print helps preserve knowledge, telephony makes it easier to communicate over long distances, and word processing makes checking spelling easier. An analysis of this kind looks at the ways in which a new technology facilitates communication, and the reconfiguration of social systems as a result. At another level is qualitative, or (Heim's term again) ontological change. This is a fundamental shift in the experience of communication, as the term suggests, and often manifests itself as a change in the organization of consciousness. Ong argues, for example, that the transformation from oral to print culture made certain ways of thinking possible, but foreclosed others;

Innis writes along the same lines, showing that print not only changed the physical organization of empires, but also changed the way humans experienced space and time.

Another way to distinguish between these modes of analysis is to look at theoretical scope. Ontological theories tend to share the quality of being non-refutable as they make very general claims, sacrificing detail for encompassing scope.

Having made this distinction, this survey will only touch briefly on the theories dealing with ontological change. This is for an entirely pragmatic reason: the practice of policy and regulation does not require a deep analysis (at least to the depth of ontological analysis) of social change. This does not mean that policy is devoid of theory (ideology, for instance, often plays an important role in policy debates); for the purposes of this project, however, it is empirical change (in the form of intangible benefits) which is to be examined. Theories dealing with quantitative change should suffice to provide a solid footing for consideration of policy issues later in this thesis. Thinkers such as Heim, Innis, Ong, and McLuhan, however, cannot be dismissed out of hand; all make interesting claims regarding the role of technology in social change, and as such at least some parts of their work are of interest for the present research.

More attention is paid to the body of socio-technological work. Borrowing typologies from Bell (1973) and Schiller (1988), three traditions of inquiry can be identified in work dealing with technology and society; these three approaches may each have their faults (indeed, there is no shortage of criticism), but they highlight issues which are of importance to the study of community networks. Perhaps a more precise name for this group of theories would be the social context of *communication and information* technology (CIT) in society, for it is the ability of technology to manipulate, mediate,

store, and produce information rather than its mechanical capabilities, these commentators claim, that affects social organization.

Bell is concerned with identifying the fundamental differences between industrial and post-industrial society; his thesis is that the revolution is "in the organization and processing of information and knowledge," (1973, p. 500) and thus he coins "information society," a term that has eclipsed the earlier "post-industrial society." He identifies information theory, the forefather of cybernetics, game theory, decision theory, and others, as one of the foundations to his own work. Bell also acknowledges communication history, begun almost single-handedly by Harold Innis, as a primary foundation. Schiller, in a critique of those who picked up Bell's work, identified information theory, the political economy of information, and the post-industrialist approach (pioneered by Bell) as the three major ways of thinking about information and society that have emerged in the twentieth century.

The above groupings capture much of the work that has been done in the past fifty years, but they do not encompass all that they could. A major stream of work, that of early mainstream sociology as it deals with technology, especially in the twentieth century, is missed. Information theory, as Schiller rightly points out (1988, pp. 29-30), tells us very little about social systems, and thus does not have to be considered in detail for the present project. Information theory has informed post-industrialists, however, and this later mode of inquiry is relevant to community networks. Communications history will also be covered, an area that Bell and many others are indebted to (Bell 1973, p. 507). This body of work, especially as developed by the Toronto School, deals directly with the impact of new communication technologies on the organization, and experience, of society.

These three traditions will be dealt with in turn, and their implications for the study of community networks explored.

Approach One: Modern Sociology

The first approach to information technology, early modern sociology, is quite broad and has a long history. Of the twentieth century thinkers in this tradition, Louis Mumford stands at the forefront. Mumford was by no means a technological determinist for he understood the complex interaction between social systems and technology: "Technics and civilisation as a whole are the result of human choices and aptitudes and strivings ... the world of technics is not isolated and self-sustained; it reacts to forces and impulses that come from apparently remote parts of the environment" (1934, p. 6). His views are in opposition to others popular at the time, especially the technologically deterministic cultural lag theory developed by Ogburn[2] (Perrolle 1987, p. 47).

Mumford's work still has an influence, as can be seen in recent work in the field of communication (Mansell, 1993; Jacobson, 1993). Others have followed in Mumford's footsteps, including Ithiel de Sola Pool and David Nye, both of whom examine the broad impact of new technologies. Like Mumford, Pool does not believe that technology dictates social change; rather, he "sees technology as enabling and as creating powerful currents but not necessarily controlling them." Here social reconfiguration is a function of human agency, not technological destiny. Technology creates new possibilities, to be sure, but these possibilities are constrained by the way the technology is implemented: "not computers, but policy threatens freedom. ... governments, fearful of a loss of control

[2]Perolle points out that Ogburn's claims sound similar to contemporary ideas of technological progress when he writes: "Forces that produce changes are the discovery of new cultural elements that have superior utility, in which case the old utilities tend to be replaced by the new. The slowness of culture to change lies in the difficulties of creativity and adopting new ideas."

over sovereignty and culture, will continue to resist opening new communications channels" (Noam, 1988, p. vii). Nye makes a similar point in his study of electricity when he writes:

> A technology is not merely a system of machines with certain functions; it is part of a social world. In the United States electrification was not a 'thing' that came from outside society and had an 'impact'; rather, it was an internal development shaped by its social context. Put another way, each technology is an extension of human lives: someone makes it, someone owns it, some oppose it, many use it, and all interpret it (1990, p. ix).

Most recently this approach has been adopted by other sociologists looking at technology using a social constructivist framework, who view society and technology as forming a "seamless web" (Bijker, Hughs and Pinch, 1987, p. 3). This point must be taken into consideration when looking at any technology, but it is crucial to the examination of communication technologies, especially community networks; these networks develop not from a centralized authority but (usually) from a grassroots movement at the local level. With community networks there is no illusion of separation between technology and social context. The services provided by the networks are "grown" according to the norms and values of users and information providers (which include community organizations).

In fact, a community network may tell us much about the community in which it is "grown." As Bijker and Law write,

> all technologies are shaped by and mirror the complex trade-offs that make up our societies; technologies that work well are no different in this respect from those that fail. The idea of a 'pure' technology is nonsense. Technologies always embody compromise. Politics, economics, theories of strength of materials, notions about what is beautiful or worthwhile, professional preferences, prejudices and skills, design tools, available raw materials, theories about the behaviour of the natural environment--all these are thrown into the melting pot whenever an artifact is designed or built (1992, p. 3).

The key to understanding the complex relationship between a technology and its social context, Bijker and Law claim, is that it may have been otherwise. That is, there is no internal logic or imperative within a technology that determines its evolution. This too is

key in understanding the efficacy of governance. Once one realizes that technologies, particularly communication technologies, can be shaped by social forces (including regulation), one concentrates not only on mitigating their harmful effects but enlarging their benefits.

While these sociological theories view technology as a thing or entity, albeit interconnected with its social context, other theories position technology differently. What separates communication technologies from the rest, many argue, is that they permit manipulation of *information*. As Melody (1994, p. 255) points out, "Information is generally interpreted as a 'stock' concept... Communication is a 'flow' concept." Information theorists have concentrated on the inherent qualities of information, its relation to "noise," ways of measuring its value, and so on. In their focus on information as a self-contained phenomenon, these theorists "sidestepped the possibility that information--at least in social 'systems'--might be a systematic product of social institutions" (Schiller 1988, p. 30).

Communication theorists, including communications historians, have noted this shortcoming of information theory, and have contextualized information as 'flow' (i.e. communication) rather than 'stock' (i.e. stored in text or other fixed forms). This is another point that must be taken into account when looking at community networks, as the flow of information may be just as important as the information itself. In fact, this is one of the central tenets in the claim that these systems enhance community development. That is, communication flow, or conversation, between community members somehow increases community identity, cohesion, and health. As will be discussed below, this idea, in its essence, is that community arises from communication more than anything else.

Approach Two: Communications History

Harold Innis is responsible for laying the foundation for what was later called the Toronto Circle, which pushed forward the boundaries of communications history. Innis' student Marshall McLuhan and McLuhan's student Walter Ong are the central thinkers in this uniquely communication-oriented tradition. This school of thought holds that technology drives changes on several levels, ontic and ontological (to use Heim's terms - the original authors' terms are explained below), but only through its mediation of communication. In other words, it is communicative technology, not technology in general, that is their focus of study.

There is a strong flavor of technological determinism to this stream of thought; Innis, for example, sees empires as products of the ability to store and transfer information through written records. The medium of the writing determined the "bias" of the society using it; hence, "the use of stone in architecture, sculpture, and writing emphasized the importance of monarchy and centralized power" - in other words, a "time" bias (p. 65). Later, more portable media (such as papyrus and paper) would contribute to a "space" bias.

Ong believes that the development of writing was necessary for the development of analytical thought (1982, p. 38 and p. 49). Here, Ong uses phrases like "the psychodynamics of orality," "writing as technology," and "writing restructures consciousness." As mentioned above, ontological claims such as Ong's are beyond the scope of this project. In Innis' work, his attention to the network structure, either as a trade network or a communication network (and in fact, he claims, early networks were both) is pertinent. A network is the structure of control, a point that has been taken up by recent thinkers dealing with telecommunications (Melody 1994; Curtis 1988; Mansell, 1993). What is also important about this tradition is the way subsequent researchers have

sought to place different communication technologies in historical context, finding patterns in the impacts of various technologies.

Both the communications historians and the sociologists have recognized an important characteristic of new technologies: their adoption forecloses other options that were previously available. Innis called this "creative destruction," and Melody presents a modern example: "The correlation between an improving quality and variety of telecommunication services and a declining quality and variety of postal services -- a clear trend in most developed countries since the 1970's -- is not accidental ..." (Melody, 1994, p. 268-9). Heim brings this point to bear against Ong's conception of history as progress. In terms of community networks, it is important to examine how these sorts of choices are being made. Are organizers conscious that certain choices erase some opportunities? For example, providing anonymity to network users may facilitate more open and honest discussion, but it may prevent close ties from forming between users (Varley, 1991).

Other communications historians have dealt with this issue, and shown it to be central. They have also shown that technologies do not have inherent social characteristics. That is, an innovation like the printing press, Eisenstein (1979) has argued, may have paved the way for the Reformation (and increased access to information), but it also entrenched literacy as a real social division, one that often came to divide upper from lower classes.

Approach Three: Post Industrialism

A third approach to the impact of technology on society stems from the field of economics; beginning with the premise that the shift away from heavy industry and manufacturing represented a major change in the organization of society, Daniel Bell (1973) concludes that it is the massive production, manipulation, and transmission of

information that distinguishes this new socioeconomic order. Bell's original analysis of the "information society" has spawned a large body of work, on the right and on the left. For Bell, it is the economic change wrought by information technology that fuels social change, at least in this century. The development and control of these technologies, Bell argues, do not have just technical implications, but political ones as well (1979, p. 515). Following in this mode of analysis have been Herbert Schiller (1984), Dan Schiller (1988), and others. These later commentators usually add a critical or structural element to Bell's original analysis.

In his prescient analysis, Bell names many of the issues that still seem fresh today; many, indeed, are directly applicable to community networks. He sees convergence (although he does not use the term) as a problem area for social analysts as well as regulators. He sees the management of exponentially increasing amounts of information as a problem for information workers. And he names what are today some of the hottest issues in information regulation and policy: infrastructure development; education about, and using, computers; efficient and fair provision of services; calculation of social worth for regulatory purposes (which this project is involved in); governments' roles in providing public information; and social impacts of information technology. The last issue includes telecommuting (another concept referred to but not named by Bell) and the location of cities, increased capabilities for surveillance, increased division between "knowledge elites" and others, and the internationalization of organizations and companies. Community networks capture just about all of these issues. In terms of infrastructure development, they are the access points for end-users. They may provide a vehicle for educating the public about computers, and then providing a channel for distance or home-based education programs. They are an alternative model to pay-for-service providers like telcos and cable companies. And they are already providing, in many cases,

substantial access to government information. The relevance of Bell's observations of technology and social impacts is self-evident.

Bell also discusses the economic contours of the information society, a stream of discourse that is picked up and amplified by many economists. Basing his observations on work done by Porat, Bell explores the implications of a changing work force, and the problems of making economic measurements in the new economy (1979, pp. 518-524). As explained in the introduction, a study of the economic impact of community networks would be completely different than the present project; it is important to keep in mind that the focus of Bell's work is primarily economic, and this is a fertile area for future research on computer networking. The case studies in this research look at intangible benefits, categorized into education, democratic participation, and community development, and are qualitative and descriptive. An economic study would, by virtue of the questions asked, be highly quantitative. This is not to say that consideration of economics is not important to discussions of information policy; rather, such consideration is an entirely different component of those discussions.

One important issue discussed by Bell, and picked up by proponents of community networking (see Civille (1993) for example), is access to strategic information. Access to computer networking, the argument goes, provides the general public with strategic information which is necessary for their participation in the economy and in society. Melody (1994) questions this line of reasoning. Without citing specific publications, he mentions studies of transnational corporations which show that "those corporations with the most sophisticated and complex decision-making systems employing enormous volumes of information make no better decisions than firms making similar decisions with less information" (p. 262). Similar results can be found at the individual level, he continues, in studies of stock brokers using different amounts of information to make

decisions. Can the same be claimed for those making strategic decisions outside of the economic realm? Is there such thing as a point of diminishing returns from access to government information for those making voting decisions in elections, for example? Is there a point where adding more information to a community network makes no difference to the quality of decisions made by those using the information? This is a difficult problem, and might be used to question the project of community networks altogether. In other words, it could be argued that these networks provide no great benefits by providing access to information, for more information may not be better.

Schiller (1988) also critiques some of the ideas proposed by Bell and others writing in the post-industrial tradition. First and foremost is the presupposition that information is a "natural and eternal" entity. In truth, Schiller counters, information attains value only through social relations between people (p. 32); in other words, the value of information is a social construct rather than an intrinsic quality. Clearly this criticism has resonance with those who see technology as existing in a social context, as discussed above. The correct way to study the information society, Schiller argues, is not simply to examine information as a commodity, but to discover what historical and social changes made information valuable in a social context. This is an important point for the study of community networking; if information provided on a network is indeed considered valuable, it is not because it is inherently so, but because of its relevance to the community using it. This is particularly so with educational resources, where inappropriate information cannot be said to be of value.

Theories of Community

The term "community" has always presented problems for sociologists, yet it is a central theme in social thought. Nesbit (1991) includes it as one of the central ideas in the history of sociology, on par with "authority," "status," "the sacred," and "alienation."

Clearly, any examination of community networks is impoverished without an examination of "community." This is certainly important for the present project, for one of the intangible benefits claimed for these networks is community development. Clarification of the term may also lead to a broader understanding of the context of these networks. Not only do they (it is claimed) support local community organizations and individuals, but they foster the development of new on-line communities. This is not the central focus of this research, but it is of interest when looking at the various levels of the public sphere and how many groups (for example an on-line class, or political discussion group) can be considered communities in their own right. The phenomenon of "virtual community" and its implications will be looked at more closely in the next section.

Both Bell (1962) and Giner (1976) trace the early work dealing with community, mainly to dispel one of the central tenants of the theory of mass society, which claims that with the massification of institutions and media there has been a concurrent loss of community. These two writers, in their review of the concept of mass society and the loss of community, refer to perhaps the most cited early sociologist in the field of community, Tˆnnies, and his distinction between *gemeinschaft* and *gesellschaft*. *Gemeinschaft* is understood to be an intimate, ideal form of community, in Tˆnnies explanation, "all praise of rural life has pointed out that the *Gemeinschaft* among people is stronger there and more alive; it is the lasting and genuine form of living together" (Nesbit, 1991, p. 300). *Gesellschaft*, on the other hand, is the mechanistic, contractually-bound nature of "society." Most theorists of mass society reference this distinction, despite its naivetÈ and lack of explanatory power.

In his chapter on "The Wane of Community," Giner identifies two central themes in the theory of mass society. The first is the idea that social density creates strains on the community structure, at a certain point causing its demise. Beginning with Herodotus'

comments on the Persian Empire, this strain of thought continued in more modern times with Malthus, Ortega, and Rˆpke, and economists such as Myrdal and Chamberlain (108-9). Although not mentioned, Durkheim's concept of *anomie*, the idea that rapid social change produces normlessness, falls into this category of thinking (Perrolle, 1987, p. 46). These thinkers, Malthus especially, only support Giner's hypothesis that the theory of mass society is only a thinly disguised version of aristocratic fear of the "masses," or class conflict.

The second theme Giner discusses is "urban dislocation and industrial servitude," which captures the reaction against modernization, or urbanization as a result of industrialization. With roots in Greek and Roman thought, this vein of the theory of mass society is continued from Engles through Durkheim and Simmel, to twentieth century research conducted by sociologists such as Robert Park. Engles, for instance, noted that "capitalist exploitation, combined with the centralization of goods, services and administration reduces city-dwellers to a state of psychological and moral helplessness" (p. 115). For Durkheim and Simmel, and others like Tˆnnes and Weber, Giner says, urban dislocation was "understood ... as part of the general process of transition from *Gemeinschaft* to the *Gesellschaft*" (p. 115). Park, looking at modern American cities, explained problems such as juvenile delinquency, vice, race riots, and so on, in similar ways; urbanization, and the subsequent isolation of individuals, led to the evils of the city.

Bell, too, sets out to dismiss the "myth" of mass society; his approach is to first question the use of the term "mass," and then to show that community, while substantially changed, is still present in modern society. "Even in urban neighborhoods," he writes, "where anonymity is presumed to flourish, the extent of local ties is astounding" (p. 33). Bell goes on to use organizations such as trade unions, interest groups, volunteer

associations, ethnic group organizations, and community newspapers as an index to community ties in the US (1973, p. 33).

Through these two thinkers a glimpse of a new usage of community becomes visible. It is not a romantic *gemeinschaft*, but defined against popular notions of mass society and mass culture. Rather than a homogenous, faceless mass, modern society is comprised of countless subgroups. The "modern democratic struggle for political, economic, and moral equality ... often strengthens the rights and identities of formerly oppressed communities, ethnic groups, and political and religious minorities" (Giner 1976, p. 212).

While some modern commentators have continued to analyze communication technology and mass media in the tradition of the theory of mass society (Meyrowitz (1985), for example, argues television destroys social cohesion), Giner and Bell represent a deep questioning of this mode of analysis. The same debate can be seen in the discourse surrounding community networks, and computer networking in general. On one side are the critics who see people "using the Net as a substitute for the real world" (Shell, 1994, p. 61), presumably leading to the disintegration of family and community ties. On the other side are those who believe that "computer technology in concert with other efforts could play a role in rebuilding community life by improving communication, economic opportunity, civic participation, and education" (Schuler, 1994, p. 39). While the essential nature of community networking is far more complex than this simple dichotomy, this is an important tension to be cognizant of. It leads to the question: are community networks in fact leading to the destruction of community ties, or are they a panacea for the ills of mass society, acting like other community media? To delve into this question deeper a discussion of community media is required.

Community Media

The study of community media is a wide and amorphous field, ill-defined within the discipline of communication. Under the rubric of "community communication" are areas of study such as "alternative media" or "alternative communication" (a sub-field, perhaps, of mass media studies), "democratic communication" (which seems to differ from the study of alternative media only in its focus on theory rather than activism), and *communicaciÛn popular* (Shulman, 1992, pp. 34-36). The last is something of a mixture of popular culture, alternative media studies, and development communication studies, and is typified by Robert White's work (Shulman, 1992, p. 36). The distinctions between these three approaches are not important for the present review, but it is important to underscore the fact that the area of research as a whole is less defined than some others in communication studies. Nevertheless, community communication studies exists at the intersection between mass media studies and the sociology of community. As such it is closely related to the present research in many ways.

Democratic Communication

From a "democratic communication" perspective, community networks might be seen on two levels. As Wasko observes, "the concept of democratic communications is two-fold, involving participation in media as well as in society. In other words, the process involves democratization *of* the media as well as democratization *through* the media" (1992, p. 7). This point captures some of what those dealing with "alternative media" and "community media" are advocating in terms of access to media, but incorporates this in a broader political understanding of the purpose behind that access: basic liberal democratic conceptions of society. A stream of this discourse is picked up by advocates of community networking (Cisler, 1993; Civille, 1993; as well as many others) who argue that access to government will, in the future, be mediated by networks. Access, therefore, will be extremely important. The other focus in this area of study,

democratization *of* the media, also applies to community networks. All rely heavily on volunteer support, and most are run to some extent by a volunteer board of directors made up of community members. The claim that these networks will somehow salvage democratic participation is suspect. They may contribute to a solution, but the idea of a technological "quick fix" seems simplistic. This claim is similar to what was predicted for earlier technologies, especially television.

Computer Networks as Community Development

Some researchers have applied the concept of "community development" directly to computer networks. Qvortrup (1991) looks at the impact "Community Teleservices Centres (CTSCs)" have on rural areas in Scandinavia. These are similar to community networks, but are not dial-up services; instead they are local offices which offer access to computers, fax machines, software, and databases, as well as dial-up to other European services (124-125). He generally found that, instead of leading to a homogenization of rural with urban culture, CTSCs allowed for vital traditional communities to remain vibrant and distinct. In a study of four US "Public Information Utilities," Guthrie and Dutton (1992) look at municipal provision of information over networks, and their shaping by existing political culture. Both Qvortrup and Guthrie & Dutton note the political dimension to the provision of these services: in Denmark CTSCs have had their public funding cut completely (Qvortrup, 1991, p. 128), while in the US,

> ...the range of potential choices was constrained by the political culture and organizational arrangements within which the developers of public information utilities operated. ... Given the vitality of neoconservative views, the political cultures of most American cities are likely to remain less congenial to the development of public information utilities than were those of Santa Monica and Pasadena (Guthrie & Dutton, 1992, p. 593).

"Public information utilities" and CTSCs are not community networks, as they are set up and controlled by various levels of government. They do perform some similar

functions, and indicate that governments do consider computer networks usefull tools for community development.

Community Access Cable

One of the more interesting forms of community media for this study is the phenomenon of public or community access television, usually provided through a local cable station. It is interesting because this service has many of the same goals of a community network, but with an earlier technology. Access to the medium is an important goal for both, as is access to local information. Many see community networks as useful tools for social change (Graham, 1995; Graham, ND), as did those promoting community channels in the early 1960s (Goldberg, 1990). While both services have similar social goals, community access television in Canada may provide community networks with a valuable regulatory model as well, which will be discussed in greater detail in chapter 5.

In the United States, public access cable has had a turbulent history, as Kellner's (1992) work shows. Working under the premise that alternative or unconventional views (in American political parlance these are termed "progressive" or "liberal") are not well represented on commercial or state-controlled television, Kellner makes a strong case for the utility of local public access cable channels. He traces the development of public access television channels and program production in the US, beginning with the 1972 FCC mandate that stated "... new cable systems [and after 1977, all cable systems] in the 100 largest television markets [are] required to provide channels for government, for education purposes, and most importantly, for public access" (Kellner, 1992, p. 101). Note how closely the *raison d'etre* for public access TV, at least as mandated by the FCC, resembles the benefits that are claimed to be derived from community computer networks (i.e. education, political participation, and community development). Kellner himself makes the connection between policies for public access to broadcasting and access to

other communication technologies when he states "Given the growing importance of computers and information in the emerging technocapitalist society, new information networks and systems must therefore be an essential ingredient of a progressive communications system" (p. 110).

Indeed, there is already an impressive "progressive" communications network in place, albeit riding piggyback on existing networks such as the internet. Services such as PeaceNet and the Web, internet based BBSs devoted to peace and social justice issues, are just two of many examples of grass-roots uses of new networking technologies. Adoption of CMC for grass-roots purposes is not restricted to the left. Authorities in Germany have had increasing difficulty dealing with neo-nazis who use networks to meet and organize, and in the United States the right wing National Rifle Association has a strong presence on certain USENET discussion groups. The central point here is that new CMC technology represents another tool for organization, dissemination, and education for those with few financial resources. From a "community media" point of view, community networks represent just another, although flashier, means of communicating within and between groups.

In Canada there is a long history of cable access channels, although the literature on this form of community media is sparse. Since 1969 the CRTC has first encouraged and then required cable companies with over 2000 subscribers to provide a community channel. The channel is included in the "basic service" package, or the first tier of channels (originally numbers 2-13). Kim Goldberg (1990) has traced the development of this medium, and argues that, with some reforms, it remains a powerful tool for social change. Its most potent form, however, is in "interactive programming" (p. 157), where viewers are able to respond to a show through phone-ins or other means. This sort of community programming "returns an element of power, control and choice to individuals and

communities," (p. 161) says Goldberg, reversing some of the "disempowerment" mainstream media promotes.

The parallels with community networks here are obvious. Local organizations and individuals are the major information providers as they develop on-line resources. More importantly, interactivity is built into the system from the ground up, whereas the cable system has to rely on phone-ins, mail-ins, and other feedback mechanisms to achieve interactivity. As community networks adopt more sophisticated operating systems (HTML-based, for instance) the degree of interactivity increases. Most WWW-based documents include a "comments" option; even without this option, there is a built-in "mail to owner" command in most Web browsers. E-mail is not the only channel of communication open to users, either. Real time chat and newsgroups offer other possibilities, and voice and video channels are in the works.

To return to the original question of whether community networks may be treated like other community media, the answer seems clear from the preceding discussion: yes. There are important differences, of course, but it is clear that community networks share many of the same characteristics of other community media, including an emphasis on access, and common social goals.

CMC and Community Networks

Before looking closely at the literature dealing with networking, it is prudent to understand its relationship with another encompassing area of research: computer-mediated-communication (CMC). This review is necessarily brief, for this is an area of some breadth and depth. Perhaps the seminal work in CMC is Hiltz and Turoff's *The Network Nation*, first published in 1978. The fact that it was reprinted in 1993, in a genre where technology (and therefore research) becomes obsolete yearly, is an indication of

how influential this work is. Hiltz and Turoff focus primarily on computer conferencing, but their discussion encompasses social impacts of CMC such as organizational considerations, applications for the disadvantaged, and public access. They also tackle broader issues such as regulatory problems, economics, and human-computer interface design. While many of their projections from 1978 were simply wrong (they predicted that by 1993 computer games would become professional sports, trials would be conducted via computer conferencing, and city councils would hold meetings on computer conferences as well) (pp. 279-280), Hiltz and Turoff managed to identify most of the areas that would occupy CMC researchers for the next fifteen years. *The Network Nation*'s primary value is as a road map to the field of CMC, and as a glimpse at the birth of this area of inquiry.

Since 1978 a great deal of energy has been devoted to the study of computer conferencing, bulletin board systems (bbs), e-mail, and real-time chat. Research generally falls into one of two categories: field work done in an organizational setting (invariably a large organization, since size often determines the availability of money for investment into expensive computer systems), and experimental work done on small groups. Of the former, Zuboff (1988) is a classic example. Her work is based on eight case studies of large corporations adopting new computer technology, and brings to light many of the unexpected negative side-effects of this form of communication. The primary effect of CMC in the workplace, she suggests, is an entrenchment of centralized and hierarchical power and a tendency towards surveillance on the part of management (a situation she terms the "information panopticon" after Bentham's famous prison design) (Zuboff, 1988, p. 320). It should be noted that the sites of Zuboff's research were all fairly large, globalized companies. Her results may have been different if she had dealt with smaller, local businesses. Indeed, her conclusions include a call for completely

different management styles and processes which counter the established management vs. labour paradigm.

The second category, experimental research, is typified by Sproull & Keisler (1993). This kind of research attempts to explain certain communicative behaviours through experimentally tested theories. One popular theory, for example, is the explanation of flaming in CMC as a result of reduced situational or social cues. This "cues-filtered-out" approach to studying CMC has been soundly criticized, with some researchers arguing that social cues are not the only determinant of behaviour in communication (Baym, 1995, p. 141). Some researchers have argued for a more complex explanation for CMC "effects," arguing that factors other than the medium affect electronic communication; some of these factors include: external contexts (such as pre-existing speech communities), temporal structure (whether the communication mode is synchronous or asynchronous), system infrastructure (variables introduced by software and hardware), group purposes, and participant characteristics. CMC research of this kind is still developing and more attention is being paid to social factors than previous studies, which tended to focus on the "newness" of the technology.

Both of these traditions are important for the study of community networks, although the first is probably more useful. Although Sproull & Keisler and others advance interesting theories about communication on an individual level, it is the larger network-encompassing picture that is important for this thesis. As well, community networks resemble more closely the corporate networks integrated into existing work communities than the rather arbitrary networks that are studied by those looking at group decision making software in a laboratory.

An interesting side-shoot of CMC studies is the work that deals with "virtual communities," an area that is ill-defined and often lacking in real sociological rigor (see, for example, Rheingold, 1994). Nevertheless, much of this work documents a real sociological phenomenon. Obviously these "communities" defy traditional conceptions of the term, for "community" is most often associated with geographical location, even in sociological definition (Wild, 1981, p. 17). Space and place play important roles in this new form of community, despite the fact that they occupy no real space. Stone, in an early definition, describes virtual communities as "incontrovertibly social spaces in which people still meet face-to-face, but under new definitions of both 'meet' and 'face' ... [V]irtual communities [are] passage points for collections of common beliefs and practices that united people who were physically separated" (1991, p. 85). Rheingold relies upon a broader, perhaps less rigorous definition: "*Virtual communities* are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace" (1993b, p. 5).

Rheingold's approach, the definition of community as merely a "meeting of minds," or a social web of shared interests, relies on a simplistic, romantic notion of community embedded in the modernist tradition. Jones (1995) critiques the common interest approach and those studies arising from it: "None of these all too brief forays into CMC and community hit the mark. What is missing is the concomitant conceptualization of space and the social, the inquiry into connections between social relations, spatial practice, values, and beliefs" (p. 23). The introduction of space into a model of community, argues Jones, brings up issues of "authority, dominance, submission, rebellion, and cooptation ... Just because the spaces with which we are now concerned are electronic it is not the case that they are democratic, egalitarian, or accessible" (p. 23).

These are all issues that a study of community networking comes face to face with. By their very nature, the "community" in community network is at once virtual and face-to-face. While a social web is woven on-line, the geographic component is impossible to ignore. Community networks exist *in* cities and towns, and pay special attention to the local as the focal point of the network. In a sense community networks are a response to the inaccessibility of new technology, addressing head on the issues of public access, media dominance, and industry authority. Traditional studies of virtual community tend to focus on purely on-line experiences, although Rheingold touches on the way the boundary between on-line and face-to-face community is not always solid: "The WELL felt like an authentic community to me from the start because it was grounded in my everyday physical world. ... By now, I've attended real-life WELL marriages, WELL births, and even a WELL funeral" (1993b, p. 2). While many sites cater to the purely virtual (such as Multi User Dungeons (MUD's) and the related MOO's, Usenet newsgroups, and commercial services like AOL and Compuserve), community networks do not. In this way they are special sites for CMC research into virtual community, and have very interesting potential for "community development" in all its dimensions.

This is not to say there is not a virtual component to a community network. However, perhaps there is a virtual component to any community, along the lines of what Benedict Anderson called "imagined communities" (1991). Many people do use community networks to communicate with others they will never see, as is seen in the case studies in chapter four. And many feel they belong to a community, based merely on their communication with others through a computer system. In this respect, some CMC literature is relevant. Community, however, is a complex notion, and its complexity multiplies on a system where the virtual and the face-to-face mix. At this point, the study of community on community networks parts from the body of CMC literature.

Conclusion

This chapter lays the foundation for the rest of this thesis. The first section developed three categories of benefits current literature claims may be derived from community networks. These categories, democratic participation, education, and community development, inform the interview methodology used to construct the cases in chapter four, and the categories structure the cases themselves.

The remaining sections in this chapter explored community, technology, and social change. It was shown that the relationship between communication technology and social change could never be simple. Technology is a social artifact, and may act as a catalyst for social action, but could never be said to *cause* changes in social configurations. This is the central argument used to dispose of technological determinism, a philosophy which is antithetical to useful regulation. This line of reasoning is pursued in the next chapter.

In many ways this chapter has been about how the experience of "community" has changed as communication technologies have changed. While early scholars and critics felt that new communication technology, namely the mass media, somehow homogenized previously diverse social groups, later work showed the opposite to be true. New means of communication do not seem to destroy community. Indeed, if community is in fact dependent upon communication, these new channels may enhance community. The rich history of "alternative voices" finding expression through community media, such as community cable channels, would seem to support this idea. Community networks, then, may be poised to become an important tool in community development, including improving education and participation in politics.

Chapter Three - The Regulatory Framework of The Information Highway and Community Networking

Introduction

Community networks are interesting from a policy perspective for several reasons: they are experiments in ubiquitous universal service of a sort, they bring together in one "place" many of the legal issues (such as copyright and privacy) that confound policy makers; and they represent the beginnings of the public, switched "information highway." There are several key concepts involved in this morass of policy discourse: universal service and basic service, convergence, and the public interest. This chapter will attempt to arrange these concepts so that they make sense in the context of the information highway. Community networking here represents an instance of a larger area that needs to be considered; that is, how is "public space" going to be incorporated into the information highway? Another way of putting it might be: how will policy makers protect and encourage non-commercial use of the new information infrastructure?

A central theme in this discussion has been adapted from Babe's (1990) deconstruction of technological determinism in Canadian communications policy. It is essentially this: human choice directs technological advancement, not *vice versa.* To ignore this perspective is to see governance as merely a response to relentless technological advancement, rather than as a guiding hand. This approach can only be used to mitigate against technology's less desirable effects rather than to shape it and place it within a larger social framework. Babe derives from this myth of technological determinism several related notions: technological nationalism, technological dependence, and technological industry structuring.[3]

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[3]Babe adds to these the myths of the "efficacy of regulation," and "gales of creative destruction"; the former is the notion that governmental control of monopolies has generally protected the public, while the latter is the notion that old monopolies will

Rather than pull the nation together (technological nationalism), Babe argues that communication technologies have actually linked Canadian regions more closely with the US. The myth of technological dependence states that, "the march of engineered artifacts is necessary" and "all important human phenomena - cultures, distribution of power, belief systems, industrial structures, and so forth - are explainable by the evolution of these same industrial devices" (Babe 1990, p. 9). It is clear that much of Canadian communications regulation is founded on this belief. The formation of regulated monopolies, Babe argues, is based on the third myth, namely that the technical nature of telecommunications (and then broadcasting) *necessitated* "natural monopolies." We can see a similar argument today as telcos argue that convergent networks *technologically necessitate* open competition and the elimination of Canadian content rules.

A second theme in this chapter is the malleability of "basic service" and "universal service." These concepts are inextricably tied to non-commercial use of public lanes on the information highway, just as the community channel, for example, is tied to the "basic service" strategy in cable regulation. These are not fixed concepts, and they have in fact changed considerably and constantly over the last century. This evolution should be recognized and embraced as communication networks change; in other words, regulators should be open to re-defining basic service and universal service as the number of "enhanced services" grows and the economics of service provision changes.

The third theme through this discussion is the social dimension of governance. Too often in rhetoric surrounding information highway policy is regulation considered merely a technical problem. While many players in the telecommunications industry are calling

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wither away with time as they are confronted with vital new competitors (18-20). Both, Babe convincingly argues, are false.

for an end to broadcast-style content regulation in the development of the information highway, they ignore the long and largely successful history of Canadian content broadcast regulation in radio and television. Content is not the only social issue involved in information highway regulation; important too are training, rural access, privacy, and access to government and corporate information. Regulation of the information highway must be understood in a larger social context with solid long-term goals in mind. In other words, a basic model of the public interest as it applies to these new communication and information technologies needs to be developed and applied to the regulatory framework.

To trace the future trajectory of communication regulation in Canada, this chapter begins with a discussion of its history, beginning with telegraphy. This will include a look at the basic concept behind all governance: the public interest. Convergence, the supposed unavoidable next phase in network development, will be examined as it is central to the regulatory problems facing the information highway. Current problems stemming from convergence, and efforts on the part of government and industry to face these problems, will take up the remainder of this chapter.

History

The development of communication networks in Canada begins with the telegraph[4], whose development was highly integrated with the growth of the press and the rapid expansion of the railroad (Babe, 1990, p. 40). This parallel development makes perfect sense: telegraph lines used the right-of-ways of railroads, railroads used the telegraph for signaling, and newspapers relied on the service to gather and transmit information. The telegraph and railroads were also closely tied under regulation, as the Board of Railway Commissioners had jurisdiction over telegraphy under the *Railway Act*, beginning in

[4]This statement holds true if one takes "network" in its technical sense; Innis (1951) has shown that fur trade routes were, in fact, early communication "networks."

1908 (Babe, 1990, p. 58). This is in effect the origin of a concept that has permeated telecommunications and broadcasting (not to mention railway) regulation for the rest of the 20th century: the separation of carriage and content. As will be shown in the next section, it is the apparent dissolution of this distinction in regulation that is underlying most of the pressing problems in information highway governance. In telegraphy, this concept was first applied in 1910 by the Board of Railway Commissioners, who ruled that CPR's press service was breaking the law by using discriminatory pricing (ibid.).

As with the telegraphs, telephone companies are considered common carriers under the Railway Act. This concept has affected telephone development in many ways; from the inception of the *Bell Canada Act* in 1880, for example, parliament has prohibited Bell from investing in other companies,[5] ostensibly to prevent the kind of discriminatory practices common in monopolies venturing into competitive markets. As well, Bell itself (as well as other telcos) are prohibited from providing content-based services, aside from those directly related to the provision of carriage (such as white pages listings).[6]

Cable providers are regulated under a similar regime, although the regulatory framework developed nearly a century later. A cable company is categorized as a "distribution undertaking" in the *Broadcasting Act*, which is defined as "an undertaking for the reception of broadcasting and the retransmission thereof by radio waves or other means of telecommunication to more than one permanent or temporary residence or dwelling unit or to another such undertaking" (2 1). Distribution undertakings are not permitted to engage in content production, with a few exceptions (a cable news channel, a cable

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[5]In his detailed attack on Bell, Babe (1990) shows how through corporate re-organization Bell has managed to slip out of this legal shackle in the 1980s.

[6]Babe argues that here, too, Bell and other telcos have slowly eroded this prohibition through enhanced services, the ownership of publishing houses, and assembling data bases (231-233).

listings channel, and a required community channel for companies serving more than 2000 subscribers (Information Highway Advisory Council, 1995)). Initially, the CRTC was hostile to cable, viewing it as "the most serious threat to Canadian broadcasting since 1932 before Parliament decided to vote the first Broadcasting Act" (Babe 1990, p. 210) because it aided in the dissemination of American content. Soon, however, it realized that the cable network could be used to enhance, rather than undermine, existing broadcast policy; this realization has led to the present system of tiered cable services and channel placement.

The whole point of governance in communications regulation, indeed in any form of regulation, is to best serve the "public interest." The interpretation of the public interest has changed considerably over the last century, especially as it has been applied to telecommunications and broadcasting. At the turn of the century concepts such as universal service were yet to be born. There was some concern with access and toll cost, and some provinces acquired telcos to meet these concerns. Saskatchewan, in 1909, Manitoba in 1908, and Alberta, also in 1908, all bought out Bell's local systems and began constructing more lines (Babe, 1990). Federal policy, however, seemed to interpret public interest as the protection of incumbent telcos (namely Bell). This found expression in several ways, including the Board of Railway Commissioners' support for Bell's refusal to interconnect long distance lines with local competitors (Babe, 1990, p. 116-7). Perhaps most important was the government's support for the notion "natural monopoly," in effect allowing established telcos such as Bell virtual monopoly service for most of this century. This is despite evidence that a competitive market might have provided universal service and reasonable rates in local service far more efficiently than the existing monopoly (Mueller, 1993; Babe, 1990). In fact, some have argued that the connection between a protected natural monopoly and the provision of universal service was an after-the-fact justification for industry protection. For instance, Mueller claims

that "universal service" was originally used by AT&T president Theodore Vail to denote a competitive practice designed to drive other smaller carriers out of the market. It "meant a nationally interconnected, centrally coordinated monopoly like Western Union" (1993, p. 357). The present definition of universal service (i.e. low cost and high penetration of telephony) is relatively new, and is arguably part of a second wave of policy making which broadened the interpretation of the public interest.

A second period of public interest interpretation begins with the broadcasting industry. While a healthy industry and some protection of established broadcasters was, and still is, part of broadcasting policy, the central tenant has been cultural integrity. The social importance of broadcasting to policy-makers is expressed early on by the Aird Report, then by the formation of the Canadian Radio Broadcasting Corporation in 1932 (replaced by the CBC in 1936) and finally formally articulated in the *Broadcasting Act* in 1968. The present version contains many of the earlier provisions, including that the "Canadian broadcasting system ... provides ... a public service essential to the maintenance and enhancement of national identity and cultural sovereignty" (3.1.b), and that the system should "serve to safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada" (3.1.d.i). The act also holds private broadcasters responsible for "contribut[ing] significantly to the creation and presentation of Canadian programming" (3.1.s.i), and states that cable companies "should give priority to the carriage of Canadian programming services" (3.1.t.i). These principles are the basis for Canadian content quotas for broadcast licenses and the tiering system for cable companies set out by the CRTC.

Serious shifts in the interpretation of the public interest begin, ironically, with the slow dismantling of telco monopolies, first with AT&T in the US, and then with successive CRTC decisions allowing increased competition. "Regulation liberalization" marks the

third, and present, re-interpretation of the public interest. Where the first stage saw encouragement of large industry incumbents as a primary goal, and the second stage saw encouragement of social goals at the expense of industry players, the third stage sees *laissez-faire* governance as the best way to ensure the health of communication systems and that social needs are met. While most liberalization has occurred in the telco sector, the CRTC has made noises about opening up the local cable monopolies to competition, and the government has stated that its goal is to "preserve and expand fair competition" in the information highway (Order In Council P.C. 1994-1689). However, even liberalization requires some government intervention, for as Mansell notes,

> [w]hen competitive entry is permitted, the critical sites for the negotiation of long-term outcomes are the terms and conditions of network interconnection, the degree to which network operators are obliged to unbundle functionality, and the political and economic choices as to who bears the costs of the underlying information and communications infrastructure (1994, p. 589).

In developed countries, newly competitive markets are typified by a single dominant telco, which raises other questions for regulators: how to "phase in" competition so that the market is as even as possible? And how do regulators ensure that dominant companies are not distorting competition by subsidizing their services with guaranteed income from a regulated service where they participate in both monopolistic and competitive markets? These are important questions, and are being faced by Canadian regulators during this period of convergence.

The public interest, then, is a malleable concept that has traditionally been interpreted variously as economic health of communication industries (both carriers and content producers), cultural sovereignty, universal access to communication services, and protection from foreign ownership.

The Public Interest

There are two arguments that permeate the rhetoric surrounding convergence. The first is that regulatory reform is necessary due to technical convergence. Technically, on a switched digital broadband network a telephone call and a television broadcast are very similar, despite their differences in function. Therefore, this argument goes, the regulation governing these two services should be "harmonized," preferably to resemble preset telco regulation (Mathieson, 1995, p. 3). In other words, regulatory convergence should mimic technological convergence, and should narrow interpretation of the public interest considerably.

The second argument is that the new convergent network is far more valuable than the existing separate networks, and will offer a myriad of opportunities and services. Consider this sample of claims made for the information highway:

> • Because of the critical role that the information highway will play in the economic and social lives of Canadians, Telus proposes that a broadband access connection should be made available to all Canadians who desire it (Telus, 1995, p. 7);
>
> • This 'network of networks' will link Canadian homes, businesses, governments and institutions to a wide range of interactive services -- from entertainment, education and cultural products to social services, data banks, computers and electronic commerce (Information Highway Advisory Council, 1995);
>
> • The information highway will provide the necessary infrastructure for Canada's emerging knowledge-based economy, and therefore, development of the highway will be critical to the competitiveness of all sectors of the economy (Order in Council PC 1994-1689).

Here is an entirely different view of the information highway; it is not only a valuable communication service and source of entertainment but is also a vital economic utility, a tool for education, and an important conduit for access to government. It would seem that, according to the rhetoric, regulation of the information highway should substantially broaden the interpretation of the public interest, for so much that is in the public interest is at stake.

What exactly are the areas of public interest that should be applied to the information highway? They are the areas that have traditionally been regulated or legally protected in the public interest in the past, and which will be transported to some extent over the new networks. These include government services and information, the education system, and the press -- essentially the building blocks of a liberal democratic society. They also include those areas which are considered utilities, or where the information highway imitates an existing utility, such as the highway system. Utilities are often provided by the state because they are deemed necessary for the citizenry, yet meet market failure in a competitive marketplace. In other cases they are privately provided but regulated as "natural monopolies." The information highway is arguably much like the highway system it is named for as it will be an important component of the nation's economy and will be a conduit for (digitized) goods and services.

These two groupings (traditionally regulated components of liberal democracy and public utilities) will be treated in turn.

Figure 3.1 - Model of a Literate Liberal Democracy

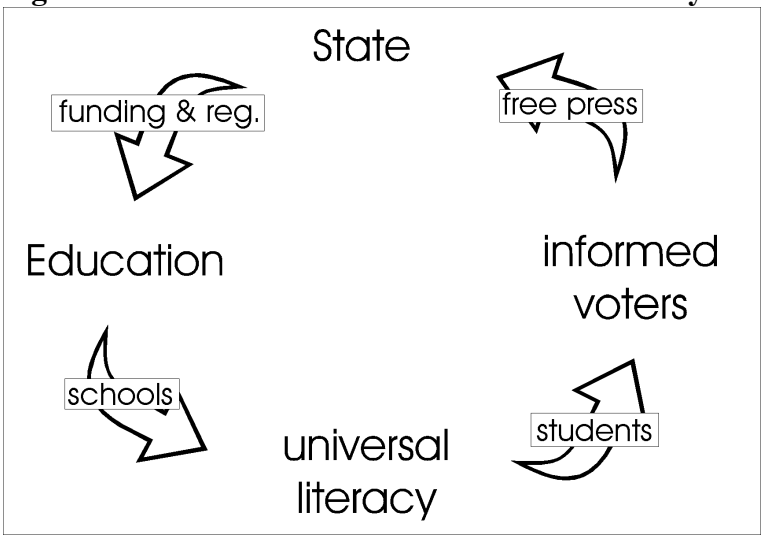


Figure 3.1 shows a highly generalized system within a traditional western democracy, namely the relationship between the state, the education system, and the press. Historically, the interpretation of "voters" has been limited, but as suffrage was extended to ever-wider groups the concept of universal literacy became important. Literacy, it was argued, was necessary to ensure that a populace could educate itself about the issues of the day and cast an informed vote. Thus began the large-scale provision of state-subsidized education. Likewise, the press was afforded freedom because of its integral role in the healthy functioning of a democracy. The present question is how far should measures such as state intervention and legal protection be extended into the realm of the information highway? If one relies on the idealized model outlined above, this question raises others: Do the new information technologies provide new and better access to government information? Will it be the conduit for delivery of the press in the future? Will it become an integral part of the education system? It has been shown here that these questions are important and pressing; one way to attempt to answer them is to look at present use of the information highway and forecast future use. Community networks are natural sites for exploring these questions, for one of their mandates is to enter into this arena of public education and political discussion.

The second area of public interest, the information highway as a utility, is perhaps less convincing than the first, for something is only a public utility insofar as it cannot be provided by unregulated market forces. At least one economist, however, has argued that the internet (or at least many of the services offered over it) will meet market failure without some government support (Schickele, 1993), and this may apply by extension to the information highway if one buys the claim that the internet is an information highway prototype. At least three municipalities have taken seriously the idea that a community network is an information utility (Varley, 1991; Guthrie & Dutton, 1992). Again, Free-

Nets provide a good measure of how the information highway is used in this capacity now, and by projection, how it might be used in the future.

Current Context of Information Highway Regulation

Canada:

Above it has been argued that the interpretation of the public interest should be expanded, not narrowed, when considering regulation for convergent networks. It is also argued that regulation should guide, rather than simply respond to, new technology and its integration into our society. In the previous section some general areas which may be included in discussions of the public interest are outlined. It will be left until the next chapter to discuss the extent to which activities, such as engagement in political discussion or delivery of newspapers, are *actually* taking place on community networks. This is essentially an exercise in measuring the industry and government (and even the community networks') rhetoric against current and possible future usage patterns. In this section the general areas outlined above will be examined in more detail, especially the concept of universal service and basic service. This section is followed by a careful look at current discussions of information highway regulation to discern what is being said, what is being left out, and what direction the government will probably take.

There are several specific issues that community networks, and convergent networks in general, raise regarding communication regulation. Among these are: privacy, copyright, and access. The first two are, for the most part, legal rather than regulatory problems, and copyright specifically is undergoing some reform in Canada. Access is the primary issue here, as it encompasses many of the spheres of public interest outlined above. For example, access includes access to government information and services, access to educational services, and access to a free press. In general, access can be divided along the lines of content and carriage. Government policy on access to information, education,

and "basic services" is quite different from (although dependent upon) that on information infrastructure development, interconnection of networks, and rural and remote access to facilities.

Universal service, in its modern definition, may be the single most useful tool to guarantee access to as many "utility-like" and essential services as possible. This regulatory tool is, of course, facilities based, and depends upon a network-wide view. That is, the network (or networks) as a whole are self-sustaining, but revenues from certain parts of the network may subsidize others (Mueller, 1993, p. 354). Although this is often the justification for natural monopolies, such a system could conceivably work in a competitive market (indeed, the CRTC thinks so, as some revenue from competing long distance carriers goes to "rebalancing," or reducing local rates). Tied to universal service is the concept of "basic service," or an essential package of services which is available at a low cost to all Canadians. Local telephone services fall into this category. This package will certainly change as networks converge; the challenge will be to figure out how and who will provide it, and what kind of rate structure they should use.

Content-based services are regulated in different ways, and to different ends. Current Canadian content quotas (60 per cent for television broadcasters, 30 per cent for radio) supposedly support cultural sovereignty, although services like the "New Country Channel" often stretch the point. Currently most of the regulatory discourse centres on Canadian content on the emerging information highway, as will be seen in the next chapter. A few government departments at the federal and provincial level are putting information on line for public perusal.

A technical distinction needs to be made here: access to government information is legally covered under two acts, the *Privacy Act* and the *Access to Information Act*. The

former limits the kinds of information the government may collect on individuals, and as a safeguard allows citizens access to their records. The latter allows access to government information in general, but has been so ineffectual as to have been nicknamed the "Access to Misinformation Act." Legislative reform, not technological advancement, will cure this woe. What new technologies may do, however, is deliver information that the government currently happily disseminates in printed and electronic form. Already several federal government departments (Industry and Trade and the CRTC both have impressive internet sites) are providing information on-line. A policy directive to all departments to provide all regularly printed material on-line would certainly be one way of ensuring electronic access to government information.

Current Initiatives

The current Liberal government has taken an important initiative addressing at least some of the issues raised above. It formed the Information Highway Advisory Council early in 1994, and by an order in council directed the CRTC to investigate regulation of the information highway in late 1994. These hearings began in March of 1995. Both bodies' reports will be used as the basis for a policy framework to be developed in late 1995.

Thus far the Advisory Council has produced discussion papers on various policy issues -- such as privacy, access, and copyright -- designed to explore issues and solicit expert and public response. The IHAC also played a role in the CRTC hearings. Although the IHAC's discussion papers are impressive in scope, they only briefly propose and explore concrete models of regulation.

On October 20, 1994 the government issued an Order in Council (1994-1689) which requested the CRTC to gather information and make recommendations regarding the information highway. The CRTC held public hearings during March, 1995, which were

the site of intense industry jockeying for governmental support. The cable industry lobbied for a seven year moratorium on any lifting of monopoly protection in cable or local telephone service (Careless, 1995, p. 9). There are a couple of reasons for this move. For one, it is far more technically difficult and expensive to upgrade a cable network to switching capability than it is to upgrade a telephone network to broadband capacity. Secondly, cable companies have just gone through a period of extensive plant upgrade and expansion, and are just now recouping some of their investments. As such they do not have the capital to undergo more upgrading at this time.

The telcos smell blood and are pushing for immediate elimination of any barriers to competitive entry into telephony and cable (Mathieson, 1995, pp. 25-27). After a decade of unprecedented profits (BCE was the most profitable company in Canada last year, while it's subsidary Bell Canada ranked sixth ("Ranking by Profits," 1995)), the telcos are in a strong position to conduct massive plant upgrading to broadband capacity within three years (Careless, 1995).

The CRTC's report arising from the hearing on recasting broadcasting and telecommunications regulation to fit the information highway is disappointing in its lack of specific direction. In the report, the CRTC leaned heavily on open competition; it recommended that

> telephone companies should be allowed to apply for broadcasting distribution licences as soon as rules have been established to remove barriers to effective competition in the local telephone business. Applications from other potential distributors should be considered without delay (CRTC, 1995, p. 23).

Of more interest to this study, however, is the chapter titled "Public Places in a Digital World" -- the presence of which indicates that the non-commercial "public lane" argument did not fall on deaf ears at the hearings. Four recommendations address some of the issues outlined above, and will be dealt with in turn.

In terms of universality the CRTC recommended that:

> The Commission believes that programs that provide access points within each community, and from which Canadians can dial up various information highway services at minimal or no charge, are an important focus of governmental strategy in moving towards universal access (p. 43).

Suggestions of what this strategy should look like are not made, but it is clear that community networks fall within this area. In several places the report talks about the importance of "windows" on a community for Canadians, another indication that community networks are seen to fulfill an important policy objective. The report also says:

> While basic telephone services can continue to be supported in part by subsidized rates, the Commission considers that decisions on funding and priorities for infrastructure development on the information highway in high-cost areas should be made by governments (p. 44).

In other words, governments can still play an active role by directly financing areas of information highway development, specifically those that deal with universality. This recommendation may, however, not be considered seriously by a government working in an increasingly conservative fiscal environment. Regardless, a case still can be made for strategic investment, such as high-speed test networks and other R&D areas, or initiatives to increase on-line access to government information. Both R&D and on-line government information can be cost effective in the long run. This area, and the role community networks can play in promoting universality, is discussed in more detail in chapter five.

The third recommendation in the chapter deals with education and health services, and states that tariffs that discriminate in favour of these services "may be desirable, and not anti-competitive" (p. 45). Since community networks obviously are positioned as training places for the public (as will be seen in the next chapter), they may well benefit from this recommendation. However, as Telus notes in its submission to the hearings,

there is already provision for favourable discrimination for "any charitable organization, disadvantaged person or other person with the Commission's approval" in section 27(6) of the *Telecommunications Act* (Telus, 1995, p. 39). This third recommendation, then, just underlines a provision that already exists, and clears the way for some PR work for the telcos.

The final recommendation in the "Public Places" chapter deals with community access. It is at once disappointing and promising. On one hand, the report says "the Commission considers that it would be unrealistic to mandate a particular form of contribution [to community access]" because of the differing technologies competition will usher in. Instead, it recommends,

> parties wishing to operate new broadcasting distribution undertakings should come forward with innovative proposals for providing community expression, perhaps through incorporation of interactive community dialogue and vehicles for sharing information. Such proposals would complement the contribution made by existing cable operators through their community channels (p. 46).

This position can be read in two ways. On one hand, it seems an open invitation to newcomers to the broadcast arena to contribute the bare minimum to community access, as there are no guidelines and no mandate for that contribution. In this scenario, telcos may be able to pass off phone-in or speakers' corner shows as "community access" -- leading to innovative uses of the term "community access" rather than innovative services.

On the other hand, it is clear that the CRTC is not blind to the need for true community access, and it has been committed to the principle for over 25 years (Goldberg, 1990). This may be a message to broadcasting newcomers to prove that they are committed to community services. In this case, the recommendation may be a golden opportunity for community-based information services, and for players like the telcos. For a relatively small investment telcos and others could support a community service, a service that in

many cases is already successfully operating in a town or city, is independently run, and has a large volunteer base. Compared to the personnel, facilities, and equipment that cable companies must contribute to community access, this could be a real deal. As for the existing community services, a guaranteed annual infusion of capital would undoubtedly lead to improved service, stability, and a re-direction of energy from PR and fundraising to maintaining a valuable service and training users. Of course, this is just one option for broadcast undertakings. As a very promising model, it will be discussed in more detail in chapter five.

The CRTC report is just one part of the government's policy formation process, as indicated earlier. It is, however, one of the most important elements. For one, it considers positions from most (if not all) of the industry players and many consumer and advocacy groups. The Advisory Council, while it did solicit feedback on its original discussion papers, relies largely on the "expert" opinion of its members and staff. Secondly, the CRTC will undoubtedly play a large role in the formation of future regulation, while the Advisory Council is a short-term entity. What direction the federal government takes from the CTRC report will remain to be seen.

<u>The United States:</u>

Americans initially were well ahead of Canadian efforts, having elected an information highway-savvy vice president in 1992. This lead may have been diminished as the US process gets bogged down in the complexity of the American system and the Canadian process slowly forges ahead. The Clinton administration established an Information Infrastructure Task Force (IITF) soon after its election to explore the economic and regulatory issues involved in building the national information infrastructure (or NII -- the American term for the information highway). In December of 1993 the IITF, under

the auspices of the National Telecommunications and Information Administration (NTIA), began hearings on universal service and the NII.

Although no specific recommendations came out of the final report (issued in September of 1994), the IITF raised what it thought were the "core issues," which are similar to those raised in the Information Highway Advisory Council's discussion paper on access. There are some key differences, however, stemming from the different organization and regulation of telecommunications carriers in the US. One of the most fundamental is that the Americans seem to put a greater amount of faith in the free market than Canadians. Another is that the American telco system has been less successful at achieving universal service than the Canadian; penetration is 94% (as opposed to 99%), with some communities having penetration rates of less than 35% (NTIA, 1994).

The Americans also have some different industry considerations, such as the importance of the software industry in the US, which controls about 70 per cent of the world's software market (Bahr, 1991, p. 175). Economies of scale are very different in the US as well, and the RBOCs and American cable companies have much more capital than those in Canada. Thus, mergers such as the failed 1994 Bell Atlantic -- TCI deal, have vaster implications for regulation for these corporations have the resources to develop and deploy technology very quickly. With annual revenues of about US$13 billion (Kline, 1995, p. 115), Bell Atlantic, for example, can afford to develop technology like a US$200 million digital video test facility in Virginia (Schwartz, 1995, p. 113).

Conclusion

It seems that many of the basic assumptions outlined at the beginning of this chapter are still considered valid by Canadian policy makers. Despite the deterministic rhetoric surrounding the most current round of public hearings and discussion papers by

government entities, regulation is still seen as an important tool to guide information highway development. The CRTC report opens with a quote from the McLuhan Program in Culture & Technology: "One line of argument that must be rejected is the fatalistic stance that globalization renders all national policies obsolete" (CRTC, 1995, p. 5). However, a move is definitely being made towards *less* regulation, a more competitive market, and broad scale reductions in direct government spending. The challenge for policy makers is to find a regulatory framework that:

- does not interfere with, or promotes, competition, including tools that guard against or break up monopolies;
- regulates efficiently, especially if that means gently prompting industry towards self-regulation and voluntary commitments that actually work;
- substitutes direct expenditure with market solutions, including cross-subsidization and tariff structuring.

Governments are also realizing that basic service, as it applies to universality, is constantly changing as new services are introduced. The social benefits that could be derived from the combination of distance education and wireless communication technologies, for example, could be tremendous in remote and northern communities. It is no longer enough to promote simple dial tone as the basic service in these areas, nor is it enough in larger communities, when far more advanced service is already in place. In broadcasting terms, basic service is still going to play an important role in promoting Canadian content, although services like video on demand challenge this regulatory tool.

Finally, while the current regulatory process is largely dominated by larger players and narrow industry interests, *some* space has been allowed for larger issues of the public interest. This is due primarily to a successful intervention strategy undertaken by advocacy groups, which organized enough interest to have a strong voice at the CRTC

hearings (L. Jeffrey, personal communication, June 5, 1995). However, over the long term industry players have more resources, better government contacts, and more influence on the policy formation process. It is important, therefore, for advocacy groups to develop proposals that are palatable to industry as well as government in their advancement of the public interest. Examples of such proposals, in the form of possible regulatory tools, are outlined in chapter five.

Chapter 4 - The Case Studies

Introduction

Up to this point this thesis has discussed community networks from a mostly theoretical point of view, involving both their sociological and the regulatory dimensions. This chapter takes an empirical look at Free-Nets, and closely examines two networks through a case study approach. These case studies are organized around a cluster of questions, with the central one being, "do community networks accomplish what they set out to do?" The answer to this question bears heavily on the policy questions posed in the past chapter, namely, what should the public interest be interpreted as in information highway regulation? The goals of community networks have been broken down into three broad categories: increasing democratic participation, facilitating community development, and education.

Although the connection between the present case studies and policy and regulation is discussed in detail in the next chapter, some justification for the approach taken should be given here. There are several reasons for this connection. The first is that community networks are a unique, and in some ways strange, phenomenon which cannot be discussed entirely in terms of previous technologies. Although previous technologies can lend insight into this burgeoning service, it is important to recognize the differences--differences which can only be identified at the empirical level. A lack of previous empirical work in this area makes the case studies here necessary.

Secondly, there is a strong bond between empirical research and policy discussions. Historically policy makers have relied heavily upon statistical measurements and other tools to make decisions. This is, in fact, one of the rationales for a federally funded agency dedicated to generating statistical information, Statistics Canada. Increasingly qualitative studies have not only pointed the way for further quantitative research, but

have served as a solid resource for decision making. Rist divides the "policy cycle" into three phases: policy formulation, policy implementation, and policy accountability (1994, pp. 548-553). Clearly discussions of the Information Highway, and by association community networking, fall into the first phase. Here, Rist claims,

> qualitative research can be highly influential. This is particularly so with respect to problem definition, understanding of prior initiatives, community and organizational receptivity to particular pragmatic approaches, and the kinds of impacts (both anticipated and unanticipated) that might emerge from different intervention strategies (p. 550).

The present study tries to address those areas Rist sees as being particularly well suited to qualitative research, namely defining problems and anticipating impacts.

The cases presented here are not based, for the most part, upon statistical or quantitative data. Rather, they are primarily exploratory and descriptive, and suggest avenues for further inquiry. This is not to say they do not contain answers to some of the regulatory and social problems posed in the previous two chapters. Most of those are qualitative in nature. For example, the question of how much access to government information an individual should enjoy is, at its heart, philosophical, and is best explored at a qualitative level. To some extent, these cases (particularly the interview component) is a continuation of this exploration at an empirical level.

The cases are of two community networks: the Chebucto Free-Net in Halifax, Nova Scotia and the National Capital Freenet in Ottawa, Ontario. The studies contain two general sections, which are not entirely distinct. The first is a description of the Free-Net's organizational development, including founding members and original goals and principles. This section is based upon primary sources such as by-laws, papers, and other documents located on-line, interviews with administrators and founding members, and secondary sources such as other case studies. The second section looks at the current

usage of the Free-Net, and is based primarily upon interviews with current users. The methodology used in conducting and analyzing these interviews is outlined in the next section. Other sources are used as well, including the existing information structures of the Free-Nets, and quantitative information such as user surveys and computer-tracked data.

Methodology

The interviews which form the basis of the major portion of these cases were conducted between January and May, 1995. Participants were solicited on each of the Free-Nets, in discussion groups pertaining to the operation of the network involved. On Chebucto this was cfn.general, and on the National Capital Freenet the discussion group was ncf.general. The rationale was that these newsgroups would be read by users who were interested in the functioning of the network, and who might therefore be willing to participate in the research. Secondly, since these were "general" discussion groups, those reading them would be representative of all users and not skewed towards a certain interest group (as might be found in the Star Trek SIG, for example).

As well as general users, one founder of each system was interviewed on-line about the development of the system, its original goals, and its successes and failures in meeting those goals. Jay Weston was interviewed regarding the NCF, and David John Murdoch was interviewed regarding Chebucto. Given the extremely busy nature of these people's lives, the interviews were more protracted than those with general users. These interviews centered on specific themes, such as the history of the founders' respective network, organizational structure, and original goals of the networks. As such, information from these two interviews is integrated into the history and goals sections of each network, rather than lumped in with the other interviews.

Responses to the initial request for participants arrived via e-mail for about a month after the first posting. Every response was followed up with a second, personalized e-mail, explaining more about the research, and requesting a mailing address for the potential participant. Once a mailing address was obtained, an introductory letter, an informed consent form, and a return envelope was mailed to the respondent (see appendix A for an example). Although there was the temptation to conduct interviews via e-mail on an informal basis, the interview process was treated as any other form of research involving human subjects and thus informed consent forms were used. Other researchers seem to be taking a similar approach to on-line research, as Jones notes (1994, p. 30). The return rate was high: of the 24 letters sent out, 23 were returned signed, and 22 first questions were responded to.

The interviews were conducted in an open-ended fashion, as this allowed for more flexibility in exploring individual usage patterns; many times interviewees were asked to propose their own theories or positions, a technique suggested by Kim (1989, p. 89). The interviews were treated as "speech event[s]" (Neuman, 1994, p. 359), although the e-mail medium had several fortuitous side-effects which differentiated it from other forms of interviewing. For one, the material was in a sense already transcribed; that is, it arrived in an electronic text format making it easier to read, search, and manipulate. Most interviews were concluded with a question like "how does this form of discussion differ from telephone or face-to-face interviews?" Most of the respondents were very positive, citing most often the mental "space" that asynchronous communication provided, allowing them time to think through their answers. This proved to be an advantage for the interviewer as well, as previous responses could be re-read carefully before new questions were sent off.

A caveat should be made here regarding the e-mail interview methodology. While the use of an informed consent form ensured that respondents signed a piece of paper, there was no fool-proof way to determine that they were actually who they said they were. It is relatively easy for users to register accounts on Free-Nets (indeed, any on-line service) under an assumed name and identity. This phenomena is illustrated by Detweiler (1993), who himself assumed several identities who engaged in debate amongst themselves and with others in electronic discussion groups. This is a central problem for any research relying on electronic response, and a solution is not simple.

Analysis:

Although the interviews were open-ended, they all focused on usage patterns, and probed the issues of community development, access to government information, and education, as well as other areas. If a respondent mentioned something that fell into one of these categories (involvement in discussion about a local municipal election, for example), it was followed up in subsequent questioning. Typically the interviews involved a total of 8 exchanges, and spanned three to four weeks. A few were longer, and some shorter. See tables 4.1 and 4.2 for a listing of respondents and information about their interviews. As a few respondents requested anonymity, and it would be awkward to refer to only some by full name, each is identified by a letter rather than by name.

After its completion, each interview was printed and coded according to category of discussion (see appendix B for a list of codes), similar to techniques suggested by Yin (1989, pp. 105-109), and Neuman (1994, p. 409). Similarities or differences between responses and between cases was noted, although no "strong" claims are made about the application of these observations to users as a whole, except in cases where such claims are supported by statistical evidence. Rather, these observations suggest a range of usage patterns and possibilities presented by community networks.

The Chebucto Community Net, Halifax, NS

History

The Chebucto Community Net was born, in a sense, on September 2, 1993, when the first meeting of its steering committee was held. The idea had been fermenting for quite a while previously, according to one of the founders, David Murdoch: "The concept was somewhat formed in my head before I discovered the Cleveland Free-Net and then an invite came for the NCF Conference of '93 and after that it was full steam ahead." Founding members included representatives from Industry & Science Canada, Nova Scotia departments of Education, Transportation and Communications, Supply and Services, and Libraries, Halifax Libraries, and the United Way, as well as local businesses. Chebucto went on-line on June 15, 1994. The organization running the Community Net has since incorporated itself as the Metro Community Access Network Society, or Metro*CAN. The actual hardware housing the Free-Net is located at Dalhousie University's Department of Mathematics, Statistics, and Computing Science, which also provides office space for the society. As with many community networks in Canada, university support has been extremely important. This is typical: a survey of North American community networks found 51% are associated with a university, while 45% have some sort of association with a library (Schuler, 1994, p. 41).

Interface

The Chebucto runs a slick HTML-based interface called Chebucto Suite. Volunteers modified two existing World Wide Web (WWW) browsers, Mosaic and Lynx, and added other programs to the suite, which is freely available to other community networks. The suite offers several advantages over the older, more traditional Freeport software developed by the Cleveland Free-Net and used by many other community nets. The suite offers true hypertext capability, including the option for users to add their own pages,

while Freeport is composed of a set of hierarchical menus and offers no user modification. Chebucto also has the ability to add graphics and other data types supported by HTML, an advantage not lost on its users.

To emphasize this different approach, Chebucto changed its name from "Free-Net" to "Community Net" on April 7, 1995. The name change was also spurred on by legal complications. The National Public Telecomputing Network (NPTN), a community network advocacy group based out of the Cleveland Free-Net, holds a trademark on the word "Free-Net," and has asked Canadian Free-Nets to respect the trademark and contribute monetarily. To date no Canadian networks calling themselves "Free-Nets" (or the NCF's case, "Freenet") have paid the $2000 annual NPTN fee, and the NPTN has yet to take legal action. The name change may avoid trouble in the future.[7]

Goals of the Organization

The Metro*CAN society has four short statements which outline the raison d'etre of the organization: a vision statement, a mission statement, a list of objectives, and a set of guiding principles and policies, all of which are available on-line on the system. Several themes arise from these statements. The vision statement is quite vague, and mentions only "free access." The mission statement is a bit more substantial, and reveals an economic-based approach; of the five points describing what the system will do, three of them mention professional use, economic development, business growth, and employment. One hints at access to government: "[the network will] foster communication among individuals and the institutions that serve them." The last deals with supporting community-based groups.

[7]The trademark presents problems for those networks that have incorporated the word in their IP addresses, such as Calgary (freenet.calgary.ab.ca), Edmonton, and a host of others. Chebucto was either prescient or lucky in its use of "cfn" (Chebucto Free-Net) in its address.

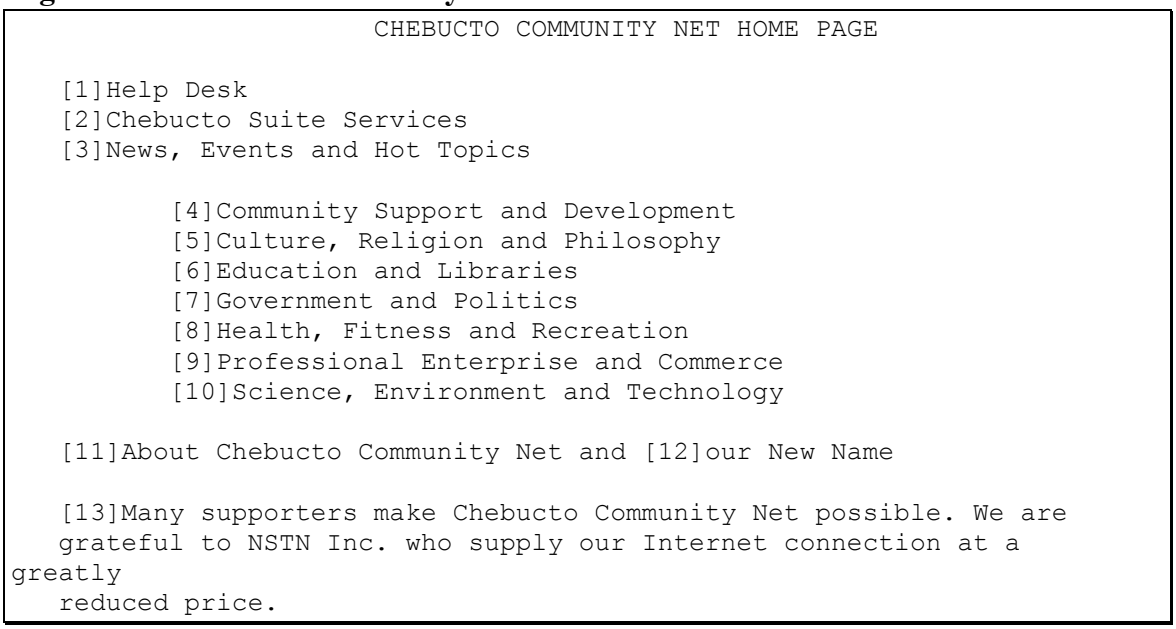
More detailed are the objectives, principles and policies. The objectives mention little about economics, but focus on community and free access. In summary they deal with:

- running the community network;
- developing relevant information and sharing it for free;
- facilitating information gathering by users;
- spreading the community network idea to other geographic communities.

The principles and policies cover many of the day-to-day considerations of running the network, including security, content policies, and so on. Of special note, however, are provisions covering access and membership. Access is reaffirmed as a free service, and the society notes it will "strive to provide access to those with special physical, mental or other challenges." It is also stated that membership is open to all members of the community, but a current address and phone number are pre-requisites, presumably to prevent fraudulent registration.

These four central documents underline the strong commitment Metro*CAN has to access and economic development, but are almost silent on education and access to government, and only mention in passing community development, three areas often cited as central services provided by community networks. This is especially surprising as the earliest information providers included several educational institutions and associations, municipal governments and the provincial ombudsman, and eleven organizations under the category of "Health and Community Enrichment." A plausible interpretation of this situation is that while the Metro*CAN had explicit objectives aimed at access to infrastructure and economic development, implicitly education and access to government and public debate were equally strong goals. This assertion is supported by the current information structure of the Chebucto Community Net, shown in figure 4.1.

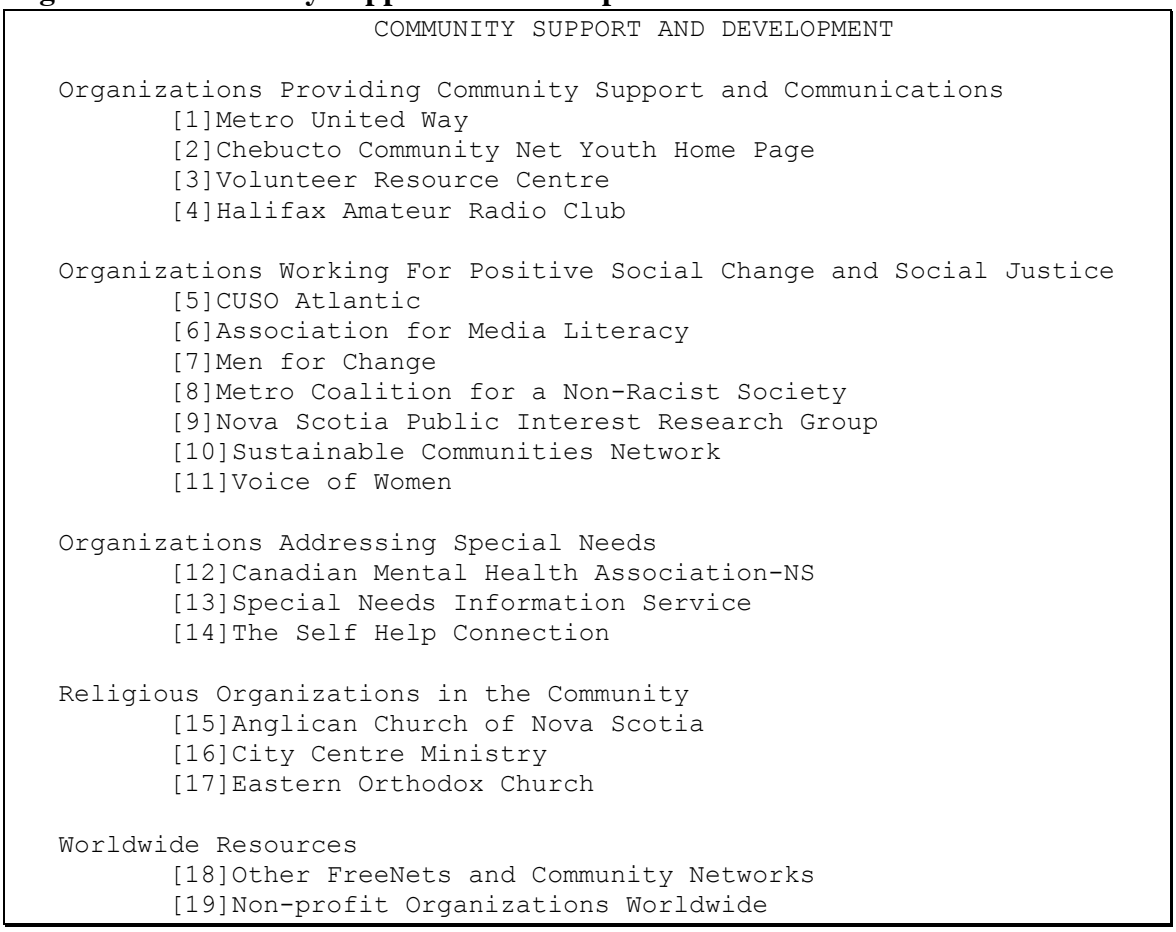
Figure 4.1 Chebucto Community Net Main Menu



```
                    CHEBUCTO COMMUNITY NET HOME PAGE

   [1]Help Desk
   [2]Chebucto Suite Services
   [3]News, Events and Hot Topics

          [4]Community Support and Development
          [5]Culture, Religion and Philosophy
          [6]Education and Libraries
          [7]Government and Politics
          [8]Health, Fitness and Recreation
          [9]Professional Enterprise and Commerce
          [10]Science, Environment and Technology

   [11]About Chebucto Community Net and [12]our New Name

   [13]Many supporters make Chebucto Community Net possible. We are
   grateful to NSTN Inc. who supply our Internet connection at a
greatly
   reduced price.
```

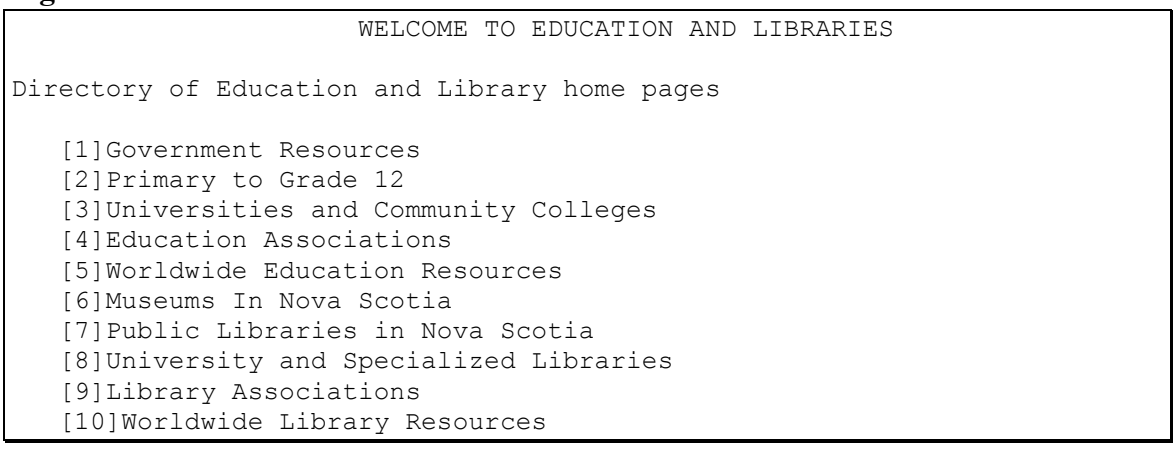
The community support and development and education and libraries menus show the breadth of information available on the network.

Figure 4.2 Community Support and Development Menu



```
                    COMMUNITY SUPPORT AND DEVELOPMENT

   Organizations Providing Community Support and Communications
          [1]Metro United Way
          [2]Chebucto Community Net Youth Home Page
          [3]Volunteer Resource Centre
          [4]Halifax Amateur Radio Club

   Organizations Working For Positive Social Change and Social Justice
          [5]CUSO Atlantic
          [6]Association for Media Literacy
          [7]Men for Change
          [8]Metro Coalition for a Non-Racist Society
          [9]Nova Scotia Public Interest Research Group
          [10]Sustainable Communities Network
          [11]Voice of Women

   Organizations Addressing Special Needs
          [12]Canadian Mental Health Association-NS
          [13]Special Needs Information Service
          [14]The Self Help Connection

   Religious Organizations in the Community
          [15]Anglican Church of Nova Scotia
          [16]City Centre Ministry
          [17]Eastern Orthodox Church

   Worldwide Resources
          [18]Other FreeNets and Community Networks
          [19]Non-profit Organizations Worldwide
```

Figure 4.3 Education and Libraries Menu



```
                    WELCOME TO EDUCATION AND LIBRARIES

Directory of Education and Library home pages

   [1]Government Resources
   [2]Primary to Grade 12
   [3]Universities and Community Colleges
   [4]Education Associations
   [5]Worldwide Education Resources
   [6]Museums In Nova Scotia
   [7]Public Libraries in Nova Scotia
   [8]University and Specialized Libraries
   [9]Library Associations
   [10]Worldwide Library Resources
```

A second possible explanation for the omission of certain goals from offical CCN goals is that the architects of the Chebucto community net considered those benefits claimed by

free-net enthusiasts to be given, and that the primary benefit was a generic access to information and infrastructure. Founder David Murdoch acknowledges that the organization aimed at educating the citizenry, increasing community interaction, and assisting "social service organizations." Murdoch has mixed feelings about the success of the CFN in meeting these goals: "Certainly we are providing the right environment on-line for these opportunities and we can improve access to those without by providing more Public Access Terminals (PATs) but we do have a way to go."

As with most community networks at this time, the CFN walks a thin line financially. Emphsis is on volunteer recruitment and membership fees to keep costs down and revenue coming in. Murdoch notes that, in March of 1995, "we have 5600 users, 39% are members of the society that runs CFN and have paid the $12 annual membership. 25% of our members have made a donation and these have amounted to $5000. We have other levels of membership but have not developed these to date but a $200 institutional membership has drawn some takers."

As was discussed in chapter two, it is clear that there is no natural "trajectory" or use for a technology, and so free, equitable access to infrastructure does not imply that certain beneficial uses will just "happen." This is a point community network planners should bear in mind.

Use of the Chebucto Network

Demographics

Ten people were interviewed about their use of the Chebucto Community Network over a period of two months. A summary of the interviewees used in this portion of the research can be found in table 4.1.

Table 4.1 - Respondent Profile from Chebucto Interviews

Name	**Age**	**Sex**	**Profession**	# of responses	**Completed Interview**
A	62	M	--	4	yes
B	41	M	applied scientist	3	yes
C	26	M	cook	3	yes
D	43	M	management consultant (MIS)	1	no
E	33	M	federal civil servant	3	yes
F	50's	M	retired engineer/computer specialist	3	yes
G	37	F	federal civil servant	3	yes
H	26	M	computer scientist	2	no
I	13	M	student	5	yes
J	27	M	fire fighter	4	yes

N = 10

Several general observations can be made about this sample. Males dominate 9 to 1, a ratio that is probably close to the actual gender ratio on community networks and on the internet in general. Most respondents were well-educated and over 30. While no statistics are available for the Chebucto network, these demographics are similar to those found on the Calgary Free-Net (Zelman & Phillips, 1995) and on the National Capital Freenet (Patrick, Black & Whalen, 1995).

The discussion below is broken into thematic categories as set out in the preceding chapters, namely use of community networks for access to education, democratic participation, and community development. Other observations are treated after these three, and include economic benefits, recreational use, and experiences with the Metro*CAN organization.

Education

Very few of the respondents said they use the Chebucto system for educational purposes, although its potential for such use was clear in the discussion with those few who did. A couple note its utility as a learning ground for networking skills in particular. A, for instance, says "From day one my purpose has been to use the Freenet to learn about the internet and to develop internet skills." He adds later on, "All in all, the Freenet has been great for me. I have learned a tremendous amount that I never would have learned without it." When A was asked whether he saw the Freenet as primarily providing access to local or global information, he responded that both were important, but "I think the local stuff is mainly important as a training ground," which allowed users to learn how to debate local issues. D echoes this focus on network education, stating he uses the system to learn about "internet functions, sites, methods, [and] standards." J, too, uses the CCN to educate himself about networks, saying it "has *really* opened my eyes as to what the Internet is all about."

I, a junior high school student, is the only respondent who uses the system to supplement formal education. He uses the system frequently for school assignments and for teaching himself programming. When preparing a science fair project on caffeine in colas, I consulted the FAQ for the newsgroup alt.drugs.caffeine, which he cross-referenced with information directly from soft-drink producers to ensure accuracy.

Education seems to be an important use when viewed as an informal exercise, but it is not being used in a formal sense by the respondents to this study.

Democratic Participation

Again, access to government information or political discussion was not a common activity for many of the respondents. A, who seeks out interesting sources of information for his own home-based business, says of government information: "I find there is too

little of it. There is really no data there, just nonsense paragraphs about 'what our department does.' I fear government is withholding our information stored in databases because it intends to sell it on the internet... ." He cites the recent federal government decision to charge $500 for internet access to the budget, which was circumvented: "It didn't last long, all the law and accounting firms posted it a day later." In the end, A is pessimistic about the prospect of having a direct line to politicians. "Pressuring politicians and senior officials only works if you possess more power than they. Individual requests and demands soon get lost in the system. I always find it best to begin in the middle."

C finds some newsgroups he reads engage him in political discussion, but he says "I also like to discuss my other interests as well." C sees the potential for government information and says "I'd like to see the ties between community networks and community governments become a lot closer because I find the community network to be the easiest way I can imagine for the average citizen to quickly and effectively interact with the government." He sees a much less ominous explanation than A's for the obvious lack of information presently available: "Government ... is just getting hooked up for the first time and simply cannot catch up to the hundreds and even thousands of people wanting information and interaction with their local politicians." C perceives the federal government as providing a large amount of useful information, unlike A.

E maintains a list of government addresses on the Chebucto network on a part-time basis, and engages in some political discussion. On one newgroup,

> a fellow ... felt the federal and provincial government hiring practices might be racist. I came to the defense of the federal department I work for citing some of the programs, visible minority ratios, etc. The discussion eventually turned into an analysis of affirmative action programs and I dropped out after being cornered by a guy with a Ph.D. in something like 'The Sociology of Affirmative Action Programs in Government' -- needless to say, the guy was very well informed and it was a really interesting discussion.

E here raises perhaps a dimension of government access that is missed in most analyses: access to civil servants on an informal basis.

In short, respondents found government information lacking, if they sought it at all. Those who had tried did not find the system useful for contacting politicians or officials. This may be a situation that changes radically as more government resources go on-line.

There are indications that some users are trying to get government information. Usage statistics on the CCN show that the "government" page was the third most popular information provider area, just behind "recreation." "Technology" was first, with more than twice the number of visits for "government." In July of 1995, the City of Halifax page was the third most popular single service, just behind "gardens and gardening," and well behind "Halifax Daily News." See Appendix D for a complete ranking of pages by use.

Community Development

Most participants agreed that the community net contributed in one way or another to the vague area of "community development," although different definitions were invoked. For B, "community participation" means "helping other CFN members with their questions about using Internet ... participation in buy/sell bulletin boards, discussion groups of local topics ... [and] keeping up with social and cultural events."

C picks up on the current events idea, and says "I use it [CCN] because I can keep in touch with what's going on in the community, and the world, in a way that the newspapers cannot deliver." When pressed about his actual use of the "community" menu, C admits "I can see a lot of promise in this easy access for community support, but I have not actually used it yet, or know anyone who has." Perhaps the most important

community development function the network plays, C suggests, is providing a forum for open discussion. "I find these discussions worthwhile because you can hear different viewpoints about community subjects, and it helps to bring the community closer together I think." E concurs, saying "the CFN provides a real local community notice board and soapbox."

Opposed to these locale-based versions of community, F sees the community net as a community in itself rather than a way to integrate the existing community. "We travel a lot," he says,

> while I am here I meet people with common interests. We live outside Halifax in a small fishing village and *no one* bothers *anyone*... that's the law! We are from away -- a neighbour who has lived here for 18 years told me that he's still from away -- so I wasn't looking for 'integration.' I do think it helps meeting others in the (larger) community.

Clearly community is in the eye of the beholder, and can take different forms for different users. A few observations can be made about community at this point; the Chebucto community net does provide a well-used forum for discussion of local and global topics, and some users perceive this as community development. The mere provision of dialogue, as suggested by one theory in chapter 2, is in itself community development. Interestingly, none of the respondents mentioned using community services on the Chebucto system, although several are represented there.

Miscellaneous Observations

Many of the respondents found the Chebucto system to be very valuable, and in fact had moved or were planning to move to a commercial provider to better access the internet and the community network. This is in part driven by the difficulty of logging on; the system has a ratio of users to lines of over 100 to one, which means most users receive a busy signal when they try to dial up.

Time and again respondents said the community net provided a taste of the internet which prompted them to "move up" to a better connection. G, for instance, observed, "I am in the process of getting a SLIP connection through a regular provider, but feel the freenet gave me a first hand look into what is available." J says essentially the same thing. D and A both have commercial connections as well, and A goes so far as to say Chebucto "seems a better system than our commercial provider, except there you seldom wait [to get a dial-up connection]. It has a better menu that aids in learning, and is much less restricting."

E uses his internet connection through work to access Chebucto, sidestepping the often busy phone lines. This phenomenon is interesting in that it seems community networks may actually create rather than erode a market for commercial providers. If community nets could generate statistics that support this trend they may be able to tap commercial providers for monetary or in kind donations. Indeed, it would seem that a vibrant system of community networks is in the best interest of internet providers as it would capture and keep a larger and broader audience.

The second observation is that few respondents mentioned economic benefits derived from the system. The two that were mentioned involved a vague reference to forming an on-line business based around finding and formatting information on the internet (by A), and finding a local business through the Chebucto system. In that case, E, a musician, says "I met an instrument maker through a CFN member and I'm about to spend a little over $1000 on a new violin, made by a local company. I call this a benefit to both of us." Immediate and tangible economic benefits on a larger scale, however, were not evident in any of the interviews.

A third observation involves Chebucto's support organization, Metro*CAN. The organization got mixed reviews; those who had attended the annual general meeting thought it was well-run and professional. A few, however, felt alienated by the cliques that have formed. A, for example, says "my only beef with the Freenet is that some of the original members and volunteers have sort of become stakeholders and disciples." After being spurned as a volunteer for several months, he stopped trying. Others, such as F, have found the same thing. "I seem to have uncovered some very territorial folks," he says. "The poor souls who started this thing are having, in my view, a terrible time accepting constructive feedback." This does not prevent him from supporting the network in other ways. He's a paid-up member and says not paying the marginal fee "is a lot like FreeLoading, as opposed to FreeNetting."

Only a survey of all users could determine whether this is a wide-spread perception. If it is, it could represent a future problem as the organization attempts to reach out and involve more community groups and information providers.

The National Capital Freenet, Ottawa, ON

History

The National Capital FreeNet[8] is perhaps the most successful, and definitely the largest, community network in Canada. Incorporated as a not-for-profit organization in October of 1992, the NCF was running and open to the public in February 1993 (Weston & Sutherland, 1993). Since then the user base has grown to over 42,000, and continues to expand.

[8]The NCF uses the variant spelling "Freenet," as it adopted the term before the National Public Telecomputing Network attempted to standardize the word and enforce its trade mark on "Free-Net."

The groundwork for the system was laid two years before the official launch, in November of 1991, by three Carleton University employees: communication professors Jay Weston and George Frajkor and director of Computer and Communication Services, David Sutherland, who remains president of the organization today. The development of the NCF, says Weston in an interview, was highly dependent upon the personalities involved, a factor often ignored in historical accounts of community networks and indeed any sociotechnological artifact. Weston had been highly active in introducing new communication technologies, including an e-mail service for the Canadian Communication Association (CCAnet) in 1988, and had served on the Advisory Board of Comserve. Regardless of his interests, Weston says that a certain element of luck was involved:

> the initiation of the NCF was a happy coincidence of unlikely circumstances and personalities. Had Frajkor and I not been trying to evolve an academically acceptable course around the development of distributed media invading mass mediated society, we would not have been exploring all of the things surrounding the possibility of community networks. Had Sutherland not been intrigued with the growth of the Internet and supported our idea of unleashing it on the Canadian public, there is no chance that Carleton would have gone along with this 'experiment'. Had Carleton's President, Robin Farquhar, not held communitarian beliefs about the role of the university in society, it is unlikely that the freenet idea would have been seen to connect to the business of a university.

In fact, Weston, says, the NCF played a crucial role in the Canadian community network movement. The system could not have been sustainable any earlier than 1993, and any later may have been too late. The NCF set an example many others followed, and even supported other community network organizers first with the preparation of an information kit, then by hosting a series of annual conferences beginning in 1993. Why would a year or two of delay make a difference to community networking in Canada? Weston claims, "a few years later when the information highway rhetoric had become part of the national dream, it is unlikely that the telecommunication industry and various governments would have been so unconcerned, or benignly neglectful, of what the freenet implied" (Weston, 1995).

Interface

The NCF uses the Freeport software developed at Case Western University and the Cleveland Free-Net, a package which is limited compared to the more recent Chebucto Suite and other HTML based interfaces. The system is relatively easy to use, however, as it is menu driven, and short cuts are available for more advanced users. As with most community networks, the menus are fairly clear and thematically organized. The main menu displays not only attention to ease of use, but organization around access to government, access to education, and community development.

Figure 4.4 The NCF Main Menu

```
               <<< The National Capital FreeNet -- Main Menu >>>

  1 All 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 Communications Centre...
 14 Professional Associations...
 15 Help Desk...
 16 Menu principal frangais...
 17 Ontario Provincial Election Project...
-----------------------------------------------
h=Help, x=Exit FreeNet, p=previous, u=up, m=main
```

While volunteers have modified the original Freeport software somewhat (the version run by the NCF was developed in 1991), and new functions continue to be added, the NCF interface is quickly becoming dated. This is perhaps the biggest drawback for early adopters of technology: the earliest systems age faster.

Goals of the Organization

The NCF's goals are far less specific and explicit than those of the Chebucto organization. The mission statement is brief and vague:

> The National Capital FreeNet is a free, computer-based information sharing network. It links the people and organizations of this region, provides useful information, and enables an open exchange of ideas with the world. Community involvement makes FreeNet an important and accessible meeting place, and prepares people for full participation in a rapidly changing communications environment.

The theme of community development is clearly there, as is the suggestion that the system will train people in using information technology. The central idea seems to be exchange of information and ideas locally and globally. This resonates with one theory of community outlined in chapter two which holds that communication, not locality, is the building material of community.

The NCF's strong emphasis on community involvement was a goal from the outset, as Weston (1995) points out that the organization used the Cleveland and Heartland networks as foils: "we realized that neither [network] had a broad community economic base. ... While the NCF would take anyone's money, we did not want to be tied to the institutional objectives of one or two groups."

While the NCF's aims are not explicitly expressed in any written document, its activities belie a few strong goals. Several election projects have been undertaken, including the 1993 federal election, municipal elections in 1994, and the provincial election in June of 1995. These will be discussed in more detail below, but their mere presence (and the tremendous organizational effort that goes into setting up such projects) is an indication that the NCF volunteers and stakeholders feel the FreeNet should play an active role in participatory democracy.

Aside from the administrative items, each part of the NCF's main menu fits nicely into the three categories proposed by this thesis. Community development and democratic participation are perhaps the strongest two of the three, but the NCF has at least three education-related menu items.

Use of the NCF

Demographics

A demographic summary of the eight interviews conducted on the NCF can be found in table 4.2.

Table 4.2 - Respondent Profile from NCF Interviews

Name	Age	Sex	Profession	# of responses	Completed Interview
A	41	F	civil servant	4	yes
B	33	M	civil servant	4	yes
C	20's	F	student	4	yes
D	25	F	unemployed	4	yes
E	29	M	unemployed	4	yes
F	38	M	civil servant	4	yes
G	48	M	consultant	4	yes
H	22	F	student	4	yes

N = 8

The respondent profile for the National Capital FreeNet is quite different from that of Chebucto. While women make up only about 20 per cent of the NCF's users (Patrick, Black, & Whalen, 1995), half of the respondents were female--which indicates immediately how non-representative (statistically at least) such a small sample can be. As well, the average age is quite a bit younger than with the Chebucto respondents. Every respondent completed his or her interview, and interviews were a uniform eight exchanges. The range of professions was not as broad as with Chebucto, and as would be expected in a capital with two major universities, civil servants and students were in the majority.

Education

Respondents did not tend to use the FreeNet for educational purposes, at least not to supplement formal education. Neither student, C and H, did research using the network, although both accessed the network using their university accounts. C mentions that she uses the NCF in her job search, as she is approaching graduation. H, a fourth year Art History student at Carleton, prefers older technology: "I don't do my research on-line. I am still trying to figure that out. I still like books."

A, who works in external relations for a federal agency, paints a different picture. As an information provider for the agency herself, she says there have been many requests from students writing papers looking for information. She says, "I think this is influenced by the fact that universities provide net access." While Free-Nets and community networks are becoming increasingly popular, universities (at this date) remain the largest access providers in Canada.

Aside from supplementing formal education, some respondents did use the network for informal education. B, for instance, used the NCF to compile lists of reading material. E, who is unemployed but enrolled in a government sponsored LAN installation and administration course, claims that "In my 7 or 8 years of hopping around the local BBS community, I've learned a lot just from reading messages. I'd have to say that 75% of what I know was learned this way. This knowledge has helped me quite a bit in finding employment in the past, or in solving my own computer problems."

The NCF is not a formal source of access to education for respondents, but it may very well be a repository of information accessed for educational purposes from other points on the internet. The informal use of this on-line service for self advancement and

learning should not be overlooked, as it was a fairly strong use for some users, especially in the computer field.

Democratic Participation

This seems to be one of the most successful non-economic benefits that the NCF offers. This is, perhaps, because of the considerable organizational effort put into enhancing access to government officials and information, the provision of several forums for political discussion, and special "all candidate meetings" for local, provincial, and federal elections. Other reasonable explanations for the proliferation of this kind of service on the NCF are: proximity to the political power centre of Ottawa; participation in the NCF by civil servants (some of whom are informal information providers); and a well-educated and politically aware user base (with a high percentage of students and university-educated people).

This user base demographic may contribute to the NCF's utility as a source of political information, it may also mean that those who need access to such information most are least likely to gain that access. At least two surveys of community network demographics indicate that users tend to be well-educated, male, and in a high income bracket (Zelman & Phillips, 1995; Schalken & Tops, 1994). As Doctor points out, this is exactly the kind of person who is already politically active, and he cites findings from several studies to back up his claim including:

> • College [university] graduates vote at nearly twice the rate of those who did not complete high school (Piven & Cloward, 1987).
>
> • Only 50 percent of those who leave school play active roles in organizations, compared to 80 percent of college-educated people.
>
> • More than 75 percent of the lowest economic class belongs to no organizations (except for church), but most upper-middle-class people belong to multiple organizations (Hyman & Wright, 1971) (1994, p. 10).

Another barrier to valuable access is the resistance to new technology demonstrated by many politicians and bureaucrats, especially if that technology may challenge the status quo. In an interview with Ottawa mayor Jacqueline Holzman, for instance, Wichers found that she "does not see the need for information to be transferred via computer and modems. She does not think that people have any trouble contacting her by telephone, mail, fax machine, or talking [to her] on the street" (1992). Wichers discovers another problem: "since Holzman does not type, the time spent by her and her staff in responding to questions would be fairly high." Holzman also brings up the cost of maintaining information on the NCF as prohibitive, although this is a questionable claim as savings through lowered printing costs and paying staff to manage traditional inquiries (through fax, telephone, etc.) might more than offset the cost of providing information electronically in the long run.

In an analysis of the NCF's first federal election project in 1993, Taylor (1993) found that despite the many advantages of the electronic medium for users and candidates, the participation by candidates was not good. Some reasons were political: "Although the FreeNet membership is growing rapidly, it is still a small percentage of the voters in this area." Others had to do with a general misapprehension of information technology: "I don't quite understand this, but staff from both the PC and Liberal headquarters ... seem to fear that candidates' postings are more likely to be quoted and used against them than things they say verbally." Participation in the most recent provincial elections (summer of 1995) seems to be much higher, but then so is the NCF's user base and profile in the community.

It is clear that, for the respondents in this study at least, the NCF's efforts have had an impact. A, for instance, participated in the municipal election forum, and says it was "extremely helpful, both in terms of deciding who to vote for, and also to generate

discussion of the issues." She also touches on cost issues of information provision: "a number of government agencies (including the one I work for) make information available on the net on a regular basis. I think that is extremely useful -- it's also less costly ... than printing and mailing thousands of leaflets, for example." Her agency makes news releases, the annual report, a quarterly magazine, and various brochures available through the network. B uses the system to gather day-to-day municipal information such as garbage collection dates.

Despite the popular conception of all discussion on the internet (and by proxy, community networks) as vacuous, emotional, and ill-informed, several respondents found the opposite to be true. A says "I am also quite impressed with the quality of the political debate on the net ... the discussions during the municipal elections were extremely useful in terms of sorting out the issues and getting direct feedback from those candidates who are computer-literate." B found the candidate information had "much more detail than would be allowed in a newspaper or television interview."

On the other hand, G disagrees with this point of view, and says he wouldn't call the political discussion "debate": "so far the postings ... [are] even less informed than what I remember around the cafeteria/coffee shop at university... and certainly less 'decorous' than the rowdiest physical all-candidates meetings."

NCF has succeeded in covering what are traditionally considered mundane and unimportant elections (at least if one uses voter participation as a barometer of perceived importance). A, for example, participated in the school board election forums, and found that the discussion group "was particularly active, with candidates responding to posters' questions on a wide range of issues."

E finds that most of the political discussion he engages in involves the NCF organization itself, particularly the annual Board of Directors elections. The last elections were controversial, as on of the issues was limiting users to two hours of on-line time per day. While G finds most of the debate around other elections unintelligent, he was impressed by the NCF elections.

Clearly the reviews are mixed, but some respondents found NCF to contribute significantly to several levels of democratic participation. Debate may be the weakest point, but one must keep in mind the number of people who are disappointed with political debate between "experts" and politicians in the mainstream media. The mere presence of this type of discussion is a positive indication of the community network's ability to promote political awareness and participation.

Community Development

Community development seems to be by far the strongest benefit the NCF offers, although ironically it is the most difficult to define and measure. Community associations, which might be one measuring stick, are well represented on the network, and cover a wide range of interest groups and geographic locations.

Figure 4.5 - NCF Community Associations

```
                <<< Community Associations >>>
                  (Part 1 of a 3 Part Menu)

 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 To Menu Part 3...

                <<< Community Associations >>>
                  (Part 2 of a 3 Part Menu)

 1 Ottawalk...
 2 Riverside Park Community and Recreation Association...
 3 United Nations Association in Canada - NCR Branch...
 4 Inventors Association of Ottawa...
 5 Nepean Masters Swim Club...
 6 Orleans Little League...
 7 Centrepointe Community Association...
 8 Ottawa Coalition for Social Justice...
 9 The Baha'i Faith Forum...
10 Coalition to Oppose the Arms Trade (COAT)...
11 Recreation Association of the Public Service...
12 Canadian Kennel Club...
13 Expo 2005...
14 Federation of Ottawa-Carleton Tenants Associations...
15 To Menu part 3...

                <<< Community Associations >>>
                  (Part 3 of a 3 Part Menu)

 1 Olde Forge Community Resource Centre...
 2 Kurdistan Committee of Canada...
 3 Consumers' Association of Canada...
 4 Conference on Community Access to the Information Highway...
   Enter "p" to return to previous menu...
```

Another indicator of a healthy "community" atmosphere is the presence of several dozen special interest groups or SIGs. These tend to be more interest oriented than location oriented. See Appendix C for a complete listing of these groups as of June, 1995.

The NCF's selection of special interest groups and community associations is by far the most comprehensive of any Canadian community network. In the interviews, several users indicated that they used these community-related services, and even used them in a way that in itself constituted "community" activity. A, for example, finds other users in these discussion areas are often "neighbourly":

> My husband and I were going away on vacation, and we wanted someone to recommend a good, inexpensive kennel for us to board the dogs. I put a posting on the local dog sig ... and got a reply from a guy who loved dogs (he had one of his own) and offered to board them for free. After meeting to ensure the dogs got along well with the family (and with the other dog), we boarded our dogs with him for a week and it worked out great. The dogs have gone there to stay twice more since then.

D likes the ease of the NCF community, and says "I like meeting people like me. And since I have several diverse interests an electronic community is easier than finding a local community." The NCF has had a real impact on her life: "It has widened my social circles greatly. In particular the Star Trek SIG has regular live events where we get together. Almost everyone in that group met on the net in the SIG. We have very little in common except Star Trek fandom and NCF." E uses the IRC (internet relay chat) service on NCF, a synchronous communication channel available after midnight, open only to NCF members. This exclusivity of local membership, he says, makes it a good place to find "community." On the other hand, H feels discussion groups representing a common interest do not contribute anything to a sense of community. They "give access to people who feel like griping," she says.

Aside from the specific services aimed at connecting users through common interests and community groups, some users find "community" to be a side effect of NCF use. G, for example, says "one uncontested positive contribution CMC makes to the community, in my view, is the access it provides the house-bound and anyone who has a hard time

getting around. On NCF, I've noticed in particular many people with disabilities saying how great it is to have much broader contacts, and the same with seniors."

Finally, some respondents find community in the NCF organization itself. H, for instance, was spending a lot of time on the system, and decided to contribute by volunteering. "It's just like any other organization. No one is quite organized, but people are nice and it is good to be involved." Others, however, are critical as well as supportive of the NCF as a community. As a core volunteer, D spends about 20 hours a week doing work for the organization. This position gives her insight into the day-to-day workings of the staff and the board of directors. Problems include under representation of "all groups other than [young] white men." D also thinks that, as with most non-profit organizations, the board of directors is ineffective. G, another volunteer, finds the organization somewhat insular. After doing quite a bit of volunteer work last year, he has not been asked to do anything this year. He says, "I was not even contacted about helping with elections this year, nor did I see a call for volunteers to help out in the general announcements which I check every couple of days. Basically, the place has become too big." The implications of these observations will be discussed in the next chapter.

Miscellaneous Observations

Respondents did not seem to be migrating to commercial services the same way those from the Chebucto net were. This could be for several reasons; most likely, since many of the respondents were either civil servants or students, they already had internet access through work or school. The fact that users with other sources of internet connection would still find the NCF useful bodes well for the future of community networking. In a recent survey, however, users expressed dissatisfaction with the lack of phone lines available for dial-up connection (Patrick, Black & Whalen, 1995). The satisfaction level

rose as income dropped, suggesting that the NCF fulfills a genuine access need for those who cannot afford a commercial service.

A theme that arose periodically throughout the NCF interviews was the problem of gender on the internet in general, and the FreeNet in particular. E saw the IRC as a potential source of problems: "I know from talking to a few female users that they're often harassed by male users who try to 'pick them up.' Some people see IRC as a 'pick up joint,' and they use it as that." A echoes this sentiment when she says:

> what does strike me on the net, however, is a certain hostility to women's point of view on ... issues. The FreeNet's feminism news group, for example, has been inundated by posts from anti-feminist men, who challenge women's views on issues like domestic violence. It can be quite disconcerting, since at least some women use these newsgroups to relate personal and painful experiences, only to be flamed by immature men.

There is no clear solution to this problem, as this situation occurs throughout society. It may happen that as the portion of users who are female increases the environment may become less chilly.

Conclusion

The cases explored above show the enormous potential of community networking for non-commercial uses, particularly enhancing and developing democratic participation, supporting formal and informal education, and creating a site for community development. These cases also show that the reality falls far short of the promise. It would be a great mistake, however, to say that this medium will never fulfill its potential. Telecommunications took several decades to reach its full potential, and like the telephone system, community networks increase in value with each new user. As the already active commercial sector expands on the information highway, new non-commercial applications will be found. And, as is noted above, there are a few services which already are being heavily used.

An important distinction needs to be made about two types of services community networks provide: infrastructure access and information access, or in a more traditional division, carriage and content. Neither is entirely separable from the other, but community networks and policy makers need to keep in mind the difference.

Access to infrastructure is merely the provision of some modem lines, a server, and an internet connection. This is no more than any commercial internet service provider sells (and in most cases it is far less as providers move to SLIP/PPP lines). It is extremely expensive, heavily over-subscribed, and a losing battle. The cases show that many respondents were deeply unhappy with the constantly busy lines they encountered when trying to dial in.

Access to information is what community networks are most successful at. It is (relatively) inexpensive and therefore sustainable, community-oriented, and it fulfills a real need. The fact that many of the respondents who had alternative internet access still used the community networks' resources illustrates this.

The conclusions here are, therefore:
1) Community networks have an enormous potential, presently undeveloped, to play a crucial role in the non-commercial sector of the information highway;
2) However, community networks have extremely limited resources. Therefore they should focus primarily on information provision and seek ways to off-load access to infrastructure (in telecommunications terms, "universal service") onto the private sector, government, or both;

3) Community networks show enough value now, and hold such possibility, that they deserve official recognition and protection as an integral component of the information highway.

Conclusion three suggests, of course, a policy and regulatory dimension to this discussion. This area is the topic of the next chapter.

Chapter Five - Analysis and Recommendations

Introduction

While the previous chapters surveyed the past and examined the present, this chapter will look to the future. Canada is in an exciting time of change, especially in the area of communication technology. By extension, the governance of that technology is in a period of flux. Can social benefits still be derived on a non-commercial basis? This author would answer yes, but only if a concerted effort is maintained by those groups defending the public interest. Another key is foresight by Canadian governments and regulators, which have traditionally only "caught up" to technologies long after they have been deployed. A third key is industry cooperation, which may surprise those activists used to fighting, rather than working with, the communication industries.

Before specific strategies, regulatory tools, and policy models are explored in detail, a brief summary of conclusions from previous chapters may be of benefit here.

In chapter two, some sociological and historical approaches to community and community media were explored. While many critics this century have claimed that certain communication technologies have "massified" and homogenized society, the evidence suggests otherwise. Modern sociologists have found that media play a complex role in building community, and many forms of media and communication technology in fact build community rather than destroy it. This suggests that the very notion of community itself has changed in the 20th century, and a satisfactory model would account for multiple sub-communities within a larger social formation. Such a model would, as well, consider communication to be the foundation of "community". In this context, community networks can be seen to act more like community media than mass media, and are in many ways sites where smaller social groups build a sense of

community. Finally, some theorists discuss the "virtual community" phenomenon -- a situation where a group of people form what they consider a community on-line. Rather than forming the boundaries of such a "community" community networks aim to have permeable borders. That is, they provide new ways to connect existing sub-communities and interest groups. In this way, community networks straddle the division between virtual and geographic community.

Chapter three reviewed communications regulation in Canada, from a historical perspective and with an eye to what is happening currently. Three arguments were forwarded:

- technology does not preclude certain forms of regulation, regardless of industry rhetoric;
- 'basic service' and 'universal service' have historically undergone constant re-definition, and will have to be reconsidered as new technologies are deployed;
- with the regulation of new communication technologies, the trend towards narrowing definitions of the public interest should be reversed, as much more is at stake.

While it was found that the CRTC and the IHAC have been somewhat open to alternative voices in the information highway debate, non-commercial uses of new technologies are taking a back seat to industry-driven issues.

In chapter four two case studies were presented. These cases indicated that community networks were not, in general, living up to their vast potential. Many users viewed the service more or less on the same terms as other forms of entertainment rather than an essential service. Educational use seemed spotty, government information, what little of it there is, was heavily under subscribed, and experiments in participatory democracy were not outstanding successes. On the other hand, there is no reason not to believe that one day the reverse will be true. Both community networks examined were making

concerted efforts to develop and promote these areas of use. Efforts at community development seemed to be, on both services, successful, and participants were generally positive. The exception to this was a perception that the organizations running the community networks were insular and self-serving. This may be the single largest stumbling block facing community networks in the future, and will be discussed further below.

These points bring us to the central theme of this chapter, which is that non-commercial use of the information highway must have a place in the developing regulatory framework because of its tremendous potential, in evidence in part through demonstrated grassroots commitment to community access and universal service. This is not an entirely radical view -- both the CRTC (1995, p. 43) and the Information Highway Advisory Council (1994, p. 17) feel that community services must be a central part of government strategy.

Regulatory Tools and Models

This section will explore two strategies for promoting community access to the information highway through community networks. It assumes that community networks are indeed the best and most efficient way to meet the access needs of an area, an assumption which may not in the long run prove to be correct. For the time being the community network model is the best (and only) working example of this level of service.

The two strategies are government initiatives and grassroots initiatives. While these two approaches aim for the same goal, they result in very different models, as will be seen below. Perhaps the most realistic expectation is for a combination of these two strategies to develop a healthy community access system in the long run. These two strategies, and

their possible variations, will be dealt with in turn. Finally, the gray area which overlaps these two areas is looked at, as it offers many possibilities. Here, at the level of community network/government partnership, governments can support community access without cumbersome regulation, while at the same time benefiting immensely through cost savings.

Governance and Regulation

This approach is perhaps misnamed, for while in the end it requires governments to promote community access through existing or new regulation, governments rarely take on new initiatives on their own. Considerable lobbying and activism will be needed before any of these regulatory tools are deployed.

That having been said, many regulatory tools are already being used to promote community access, universal service, and non-commercial use of various communications media. Those that might be adapted for the information highway are considered here.

Community Channel model

Community networks operate in a very similar manner to community channels, and have many of the same objectives. They both attempt to democratize an otherwise undemocratic media; they promote local information providers and services, and concentrate on those that have few resources; and they are non-commercial.

Community access channels have a long history in Canada, as long as the cable system itself has. As early as the 1950's some forms of community access programming were being aired (Goldberg, 1990, p. 14). From its inception in 1968, the CRTC supported community access, in spirit at least, and encouraged cable companies to provide this

service. Many did, as it was seen as another, inexpensive way to attract more subscribers.[9] The CRTC's cable policies were reviewed in 1975, and a mandatory contribution from cable companies to community access of 10 per cent of revenues was debated. This proposal was never instituted, although today companies are required to provide a community channel anywhere they have more than 2000 subscribers. In 1990 a proposal to require a 5 per cent mandatory contribution was considered (Partridge, 1990). The voluntary financing at that time ranged from 1.2 to 19 percent, although the average was around 5 per cent.

As discussed in chapter 3, the CRTC still considers community access important in the context of the information highway. It writes:

> The development of the cable community channel as an integral part of the Canadian broadcasting system has ensured that individual Canadians have direct access to that system to express their ideas and opinions. The Commission agrees with the view expressed at the hearing that it is important to 'sustain the local in the face of the global.' It also expects that new opportunities to develop the public lane will present themselves as interested parties apply for licences to operate broadcasting distribution undertakings. *The Commission considers that all broadcasting distribution undertakings should make comparable contributions to outlets for community expression.* [emphasis added] (CRTC, 1995, pp. 45-46).

The CRTC will not, however, mandate any particular form of contribution. Instead, it says, "parties wishing to operate new broadcasting distribution undertakings should come forward with innovative proposals for providing community expression, perhaps through incorporation of interactive community dialogue and vehicles for sharing information" (p. 46).

While community networks do not qualify as broadcasting *per se*, (Broadcasting Act, 2. (1)), they are indeed outlets for community expression, and may be the perfect recipients of contributions from new distribution undertakings.

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[9]Goldberg notes that in the 1970s cable subscription rates were under 50 per cent, so anything that might increase the market was considered by the industry.

The telcos, through Stentor, have been receptive to this idea. Stentor, in its submission to the CRTC hearings, promised to pay an appropriate fee to a cable company to carry its community channel and "supplement this amount by supporting local community initiatives so that the total equals approximately 5% of the revenues [the telephone companies] derive from their broadcasting services" (Stentor, 1995, p. 119).

This model of support has many distinct advantages. The telcos have already made a promise of support for some kind of community access. It remains up to community networks to convince the telcos that they are the best recipients of these funds. A stable, long term commitment of funds is essential to these services, a hard fact many are just now facing. If one conservatively estimates a 25 per cent market share from entering telcos, and assumes that the 1987 cable industry revenues of $979 million (Goldberg, 1990, p. 39) remain unchanged, then telcos would have broadcast revenues of around $275 million. Five per cent of this would be about $12 million. The average annual operating budget of a community network in Canada is between $150,000 and $250,000. The telco contribution would fund completely 60 community networks across Canada, which is certainly a very small number compared to the number of communities involved. Clearly the community channel model is a rich possibility, but it should not be viewed as the only source of funding for this service.

For the telcos the advantages are many as well. Community networks fulfill all the criteria set out by the CRTC; they are legally independent (unlike a community channel, which is the legal responsibility of its parent cable company). Community networks provide two-way access: those wanting to provide information have a place to put it, and those wanting to access that information and other services have a free or inexpensive way to have it. The CRTC all but points the telcos in the direction of community

networks in its report. Finally, the substantial country-wide support for community networks, and the success they have had without much funding, suggests that the investment will be well spent.

Unfortunately this is not a source of funding that can be exploited immediately. There are still many regulatory issues that must be taken care of before telcos move into the broadcasting arena. Primary among these issues is structural separation, which the CRTC says should be required before cable companies or telcos embark on programming initiatives (CRTC, 1995, p. 21).

The disadvantage of this model has to do with control. Telcos may want to have some say over how their contributions are spent. Goldberg, however, shows how corporate control has distorted the cable community access channel. "Whereas in 1972, 75 per cent of the programs were produced primarily or totally by community members with little or no technical assistance from cable staff, by 1978 this had dropped dramatically to 44 per cent" (1990, p. 18). Content became more general and less controversial, and the original spirit of community access had in many ways been dampened. While some sort of control must indeed be in place, the direction provided by volunteer boards at this time should suffice into the future. It is imperative that community networks remain independent entities, even if they do become dependent upon telco financing.

In the US, Goldberg notes, an entirely different model of community channel has emerged. Two or more channels are often offered on a cable system, one with local programming originating from the cable company, the other(s) with programming developed by other groups, including governments, schools, and non-profit cable access organizations (Goldberg, 1990, p. 61). This "democratically structured" system can provide a model for Canadian community networks. A concerted effort on the part of

activists and interest groups will be needed, however, as a similar proposal for reforming the community cable channel system in Canada by the Caplan-Sauvageau Task Force in 1986 was torpedoed by the cable industry (Goldberg, 1990).

There are several other problems with this model, aside from corporate control. Since contributions are tied to revenues, the funds available to community networks could fluctuate, perhaps to the point where long-term planning is impossible. The Stentor proposal is for contributions to be based upon revenues arising from broadcast undertakings. As several economists have pointed out (for example Cary, 1991), entertainment tends to be a zero-sum environment, where increases in telco-broadcast revenues probably indicate decreases in cable-broadcast revenues, causing traditional community cable channels to suffer. The revenue base on which contributions are based would have to be broadened significantly, perhaps to include internet provision and other forms of data transmission. This would be very difficult to sell to an industry that feels it is already over regulated.

Finally, as was indicated in the previous chapter, community network organizations tend to become highly proprietary. Boards may become insular and self-serving. New users may find it difficult to "enter" the organization as a volunteer, to be accepted into well formed cliques. It is difficult to judge how this would affect the efficiency to an organization, although certainly it would discourage some of the openness necessary for true community development. Community networks must keep in mind their role as means to an end rather than an end unto themselves.

Universal Service Fund / American models

Noam (1994, p. 691) notes that the current system of ensuring universal service in the US telecommunications environment is opaque at best:

> There are inter-industry transfers such as access charges by interexchange and mobile carriers into local exchange networks. There are high-cost funds, toll pools, long-term support agreements, lifeline contributions and universal service funds. Major intercustomer transfer mechanisms also exist, such as 'contributory' charges on business customer services, special rates averaged across customers and geography, etc. And there are some direct governmental credit contributions, primarily by Rural Electrification Administration loan guarantees.

His suggested reform of replacing the entire system with a value added tax (VAT) is worth exploring, especially in the present discussion.

In Noam's proposal, the VAT is not primarily a way of transferring money, but "a way of *keeping score* that all carriers pay a proportionately similar share to the maintenance of that type of universal service which the political process has decided upon" (1994, p. 695). The system is described briefly as:

> all carriers are debited a flat percentage of their transmission revenues, net of payments to other carriers. They are credited for net transfer outlays and for providing service to all users in low-density regions. Benefited customers receive 'virtual vouchers' usable at any carrier as a credit to its account (1995, p. 695).

In the Canadian information highway environment, how would this approach play out? It could be applied to commercial internet and other interactive broadband network providers, and the revenues applied to reducing internet connectivity costs for community networks and other deserving users (such as schools and hospitals). At the moment these costs are being underwritten by federal programs such as SchoolNet. A VAT would transfer the universal access responsibility to industry, where some would argue it belongs in the first place. However, many critics, from both the left and the right, would be highly resistant to the VAT idea. Both ends of the spectrum would question that industry should shoulder the cost of an area they feel should either be provided by the market (from the right's perspective) or should be under the auspices of the state (from the left's perspective). Also, earmarked taxes are inefficient, as they parallel the existing general taxation apparatus.

The VAT proposed by Noam belongs to a larger class of schemes known as universal service funds. The present scheme of universal service funds in place in the US is complex and difficult to administer, something Canadian regulators should keep in mind. However, in an open and competitive arena, some method must be devised to ensure that carriers are contributing to universal service and community access. A VAT may be too complex for the present Canadian cable, telecommunications, and information industries.

The Cable Production Fund

In 1993, after hearings in March, the CRTC revised its rules for cable rate increases (Cuthbert & Siklos, 1993). It allowed companies to maintain rate increases attributed to capital expenditures for five years if half of those revenues went into a new fund to promote Canadian programming. Early estimates were that the fund would raise $300 million over the five years.

Telcos and others who wish to enter the cable market, and who will be investing heavily in broadband switched networks, will also be spending considerable money on upgrading or installing their systems. They may try to pay for these capital expenditures through rate increases (although most telcos are profitable enough that they will be able to cover the capital investments without any rate increase).

Could an information highway production fund be implemented? Perhaps, although it is far more likely that new distribution undertakings will be asked to contribute to the existing fund rather than form a new one, as unlike with the community channel, no services will be duplicated. As well, the cable production fund is not intended to supplement public access but rather to promote Canadian content of a professional nature. The largest portion of the fund will go to independent producers of children's programming and drama (McHugh 1994). The fund may serve as a model, however, of

how to steer some of the revenues from rate increases back into services serving the public interest.

The cable fund has been criticized lately because it allows cable companies to implement rate increases without having to prove that they need it. The cable fund was a "compromise" between the industry and the CRTC (McHugh, 1994, p. 14), whereby the companies get to keep some their rate increases, regardless of whether they use it for capital expenditures or not, if they gave half of these revenues to the cable fund. A similar, highly unpopular, deal might have to be made with industry players to establish a community network fund.

Cross-Subsidization

For decades the Canadian telecommunications system operated under the twin concepts of natural monopoly and cross-subsidization. Revenues from profitable service, such as high-density urban service and long distance, were used to subsidize rural and local service. Since rate rebalancing and new competition in telecommunications, however, cross-subsidization as it once existed may be a thing of the past. There are even questions as to how much long distance service was actually subsidizing local rates (Babe, 1990). New and more effective ways of cross-subsidizing basic services with enhanced services should be explored, such as universal service funds and VATs (discussed above).

Perhaps the simplest form of cross-subsidization requires no transfer of funds whatsoever. The CRTC, in licensing carriers and service providers, could require that a percentage of lines be dedicated to free service. This would lift the burden of providing free dial-up off community networks and place it on the shoulder of industry, allowing the community networks to concentrate on providing information. The problem with this

option is that it allows for a huge discrepancy in quality and quantity across the country. Regions under serviced commercially would be even more so non-commercially. Even with standards, the potential exists for widely differing interpretations of those standards, as is currently the case with community access cable channels (Goldberg, 1990; Partridge, 1990).

Grass Roots Initiatives

Aside from agitating for recognition by federal regulators, community networks have several options when it comes to finding sources of funding and promoting the public interest agenda. As with the community access channel effort in the late 1960s, governments and industry are not going to implement community services on their own. Rather, a concerted effort needs to be maintained on two fronts: lobbying regulators to consider some of the models outlined above, and ensuring the health of existing community networks as outlined below.

Selling Services

One of the simplest ways to raise funds is selling services, including advertising and expertise. Small and medium sized businesses do not have the resources to access the internet, and fees for service can go to support other initiatives or go into the general revenue pool.

Service Club Model

Most community networks presently charge membership fees or accept donations, although they usually also offer free service for non-members. This effort should be extended to more closely represent the service club model. That is, memberships are not sold as products (usually associated with increased service), but as purely philanthropic gestures. The mandate of the community network needs to be more clearly

communicated to its members and users, who in turn feel that their contribution goes towards a higher purpose rather than and extra hour of connect time.[10]

This implementation would be greatly helped by the granting of charitable status on community networks. Revenue Canada has been, up until now, adamant in refusing charitable status, but efforts are being made on several fronts to organize a legal challenge. Charitable status would mean that memberships, and all other donations, would be tax deductible, which could have a dramatic impact on membership size, and an even larger impact on corporate donations.

Internal Stability

Community networks in Canada are relatively new, and thus are still working out many of the factors that lead to long term stability. These include: organized and professional fundraising efforts, volunteer management, and clear organizational objectives and structures. As with any non-profit organization, a community network needs to take care of these first to ensure long term sustainability.

To meet this objective, community networks must share responsibilities internally among competent volunteers, officers, and paid staff. Proprietary interests must be kept to a minimum, and a genuine openness to the community must be maintained.

Community Network / Government Partnerships

Three broad areas that could be explored by community network organizations and governments for mutually beneficial partnerships are outlined below. There are others, such as government procurement programs (IHAC, 1995), election forum projects, and so

[10]The Calgary Free-Net Association, for example, includes several benefits with its memberships, including unlimited connect time, extra disk space, and a better Usenet news reader.

on. Government procurement has in fact played a significant role in community network development in British Columbia, where provincial leverage has obtained favorable connection rates for Free-Nets. The three areas discussed below, however, share in common their potential to save governments money, and could therefore be easier to sell than other initiatives.

Health and Education

Already the federal government has shown its commitment to educational network use, through substantial support for CANARIE (Shade, 1994) and SchoolNet. These programs, however, are costing money out of general revenues. Community networks, especially in rural areas and in the north, could save governments money through distance education applications. These networks would be funded through local school board funds or provincial or territorial education budgets. The major barrier here is the development of courseware, as well as the problem of training teachers in new technologies.

Health care may also be a major source of funding. The first community network, the Cleveland Free-Net, was in fact conceived as a health promotion tool. Users could leave a medical question on the system and have an answer from a doctor within 24 hours (Beamish, 1995). Developing a similar service could be a potential source of funds for Canadian community networks, a funding source that is ironically tied to health budget cutbacks and an emphasis on home care.

Emergency Services

As Thomas (1992) notes, 911 emergency service has been implemented in scattered pockets across the country. There may be resistance to the service in many areas because "some local authorities perceive 911 as part of a trend towards amalgamation and regionalization, fearing any further loss of community autonomy" (p. 233).

Community networks may be able to partner with local authorities to supplement existing emergency services, and sustain a feeling of community autonomy. The advantages are many: detailed information could be posted in the case of a disaster; citizens would have the opportunity to post queries and observations; and as networks move up in bandwidth, detailed maps and video could be included in the response. Finally, the existence of one more channel for emergency communication increases the redundancy of the overall communication system, an important part of any emergency communication strategy.

There are several disadvantages, however. For one, the number of people with basic terminal equipment would have to increase dramatically before a community network could supplement existing systems to any great degree. Secondly, slow start-up and dial-up times means the service could never really match the speed of 911 or broadcasting. Finally, community networks rely on both the electrical grid and the telephone system, meaning they are doubly in peril in the case of a severe disaster.

As long as a community network is used to supplement, rather than replace, existing channels of communication, it could prove to be an efficient and cost-effective method of emergency service delivery.

Government Publication

As freedom of information legislation begins to take effect at municipal and provincial levels, governments are increasingly faced with the problem of distributing information. Publication costs can be astronomical. In this case community networks could play a central role in meeting their mandates by providing access to important local information, while getting funding from governments for providing the service. Governments, in turn,

would be fulfilling their obligation of providing this information free of charge, while saving substantial sums on printing.

The scenario could be played out in several ways. A larger government, a city or province, for example, would probably store information on its own computer for security reasons. The local community network would serve as a front end to the information, and would perhaps store some of the more useful material in its own machine. For smaller municipalities that cannot afford a terminal server dedicated to electronic publication, a community network could provide the disk space in return for financial support. The arrangement would be mutually beneficial.

There are some drawbacks to this proposal that will need to be sorted out. System security is very important to governments, and for good reason. Any possible breach introduced by a community network connection would not be viewed favourably. Second, since many municipalities already have significant computing power, they may want to cut the community networks out of the picture and provide direct access themselves. This would be a tremendous mistake, as dial-up access is very expensive and difficult to manage. There is no reason to duplicate services already in place in many locations. Finally, merely convincing some government officials and bureaucrats that certain information should be in the public domain may prove to be difficult.

Another area of government activity where community networks can play an important role is in the public consultation process. Already these networks are being used for this purpose, as the recent CRTC Information Highway hearings showed. Several proposals, such as P-IHAC's, were developed on-line, circulated on mailing lists for comment before being submitted to the CRTC. The CRTC made many submissions available on-line at its Web site, as did the major industry players such as Telus and Stentor. The

potential for consultation and public hearings is enormous. However, all the caveats mentioned above apply here as well.

Conclusion

There are many methods by which governments, community networks, individuals, and industry players can ensure a vibrant public sphere on the information highway. As outlined above, these methods roughly fall into three categories. At the moment grassroots initiatives, in the form of organizing and running community networks, are the most apparent. With the recent CRTC hearings, and with sufficient public agitation, a forward-looking framework of government policy and regulation may soon supplement these first efforts. While these provisions are being worked out, and they will take time, governments can take an activist approach and partner directly with existing community networks. These partnerships will undoubtedly prove to be mutually beneficial.

Chapter Six - Conclusion

The Significance of this Study

This thesis has explored the phenomenon of community networks in Canada, and began with the question, how should the public interest be defined in regards to computer networks? It was concluded, in chapter three, that the public interest should be more broadly interpreted than it is presently, and should include public and community access. It was discovered through two case studies that community networks are not being used to their full potential, although this does not mean that there is a fundamental flaw in the concept. Rather, it is an indication of the freshness of the idea, and perhaps also of the lack of support from government and industry. How to garner that support, and what form it should take, was the subject of chapter five. There is a window of opportunity now, before the turf is divvied up between the big players, before governments wash their hands completely of regulation, to make room for public space on the emerging information highway.

The present study has been largely exploratory, looking at the role of community networks in the larger environment of emerging broadband networks more commonly termed the information highway. Its qualitative methodology is employed not to generalize what *all* community networks are doing, but to discover the issues that are important, and to describe the possibilities this technology presents.

The information highway has been the focus of policy discourse in Canada over the past year, especially at the federal level. It holds great promise, but many social benefits will not arise from *laissez-faire* deployment of new technology. The argument sustained throughout this project has been that some sort of provision must be made at the government level to ensure that public spaces are built and preserved in the new

networked environment. Moreover, the best vehicle, at least at the moment, to ensure these public spaces is the community network. It is a service that already enjoys extensive grassroots support across Canada, and at the moment is the only site of "universal service" to the information highway.

While several models of support are outlined in chapter five, this author feels that the community channel model deserves the most serious attention. It is familiar, and therefore easier to sell to regulators and industry players alike. It has several intrinsic benefits as well, most notably it is easily adaptable to the existing system of community networking in Canada, and may be adapted to give those networks the autonomy they need to flourish and truly represent their communities.

Further Research

In the fourth chapter of this thesis two case studies were presented which explored three areas of non-commercial network use: democratic participation, education, and community development. The results of these cases, and process of conducting them, suggest several other areas for further study. These areas are outlined below. Because of the rapid changes taking place on community networks, research can only provide a "snapshot" of a point in time; a longitudinal study, while far more labour intensive, would track the trajectory of development, and might prove more useful for long term forecasting and policy planning.

While the three broad areas addressed were comprehensive, they were not complete. There are other categories of non-commercial network use that deserve attention. Most notable of these is health care, which, interestingly enough, was the original *raison d'Ítre* of the first Free-Net in Cleveland. As mentioned in the previous chapter, as Canadian health authorities are put under increasing financial strain, they will be seeking cost

effective ways of delivering information and advice. Networks, and possibly community networks, will play a role in these efforts.

On a more specific level, the three categories of use explored in the case studies deserve further study. The area of democratic participation is rich with possibility for qualitative and quantitative research. A systematic tracking of who accesses what kind government information on various community networks would help determine the quantity and type of information being accessed. A content analysis, or rhetorical analysis, of political discussion on-line as compared to off-line would add to the understanding of what increased access to these fora means. It was the impression of several case study respondents that political debate was more charged, polarized, and emotional on-line. An interesting question is: are these perceptions correct?

As more schools are linked to networks, via SchoolNet and other services, more research will be conducted on educational use of the information highway. Schools do not, as yet, seem to be partnering with local community networks in any significant way. However, this may change as education funding continues to be cut and school boards search for cost effective ways to provide network connection to students. Are networks useful sources of information? How do students use this technology? Perhaps the most pertinent question, however, will be pragmatic: how should community networks accommodate local schools?

The cases in this project suggest that there is a tremendous amount of informal learning going on on-line, and that this might be a fruitful avenue of research. While many respondents typified their use as "entertainment," clearly learning was taking place, particularly in computer-related fields. How effective a learning tool is a community network in this context? For community networks, a needs assessment of users would be

quite useful: what areas are users interested in learning about? Partnership with local libraries in this area will be extremely important, as they are institutions dedicated to lifelong learning, and have expertise that is invaluable to community networks.

Community development, this study found, is at the moment the area community networks are most successful at. Many questions were raised about this area in the cases. One of the most interesting is how do community networks bridge the gap between "virtual" and "real" communities? That is, how do on-line interactions affect off-line relationships, interactions, organizations, events, and so on? The specifics of this line of inquiry are many:

• how do on-line relationships move into off-line relationships?

• is commitment to an organization on-line as strong as one made off-line?

• how do electronic meetings differ from real life ones?

• what kinds of organizations benefit from hooking up to a community network, and how?

• do physically excluded people (the elderly, the disabled, and so on) find a suitable space for human contact on community networks, and what is the nature of this contact?

Clearly, there are many other similar questions that can be asked.

Community development also implies increased connections between organizations and individuals. A social network analysis of community network users versus non-users might address the hypothesis that those on-line have more opportunity to meet and connect with others.

Finally, research that focuses on the use of community networks by organizations, rather than users, might be useful in measuring another facet of community development.

Three areas are of particular interest: internal communication, communication between organizations, and communication with members and the public.

Conclusion

This study is certainly not a complete picture of community networks, and many of the avenues of research suggested above will have to be explored before a better understanding is developed. However, the regulatory process may not wait for social scientists to complete these studies. There is enough evidence now to indicate that community networking is a good solution to problems of access to broadband networks, and that they meet current and emerging needs. One thing is clear: the issues of public access to and public space on developing computer networks will be decided within the next decade. Whether the technology will be developed so that social benefits are maximized will remain to be seen.

Finally, this work has followed in the spirit of Bijker, Hughs, & Pinch (1987) in that it has seen community networks as social artifacts as much as technological artifacts. That is, communities and social groups shape community networks, not *vice versa*. In this respect, a study of a community network tells us much about the community it is located in, and a good look at community networking in Canada will tell us much about the state of community in this country.

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Appendix A - Informed Consent Form

Dear Participant,

Thank you for agreeing to participate in my research project, "Community Networks and the Public Interest," under the supervision of Dr. David Mitchell at the University of Calgary. Please read this document carefully, then sign below and return it to me. You may mail or fax this consent form. I need to receive this form before we can begin our interview.

My research will look at how community networks are used and how they affect the community in which they are located. I hope to use my results to develop policy recommendations for various levels of government, and to explore fund-raising strategies for community networks. To accomplish this, I am doing case studies on several Free-Nets in Canada. These case studies will be based, in part, on in-depth interviews with users like yourself. Our interview will take place through e-mail, a few questions at a time, and may take several days, depending upon the frequency of our correspondence. I will be keeping a copy of all our correspondence for my records. This interview will be used by me only, and will not be made available to anyone else. Should I wish to use our correspondence for any subsequent work, I will seek your consent to use it again.

Although I would like to attribute your comments to you in my final report, you may, at any time, request anonymity. You may also refuse to answer any specific questions during the interviews, and you may cease participation at any point. The final document will be in the form of a Masters thesis and will be available in the University of Calgary library. I will also make electronic copies available to each of the Free-Nets I use in the case studies. You will be provided with a summary of the results, and you will be notified if your particular Free-Net makes the thesis available.

Your signature below indicates that you have understood your participation in the study, but in no way does this waive your legal rights nor release the researcher from his legal and professional responsibilities. If you have any questions about your participation, I will try to address them as quickly as possible. You may also contact the University of Calgary Research Services Office at (403) 220-3380 and ask for the Chair of the Faculty of General Studies Ethics Committee for further clarification.

Sincerely,

Andrew Avis

_____ _____

Participant's Signature
(or signature of legal gardian or parent,
if subject is under 18)

Date

_____

Participant's Name (please print)

Appendix B - Codes for Interviews

1 - demographics

2 - cost

3 - heavy use

4 - global vs. local information

5 - e-mail use

6 - work

7 - education

8 - "community"

9 - discussion or debate

10 - on-line vs. off-line

11 - news

12 - anonymity

13 - government

14 - meeting people / social interaction

15 - moving up to a better service

16 - economic benefits

17 - recreational use

18 - the free-net organization - volunteering

19 - busy lines or bad service

20 - answer to "how did you find this interview?"

Appendix C - Special Interest Groups on the NCF

```
2. Arts, Literature, Music, History SIGs  (go sigalmh)
     The History SIGs           (go sighist)
          Bavarian Kings        (go bav-king)
          Civil War             (go glory)
          History               (go history)
     The Literature SIGs        (go siglit)
          NCF Book Readers      (go books)
          Poetry                (go poetry)
          Writers'              (go writers)
     The Music SIGs        (go sigmus, sigmus2)
          60's & 70's Rock (go 60-rock)
          A Cappella       (go a-cappella)
          Bands            (go bands)
          Bassist          (go bassist)
          Bluegrass Music  (go bluegrass)
          Blues            (go blues)
          Choral Music     (go choral)
          Classical Music  (go classical)
          Compact Disk     (go cd)
          Contemporary Christian Music  (go ccm)
          Hard Rock        (go rock)
          Hip Hop          (go hiphop)
          Independent Music(go indie)
          Jazz             (go jazz)
          Marching Music   (go march)
          Maritime Music   (go marit-music)
          New Music        (go new-music)
          Punk             (go punk)
          Techno/Rave      (go rave)
          Zappa            (go zappa)
     Comedy                (go laugh)
     Comics                (go comix)
     Language Abuse        (go lang-abuse)
     Movie                 (go movie)
     Saturday Night Live   (go snl)
     Sherlock Holmes       (go holmes)
     Theatre               (go theatre)
     Video Production      (go video-prod)
     Visual Arts           (go arts)

3. Business SIGs              (go sigbus)
     Business and Environment (go biz-environ)
     Creativity               (go creativity)
     Customer Satisfaction    (go customer)
     FreeData                 (go freedata)
     Gas Prices               (go gas)
     Hi-Tech Entrepreneurs    (go hi-tech)
     Home Based Business      (go hbiz)
     Internet Business Users  (go ibug)
     Management               (go management)
     Project Management       (project)
     Public Transit           (go transit)
     Stock and Commodity Trading (go invest)
     Technometer              (go technometer)
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     Transportation Industry  (go transport)
     Virtual Office           (go virtual-office)

4. Computer Related SIGs      (go sigcomp, sigcomp2)
     Amiga Users              (go amiga)
     Artificial Intelligence  (go ai)
     Atari Users              (go atari)
     Basic Programmers        (go basic)
     C/C++ Programming        (go c-cpp)
     Databases                (go database)
     DECUS                    (go decus)
     Geographic Information Systems  (go gis)
     GeoWorks                 (go geoworks)
     Linux                    (go linux)
     Lotus Notes Users        (go lotus)
     Macintosh Users          (go macintosh)
     MIDI                     (go midi)
     Multimedia               (go mmedia)
     Networking               (go network)
     Online Community         (go online)
     PC Users                 (go pc-user)
        PC Technical Support
        Windows Users
        Windows Developers
        OS/2 Users
     PowerBuilder Developer   (go power-builder)
     Smalltalk and OOP        (go oops)
     Software Engineering     (go soft-eng)
     TeX Users                (go tex)
     User Interface Design    (go interface)

5. Futurist, Space, Supernatural SIGs    (go sigfut)
     Cryptozoology                (go crypt-zoo)
     Dreams                       (go dreams)
     Flat Earth                   (go flatearth)
     Futures, Trends & Scenarios  (go fut-scenes)
     Living in Space              (go space)
     Paranormal                   (go paranormal)
     Sci-Fiction                  (go sci-fi)
     Star Trek                    (go boldly)
     Star Wars                    (go jedi)
     Time Travel                  (go time)
     UFO                          (go ufo)
     Vampire                      (go vampire)
     X-Files                      (go x-files)

6. Games SIGs                (go siggame)
     Board Games             (go boardgames)
     Chess                   (go chess)
     Contract Bridge         (go bridge)
     Computer Games          (go comp-games)
     Doom                    (go doom)
     GO                      (go go)
     Lateral Thinking        (go figure)
     Pinball                 (go pinball)
     Pog                     (go pog)
     Role Playing            (go rpg)
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     Trading Card Games      (go trading-card)
     Video Games             (go vidgames)

7. Health Related SIGs         (go sighealth)
     Ask the Doctor            (go ask-doc)
     Asthma and COPD           (go breate)
     Childbirth                (go childbirth)
     Complementary Healthcare  (go comp-health)
     Eating Disorder Support   (go eat-disord)
     Emergency Health Care     (go emergency)
     Endometriosis             (go endometriosis)
     Medical Topics            (go med-topics)
     Parkinsons                (go pd)

8. Hobbies SIGs              (go sighob, sighob2)
     Adventure               (go adventure)
     Aquarium                (go fish)
     Astronomy               (go astronomy)
     Bird Watchers           (go birds)
     Black Powder            (go boom)
     Car Audio               (go caraudio)
     Cat Lovers              (go meow)
     Chaos and Fractal       (go chaos)
     Collectibles            (go collect)
     Cooking and Eating      (go cook)
     Crafts                  (go craft)
     Dog Lovers              (go woof)
     Gardeners' Exchange     (go grow)
     Genealogy               (go roots)
     Home Audio/Video        (go audio-video)
     Horse Lovers            (go horses)
     Lighter-than-Air        (go lta)
     Math/Physics            (go math-phys)
     Miniatures              (go minis)
     Miscellaneous Pets      (go pets)
     Model Railroad          (go railroads)
     Photography             (go photography)
     Remote Control          (go remote)
     Restaurant              (go eat)
     Sports Car              (go vroom)
     Travel                  (go travel)
     Wild Mushroom           (go fungi)
     Wine and Beer SIGs      (go brewing, go wine)
         Home Beer and Wine Making
         Wine Connoisseur

9. Lifestyles, Gender Issues and Relationships SIGs    (go siglife)
     Christian Youth                 (go ch-youth)
     Disability                      (go disability)
     Feminism                        (go feminism)
     Gay, Lesbian and Bisexual       (go glb)
     Generation X                    (go genx)
     Mens' Issues                    (go mens)
     Parenting                       (go parents)
     Seniors                         (go seniors)
     Separation, Divorce and Marriage (go divorce)
     Singles                         (go singles)
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         ott.singles
         ont.singles
         soc.singles
         NCF 30 Something Singles
     Youth                              (go youth)

10. Miscellaneous SIGs          (go sigmisc)
     Anarchism                  (go anarchy)
     Community Networking       (go comnetsig)
     Ecological Development     (go ecol-dev)
     FreeNet Birthday Party     (go birthday, va fjte)
     FreeNet Picnic             (go picnic)
     Homeowners                 (go house)
     RAP-ROC                    (go raproc)
     Ride Sharing               (go rides)
     St. Lawrence FreeNet       (go slv-freenet)
     Smoker's Freedom           (go smoke)
     Socialism                  (go socialism)
     Toastmasters               (go toast)
     Vegetarian                 (go vegetarian)
     Volunteer Job Exchange     (go vol-exchange)
     Waste Management           (go waste)

11. People, Places and Cultures SIGs    (go sigppc)
     Alberta              (go alberta)
     Cape Breton          (go cape-breton)
     Dutch                (go dutch)
     East Timor Alert Network  (go timor)
     Ex-Brits             (go ex-brits)
     German               (go german)
     Kanata Community     (go kanata)
     Military Brats       (go brats)
     Military Community   (go mil-comm)
     Multicultural        (go multiculture)
     Newfoundland         (go nfld)
     Persian Web          (go persian)
     Philippines          (go philippines)
     Saskatchewan         (go sask)
     Scottish Culture     (go scottish)

12. Professional SIGs            (go sigprof)
     Communication Disorders     (go communi-prob)
     Ergonomics                  (go ergonomics)
     Health Professionals        (go health-pro)
     Legal Advice                (go law)
     Librarians and Information Professionals  (go librarians)
     Museum & Gallery Professionals     (go museum)
     Pilots and Aircraft Owners (go pilots)
     Registered Nurses           (go nurses)
     Rehabilitation              (go rehab)
     Social Sciences Research    (go social-sci)
     Translation/Interpretation (go translate)

13. Radio, Television, Media SIGs  (go sigmedia)
     Amateur Radio              (go ham)
     Instructional Television   (go itv)
     Propaganda and Media       (go propaganda)
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     Radio and Television      (go radio, go tv)
     Radio Scanners            (go scanners)
     Shortwave Listeners       (go shortwave)
     Tom Green Show            (go tomgreen)

14. Religion and Spirituality      (go sigrel)
     Buddhism and Meditation       (go buddha)
     Christianity                  (go christian)
     Eastern Orthodox Christianity (go orthodox)
     Ethical Humanism              (go ethics)
     Islam                         (go islam)
     Judaism                       (go lchayim)
     Pagan Spirituality            (go pagan)
     Study of James                (go james)
     Torah Study                   (go parshe)
     Yoga                          (go yoga)

15. Sports and Outdoor Recreation SIGs  (go sigsp, sigsp2, sigsp3)
     Archery                  (go arrow)
     Baseball                 (go baseball)
     Basketball               (go basketball)
     Boating and Sailing      (go boating)
     Canoeing and Kayaking    (go paddle)
     Climbing                 (go climbing)
     Cricket                  (go cricket)
     Curling                  (go curling)
     Cycling                  (go cycling)
     Field Hockey             (go field-hockey)
     Fitness                  (go fitness)
     Football                 (go hut)
     Golf                     (go golf)
     Gymnastics               (go gymnast)
     Hang Gliding             (go glide)
     Martial Arts             (go martial)
     Motor Sports             (go motoring)
     NHL Hockey               (go nhl-hockey)
     Ottawa Area Fishing      (go anglers)
     Pro Wrestling            (go wrestle)
     Racquet Ball Games       (go racquet)
     Ringette                 (go ringette)
     Rugby                    (go rugby)
     Running                  (go run)
     Scuba Diving             (go scuba)
     Skating                  (go skate)
         Ice Skating
         Inline Skating
     Skiing                   (go skiing)
     Soccer                   (go soccer)
     Target Shooting          (go shoot)
     Triathlon/Duathlon       (go triathlon)
     Ultimate Frisbee         (go disc)
     Volleyball               (go volleyball)

16. Teaching and Learning SIGs    (go sigteach)
     Christian Education          (go christ-ed)
     Classrooms on the Internet   (go net-class)
     High School Tutoring         (go tutor)
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Home Schooling              (go home-class)
Native Language Study       (native-lang)
Russian Language Teachers   (go russian)
Students                    (go students)
   General
   A.Y. Jackson S.S.        (go jackson)
   Commerce
   Earl of March            (go eom)
   Gloucester HS            (go gators)
   Merivale High
```

Appendix D - Chebucto Community Network Usage Statistics

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                    CHEBUCTO RESOURCE USAGE - JULY 1995

   Chebucto Resource Disk Usage

   57744    Public Download Area Software
   44689    Archived Mailing Lists
    3729    Metro*CAN Society Pages
    1884    Chebucto Services
    1757    Chebucto Help Desk

   Information Provider Category Disk Usage (Kb)

   69488    Technology
   46707    Recreation
   33646    Government
   30083    Environment
   20290    Culture
    6828    Media
    5453    Law
    4843    Libraries
    3847    Science
    2594    Community Support
    2462    Religion
    2418    Education
    1877    Current
    1061    Sport and Fitness
     956    Commerce
     397    G7
     273    Health
     163    Politics
     134    MetroHalifax
      28    Freenets
      11    Communications
```

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                            CHEBUCTO CONNECTIONS TOP TEN - July 1995
226199 [3]Halifax Daily News
 15509 [4]Gardens and Gardening
 14200 [5]City of Halifax
 14180 [6]Ecology Action Centre
  9156 [7]Rockingham School
  5630 [8]Entertainment Media Archives
  4707 [9]St. Paul's Anglican Church
  4308 [10]Discovery Centre
  3694 [11]Metro Transit
  3548 [12]Orchid Society of Nova Scotia
```

Appendix E - Canadian Community Networks in Operation, August 1995

* Antigonish Community Network
* Blue Sky Freenet of Manitoba
* Calgary Free-Net
* Cape Breton Community Network
* Chebucto Community Net (Halifax, Nova Scotia)
* CIAO! (Trail, BC)
* Edmonton FreeNet
* Great Plains Free-Net, Regina
* Greater Kingston CommunityNet Demo Page
* Halton Community Network
* Hamilton-Wentworth FreeNet
* HOMEtown Community Network (Southwestern Ont)
* Libertel Montreal
* National Capital FreeNet
* Niagara Peninsula Free-net
* Prince George Free-Net
* Saskatoon Free-Net
* Sea to Sky Free-Net
* St.John's InfoNET
* Toronto Free-Net
* Vancouver Regional Freenet
* Victoria Free-Net
* Westman Community Networks (Brandon, Manitoba)
* Yarmouth Freenet