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Steve Cisler (p. 4) at the Amman, Jordan Knowledge Station

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Editorial: Community Informatics and the World Summit on the Information Society

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This issue of the Journal is coming out just as the final sessions of the World Summit on the Information Society (WSIS) are about to begin. Many of those concerned with Community Informatics whether as practitioners or as researchers have chosen to ignore WSIS, arguing that it has little or nothing to do with communities and ICTs as they are, on the ground. Others, and perhaps those with more of a policy orientation, have thought or worked at little else for months.

In a sense both positions are appropriate. Those who ignored WSIS have made a quite correct assessment of the process as being "top down", elitist, a display-case reflecting more on the desire for self-advertisement by funders and politicians than a realistic presentation of what might or might not be useful to those looking to become enabled, empowered or "developed" through the use of ICTs in communities around the world. That the selection of "representation" or participation in WSIS at every stage was either based on access to personal or institutional resources or, in a few instances, based on externally-determined definitions of appropriateness or representativeness (i.e., those participants the funders thought it best to invite), certainly reinforces this perspective. This was not about ICTs "doing with" but about others "doing to" communities and end users, wherever they might be.

And yet, the outcome of WSIS will be of as much significance to communities and community informatics folks as to others. The agreements, declarations, and statements that come out of WSIS will define and provide the language, and to a degree the concepts, for the broad institutional and other frameworks within which ICT for Development (ICT4D) will be deployed and managed over the period to come. It will determine how past efforts are assessed; what information, and most importantly what lessons, will be derived from this; and who will be in a position to move forward the national and global policies that will follow.

One other lesson that can be drawn from the most recent WSIS discussions, though, is the gap between those who present themselves as Civil Society in the context of the global discussions and, particularly, through the face-to-face discussions, and the reality of Civil Society outside of these narrow corridors. While WSIS-CS has been focused on issues of Internet Governance (and the arcane technical elements of which it is largely composed) most of the rest of the world, and certainly those who look to ICTs as sources of opportunities for social or economic advance, have been rather more concerned with issues arising from the evident pull-back in financial support for "bridging the digital divide" through the termination of funding for programs to support broad-based public access and applications in Canada, the US, and Australia, among others.

One could say that there is a pause in the broad sweep towards publicly funded support for community use of ICTs. A notable exception is the recently announced Mission 2007 program in India, and to a degree the New Zealand *Digital Strategy* whose current and future directions are presented in the Point of View from Andy Williamson in this issue. One hopes that this is a time to pause for reflection, a time to assess what has gone before and to use that as the basis to determine how to go forward.

Certainly this issue provides some useful bases for beginning that assessment. Williams, Sligo, and Wallace present results from their study of Computers in Homes and trace implications for policy

generally, and New Zealand's *Digital Strategy*, in particular. Grandqvist's field level observation of Lincos, a highly touted project in Latin America, gives a very useful assessment of how this ICT4D effort worked out in one of its most important areas of application. In his own Point of View, Steve Cisler provides a fanciful, yet disturbing, vignette of how ICT4D projects can go wrong, even when based on some good intentions and yielding some constructive outcomes. His scenario captures the experience of many with the range of ICT4D projects that have gone on in the past. Similarly, Cordell and Romanow cast a critical eye on the notion of Community Networking (and by implication all publicly supported community based technology applications) as "public goods" and come up with some surprising, and even controversial, conclusions.

But sprinkled throughout these articles, and figuring notably in the Note from the Field on a new community security application by Fujii and his colleagues, are seeds that suggest a possible stronger, firmer direction for community-based ICTs. And the domain of security and surveillance, of course, brings us full circle to the need for careful and informed Civil Society policy decisions. Proulx and Latzko-Toth provide us with a useful conceptual analysis of the notion of the "virtual" which must be seen in the context of the continuing tension (and possible long-term reconciliation) between "virtual communities" and "physical communities" as a direction of interest for Community Informatics, while Leaning moves us forward with his own analysis of specific approaches to how society (and communities) and technologies interact[1].

Those participating in WSIS would be well-advised to spend a few moments looking at this and earlier issues of JoCI. If they did so, they would see both the variety and the complexity of end/community use of ICTs. They would see how technology is enabling communities and how these processes are facing challenges in all directions equal at least to the opportunities. What they would surely also see is that community use of ICTs is at the core of how a *global Information Society for all* will be built.

And a final comment on "research" in and around WSIS and particularly Community Informatics Research. It is notable that virtually all of the "research" and here I include most of the evaluations of ICT4D activities undertaken in the context of WSIS (which includes most of the recent activities of the major donors) is notable for being top-down, closed access and "expert" driven. The notion of community-driven research or research done with a close collaboration between the researcher and the researched seems not to have figured in the preferred approaches or the plans and contracts of the researchers, or funding or sponsoring agencies. The result is that most if not all of this "research" and including areas such as "lessons learned" appear to be structured so as to inform funders rather than to support those actually doing (and presumably benefiting from) the activities on the ground. This of course, both reflects and reinforces the prevailing top-down project design and implementation approaches and from the community's perspective contribute to the creation of a closed and impenetrable loop.

One of the observations that probably won't be made at this second round of the World Summit is how little progress evidently seems to have been made in activities driven by these approaches and framed by these strategies since the first round in Geneva two years ago. In the absence of a firm and grounded participation by end users and end user communities, projects fail to take root and once the funders lose interest doors close, reports are filed, donors and consultants go on to something else and communities are left little better if not worse off than before…as Steve Cisler suggests, more cynical if not more "developed".

In this area, as in others there is a very significant role for Community Informatics research and researchers in helping to design and redesign research methods and strategies so as to be inclusive of community users as necessary elements in the research process--not simply as *subjects* of research, but as research *partners* helping to establish research directions, areas and priorities of research interest, and research methods among others. This is one way to realize "open research" and to have research (and evaluation) become quite directly a contributor to enabling (and "developing") communities.

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1 It should be noted that this paper was a prize winner at the Community Informatics Research Network 2005 conference in Cape Town http://www.cirn2005.org . The remaining two prize winning papers will appear in the next issue.

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A short movie about ICT

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The current *Harper's* magazine has an article called "Valkyries over Iraq: the trouble with war movies." It discusses the making of *Jarhead* (a movie about Gulf War I, opening Friday in the U.S.) and how soldiers form their view of war from their memories of war movies, including anti-war films like *Apocalypse Now* and *Deer Hunter*.

I began thinking about a documentary that would never be made: the life of an ICT project. It is of little interest to most people, any more than a movie about plumbing would capture a large audience. But we are a small, specialized audience so come into the viewing room. This is a rough cut...

The movie begins with an office scene: a few program officers sitting in a meeting room in Ottawa or Washington or London or The Hague or Geneva. It's getting near the end of the fiscal year, and there is some money left in their budget for another pilot project. They know that if it is not spent, it will be hard to justify an increase for their agency in the next budget cycle.

One officer who has attended many conferences on poverty and knowledge management and ICT says he'll make some calls to people who might have some good ideas. Another officer has spent time in short visits to poor countries, including the handful blessed with substantial existing project funds from her agency. The country she has in mind is of strategic importance to her government either because the president has changed his ways and has renounced corruption, is on a path to democratic elections, has opened its markets to firms from abroad, or has agreed to joint military exercises in the north of his land.

What follows are short scenes of non-profits and contractors pitching ideas to the program officer: a wireless network for indigenous groups, a mobile computer lab, barefoot doctors with PDAs in favelas, a literacy program using a new cheap computer with a no-cost operating system. The most appealing ideas happen to be for places in Asia and Latin America, but the agency is focused on Africa. The chosen NGOs oblige and submit two-page proposals for pilots in Africa. After a quick turnaround and a nod of tentative approval from the program officer, the NGO contacts a local "champion" or consultant in-country. Everyone is enthusiastic about the idea of a new ICT pilot project. New technology, more money to spend.

The local contact meets with an underling from the Minister's office. This person is neutral about ICT and is more focused on surviving within his government bureaucracy, but he assures the champion that the ministry will offer staff and in-kind support. A final proposal is written.

The NGO and the government work out a budget to use up available funds. Computers, Internet connection fees, a new Land Rover, travel expenses (in-country and for a few international conferences), training for the people involved, and an evaluation by a consultant from the donor's country. The software will be open source or pirated.

Scenes of the Land Rover loaded with new gear (customs had to be given something extra to clear the shipments) headed into a rural village or urban slum. Young people carrying the gear to the school, community center, health clinic. Celebrations: dances, speeches by the donor, the mayor, the minister, a ribbon cut. Then training classes. Intense focus on the instructor. Excited faces gathered around the computer screens. A good start.

The project has lift off. High demand, not enough places for everyone. Yet there are problems. The town/barrio leader puts one of the computers in his house "to prevent theft." Electricity is a problem. The computers sometimes sit idle until the NGO provides a backup generator using expensive fuel. Still, the project is making an impact. Theft is not a problem. The locals have "taken ownership."

Young people testify to the changes it is making in their lives. A professional demonstrates how he is less isolated now that he can communicate with colleagues. A farmer shows what he has learned about a crop, a sick animal, an insect infestation. The project hums along...

The NGO representative begins to worry about where money will come from to keep the project going. In spite of the perceived benefits, the ministry is not interested in budgeting to support the project. There are arguments among the parties: the donor country, the NGO, and the ministry. The ministry wants the donor to extend the funding. The donor says no. The locals are encouraged to come up with a plan to raise some money. There is talk of matching funds, but locals have a lot of energy and little extra money and what they raise is not sufficient.

They enter ICT contests in distant lands, hoping for recognition. They hear of other grants but don't have the resources to apply. The pilot project is winding down. Priorities have changed and the funding agency is now concentrating on some new aspect of ICT. The NGO follows the money and prepares the transition from the current project. The locals find money to pay a former student to take over the project. He dreams of working in the capital but will take this position for a while.

The computers are showing their age. The dust and heat are taking a toll. Most are still working at the end of the project. Others sit in a back room. There is no money for repairs or for the Internet connection any more. The Land Rover is now an addition to the ministry's motor pool. The evaluator has come and gone. Her report sits in the inboxes of the program officer, the NGO, and the minister's liaison. New pilot projects are being hatched.

Back in the village or barrio the project building is dark. The doors are locked most of the time. A girl is sitting at a table in her kitchen. In her school copybook she is writing her email address over and over, just so she won't forget. Maybe she will go online again some day and see if her new friends in the capital and in Canada have written her. It might happen, but the fiscal year is coming to an end. New projects are coming.

Steve Cisler is a librarian who lives in Silicon Valley. He ran a grant program at Apple Computer and has worked on projects in the rural U.S., Latin America, Uganda, Jordan, and Thailand.

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Community Networking and Public Benefits

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Abstract

In general, healthy networks seem to result in improved community welfare i.e., they are characteristic of public benefits. The converse is true of unhealthy networks. This paper explores if healthy networks are where limited government funding should be focused in order to get the greatest social payback, or if these funds should be spent helping to improve the strength of less healthy networks and communities, in order to improve the well-being of the country as a whole. It will do so by examining if community networks, both virtual and place-based, create public benefits on both the macro and micro levels.

Introduction

Everywhere one turns today, one is bombarded with talk of community, and networks, and computers, and often all three things at once. From the first glimmerings of the economic potential inherent in the new information and communication technologies (ICTs), the rhetoric from governments, academics, business, and community economic development (CED) organizations has held that if a community has access to and uses ICTs, then economic well-being is sure to follow. However, as experience has shown, this is not necessarily the case. For while ICTs do hold a great potential for immense positive benefits, not just in economic terms, but in broader applications for creating community networks to deal with civic engagement, education, health and other social services, as well as overall general knowledge and connectivity, they are tools, and the potential lies in how they are used, not their mere presence.

However, if government is going to fund community networks, it is important to identify which of these networks are more likely to generate positive externalities (that whole range of benefits from the somewhat tangible to the quite intangible such as community self-worth); these externalities are often referred to as social capital, and it is in this special sense that "public benefit1" aspects are attributed to

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1 This article was initially entitled “Community Networks and the Public Good.” However, the authors felt that the term “public good” is too limiting to this exploration, since it has a very specific definition in economics, to whit "...goods that may be enjoyed by any number of people without affecting other peoples' enjoyment" (www.ecosystemvaluation.org/glossary.htm). Or alternately, "a good which can only be supplied to all if it is supplied to one and the availability of which is not diminished by any one consumer's use of it" (www.chass.utoronto.ca/~reak/eco100/glosslist.htm). For example, an aesthetic view is a pure public good. No matter how many people enjoy the view, others can also enjoy it. This paper however, will keep separate the discussion of classical public goods and public benefits

community networks. Some community networks are healthy[2], i.e., they generate lots of external or social benefits. Some are less healthy, i.e., they generate few or no external benefits. In fact, unhealthy networks might be found to generate external or social costs, (e.g., putting or keeping in place undemocratic ways of governing).

In general, it seems evident that healthy networks result in improved community welfare. They have more of a "public benefit" characteristic. The converse is true with unhealthy networks. Therefore, is it towards healthy networks that limited government funding should be focused in order to get the greatest social payback? Or should these funds be spent helping to improve the strength of less healthy networks and communities, in order to improve the well-being of the country as a whole? This paper sets out to try and answer these questions by exploring whether or not community networks, both virtual and place-based, create public benefits on both the macro and micro levels. For if government can distinguish between healthy and unhealthy network investment situations, then there is the possibility for wiser spending on the part of government and increased welfare for the general community.

In an attempt to facilitate this decision-making process, this article will set out to determine which investment decisions are likely to yield the greatest benefits. It will do so by, first of all, ascertaining to what extent the concept of "public benefit" arising from community networks has been addressed to date; this will take the shape of an exploration of the concept of social capital, followed by a discussion of whether or not ICTs help to generate positive social ties. Secondly, drawing upon the existing literature, the paper will attempt to create a "taxonomy of public benefits" by identifying both tangible and intangible indicators of both healthy and less healthy community networks. Finally, we offer some recommendations for funding models that will ensure that the public goods aspects of community networks are optimized.

This sounds simple enough, but there are a number of issues that come to light when one starts to delve beneath the apparently obvious concepts of healthy and less-healthy communities. For instance, what exactly is a community? Is it a place-based geographical entity? A group that comes together to share similar interests? A group which engages in similar practices and beliefs? Individuals who never actually meet in person, but only interact in cyberspace? Or indeed, all of the above?

Further, what is a useful definition of community network? For the purposes of funding, should community networks be solely defined by technology? What about other types of networks found within communities such as those of kinship, friendship, business associates, religion, practice, shared interests, education and so on? For a community, no matter how it is defined, is made up of an immense number of networks, a multi-dimensional series of interconnections between people, organizations, macro-entities such as government and global corporations, and indeed the technologies with which all of these things interact.

It is, of course, of prime importance that these networks function in such a way as to create well-being in a community, i.e., that they generate social capital. It seems easy at first glance to see if a community is functioning in such a way as to provide the greatest possible set of public benefits to its members; is there a feeling of civic pride, community cohesion, sustainability, etc.? But sometimes

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(although in many ways, it might be noted that creating a public good might in itself be one of the parameters indicating a healthy network). For our purposes here, however, although closely related to public goods, a public benefit is a somewhat looser concept, which we are defining as "something accessible to all members of a community, which has a healthy or good effect on the community as a whole."

2 The authors realize that the terms "healthy" and "unhealthy" come with a whole set of value-laden inferences. However, no other terms seem to accurately capture the idea of fully functioning networks that operate for the public benefit. For instance, a specific network may be totally functional, yet not operate in the best interests of the larger community as a whole e.g., the drug trade. Or a given community could also be said to be resilient, in the sense of long-lasting and self-sustaining, but this doesn't necessarily indicate well-being, e.g., generations who have lived on social assistance. And so we are using the term healthy in the biological sense, i.e., showing full strength and vigor, and free from any signs of disease.

what appears on the surface to be working well, may in fact harbour deep-rooted problems. So what indicators can be used to tangibly measure what is often intangible? How to measure the unmeasurable? Further, how exactly do we determine what is beneficial? What may be of great public benefit to one community may well be of no public benefit to another. Therefore, is it possible to extrapolate any given set of indicators across all cases? And how do we fit ICTs into this discussion of what exactly constitutes public benefits?

All of these questions are of prime importance to government because it is their job to allocate a finite number of resources in such a way as to provide the largest number of benefits to the greatest number of citizens. But what if funding could be "fine-tuned?" What if funding could be allocated so that it is targeted at those communities where there is a greater potential for social benefits? Either the community in question possesses such characteristics already, or the creation of a community network is likely to create social benefits. Such knowledge would lead to "smarter" funding. Thus, having a sense of such indicators would benefit not just government, but also those communities in search of funding. Before considering just what these indicators might be, however, it is important to first explore the concepts of social capital, and community.

The Role of Social Capital in Determining Public Benefits

Social capital, which Putnam (2000) defines as "social networks and the trust and reciprocity that arise from them" (p. 19), is increasingly being understood as perhaps the most significant factor in determining a community's resilience. Indeed, Australian social commentator Eva Cox suggests that "Social capital should be the pre-eminent and most valued form of any capital as it provides the basis on which we build a truly civil society. Without our social bases we cannot be fully human. Social capital is as vital as language for human society" (in Cavaye, 2004, p. 2).

As Alejandro Portes (1998) points out, social capital is a term imported from the sociological literature into everyday language. In the process, however, it has "evolved into something of a cure-all for the maladies affecting society at home and abroad…[and] the point is approaching at which social capital comes to be applied to so many events and in so many different contexts as to lose any distinct meaning" (p. 2). Portes traces the term social capital to Pierre Bourdieu[3], who briefly discussed the concept first in 1980, and then at more length in his chapter "The Forms of Capital", which appeared in a 1985 text on the sociology of education. Bourdieu's definition of social capital is more detailed than the more generally used one by Putnam seen above; Bourdieu suggests that it is "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (in Portes, 1998, p. 3). This definition goes one step beyond Putnam's in that it emphasizes the quality and quantity of the resources, e.g., trust and reciprocity, that arise from social networks. Bourdieu also stresses the inherently economic outcomes of social interactions, and indeed, of all forms of capital, although he acknowledges that the processes that create various forms of capital do not necessarily arise from an economic base. Indeed, Bourdieu considers these processes to be the opposite of market exchanges in that they tend to lack clarity and well-defined time-lines, and the reciprocal obligations inherent in them are usually unspecified and have the potential to be violated. However Bourdieu's discussion makes plain how easily the idea of social capital could be adopted by business and government and translated into purely economic terms.

As Portes shows, economists such as Loury, Coleman, and Ben-Porath (in Portes, 1998), did indeed adopt the idea of social capital and develop its connections with other kinds of capital from an economic basis rather than a sociological one. Nonetheless, unlike financial or physical capital, social

3 However, Portes also acknowledges that the concepts underlying social capital, i.e., involvement in groups and the benefits of such involvement, are as old as sociology itself, and can be traced back to Durkheim and Marx.

capital has been both interpreted and applied in a wide variety of situations.[4] Portes, in his extensive review of the literature, identifies three basic functions of social capital: 1) as a source of social control and rule enforcement; 2) as a source of family support; and 3) as a source of benefits through extra-familial networks, which he suggests is by far the most common use, a finding supported by much of the community development literature (see, for example, Healy & Hampshire, 2003; Odasz, n.d.; Onyx & Bullen, 2000; and of course, Putnam, 2000).

But virtually all of the literature surveyed for this paper agrees that there is no single, clear definition of social capital; one could even go so far as to say that this is one of its hallmarks. However, following Cavaye (2004) and others, social capital has the following general characteristics: participation in networks of various kinds (e.g., family, neighbourhood, friends, business), reciprocity, trust, social norms, a sense of the "commons", and pro-activity and cooperation. Further, Cavaye (2004, p. 4-5) lists the following established understandings of social capital:

- It consists of three related forms i.e., *bonding* (relations between relatively homogenous groups such as family), *bridging* (ties across heterogeneous groups such as friends and colleagues), and *linking* (ties across social strata and community members accessing resources and information beyond the community itself).
- It interacts with other forms of capital.
- Communities have large reserves of latent social capital, evidenced in times of crisis as the community comes together without question to solve problems (e.g., in the face of a natural disaster).
- It is both a means and an end, i.e., it can mediate both relationships and participation that can, in turn, lead to concrete outcomes; while at the same time the relationships and networks that mediate these actions become strengthened.
- It fundamentally involves values, and what is considered to be "good" social capital cannot help but be a value judgment.
- It must be considered in the larger community context.
- It is a public good that increases as people within a community "use" it and decreases if they don't[5].

It is also important to note that we must be cautious in considering social capital as a panacea for all problems concerning community. While it is true that the more social capital a community has, the more resilient it is, it is not a given that this resilient community will function in a positive manner. For instance, strong social networks also may support things like racism, bigotry, chauvinism, or a culture of poverty, drugs and/or crime. In instances such as these, social capital may well serve to ostracize those trying to change the culture in any way. In the same way, it can support unjust power structures at the macro level, and bolster dysfunctional familial ties at the micro level. "Social capital can consist of not only trust but also mistrust; information transferred between people can also be misinformation; and unjust norms can be perpetuated.

Strong bonding social capital can reduce tolerance of outsiders, stifle innovation and disagreement, support unhealthy norms, and cause people to reject alternatives" (Cavaye, 2004, p. 5). As Onyx and Bullen (2000) demonstrate in their study of five Australian communities, both bonding and bridging forms of social capital are just as likely to have a negative impact on a community as a positive one, especially where issues of diversity are present. On the other hand, communities that have

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4 Portes (1998) identifies, among others, school attrition and academic performance, children's intellectual development, sources of employment and occupational attainment, juvenile delinquency and its prevention, and immigrant and ethnic enterprise. To these might also be added such things as engagement in civil society, community economic development, rural vs. urban communal networks, and the effects of an aging population on such things as health and other social services, among others.

5 This latter characteristic is of primary interest to this paper, and will be discussed at more length below.

strong linking social capital tend to be more outward-looking, and often more resilient in a positive and sustainable manner. Despite the body of literature that focuses on the "dark side" of social capital (e.g., Cohen & Prusak, 2001; Portes, 1998; Portes & Sensenbrenner, 1993; Uzzi, 1997), there is a tendency to consider social capital within a communitarian perspective, and it is in this sense that ICTs and social capital are discussed in this paper.

The Role of ICTs in Developing Social Capital

It would appear at first glance that ICTs, and especially the internet, being inherently about interconnections and networks, should support and facilitate social and communal networks. Indeed, until fairly recently, ICTs have been enthusiastically held up as generators of social capital. This is particularly true in the mainstream, non-academic literature, where the rhetoric often outstrips real-world experience, occasionally with worrying results[6] (see, for instance, Odasz, n.d.; Association for Community Networking, n.d.; National Civic League, 2003). But it is also seen in the work of the so-called Cyberutopians, those academics such as Lévy (1997), Heim (1998) and De Kerckhove (1997) who claim that the internet has created new and better ways to communicate. Indeed, academic research has found some empirical support for this view. For instance, there is evidence that the internet enhances social networks at a distance, especially with friends and relatives, through the use of e-mail (see, e.g., Boneva, Kraut & Frolich, 2001; Hampton & Wellman, 2001; Haythornthwaite, 2001b; Kavanaugh & Patterson, 2001; Kazmer & Haythornthwaite, 2001; Wellman, Quan Hasse, Witte, & Hampton, 2001).

Further, researchers studying wired communities such as Blacksburg, Virginia, and "Netville", a suburb of Toronto, also found that increased levels of civic involvement corresponded with higher internet usage (Hampton & Wellman, 2001; Kavanaugh & Patterson, 2001). Tied to this, and of particular interest to the question of whether or not funding communities to help them develop ICT networks is an efficient use of government resources, is the finding that existing connectivity levels off-line appear to increase the potential for positive on-line connectivity. For instance, Kavanaugh and Patterson (2001) note that the Blacksburg Electronic Village project may well have been as successful as it was because it was located in a place-based community where high levels of social interconnectivity already existed. They suggest that high levels of social capital may be a prerequisite condition for, rather than a result of, effective computer-mediated communication. Wellman, et al. (2001) also found that those who had frequent contact with others via the internet also had frequent contact with them off-line. Their survey of 39,211 visitors to the National Geographic Society website found that the internet supplemented the participants' face-to-face and telephone communication rather than either increasing or decreasing it. They also found that heavy internet use can be associated with increased civic engagement, but concluded that for the most part, this did not mean that people became more engaged. Rather, those already engaged are increasingly using the internet as another tool in their work.

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6 For instance, recent newspaper articles have discussed the I-Neighbors project at the Massachusetts Institute of Technology (MIT). This project set up a neighborhood web-site which let participants establish an e-mail address list, post personal profiles and then connect to other residents of their suburban community with similar interests. Over three years, those who used the site came into contact with more new neighbors than those who didn't. Keith Hampton, the lead researcher on the project, noted that by meeting those with similar interests through the website, people formed more diverse social ties. However, he also found that these new on-line relationships typically lacked strength, and tended to be weaker social ties (The Internet makes good neighbors, 13 September, 2004; Who's knocking at your door?, 26 August, 2004). This type of connection is reminiscent of on-line dating services or other types of chat-rooms; where the potential for false, or at the least misleading, information being posted, has been well-documented. In general, it is easier to mislead others when no physical cues are present to help the receiver process the information being sent. Even telephone conversations provide verbal cues such as tone of voice, accents, etc.

A number of other studies echo this finding. As Haythornthwaite puts it, "Connectivity seems to go to the connected, that is, greater social benefit from the internet accrues to those already well situated socially. As Nie (2001) pointed out, connectivity already goes to those with higher levels of income and education" (2001a, p. 376). In other words, those with strong social ties off-line were more likely to have strong ties on-line; the converse also appears to be true[7]. So it might well appear that an efficient allocation of funds for ICTs would be to support place-based communities that already show strong evidence of positive social capital.

The danger of this argument however, is that such a strategy can't help but to reinforce the so-called digital divide. According to Statistics Canada (2004), in 2003, 7.9 million[8] Canadian households had at least one individual who used the internet regularly, an increase of 5% from 2002[9]; however, the same survey also showed that internet adoption was highest in households with higher income levels, those which had members in the workforce, and those which had higher levels of education. In contrast, in 2003, 3.6 million Canadian households had never used the internet, 49% of which were found in the lowest income group. As Haythornthwaite (2001a) points out, "Great though these numbers are, they indicate a large proportion of people who are not connected to the internet, do not know about it, have no interest in using it, have no affordable access to it, or have poor infrastructural support for it. The large social phenomenon of the internet is passing some by, and for better or worse, that sector is failing to gain access to the resources available to those with access to the internet" (p. 366). Thus the question is, would government better serve the population as a whole by putting in place funding to help support initiatives that increase a community's positive social capital in ways that don't necessarily involve technology, before allocating funds specifically for ICT and connectivity projects?

The answer to this question may come, in part, from more critical consideration of the relationship between ICTs and social capital. One of the overall findings of this body of literature is that it is simply too early in the development of the internet to determine with any authority whether or not ICTs increase social ties in any lasting or meaningful way; in part, this is because of the way that research has positioned. A number of researchers are very explicit in their warning that setting one type of communication against another, i.e., face-to-face against computer-mediated, is counterproductive, especially as ICTs become more and more integrated into our everyday lives. Caroline Haythornthwaite (2001a, p. 363-378) perhaps says it best:

> Much existing research on computer-mediated communication (CMC) and online behaviour has laid out differences between CMC and face-to-face communication and provided in-depth reports on online communities. Whereas important research has been done from this perspective, its concentration on CMC versus face-to-face, online versus offline, and virtual versus real has perpetuated a dichotomized view of human behaviour. These dichotomies pit one form of CMC against another … as well as one category of human endeavour against another…. In considering the integration of the Internet into our daily lives, we also need to remember that, as many point out, the Internet is a new social phenomenon that has been in place for fewer than 11 years. We already see that experience and time online changes behaviour; we are watching an emerging phenomenon, not a mature one.

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7 However, a number of studies also found that very high internet usage appears to contribute to higher rates of depression among individuals (e.g., Kraut, Lundmark, Kiesler, Mukhopadhyay & Scherlis, (1998); LaRose, Eastin & Gregg, 2001). Of particular concern is a case in Winnipeg concerning the death of a 53 year-old man. Because he had few social ties, suffered from a disability and so was rarely seen outside his apartment, and had all of his day-today banking deposits and withdrawals set up on-line, it was two years before anyone discovered his body (George, 2004). As George goes on to point out, "new technologies like electronic banking have created a system in which it's possible to become so physically disengaged from the day-to-day administration of your own affairs that your life can effectively go on without you, perhaps indefinitely" (2004, p. 32).

8 Of a total of 12.3 million households.

9 And substantially down from increases of 19% in 2000 and 24% in 2001. These individuals accessed the internet at home, work, school and/or a public library or other location.

Other researchers echo this caution. Pigg and Crank (2004), in their exploration of the functionality of various ICTs and resulting ties to social capital formation, conclude that "More research and further documentation is necessary before we can say for certain that ICTs can and do create social capital and, thereby, build community. Enhancing social networks is obviously necessary, but this analysis suggests it is certainly not sufficient to support the claim of ICT advocates" (p. 69-70). Anderson & Tracy (2001), Blanchard (2004), Huysman and Wulf (2004) and Kavanaugh & Patterson, (2001) echo this sentiment. At the present time, it is safe to say that ICTs, as they are being assimilated into society, tend to be used as an adjunct to other older technologies, such as the telephone, and should be considered in this light.

Community is as Community Does

However, if the jury is still out on whether or not ICTs generate the social ties that constitute positive social capital, and vice versa, the same may not be said about computer-mediated community networks. Overwhelmingly, the literature suggests that where community networks exist, they prove beneficial to some extent (see, for instance, Casapulla, de Cindio & Ripamonti, 2001; Day, 1997; Gurstein, 2001; Jones, 2003; London, 1997; Odasz, n.d.; Schuler, 1996; Silver, 2003). For the purposes of this article, community networks can be defined as "a network of computers with modems that allow users to connect to a central computer which provides community information and a means for the community to communicate electronically…. Unlike 'virtual communities' community networks are based in a physical place…. The common element of users of community networks is their physical proximity and interest in local issues that affect them all" (Hall, n.d., ¶12). In general, community networks have three characteristics that separate them from other forms of computer based communication:

1) They focus on local issues, culture, and ownership, as well as providing forums for community discussion and problem solving;
2) They strive to reach all groups and individuals in a community, stressing public access and computer skills acquisition (e.g., the Community Access Program in Canada, as well as the many freenets found in various cities) for not just the computer literate, but also marginalized groups and non-traditional users of technology; and
3) They emphasize democratic participation and community development.

To this might be added a fourth characteristic, if not of the network itself, then of the individuals who run it: they believe implicitly that "community networks can build and strengthen community identity and ties" (Hall, n.d., ¶ 27). This is borne out in some of the more common aims underlying the creation of most community networks: providing otherwise inaccessible services and information to the community, stimulating local economic development enterprises, providing training to marginalized groups, etc. The fundamental element of community networks, however, is that they are developed by the local people for the local people, with an understanding of just what the local needs are.

The question needs to be asked however, in determining whether or not such community networks provide public benefits, is exactly how they compare to other types of non-computer mediated community networks in this regard. This is because while place-based communities are still considered as the primary unit in terms of funding allocation, increasingly, there are other types of communities that may well be more suited to development in terms of ICTs, and perhaps it is these that may be more appropriate for funding.

What exactly constitutes a community has engendered a great deal of debate in the social sciences literature. The complexities inherent in the idea of community reach across almost all disciplines and theoretical variations (for some thorough reviews of the literature in this area, see Cohen, 1985; Connell, 2000, 2002; and Liepins, 2000). And just as academics struggle with the concept of community, so do governments. As noted above, this is a crucial question for governments, because how funding is allocated depends in many ways on determining the constitution of a community. A

potentially useful breakdown of types of communities may be found in the New Zealand government's recent draft *Digital Strategy*. It suggests that "there are a number of ways of defining communities and *together they make up the interconnected systems of society*" (Government of New Zealand, 2004, p. 96, emphasis added). Some of these approaches to community include: geographic communities; communities of interest such as those for business, research; hobbies, sports or politics; communities of identity or circumstance, such as youth, seniors or the physically or mentally challenged; non-profit and voluntary sectors, also known as the community sector; and ethnic and cultural communities. In Canada, however, as David Connell notes, while "references to community remain dominant in today's social policy" (2000, p.2), a hard and fast definition of what exactly is meant by community is absent.[10]

The one point of agreement seems to be that the root of community in the Latin *communis*, meaning common or shared, is a good place to start. As we saw in our discussion of social capital, the stronger the social ties, the more resilient the community. Place-based communities consist of a myriad of such ties, which perhaps can better be thought of as networks, although the idea of network is as rife with complexity as the idea of community.

There is a tendency to think of networks as hierarchical entities, a series of connections able to be delineated in a flow chart. This is too simplistic. For, while the root concept of the network is undoubtedly that of connections, rarely (outside perhaps of organizational theory) are these able to be defined hierarchically, or indeed linearly, because networks are also defined by their context. A rural community is a good illustration of this: depending on the context, the network of social relations is constantly shifting, thinning out in some places while deepening in others: a person is a farmer within a certain set of relationships, while at the same time being the mayor, or a parent or a spouse or a member of a church, etc. But not all members of the church are family, nor are all those involved in the public sphere necessarily farmers or involved in agriculture. Strong ties in some directions, weaker in others. The important notion here is context. In many ways, context is what defines a community's boundaries and needs to be considered in the allocation of funding.

A given community of the homeless for instance, may find the ability to access the internet much less useful than a community of tourism operators; on the other hand, another community of homeless may be able to upgrade literacy skills, or seek employment or health information with the help of ICTs. It depends on a number of things, such as familiarity with the technology, access, willingness to learn and even physical locale. Funding decisions must be made in a context-specific way, and from a bottom-up approach. Certainly, the individuals and groups requesting funding know what their needs are, and generally have a fairly good idea how they can best be met.[11] And sometimes these needs aren't centred in a physical locale, e.g., groups that advocate for health-related issues, literacy, and other social justice matters. Funders need to consider communities in ways other than simple geography.

Measuring the Unmeasurable: Indicators of Health in a Community

As we mentioned above, determining the health and resilience of a community is not an easy task. One purpose of this paper, however, is to try to come up with a taxonomy of indicators that funding

10 When conducting research for his doctorate, Connell had "the opportunity to listen to a presentation by a senior, federal bureaucrat that included many references to community, e.g., community capacity. Following the presentation, [he] asked the presenter if community was defined for these policies. The presenter replied there was no definition" (2000, p. 2n).

11 For instance, the Canadian Research Alliance for Community Innovation and Networking's (CRACIN) case study sites have indicated that this is indeed the case. The implementation of ICT is helpful, but not necessarily the answer to all of their prayers. The authors have also heard, in the course of other community-based research, the frustration that arises when funding requests are met with a cookie-cutter approach by government. For while funders must of course be careful of risk, it can equally be said that without risk, nothing creative and positive can take place.

agencies might use as guidelines when evaluating requests for funding. However, before embarking on this task, it is important to stress again that a cookie-cutter approach to resource allocation is not only counterproductive, but may well be harmful to the communities that governments wish to help. As Spigelman (2001) notes, "not everything that counts can be counted. Some measures can only be judged" (p. 2). He adds "Perhaps the most definitive characteristic of the 'new public management' is the greater salience that is given to what is called the 'three E's'–economy, efficiency and effectiveness–in competition with other values of government activity, such as accessibility, openness, fairness, impartiality, legitimacy, participation, honesty and rationality" (p. 3). We need to be reminded that quantitative measurement, whether funding formula or performance indicator, is as value-laden as more qualitative methods[12]. Again, every application must be taken on its own merit, and evaluated within its specific context. Thus, the following discussion is meant as a guideline and *not* as a checklist.

Over the last 20 years, there has been an increasing interest in being able to articulate indicators of civic well-being, arising mainly from decreasing resources for community support. Of particular use to this paper was the work done by Warren Dow, who has pulled together a review of many of the existing assessment resources both in Canada and around the world (Dow, 2003). It is impossible to outline all of them; the 96 pages of his report contain hundreds of annotated links and portal sites where assessment tools can be found. However, drawing on this work, as well as others, we shall attempt to outline a few of the most effective tools, ending with a list of what appears to be the most common and useful indicators in assessing community well-being[13].

Healey and Hampshire discuss community well-being indicators in terms of community resilience, which they define as "the individual and collective capacity to respond to adversity and change" (2003, p. 1). They conducted a three year study of four geographically diverse communities in Australia to determine whether or not social networks do in fact contribute to community resilience, and what the implications of their findings might be for government policy. They found that personal resilience is an important factor in overall community resilience. Further, they list the following indicators (p. 4-9):

- A positive outlook on the future, arising from such things as a large supportive friendship network, feeling part of the local community, volunteering in local groups, the involvement of local businesses in the community, and a belief that government institutions seek to benefit the community[14];
- The capacity to be proactive in the face of adversity; and
- The feeling among residents that "life is manageable", which arose from higher income levels, being older, and having large friendship and family networks.

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12 This is backed up by a number of municipal studies into ICT use and their communities. For instance, the City of Seattle's Community Technology Program, in its report 2000-2001 Information Technology Indicators for a Healthy Community notes that "…there are areas where defining the indicator is extremely difficult or where there remain significant barriers to collecting reliable and valid information…. Statistical data doesn't always tell the whole story. There are qualitative measures that could be included or refined. For example, measuring culturally relevant content continues to be a challenge. Some issues and benefits are most relevant when told in stories…." (2002, p. vii).

13 Because of the community-specific nature of these, we will not attempt to draw up a definitive list of indicators, but rather show a sample of some studies and tools most applicable within the Canadian context; indeed, as Sharpe and Osberg (in Reed, 2000) correctly point out, the level of these indicators are less important than the trends they show. Further, because many of these assessment tools deal with specific areas of community such as health, aboriginal concerns, education and so on, we have concentrated on those tools which try to get an overall picture of a community. It goes without saying that should funders be looking in specific areas; then some of these other tools would be of more value; however, since the purpose of this article is to evaluate the overall public benefits arising from community networks, it makes more sense to look at some of the more general ones.

14 Interestingly, respondents felt that government involvement in the community was more beneficial than that of big business.

However, in their conclusion, they note that different institutions are important to different communities, and stress that each must be looked at in context. This finding backed up by Stoll, et al. (2001), who note that the use of indicators can be helpful, but that each indicator must be considered in the overall context of the community in question.

One of the most well-known and widely used set of indicators can be found in the Oregon Benchmarks. They are described by Lewis and Lockhart (n.d.) as "simple, holistic, yet transparent—Oregon's approach to state-wide planning gets different sectors and interests tracking change in terms of a common set of specific outcomes. Having agreed on what they wish to achieve, people can turn to more constructive issues—what is effective and what is not" (p. 1). One of the most useful things about this process is its longitudinal study over 20 years, with a feedback loop that allows all levels of participants to learn as they go, and make adjustments accordingly. The Benchmarks themselves are drawn from the economic, social and environmental factors that Oregonians believe are most important to their quality of life, and fall under the following seven categories:

- Economy
- Education
- Civic engagement
- Social support
- Public safety
- Community development
- Environment.

Some of the specific indicators found within these categories are: employment dispersion (Economic); teen pregnancy rates Social support); and wetland preservation percentages (Environment).

In an Australian study, Pepperdine (2000) provides an in-depth discussion of indicator development. In it, she notes that the following key indicators of community well-being and successful functioning were derived directly from the community's residents:

- Political representation
- Sense of the future
- Maintenance of services and facilities
- Maintenance of population (numbers)
- Even age structure
- Sense of community of belonging
- Community-mindedness
- Neighbourliness
- Co-operation
- Accepting of difference
- Communication
- Community activities
- Availability of meeting places
- Active participation
- Presence of leaders and vibrant people
- Employment opportunities
- Economic viability
- Environmental issues.

Interestingly, she concludes that contrary to the traditional emphasis on economics as the underlying element of (in this case, rural) sustainability, her respondents identified indicators that highlighted social sustainability as more important, a key finding, one might think, for policy makers. (The experience of the Nova Scotian town of Canso, which has been continuously threatened with closure because of the failure of the local fishing catch, but whose local population is very actively resisting, appears to back up this finding.)

In his report on how researchers might best develop civic indicators in Canada, Paul Reed (2000) noted 100 potential civic indicators in 16 categories:

- Economic resources
- Work
- Situation of children
- Situation of young people
- Situation of adults
- Families
- Population stability
- Destabilizing and social stress conditions
- Institutional resources and capacities
- Community physical facilities
- Environment
- Time use
- Civic participation
- Social participation
- Caring and contributing to the community
- Trust and confidence in institutions.

What is particularly evident from this set of indicators is the importance of the mix of both civic and personal features. Reed also notes that "the great majority of these projects [development of community indicators] are more output-oriented than input-oriented. Far more is known about 'where we are at' or 'where we want to go'–be they objectives for water quality, health care, educational attainment, economic development–than about the capacity and resources required to produce those results" (2000, p. 44). He also points out that while many Canadian and international publications outlining social indicators exist, few of these national level compendia have "developed a systematized or core methodology of the kind that could be disaggregated or easily replicated at the community level" (p. 45), which speaks again to the need for context at the community level.

There are a number of Quality of Life indices being used to measure community well-being, many of which came into being as government funding for social services began to erode. In general, these measure four things: social, health, economic and environmental well-being, and are used to track the perceived growth or decline of a community through determining the overall satisfaction among its residents. Of particular interest is the Federation of Canadian Municipalities' Quality of Life Reporting System (in Reed, 2000), which tracks nine areas and is one of the most comprehensive assessment tools used in urban Canada:

- Population resources
- Community affordability
- Quality of employment
- Quality of housing
- Community stress
- Health of community
- Community safety
- Community participation
- Strategic and sustainable well-being.

This particular assessment focuses on the effects of the downloading of public services from a national or provincial level to the municipal, and is one of the first to do so on a nation-wide basis.

Overall, what is evident from this brief survey is that while most of these tools are developed by various levels of governance, and are being used either to track social trends, or to conduct cost-benefit analyses of various funding projects and there is a mix of the personal and the private (especially from those developed with public consultation). And, strikingly, what appears to be most important to communities are close interpersonal relationships, rather than external environments, as the primary source of satisfaction. Thus it may well be that community networks, with the emphasis on social ties, may prove to be important as public benefits.

Conclusions

As we have seen, while community networks may well both be and produce public benefits, there is currently not enough data to state this with certainty. Further, the emphasis on social capital from a communitarian standpoint must be tempered with caution; it is not enough to say that by developing social capital, we are improving our communities. Finally, while having some guidelines for indicators of community well-being will be of benefit to funding agencies, there are so many contextual concerns that for the most part, such lists may prove detrimental to the very communities that funding agencies are trying to help.

Thus, we offer the following recommendations:

- Funding agencies should consider providing support for the development of strong linking types of social capital, as this is what appears to create the most resiliency within communities.
- When allocating funds for ICTs, the best results may be achieved when such funds are directed to those place-based communities that already show evidence of strong positive social capital; the development of computer-mediated networks in and of themselves will not necessarily generate community well-being because high levels of social capital may be a prerequisite condition for, rather than a result of, effective computer-mediated communication.
- Funding agencies might better serve their over-all population by supporting those initiatives that increase a community's positive social capital in ways that don't necessarily involve technology, before allocating funds specifically for ICT and connectivity projects. However, it should be recognized that there is a danger in funding only those place-based communities that already exhibit strong positive social capital, as this may serve to strengthen the so-called digital divide.
- Funding agencies should pay particular attention to individual community context. To this end, attention should be paid to the needs of individual local applications, rather than applying a one size fits all approach.
- Place-based communities are not necessarily ideal for investing the bulk of funds for ICT for development. Other types of communities might benefit more from ICT use, especially on-line or virtual communities.

It appears evident that adding ICT to a community characterized by strong social cohesion (a healthy community) will enhance the social infrastructure of the community and add to the public good. It is equally clear that where the community is unhealthy, i.e., where there is little social cohesion, it is unlikely that the addition of ICT will bring about a change in the community—and thus, few public good benefits can be expected to be realized.

The authors thus conclude that incremental investments in ICT in communities should be targeted at those communities that are likely to benefit, that is those communities which are most likely to use the technology to enhance the public good. The ICT investments that would have gone into unhealthy communities should be re-directed directly into the community itself. By targeting investments, we are not abandoning those communities with low social cohesion. Rather we are saying that scarce resources should be directed where the pay-offs are greatest. Putting ICT into unhealthy communities, i.e., communities with low social cohesion, is not a good use of public funds.

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Looking Critically at ICT4Dev: The Case of Lincos

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Abstract

*The following article is based on thesis research for the Communication for Development program at Malmö University, Sweden (Granqvist, 2003). It represents a study carried out through the NGO Funredes in the Dominican Republic, as a part of its Olistica project – an internet-based research "observatory" devoted to the assessment of the social impact of information and communication technology (ICT) in Latin America and the Caribbean*1*. The objective of the research was to contribute to a framework for the assessment of ICT-for-Development projects from a critical, social viewpoint. The study consisted of both an extended theoretical discussion on the social dimensions of technology and a case study from the Lincos project in the Dominican Republic.*

Introduction

Appreciating the Social Dimensions of ICT in Development

The intention of the research (Granqvist, 2003) discussed below was to demonstrate how theoretical insights from critical social research traditions could inform the assessment of ICT projects in marginalized regions. While mainstream assessment models were (and are) devoted to infrastructure issues, and further fit well within a technologically determinist and often neo-liberal conceptual framework, alternatively minded movements have begun to explore more socially-oriented instruments. In order for such measures to form part of a cogent critical approach, an increased recognition of the social and political nature of technological development and design is imperative. Such a critical approach shares with the so-called 'post-development' tradition (Rahnema & Bawtree, 1997; Saunders, 2003) a skeptical stance towards established development thinking. Power relations, particularly between 'developers' (development agencies, experts, governments) and 'developees' (marginalized communities) ought to be the focus of attention, instead of neglected (as is typically the case in mainstream assessment models).

In order to discuss the role of technology and technological discourse in the maintenance of such power relations, the thesis drew from different theoretical streams of thought. As an entry point, four "social dimensions" of technology were identified; social embeddedness, the design process, usage, and political context. These abstractions were meant to bring to light aspects of technology that are rarely acknowledged in the dominant discourse. The two first categories, in particular, were brought up to counter the common understanding of technology as a neutral tool, and bring attention to its historicity and political workings.

The 'social embeddedness' of technologies is a concept debated in Science & Technology Studies (STS), which, put simply, refers to the values "built into" a technology (Escobar, 1994; Pfaffenberger,

1 http://www.funredes.org; http://www.funredes.org/olistica

1992). Current STS theory, but also classical Critical Theory and feminist research inform discussions on how such social embeddedness may be dealt with and assessed. In terms of the design process, the Scandinavian Participatory Design tradition presents us with a movement of systems designers whose members were among the first to recognize the political character of technological design (see, e.g., Bjerknes, Ehn, & Kyng, 1987; and Ehn, 1988). These scientists made common cause with industrial workers rather than with management when designing workplace information systems. Their legacy is particularly instructive for a critical approach to technology in the development context, where conflicts of interests similar to those of workplaces prevail. Richard Heeks' (1999) critique of the ”tyranny of participation” provides a further source of inspiration for this section, stressing the need to be cautious about 'cosmetic participation' as the concept of participatory development increases in popularity.

The third category, usage, was (and is) the one where socially-oriented theorists and practitioners, such as the Olistica network, had come the farthest; and the discussion here was informed by current debates among NGO's, grassroots groups and activists devoted to this area (e.g. Mistica, 2002; Menou, 2001). Issues such as equitable access, local content production, and socially meaningful usage were emphasized. The last concept, the political context, differs from the others in that it was not regarded as an analytical category in itself, but rather as making up the framework of the other three and providing them with meaning. Bringing it up as a 'social dimension of technology' served to highlight the importance of contextual analysis and the need to politicize every instance of assessment, focusing on how different aspects of ICT projects relate to broader relations of power. A critically-oriented assessment approach could be rewardingly informed, it is argued, by the perspectives of dependency theory and post-development thinking – research traditions which have attended to the power structures of the development domain and emphasized the continuing role of economically dominant societies in perpetuating the conditions of marginalization.

The notions of social embeddedness, design process, and usage would thus serve as analytical categories when examining the Lincos project to appreciate the theoretical discussion's relevance and applicability in the field. The various issues debated under each category became ”investigational themes” that would guide the observation of the Lincos case. The theoretical framework was not regarded as a completed intstrument and the case study did not set out to arrive at a formal and conclusive assessment regarding the Lincos project. Rather, the aim of both was to offer some new perspectives and demonstrate their relevance in an actual ICT-for-Development experience. The expectation was that this work could form part of broader strivings towards more structured social assessment models, based upon a critical social perspective. The remainder of this article is based on observations from the Lincos project.

Background

The Dominican Republic

The Dominican Republic is a country of nine million inhabitants, located in the Caribbean Sea between Cuba, Jamaica and Puerto Rico, on the island of Hispaniola, which it shares with the Republic of Haiti. The Dominican Republic, which, following Columbus' arrival in 1492 served as the lead settlement of the Spanish colonization of the Americas, gained its independence in 1865. Since then – similar to other Latin American countries – the nation has been plagued by an array of infamous dictators, high levels of political corruption, dubious invasions by the United States and, as a result, widespread human calamity. Of the population, of which the vast majority are descendants of Africans that were enslaved by the Spaniards, around thirty to forty percent live in “poverty” (according to the World Bank, 2002).

About half of the workforce is formally unemployed (World Bank, 2002) and for those who manage to obtain a job, salaries are minimal. Four out of five large businesses are owned by foreigners, predominantly North Americans and Spaniards (Howard, 1998), many of whom exploit the economic conditions of the “Zonas Francas” – the free trade zones where foreign companies escape taxes and pay minimum salaries for repetitive labor during twelve-hour working days. Others own large plantations, where Haitian immigrant workers are employed in what has been labelled “modern slavery” (Latortue, 1999). Although the country is a primary exporter of agricultural products such as sugar, coffee, tobacco and fruits, only a minority of the population have access to participation in the wage economy. Dominican politics

traditionally caters to the small but very wealthy economic and political elite, and social welfare is practically non-existent. Past and current conditions have caused over one million Dominicans to flee the country – the largest diaspora in the world in relation to the size of the mother country (Howard, 1998).

In the year 2000, Hipolito Mejía of the Dominican Revolutionary Party, took over the presidency from Leonel Fernández of the Dominican Liberation Party, after winning the election on a program that promised to eradicate corruption and improve the situation of the poor. Mejía soon proved incapable of removing corruption, however, and despite initial promises to the contrary, his economic strategy for the nation drew to a large extent on a neo-liberal (free market) agenda. Nevertheless, Mejía's government had at the time of this study initiated a widely proclaimed "Plan against poverty" and many Dominicans believed that Mejía was launching a serious attempt to improve the situation of the country's marginalized communities, although discontent was beginning to spread. The plan included inititatives concerning infrastructure, education and attempts to extend the use of ICTs in the nation. These latter projects are typically sponsored by the telecommunication industry and include a computer lab initiative for schools and technological community centers such as Proyecto Ave2 as well as the Lincos, which will be discussed more comprehensively below.

For this study, five Dominican communities that had received a Lincos center were visited during a three-week period. This time was divided between one community chosen for in-depth observation, another chosen for comparative observation, and shorter visits at three other Lincos sites. Interviews were conducted with Lincos staff members, Lincos community committee members, Lincos users, ordinary community members, village politicians and the director of the Dominican Lincos project. Meetings and classes were attended and the researcher also conducted direct participant observation as an ordinary Lincos user. In addition to these field impressions, official Lincos documents were analyzed. The objective was to gather a multi-faceted impression of the Lincos experience. The selection of persons for interviews, and locations for observation, was aimed towards broad representation rather than being formally randomized. The process was an evolving one, in which selections were made during the course of the investigation, combining a non-probability "subjective selection" (interviewees and observation sites are hand-picked) with a "snow-ball selection" (one experience leads to another) strategy (Denscombe 1998). Interviews and observation were carried out more in a journalistic format than that of traditional research with the overall objective of obtaining a rich and multi-dimensional image of the Lincos project.

The Lincos Project

The Lincos project was an initiative launched by Entebbe, a Costa Rican foundation3 founded and directed by Jose María Figueres, former president of Costa Rica and a former military engineer. Although Entebbe engaged in other development projects, particularly related to environmental issues (reflecting Figueres personal engagement), Lincos – which stands for "Little Intelligent Communities" – was the organization's flagship. The Lincos project was carried out together with a host of cooperating actors, mainly representing business and academic institutions. The Massachusetts Institute of Technology (MIT) and the Instituto Tecnológico de Costa Rica, on the academic side, and Microsoft and Hewlett Packard on the business side, were among the most prominent partners. Altogether, some two hundred different institutional actors were engaged in the project.

The Lincos initiative started its implementations in Costa Rica in 2000, with the intention of eventually going international on a large scale. In the end, though, the Dominican Republic was the only other country to which the project was exported. The government of the Dominican Republic closed a deal with Entebbe for the installation of sixty Lincos stations throughout the country, as a part of president Mejías Plan against Poverty. The idea was to have these installed by the end of 2002, on a budget of 60 million US

2 http://www.proyectoave.com.do

3 The organization is known formally as La Fundación Costa Rica de Desarollo Sostenible ("The Costa Rican Foundation for Sustainable Development"). The shorter name, Entebbe, is borrowed from the name of its founder's residencial area in Costa Rica (Hoffman, 2002). As of 2005, and the writing of this article, the organization seems to be rather inactive. The Lincos project is apparently deteriorating, as demonstrated by its webpage which has not been updated for some two years.

dollars4 (Lincos website5, newsletter March 2001). The number of Lincos sites were later reduced to thirty. A government office in Santo Domingo (the Dominican capital) called "Pequeñas Comunidades Inteligentes"6, with around thirty employees, was in charge of the project in the country. Entebbe was responsible for delivering the centers and upgrading them, providing training to their workers, and overall development of the project.

Half of the thirty centers had been installed at the time of this study and the government had decided not to continue the collaboration with Entebbe for the remaining fifteen, which were to be realized instead under the supervision of the Dominican Ministry of Education. The cost of installing each unit was 2.8 million Dominican pesos (appr. 130 000 US dollars in 2003). This price did not include the administrative costs of either the central office or the individual units. A monthly budget of 25 000 pesos (approximately 1 100 US dollars) was allocated for the maintenance of each center, intended to cover salaries, as well as running costs, such as electricity and purchases.

According to the information provided by the Dominican Secretary of State, the principal objective of the project was to "attain sustainable human development in the selected communities, through processes of learning supported by a variety of technological tools; contribute to the elimination of the so-called technological divide; and guarantee that these remote communities have the same opportunities as other, more developed communities". A further purpose of the implementation of the project was "to make these groups of people from very poor communities with serious limitations advance as individuals, emphasizing education, health and a harmonious relationship to nature" (Lincos web page and information brochures, author's translation).7

What is a Linco?

What exactly is a Linco? The answer to that question actually shifted during the course of the project's implementation. Until shortly before the case study was carried out, the Linco was equal to a very specific concept – an industrial container, redesigned and filled with computers and a range of other high tech equipment. For reasons that will be discussed below, however, the container concept was eventually abandoned in favor of ordinary concrete buildings, with a set of rooms throughout which the equipment was distributed. This development meant that at the time this study was carried out, there existed two types of Lincos. The two Costa Rican ones, as well as the first five of the Dominican ones were metal containers; while the ten most newly built Lincos in the Dominican Republic were installed into ordinary houses. Three of the five Lincos sites visited during the study were of the container variety. However, the old containers were gradually being phased out in favor of houses (as Dominican authorities took control of the project from Entebbe) and the different sites would soon all be of a similar appearance. At the time of the study only one of the Lincos in Costa Rica was in service.

The Lincos units all had a similar initial set of equipment:

- A set of Pentium II/III PC's (5-6 in the containers, 10-14 in the new buildings)
- Each computer equipped with a 15" screen, audio speakers, CD-ROM, and diskette station

4 The accurateness of this figure is unclear, as is the contents of this alleged budget. Another newsletter confusingly even mentions an(other?) investment of $180 million (October 2001). The Director of the Dominican administration of the project claimed to never have heard of either of these amounts when interviewed. See below for further discussion of official financial circumstances of the project.

5 http://www.lincos.net. All referenced newsletters are published on the website and were verified in June 2005.

6 "Little Intelligent Communities"

7 Taken from the Lincos website (http://www.lincos.net). Entebbe's declared mission for the Lincos project was expressed slightly differently, as follows: "To help communities in disadvantage from developing countries to intelligently access and use a series of services and applications such as: Telemedicine, Internet, Electronic Communication, Videoconference, Electronic Trade, Educational Computer Science, etc., within the training setting of the target population. As a result, these communities will be able to take a remarkable quality step in their development process and become Little Intelligent Communities, 'LINCOS'.

- 1 Laser printer
- 1 flatbed scanner
- 1 server computer
- Internet access through a VSAT satellite mounted on the roof
- 1 Fax/Copy machine
- 1-4 satellite phones
- 1-2 television sets with VCR and DVD players
- 1 VHS Camera
- 1 digital still camera
- 1 ”telemedicine kit”
- 1 instrument for water and soil analysis
- A radio transmitter

Most of the hardware was produced by Hewlett-Packard, and the majority of the initially installed software had been provided by Microsoft. The latter included the operating system (MS Windows 98), and the office package (MS Office), plus several other programs (MS Encarta, MS Money, Age of Empires, etc.). Additional software came from LCSI, another project sponsor, which produces educational software and contributed their programs “Micromundos” and “Mi Isla de Fantasia”8 to the project.

Lincos & Social Embeddedness

In considering the *social embeddedness* of technologies in this research, a set of identified issues suggested guidelines for the assessment of ICT projects. A critical social assessment should examine what type of usage different technologies allow, which behaviors they prompt and what social values they tend to reproduce or confront. A critical assessment effort should seek to reveal, although not exaggerate, the political significance of this embeddedness. As a further task, the critical investigator should draw attention to the prospect of alternative designs. Following are some observations from the Lincos project with reference to these issues.

A Box from the Sky

As mentioned, the units making up the first set of Lincos were accommodated in industrial metal containers and five such containers existed in the Dominican Republic at the time of the observations. Three of these were visited during a phase when they were about to be exchanged for ordinary concrete buildings. In all three sites, workers and users expressed serious dissatisfaction with the containers. At one of the sites, the Lincos staff had been on strike for six months because of the unbearable tropical heat in the metal containers, which lacked air-conditioning and proper ventilation. At another site, all computer classes had been cancelled, awaiting the inauguration of the new concrete building, partly due to the heat conditions and partly because of the limited space available in the containers – only five to six uncomfortably seated students could fit into the tiny room, making it impossible to share computers between two persons, and leaving only minimal space for a teacher. The designers of the containers initially included a giant, pole-mounted awning above the container to cover it from sun (and rain). The Lincos staff soon experienced problems with this expensive add-on accessory, however, as it had to be taken down in the event of a threatening hurricane, or to be cleaned, and it could not be mounted again by the regular staff.) At the time of the visits, none of the site containers were protected from the sun by this or any other means.

Power shortages are very common in the Dominican Republic – most villages experience daily, several hour-long interruptions – and when they occur, the Lincos staff must resort to the container’s small power plant, which runs on gas and is extremely costly. One of the Lincos sites was simply closed down during power shortages, because of the inability to cover the gas costs with the limited financial funds available

8 The English titles are “MicroWorlds” and “My Fantastic Island” respectively.

through the project9. On their web page, Entebbe had declared that the units would be supplied with solar panels (Lincos newsletter, November 2001), which would both increase self-sustainability and be consistent with environmental awareness (particularly since the Dominican electricity system relies on imported petroleum).

The newsletter even indicated that the required technology had already been developed by the Lincos team and that it would be installed within a short time at the Dominican Lincos units. By the time of this study however, none of the sites had been so equipped. A Lincos staff member in one of the communities commented10: "The bosses, when they were here during the inauguration, they said they'd bring twenty solar panels, but no…. […] Politics, you know, they talk and talk". According to Luis Veras, then the director of the Lincos project in the Dominican Republic, there existed no plans to carry out this work, except possibly in those communities that were not covered by the national electricity grid.

A further drawback of the container concept was expressed by Mr. Veras, when explaining why it was eventually abandoned: "The container creates the concept of temporariness; the people do not regard it as rooted in the community". While a container may imply some advantages when transporting the project to the remote communities ("it may even be transported by helicopter" according to the Lincos web) its value as compared to relatively cheap local constructions may certainly be questioned. As one observer commented, "[i]n practice, the mobility characteristic of the containers is irrelevant, since their final destination is the stationary implementation in one site" (Hoffman, 2002, author's translation). In addition to indicating temporariness (and transience), the containers also give the clear impression (in this case well-founded) that the project has been developed externally and brought to the community in a top-down manner as a wrapped-up "development package". As one Olistica member who visited a Lincos container concluded, this concept is certainly not helping to demystify the technology or to integrate it into the community11.

The container idea was at the center of the marketing of the project – an image of the container was even included in its logo. In a sense, the container was crucial for the Lincos project, something that was demonstrated by the fact that there was hardly any mention on the Lincos web page about the Dominican administration's decision to abandon the unsuccessful concept (where it was mentioned, the limited space was the only declared reason for the decision). The logo and website including the container image continue to appear, suggesting that despite the negative experience in the Dominican Republic the use of the container remains a key element in Entebbe's overall Lincos marketing strategy.

A reasonable assumption is that the container concept was developed partly as a marketing strategy. While for the people of the communities, the design was more or less disastrous, for other persons, the same design may be seen as successful, particularly for the Lincos officials. "They have their reality, we have ours", one of the striking staff members commented appositely, referring to those responsible for the design of the container. One understanding is that the interest of the Lincos officials, eager to develop a marketable product, has taken precedence over the interest of the community members.

This small metal box, crammed with state-of-the art technology, obviously signals modernity and inventiveness to potential sponsors, buyers and reporters. Articles about the Lincos project have been overwhelmingly enthusiastic (as a search on the web would show), and evidently, Lincos fundraising has been highly successful.

The Dominican Lincos administration's decision to switch from the container to ordinary houses was significant. The heat was no longer a problem and the space of the sites was obviously much greater. The power plant solution was replaced by generators, which stored electricity from the ordinary power grid onto a set of batteries to be used during shortages, thus avoiding reliance on expensive gasoline. The buildings, looking like ordinary houses and built in the community, rather than constructed in a foreign country and then transported there, presumably also had an effect on the experience of affiliation among community

9 As mentioned above, one of the other two sites visited was entirely closed down and since only a short time was spent at the third one, there was no opportunity to investigate if the same was occurring there.
10 When not stated otherwise, all quotes (presented anonymously as to indiviudal and community) in this section are from interviews and chats with community members of the five sites visited.
11 Personal Communication.

members. It was noted during the observations that the Lincos houses were frequented far more often than their container equivalents.

One Size Fits All?

The concrete buildings shared one aspect with the deserted containers. They were a ready-developed concept, thought to apply equally well to all the different communities involved in the Lincos project. Minor differences existed, specifically between the three different "batches" (units were built five at a time, with several months and a new contract with Entebbe between them), but basically, the architecture was one and the same in all of the communities. An appointed community committee, as well as the local Lincos workers, did have a say in how to fit up the building once it had been built, but they did not participate in designing it. While this remains true of most architectural projects around the world, it certainly perpetuates the image of the Lincos project as a "one-size-fits-all" model, developed externally to be subsequently brought to non-participating communities.

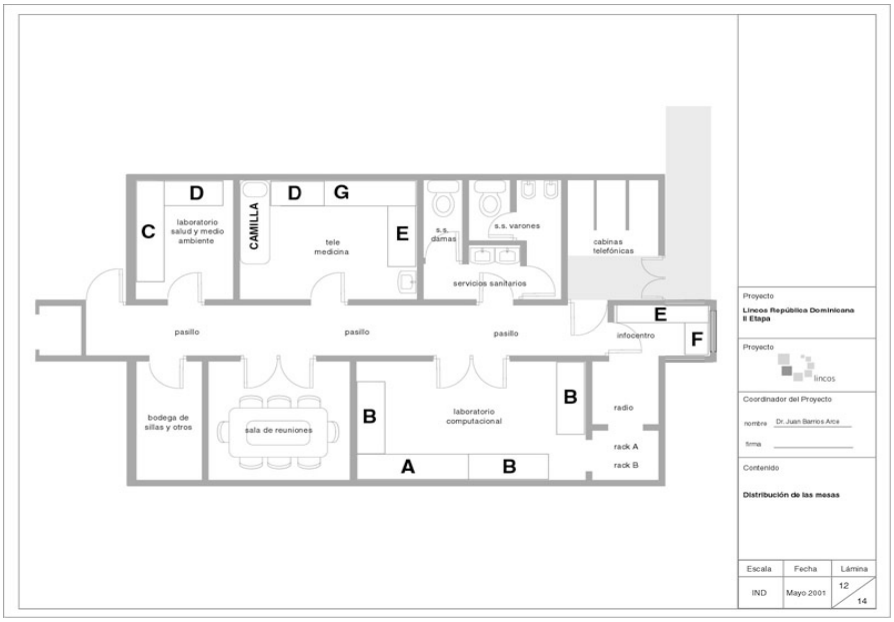

Figure 2. Architectural solution shared by all new Lincos sites. (from internal Lincos document)

Although Lincos' Director asserted that "no two containers are the same"12 – a statement for which little support was found – uniformity was manifest in many aspects. Just like the architecture and the design of the container, the ICT equipment was similar at the different Lincos sites. A similar set of information technologies was thought to be suitable for all the communities involved in the project. As one unimpressed observer remarked: "Like a Swiss army knife with 23 functions, Lincos offers a fascinating technological potential, suggesting that with this the recipients are prepared to address any type of underdevelopment problem" (Hoffman, 2002). What was more problematic than the fact that they were all the same – Dominican rural villages do indeed share many conditions and needs – was that the uniformity reflected the fact that the technology had not been adapted to the circumstances of the users, neither in its choice nor in its design. While the Lincos website claimed that the technology was selected according to the needs of every individual community, the Lincos office in Santo Domingo distributed similar brochures for local Lincos communities, in which exactly the same set of technologies was listed.

"No Comprendo"

12 Interview with Lincos director Juan Barrios - "El tercer mundo en línea". http://centralamerica.ms.dk/articles/Spanish/enlinea.htm

To varying degrees at different sites, the software, the manuals and even the keyboards of the Lincos were in English. At some of the sites, even the Windows version was English. There is most certainly reason to wonder why, since both the software and the manuals used, as well as keyboards, are produced on a large scale in Spanish. Whatever the reasons for this mistake, it certainly had implications for the users at the Lincos sites, where there was virtually no one with proficiency in English. In one village, the scanner and the video camera had never been used until an American visitor was able to interpret the instructions for the potential users.

Summary

This section has illustrated the relevance of the social embeddedness of technologies in the Lincos case. The technologies involved in the Lincos project – and in any other technological experience – through the way they were chosen, designed, marketed and understood, all have different social implications for the members of the user communities and for other stakeholders.

Further, as demonstrated in the case of the Lincos container, different technological characteristics are of different interest for different persons and may also be interpreted quite differently. A critical investigator has to examine the experiences of those persons or groups whose situation she is concerned by, while also contrasting those experiences with conflicting ones. In the cases above, the social implications of the design have been interpreted from the viewpoint of the community members as a group, and to some extent compared to that of the project's management (also as a group). In many situations it may be of equal interest for a critical assessment effort to investigate differing experiences between community members, drawing attention, for instance, to the way specific designs affect women in comparison to men.

Lincos & The Design Process

In our work elsewhere on the *design process* (Granqvist, 2003), a series of themes and their significance for the social world of users and community members was discussed. Crucial issues include whether or not the users are actively involved in the planning, creation and evaluation of technologies, and under what circumstances; to whom the process is open; how it is affected by socio-cultural structures; and whether participation is cosmetic, rather than empowering. Also important is the extent to which an ICT project builds upon local knowledge and the viewpoints of marginalized citizens. Recognition should further be given to the role of the designers: whether they act primarily as technical experts; to what extent they share everyday life with community members; and to what extent their understanding of the problem is allowed to guide the process.

In the Lincos case, several of these issues were rather simple to deal with – participation was close to nonexistent and the design process did not even take place within the borders of the country. With its uniform design and lack of participation, the Lincos project appeared as the archetype of a "solution in search of an application". No part of the Lincos project had been developed on a local level. Instead, a host of institutions from different countries had been involved in developing everything from the container and its contents, to the "methodologies" intended to be used inside them.

Lincos Coming to Town

Let us start with the actual decision of bringing a Linco to a community. Juan Barrios, Entebbe's Lincos director asserted that the establishment of a Lincos unit in a community was "always realized upon the initiative of the people themselves"13. There are clear difficulties with this statement since it is almost

13 Interview with Lincos director Juan Barrios - "El tercer mundo en línea"
http://centralamerica.ms.dk/articles/Spanish/enlinea.htm

without exception the case that it is a decison of the funder (in this case the government of the Dominican Republic) as to where such projects are implemented14.

It is true that the government, once it had decided on a proper location, did turn to the local authorities of the community in question before having the Lincos installed. "They did introduce the project", as one community member explained, "but speaking only to the important persons, without reaching the mass of the people". Further, as is common for these types of projects (cf. Benjamin & Dahms, 2001) – the communities were not offered any alternatives to the project. They might indeed turn it down, but were hardly likely to do so because the project would then simply go to another community instead. "It was like a lottery draw", one Lincos staff member remarked. A community committee member explained it as "a battle between two communities".

While the initiative resided with the government, rather than with the communties (as claimed by some Lincos officials), the centers were certainly accepted by the communities before being installed. In these cases, however, the community was represented by politicians with no other options from which to choose.

In relation to the subsequent installation of a center, a town meeting was held, to which all interested community members were invited (reportedly some 50-300 persons showed up in the various communities out of a population range of 5-10 000). At the meeting, at the initiation of "the high-up persons of the central organization of the project" (as one committee member put it) a community committee was elected to supervise the Linco. This committee consisted of fifteen persons and was the key to the community's influence over the center. By decision of the Lincos administration, nine of these were those with important positions in the community – the mayor, the elementary and high school principals, a representative from the Catholic Church and others. The remaining six committee members were elected by the meeting attendees, and also tended to be village members with significant social standing. Notably, the committee that was now supposed to guarantee the community's involvement in the project, had a membership that was not only delegated by the government, but also, as Heeks (1999) has put it with reference to these types of projects, "skewed towards the powerful and away from the marginalized". Moreover, committee members were non-users, or at least they were not chosen because of their status as users but rather because of their (high) social status.

In addition, the committee, whose members received no payment, was not formed until after the installation of the center, drastically limiting community influence over the design process. This was true for the first container Lincos as well as the subsequent concrete house Lincos, where the staff confirmed that the committee was appointed some three months after the start of construction of the building.

Lincos Evaluation – Cries and Struggles

Additionally, there existed no formally structured evaluations undertaken by the community members. The assessments that were made were carried out by visiting Lincos officials. Although the containers were finally replaced in the first set of Dominican Lincos communities, this was happening only after some three years, implying a very slow and non-interactive response process.

As one staff member expressed it, "It was a cry from us, the local coordinators". In another community, no one was using the telephones because there was a Codetel15 office nearby, where clients could receive calls instead of just making them (and pay with coins instead of prepaid phone cards). A staff member commented: "We have struggled for a telephone with which we can receive phone calls, to send messages to the villagers so that they come here and return the calls. It hasn't been possible. We don't know the reasons. We don't know." This person was still very positive about the project, but in his choice of words, one might get a sense of the nature of the relationship between the community members and the Lincos officials.

14 If there are any doubts, the dissemination of the units makes the case clear; out of 27 planned and realized units at the time the study was conducted, 23 were located in the westernmost part of the country, in the border regions currently prioritized in the government's development efforts.
15 A national phone company

Even Mr. Veras, the head of the Lincos office in Santo Domingo, recognized the fact that the design process failed to take into account the local situation: "The container was designed with Costa Rica in mind. Costa Rica is much chillier than here", he admitted.

Additional issues with the units are suggested by the fact that several installed applications were never used. Neither the telemedicine equipment nor the water and soil analysis kit, both widely referred to by the promoters of the project (and a basis for the image of Lincos as being of wide-ranging social benefit) had *ever* been used in *any* of the communities visited, with only a few exceptions for testing purposes. As well, the videoconference system was seldom or never used ("who would we videoconference with?"), as was true for an array of the installed software (particularly that which was only available in English). Except for a few commonly used services (see below), fact was that most communities still wondered what they were supposed to do with their Lincos. The whole experience might be best summarized with an excerpt from an interview with a community member:

> In the case of the Lincos projects...there was no real introduction. They didn't tell the people first, before bringing the project, instead they came with the project first and then they spoke to the people. The first thing should be to speak to the people, 'we're bringing a project, and we're bringing it to show you', speaking to different sectors.... that way they will know what the people think, 'well, we're going to modify this, we'll drop this thing that the people are not interested in'.... The obvious consequence of this is that the people didn't give their support, they didn't attach importance to it, and with time the project diminishes, it won't be growing, because the people don't regard it as useful, because it doesn't have any importance for them, it doesn't have any value [...]. The consequence is fatal, very negative, and then the project is lost.

Thus, the organization of the Lincos project did not only exclude users from participating on any level of the design process, but also kept them from taking part in the planning and introduction of the project, failed to provide a structure for evaluation, and neglected local knowledge and understanding of the local situation. As noted above, to the limited extent that community members were involved, membership was biased towards the already powerful, and actual users were not generally included. The design team – whose members appeared not to have visited the communities, let alone shared their everyday life – had sole responsibility for both defining the problems and working out the solutions, which in practice meant that "solutions" and implementations were the same for all communities.

The consequence was, that, out of a host of expensive technologies, only a handful were used to a reasonable extent, and the services they provided could have been supplied equally well by much less costly telecenters. Moreover, the development of the technology had not formed as part of a strategy in line with community members' own visions, and decision-making had taken place above their heads. Consequently, people generally did not feel affiliated with the project and expressed indifference or, as in the case of some staff members, even frustration towards the project. The apparent attitude of Entebbe when it comes to these matters is perhaps best expressed on their own webpage: "With an adequate process of technological transference", it was predicted, "the individuals will accustom to the applications when they become adapted to the unit".

Lincos & The Usage of ICTs

At the Lincos sites visited, activities were concentrated on mainly three services: computer classes, websurfing and e-mailing, and photocopying. At the occasional site, the radio transmitter was also used extensively. Other services that the centers offered, including telephones, seemed to be used only to a very limited extent, or not at all.

Access for All?

The Lincos case – like most other ICT-for-Development efforts – succeeded in bringing ICT access to people who had previously lived without it. Not only computer technologies, but also public phones now became available to people who had been excluded from the use of such equipment before. Observations at the Lincos sites further confirmed that use was relatively equally distributed between men and women, and

between different age groups. There were obstacles however, that prevented some citizens from participating. In the case of Lincos, the charges applied to the services would appear to be the primary reason for such restriction.

In the Lincos case, serving villages with official unemployment rates of over seventy percent, the attendance in classes was quite high, even though the charges applied very likely excluded a large proportion of the population. Lincos' prices were not high compared to those of other similar services; rather the opposite16. Nonetheless, even relatively low prices exclude the poorest parts of the population from participation.

While monetary charges were probably the most common factor of exclusion, others may have existed as well, apart from those already mentioned (the lack of Spanish manuals and the unbearable heat). These might include the formal "terms of usage" which declared, among other things, that users were not allowed to "make politics" when using the computers. Further it is notable that during the period of this study, no member of the Dominican Republic's largest immigrant group, the Haitians, was observed as visiting a Lincos. This may be due to the issue of charges (Haitians make up the poorest part of the population) or to deeper issues of Dominican attitude towards Haitians.

In response to these issues, according to several Lincos staff members, scholarships existed for children whose parents could not afford their computers courses. It should be noted, however, that these scholarships were donations from private persons or local businesses, rather than strategies initiated by Lincos or the other project sponsors.

Autonomy & Empowerment?

With respect to local content or program development, this was very limited at the Lincos sites, and the result of individual rather than project-based initiatives. Students used word processors to do their homework, others wrote résumés and occasionally individuals would hire the digital camera to take wedding pictures. In one village an employee at the Linco used the video camera to make an educational film about the environment that he intended to show to young people for educational purposes. Notably, in those communities where the radio transmitter was functioning, it was actively used. Although most of the material transmitted was commercial music, the shows were created locally by, and for, the community itself.

The computer classes used software, most of it coming from a single producer, which was taught with the help of structured, written instructions, telling the students exactly what to do. The teachers seldom had much more computer skills than their students. Notably, these classes stood in sharp contrast to the marketed educational vision of Lincos officials, according to which the technologies were used in exploratory and independent ways to accomplish communitarian ends in the community (see, e.g., the Lincos website; and Badilla, 2001).

Many persons expressed content with the fact that they now had access to new information. "Now we can look for facts about any issue", one person explained when asked to describe the benefits of the project. "For example, [...] when the problems with Bin Ladin began [...] I was interested in finding out who Bin Laden was [...] and I searched the Internet and I found out who he was". However, there was little concern expressed with regard to the validity of sources nor of the assumptions or political positions which underlie much of this information.

In cases such as Lincos, where the government is in charge of the project, there is reason to examine whether the available communication tools can be used to support strategies for increasing the political influence of marginalized people. Certainly it would seem that this was not a concern in the case of Lincos. Although the project was a part of the government's efforts against poverty, neither this nor other projects seemed likely to threaten existing political relations or resource distribution. Not only did people not seem to be given training or assistance in using ICTs to increase their political influence, in this case they seemed to be expressly forbidden from doing so. Communicational activities were primarily carried out on an

16 To use the Internet cost 10-20 pesos ($0.50-1) for an hour, and computer courses were 50 to 100 pesos ($2.50 – 5) per month.

individual level; people used the e-mail for keeping in touch with friends and relatives, and chat rooms on the Internet were used for recreation rather than as a means to achieve greater social (or political) influence or participation.

Maintenance

Another theme to which attention might be drawn is that of the maintenance and workings of an ICT project, and whether it creates self-reliance or dependency. The impression from the Lincos case was that Lincos management tended to give responsibility to the individual centers while at the same time restraining their potential for self-reliance. In Lincos official material, it was stressed that it was up to the community to make the most of their Linco, yet they were given hardly any resources to do so. Each community was allocated 25 000 pesos (approximately $1.100) to cover their monthly expenses. The income from the services the Lincos provided could be added to that as revenue, but that amount was typically very small. After salaries had been paid, there was seldom much left. Lincos staff members reported that they frequently had to wait up to two weeks before being able to purchase such things as paper and toner.

Money was not the main problem, however. Most of the sites visited in this study experienced problems with the technologies. At one center, the Internet connection was down for a month, at another the telephone never worked, and at several there were problems with the computers. When faced with broken machines, the Lincos staff was often helpless because of the very limited means for communicating with the central office. One of the centers reported not having had any contact with Lincos officials for three months. A staff member indicated that "[the computers] all have problems, all of them do. But we don't have any resources to fix them and we can't get a technician to come here and fix them. [...] The Ethernet cards are wearing out on some of them, that's why we can't get Internet on some of them, but we can't replace them". They could not even reformat the computers because nobody knew where to find copies of the pre-installed software. And even if they did, staff members were afraid that they would not know how to use them. At most of the Lincos sites, limited financial resources and technical skills, and the dependency on external engineers, severely reduced their capacity for self-reliance; the poor communication between the centers and the officials was often the cause of frustration.

Meaningful & Transformational Usage

When asked to explain the benefits of the computer labs, most people replied by mentioning that young people were now able to learn how to use a computer, an opportunity that did not exist before. When asked further why this was beneficial, answers were less easily forthcoming. When a response was given, it was typically that the youth would learn computer skills and in that way hopefully manage to obtain employment… preferably local employment. However, the Lincos communities with their very high unemployment rates generally suffer from their inhabitants fleeing to the cities in search of income opportunities. The Lincos project, even were it to succeed in teaching computer skills may actually expedite the process of out-migration. As one Lincos worker put it, " If you are in computers here, what can you do? There is nothing here!"

Lincos did exhibit ways of using its equipment in more self-sustainable ways, however. In one village, a young man who had spent several years working in a "Zona Franca" or "free trade zone" and was determined to never do so again, decided to make a garden out of his backyard in order to live off the consumption and selling of his crops. Knowing nothing about gardening, he borrowed an educational video from the local Lincos center and learned enough to get the crops going. This example may suggest a further element of the Lincos case – namely that the Lincos' benefits are dependent on individual initiatives while also contributing mainly to the advance of individuals rather than, as Lincos has stated as its ambition, to promote and become a natural part in the strategies supporting the advance of the community as a whole (see Lincos website).

The wish of many, however, was that the Lincos project and its anticipated result in developing computer-literate people, would help to attract businesses to the individual communities. A hope expressed in one of the villages was that a "Zona Franca" be established in the region. People who had learned

computer skills at the Lincos would then be able to find employment in this free trade zone, it was suggested. Such a development would certainly be in line with the dominant vision of ICT-for-development, which regards a nation's commercial growth as the primary source of development, and envisions ICT to be its motor. ICTs in this case would be used to marginally, and occasionally, improve the financial situation of occasional individuals but not to provide assistance in communitarian strategies towards structural social change.

Conclusion

This paper has attempted to provide a critical social perspective on a specific project but within the context of the broader use of ICTs as support for development. If and how citizens of marginalized communities should use ICTs are decisions that have to be made by these people themselves. Today, however, the dominant discourse informing such decision-making is deeply biased towards the excellence of Western technology – as the Lincos experience vividly demonstrates – and thus one important task of critical activists and investigators is to begin a process of exploring alternative understandings and strategies.

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The modal nature of ICT: Challenging historical interpretation of the social understanding and appropriation of ICT

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Abstract

This paper proposes a sociological model for understanding the social appropriation of information and communications technology (ICT). It is argued that the relationship between a media form and the society in which it is deployed is of key import in understanding how media is used. An account is given of the way in which the power of ICT to affect society has been understood. It is argued that positions within this debate are deeply tied to Western cultural beliefs and values. An alternate model of technology is proposed. In this model ICT is regarded as 'modal' in operation, that is, it may operate differently in different situations.

Introduction

Information and communication technologies (ICTs) have been widely understood to bring about social change. For example, ICTs have been thought to: invigorate economic systems (Gates, 2000), empower citizens (Gore, 1994) and even contribute to social and psychological well-being (Cole, et al., 2001). This article advocates a slightly different position; that the ability of a media or technology, such as ICT, to bring about change is tied very much to the social form of the society in which it is deployed. The manner in which a technology is used, its "local" appropriation, is argued to be more closely linked to the social organisation of the society in which the technology is deployed than any essential qualities the technology itself is understood to possess. This argument was, of course, initially set forth by Raymond Williams (1974). Moreover, it has received a partial re-articulation by a number of academics in recent years, (Slevin, 2000; Miller & Slater, 2000; Selwyn & Gorrard, 2002) but has seemingly lost out to the neo-McLuhanite approaches advocated by numerous techno-optimists (Bolter, 2002). The emergence of Community Informatics as an academic discipline presents an opportunity to re-engage with the social side of ICT. Indeed as Selwyn and Gorrard contend "there is clearly a pressing need to step beyond the limitations of previous analyses of ICT if we are to gain a deeper understanding… We need to be aware of the social, cultural, political, economic and technological aspects of ICT–the 'soft' as well as the 'hard' concerns" (p. 6). As Harris (2002) and Taylor (2004) both indicate, Social Informatics is a discipline that requires focus to be placed not upon the rarefied use of ICT but upon their use in social situations. In such situations, the "dominant referent discipline" (as Harris suggests), moves from economics and marketing to social science. This shift to a social scientific, if not a sociological, critical idiom incorporates an implicit re-emphasis upon social factors in the understanding of the use of ICT.

Much early literature on the subject of the social use of ICT incorporated a sense of "technological utopianism". ICT was understood as a means by which desirable values, understood to have been lost in recent times, could be restored. Rheingold (1993), for example, utilising an instrumentalist conception of technology usage, proposed, "one of the explanations for the virtual community phenomenon is the hunger for community that grows in the breasts of people around the world as more and more informal public

spaces disappear from our real lives" (p. 6). Similarly Schuler (1996), with a more technological determinist approach, contended that virtual communities "can—in concert with other efforts—play a positive role in rebuilding community by strengthening…. core values" (p. 34). The emphasis here has been very much along liberal progressive lines and perhaps narrow conceptualisations of communities, core values and "positive" roles.

Such opinions can be seen as examples of a belief in the power of ICT to provide a "technological fix" (Selwyn & Gorrard, 2002)—the ability of technology to solve complex social problems. Leaning (2004) argues that such an interpretation of ICT arises as ICT has primarily been studied in societies in where such beliefs are the common currency. ICT is imbued with a potency to restore liberal values as it has primarily been studied in societies where such values are desirable and perceived as being threatened. This argument resonates strongly with the views of Downing (1996), who argues for the study of ICT (along with other media forms) outside of the traditional laboratories of Western Europe, North America and Oceana.

This article continues this line of argument. It is asserted that ICT's potency to cause change is closely tied to the society in which it is deployed and, furthermore, attention should be placed upon both the technology and the society equally. As Miller and Slater (2000, p. 11) argue, "if you want to get to the Internet, don't start from there".

However, the relationship of ICT to social form has as yet to be fully explored. This article is concerned with sketching a sociological model by which the relationship of ICTs to society may be understood. This proposal consists of two arguments. The first is that current understandings of the way in which technology is used, appropriated and affects society derive from the experience of technological development and the philosophic interpretation of this experience in Western societies. In many instances it is the West's experience of technology that has shaped and informed the general cultural interpretation of how technology can and should be deployed and used. Regarding the West's experience as universal is problematic for, as Hård and Jamison (1998) propose, cultural tradition plays a considerable part in conceptions of technology and technological power. What is required is recognition that current interpretations of the power of ICT are deeply and historically situated within a Western cultural milieu. The intricacies of this interpretation need to be foregrounded and examined.

Secondly, an alternate model of how technology may operate in relation to society is needed. While the current model of ICT power is intricately bound up with a Western interpretation, it must be acknowledged that technology and social form do exist in a close relationship. What is needed, therefore, is a model of technology that does not "close off" non-Western cultural interpretations of technology. This model regards technology not as in some way an external force affecting society, but as a phenomenon constructed, appropriated and understood by society. The model conceptualises technology not as a fixed external, eternal aspect of the social world but instead as a part of the social world. Accordingly, ICT should be regarded as something operating and existing in a plurality of forms. Technology needs to be understood as something that may interact with society in various ways. It is proposed here that ICT be understood as being "modal"—something that may be used in a particular way in one society but in a different way in another. Technology possesses no quality that necessitates its particular form of use or societal level consequence.

The Understanding of ICT's Relationship to Society

Underpinning discussions of technology, such as contemporary discourse surrounding ICTs, are deeply felt, but often unarticulated, assumptions of how technology and people interact. The relationship between technology and society, particularly in discussions concerning new technologies, is often assumed to be of a simple deterministic nature; the introduction of new technology causes social change. However there are slight, historically situated, variations to this model. In proposing a philosophical-anthropological orientation to the study of technology, Feenberg (1999) contends that within modern discourse the relationship of technology with society has been conceived of in a number of different ways. Using a broadly Kuhnian (Kuhn, 1962) approach, Feenberg argues that discourses of technological understanding, like scientific paradigms, emerge from "local" historical conceptions, and are interwoven with political and social projects. He asserts that the development of such an analysis is key to grasping a sense of

technology's significance, asking "How can one study specific technologies without a theory of the larger society in which they develop?" (Feenberg, 2003). The categories Feenberg identifies, instrumentalism, determinism and substantivism, thus may offer a richer and more detailed account of the beliefs underpinning accounts of technology, and consequently ICT.

Instrumentalism

Feenberg states that the classical disciplines of the humanities exclude science and technology. It is only since the emergence of the discourses of modernity that accounts of technology have become more central. However, as Winner (1987) notes, such views of technology were largely instrumental, as technology was often subsumed under the rubric of "economics" or "politics". This account of technology persists today, for, as Winner (1987, p. 2) states, there is still an open "tendency … to see the matter solely in terms of economics and economic history". In addition to the relegation of technology to a position subordinate to economics or politics, instrumental accounts of technology tend to centre on certain unchallenged assumptions. Winner (pp. 25-27) states that: "In the conventional perspective… technical means are by their nature mere tools subject to the will of whomever employs them.… Technology is essentially neutral. In the conventional way of thinking, the moral context appropriate to technical matters is clear. Technology is nothing more than a tool."

The *instrumental* understanding of technology holds that technology is "essentially neutral" and subservient. The idea of the neutrality of technology presupposes an established position of objective truth, one that has been discerned through scientific investigation. According to this idea, technological artefacts are different from cultural artefacts in that they are purely means-oriented, a position arising out of a view of technology as essentially progressive. Furthermore, in instrumental thought, as Feenberg (2003, p. 3) notes, technology "appears as purely instrumental, as value-free. It does not respond to inherent purposes, but is merely a means of serving subjective goals we choose as we wish". Instrumentalist readings of technology still circulate widely within the more scientific disciplines and have proven quite influential in more positivist approaches to the study of communication (see for example Weaver and Shannon, 1963).

Determinism

Along with the instrumental reading of technology, a second and persistent understanding of technology is evident within the discourses of modernity. Broadly referred to as *determinist*, this category has as its mainstay a belief in the potential of technology to bring about social change on a macro or societal level. Technological determinism has proven a strong and persistent strand of thought in understanding the role of technology within modern Western thought even though it seems rarely to be explicitly stated. Marx and Smith (1996, pp. ix-xv) contend: "A sense of technology's power as a crucial agent of change has a prominent place in the culture of modernity. It belongs to the body of widely shared tacit knowledge that is more likely to be acquired by direct experience than by the transmittal of explicit ideas".

Similarly, Bimber proposes: "Technological determinism seems to lurk in the shadows of many explanations of the role of technology" (1996, p. 80). With regards to a general description of technological determinism, Heilbroner summarises the argument as follows: "Machines make history by changing the material conditions of human existence. It is largely machines… that define what it is to live in a certain epoch" (1996, p. 69). Feenberg contends that such a trend emerged out of notions of progressivism within the Enlightenment and, more specifically, an engagement with the progressivism of Marx and even Darwin (2003, pp. 1-2). In post-Enlightenment European society, progress came to be broadly equated with an acknowledgement of technology's power; "progressivism had become technological determinism" (Feenberg, pp. 1-2).

This form of understanding has proven highly persistent and popular. It continues to manifest itself in numerous formats. For example, one particular and contemporary understanding equates the deployment of technology with improved social conditions. A number of populist accounts, for example Kawamoto (2003), regard the deployment of ICT as a necessary precursor to the development of a "knowledge economy" or "information society". Several national governments have sought a rapid deployment of

technology in pursuit of economic and social development. For example, in a statement by the Welsh Assembly detailing its *Information and Communication Strategy* it is contended that: "Many of us are now using computers, mobile phones and the Internet…These technologies have the potential to transform society and the economy in Wales; they are already doing so in many parts of the world. The choices we make now—about which new technologies we use and, more importantly, how we use them—are crucial to the future of Wales and will help us to create a Better Wales!" (Welsh Assembly Government, 2003).

Similarly, the Malaysian government has instigated, and to a degree acted upon, plans to "leapfrog into the Information Age", developing a "Multimedia Super-Corridor", a region of technological development incorporating purpose-built cities and a university all underpinned by highly developed technological infrastructure (Multimedia Development Corporation, 2000).

Substantivism

A range of attitudes broadly termed *substantivist* challenge the determinist belief in the neutrality and truth-revealing nature of technology (Feenberg, 2003, p. 2). As instrumentalism and determinism are understood to have emerged from empiricist and positivist tendencies within Enlightenment thought, substantivism is understood to have arisen from the distrust of technology and the reassertion of the "natural" found within Romanticist discourse. Similar to determinist discourse, substantivists contend that technology can directly intersect with and modify social life. However, substantivism avoids the utopian and optimistic tendencies that characterise determinist accounts and instead maintains deep reservations about technology. Technology is understood to, inherently, subjugate the user to systems not initially declared in the operation of the technology. Such a belief reaches its most eloquent form in Heidegger's *The Question Concerning Technology* (1954). Heidegger proposes that technology is far from the neutral or simply goal-oriented system determinists or instrumentalists would claim. Rather: "we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology" (p. 4).

Technology contains an "essence": Heidegger envisages that technology is not about achieving goals but about revealing or bringing forth the use of a resource. However, "modern technology is fundamentally different from what Heidegger regards as ancient technology. The form of revealing is primarily different because of the physics-based nature of modern technology that allows for the ordering of a "standing reserve" at the behest of humans. This is opposed to the fundamental primacy of natural forces in old technology. However, Heidegger regards modern technology as inherently insidious, as humans do not control this; humans form part of the system of standing reserve. Humans are "enframed" by technology and technological systems and lose their freedom through their incorporation into technological systems. While Heidegger offers a radical reading of technology it lacks a sociologically "critical" aspect in that "fault" is understood to lie with modern technology as an entity as opposed to the more critical conflicts and power relations that underpin modernity.

Substantivist thought also incorporates a spectrum of opinion that links the subjectifying nature of technology with specific political projects—a radicalising and politicising of Romantic thought. Technology is conceptualised as inherently political, Winner contends: "At issue is the claim that machines, structures, and systems of modern material culture can be accurately judged not only for their contributions of efficiency and productivity, not merely for their positive and negative side effects, but also for the ways in which they can embody specific forms of power and authority" (1996, p. 28).

At the core of such claims lies a different conceptualisation of the nature and understanding of the origin of technological artefacts to that of the instrumentalists and the determinists. Here, in an engagement with Kuhnian theory, substantivism explicitly challenges the notion that technology is a truth-revealing (or revealed) phenomenon; on the contrary, technology arises from, and is broadly shaped by, society. Substantivists argue that technology cannot be distinctly discerned from other forms of cultural production and, as with all forms of cultural production, technology is inherently stained by the situation of its material and economic production.

Substantivism offers a theory not only of the effects of technology upon society, but also of the effects of society upon technology. Qvortrup opines that new technology "cannot be properly understood if we persist in treating technology and society as two independent entities" (1984, p. 7). Technology needs to be

understood as a component of society. Consequently, and most importantly, technology is in essence determined by the society in which it originates. It is an artefact of a civilisation and not "a progressive quest towards truth". Technology is not the neutral artefact presumed by instrumentalists and determinists. For a substantivist, technology is inherently compromised by its site of production. As Marcuse proposes: "Specific purposes and interests of domination are not foisted upon technology 'subsequently' and from the outside; they enter the very construction of the technical apparatus. Technology is always a historical-social *project*: in it is projected what a society and its ruling interests intend to do with men and things. Such a 'purpose' of domination is 'substantive' and to this extent belongs to the very form of technical reason" (italics in original, 1968, p. 224).

It is in this critical and dystopian dimension, where technology contains the insidious "will" of its situation of manufacture, and where substantivist accounts are distinguished from the utopian progressive accounts of technology proffered by determinists. Technology is inherently a problematic system of control for substantivists, a form of instantiated power. Contrasted with the instrumental and determinist interpretations of technology, substantivism offers a highly pessimistic and critical reading of the further integration of social functions within systems of technology.

The above-noted multiple forms of understanding of technology's interaction with society constitute the general range of opinion on the topic. While the range of views examined is not exhaustive of the entire body of thought within the field, the beliefs and opinions cited can be considered to be representative of the general prevailing ideas in circulation and they can be seen to set out the parameters of the debate.

The Alternate Model: ICT as Modal

In examining the deep cultural and historical origin of the arguments surrounding technology, the very nature of the way in which technology, and consequently ICTs, are conceptualised is questioned. As technology may be interpreted in differing ways, a conceptual model of technology and ICT that allows for multiple interpretations is needed.

In light of this, it is proposed that ICTs be regarded as contingent or modal forms of communication. It should be noted that this use of the terms "mode", "modal" and "modality" is distinct from a number of other uses of the terms in media and communications theory. Rather than arguing that ICTs are a mode or form of communication or cultural transmission—it is proposed that the ICTs *have* modal quality in relation to their use, that they have different modes of use. As with Thompson (1990, pp. 216-264), it is argued that media, such as ICTs, are socially contingent means of communicating information and, following Kress and Van Leeuwen (2001), that the Internet itself is a mode of communication, or as Slevin (2000) proposes, that it is to be seen as a modality of cultural transmission.

Therefore, the use of the term here is different. Modal refers to the multiple ways in which ICTs may be read, understood and used. Although ICTs may function in certain ways in some societies, they may not function in that way in *all* societies. ICTs may cause change and, as has been noted by numerous previous researchers, may bring about new ways of acting. However, we are contending that they may not do so in the same way in all societies, with the ability of technology to cause change being deeply linked to other aspects of social life. ICT, thus, is not understood as an asocial channel that passes information, regardless of the environment in which it is used. Instead it needs to be understood as deeply linked to the social systems and contexts in which it is used—ICT use depends upon the social environment.

It is therefore proposed that, methodologically, ICTs be conceptualised in the following way:

> ICTs are a modal form of media and their use and appropriation may vary according to the environment in which they are used. Therefore, to examine ICTs, attention should be focused upon the interdependence of social systems, media technology and form of action studied.

Like all technology, ICTs are not outside of society, they are interpreted, appropriated and used within social frameworks. Consequently there can be no single interpretation of the outcome of their use—they will not have the same effect in all places and at all times. We must, therefore, understand their use as deeply linked to the society in question.

Adopting such a position involves stepping back from the direct acceptance of our view of technology or of our interpretation of what technology can do. It challenges the idea that either technology or society should be considered as *a priori* in conception. The focus of attention shifts from a focus upon the implicit potency of a technology to an analysis of how a society makes use of the technology. As noted above, it affords an opportunity to develop a social account of the use of ICT, an approach that integrates the potency of ICT within a social or sociological account of action. It is argued that the discipline of Community Informatics is well suited to, and will benefit from, developing a critical idiom that can examine the technological and sociological in concert rather than as discrete and distinct elements.

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Mapping the Virtual in Social Sciences: On the Category of "Virtual Community"

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Abstract

Lately the term "virtual" has been used more and more frequently by both scholars and journalists to refer to social phenomena and entities. Quite representative of this trend is the phrase "virtual community" which has been rapidly accepted in common language. However, its use by social scientists raises many questions. Since the words "virtual" and "community" are both polysemic, what exactly might the term "virtual community" mean? And what new kind of collectivity is it supposed to circumscribe? Doesn't it imply a sort of nostalgia for a mythical form of community, along with an idealization of face-to-face interactions? This paper attempts to offer some elements of solution to these questions by means of a critical examination of recent social science texts.

The virtual, so often praised, is becoming more and more used as a term, tending to replace the vernacular use of "the network". In so doing, it is undergoing the same variations and shifts. Like the network it is a gateway notion which serves to join opposites, to render them a single entity, in a formula which faithfully reproduces the behaviour of the contemporary network in its Internet form. - Lucien Sfezi[1]

Introduction

This article is triggered by what appears to be a growing tendency in both academic and popular discourse: recourse to the notion of the "virtual" as a way of describing social phenomena and, indeed, social realities. Particularly in recently published English-language work, but also in much that is published in French, we find the adjective attached to notions and concepts as diverse as culture, society, community, democracy, university, enterprise, territory, and geography—to cite only the most striking. Emblematic of this tendency is the rapid diffusion of the expression "virtual community" through media channels, whose pervasiveness is such that it has almost become a cliché. This *naturalisation* of the neologism popularized by Howard Rheingold (1993) accompanied others, such as "virtual reality" and "cyberspace". Drawing on a statistical study of the occurrence of the phrase "virtual reality" in the print media between 1988 and 1993, for example, Biocca, et al. (1995, pp. 5-6) talk of a "meteoric trajectory", seeing it as a symbol of "both our enthusiasm and ambivalence about social and cultural transformation through technology."

It is as though the discursive inflation aiming at the promotion of what Phillippe Quéau (1993) called the *techniques du virtuel* (virtual technologies) had stimulated the opening, or at least reopening, of vast theoretical worksites across the social sciences, including sociology, anthropology, political science, history, geography and urban studies, linguistics, literary studies, and communication, as well as philosophy (Holmes, 1997a). Virtual reality, virtual community, and social reality are the recurring themes

of these reflections, often critiques or polemics, which propose to re-examine old problematics in light of "the virtual". Yet in comparison to the sheer volume of such writing, little work appears to have been done on the usefulness or even pertinence of constantly referring to this notion as a way of shedding light on the social field. Do said notions really offer something that was missing? If so, are they deployed appropriately? Do we not risk becoming slaves to fashion, mouthing computer science jargon preprocessed by marketing specialists? How might the notion of virtuality be articulated as a detailed description of the new social uses that are linked to the technological reticulation of human territories?

This article represents a first effort to sketch out a response to these questions, via an initial cartography of the uses of virtuality in a corpus of recent writing which, to us, appeared significant within the field of the social sciences.ii[2] The first difficulty in developing a critical approach to this corpus was that, while the various authors' definitions of the virtual relied on one another so as to be mutually reinforcing, only rarely were these definitions or their sources made explicit. Hence, most of the articles in our corpus which dealt with *virtual communities* defined the expression vaguely at best, deferring to a notion of virtuality that was even blurrier—to the point that it is tempting to speak of "virtuality" in the social sciences as, indeed, a virtual concept. Fernback and Thompson's observation (1995) remains pertinent: "Virtual community as a concept is still amorphous due to a lack of shared mental models about what exactly constitutes community in cyberspace."

If we have chosen to concentrate on the expression "virtual community", it is precisely because that term appears to crystallize the key misunderstandings and ambiguities that litter the linkage between social and virtual. That situates our investigation at the heart of a debate operating at several levels, because it intersects with a line of questioning which continues to haunt sociology—the very definition of community as a form of social organisation and figure of life in society. Indeed, if we return to the traditional definition for community (*Gemeinschaft*) formulated by Tönnies (1992 [1887]), we are confronted by a collective founded on geographic and emotional proximity, involving direct, concrete, and authentic interaction between its members. It is, then, paradoxical in the first instance to associate with "community" the qualifier "virtual", linked as it is the ideas of abstraction, illusion, and simulation.

Some have openly wondered (Tremblay, 1998) about the usefulness of coining a new concept and of the words selected to name it. What new social phenomenon is being described and illuminated? Certainly, a context in which discourses underlining the radically new character of computer communication technologies invites caution (Markley, 1996; Mosco, 1998). And the terminological haze generated by the coexistence of various related phrases often employed as synonyms—online or computer-mediated communities, electronic communities, tele- and cyber- and techno-communities, techno-sociality, and so forth—contrasted with the prudence with which certain authors tiptoe around the term "virtual communities" betrays a certain malaise.

But we have no wish to act as linguistic referees and are utterly disinterested in legitimating or denouncing how the notion of "virtual community" is used. The opposite, in fact: we believe that, beyond its intrinsic qualities or failures, the persistence of this expression—which is moving beyond the status of neologism to emerge as a field of research—may be explained precisely by its problematic character (Wilbur, 1997); similarly, its performative aspect must not be neglected. Rather than staking out a position in this debate, then, we attempt to delve into it transversally, hoping to dislodge the motivations behind, and key challenges awaiting, this recent propensity to consider the social through the dawning of the virtual.

Between the Ersatz and the Sublime: Three Ways to Conjugate the Virtual

The etymology of the adjective "virtual" brings up more ambivalence than clarification, which partly explains the wide variations in its meaning and the confusion it engenders (Wood, 1998, p. 4). Blaise Galland (1999) notesiii[3] that "the history of the term 'virtual' depends upon the social uses which we make of it." And Pierre Lévy (1995, p. 13) points out that the word comes from the medieval Latin *virtualis,* itself a derivation of *virtus*, literally "force, potential". According to the French dictionary *Le Petit Robert*, to be virtual is thus to "not be so except potentially"—"potentially", with regard to an actualisation which may or may not take place. In this sense, the virtual is *real* but "not present". Yet *virtus* also signifies *virtue* (Cadoz, 1994, p. 8; Granger, 1995) in its archaic sense of "quality" or "power". It is interesting to note that it is particularly in English-language writing that the ethical implications of this "semantic overlap

between the terms 'virtue' and 'virtual'" are underlined (Keown, 1998, p. 76). Shawn Wilbur (1997, p. 9), for example, considers this notion of virtuality profoundly rooted in "a religious world view where power and moral goodness are united in virtue."

As Gilles-Gaston Granger (1995) and Jean-Michel Besnier (1995) explain, it is the physico-mathematical sciences which, from the 18th century, helped spread the use of the word "virtual" and diversified its meaning considerably according to its field of application. Its use in mechanics, the theory of forces and of movement, refers to non-observable phenomena, but in an etiological or explanatory manner. Hence Dirac's notion of "virtual particles", so fleeting that they cannot be detected individually, yet whose influence can be statistically measured (see Iliopoulos, 1995). In other cases the virtual realities of physics are purely imaginary constructs, underscoring the idea that the empirical world is but one actualisation from within "the matrix of possible [worlds]" (Besnier, p. 6).

"Quite naturally, it is the notion of model which positively connotes that of virtual," in Besnier's summation (1995, p.13). That the model's status is ambiguous, however, is as obvious to common sense as it is to philosophers, for if it connotes a sense of "purification" or of "ideal" which underlies empirical phenomena, it can also evoke the reduction through abstraction of a richer reality. The fundamental ambiguity of the virtual may also be linked to its use in optics: an image is said to be *virtual* when it appears to form between a real object and a divergent lens (magnification). Unlike the *real image* produced by a convergent lens, the virtual image cannot be materialized on a screen, because it exists only on the retina. This "image", in other words, is but a *subjective perception.* It does not exist independently of the subject-spectator. To a certain extent, optics assimilates virtuality to *illusion.*

We see, then, the outlines of two very distinct methods of imagining the relationship between the virtual and the real in the physical sciences, each of which has influenced the epistemology of the virtual in its own manner. While the theory of forces opposes the virtual to the *actual* or *present,* two modalities of being each as "real" as the other, the theory of light—closer to ordinary intuition—opposes the virtual and the real.

It is therefore unsurprising that philosophy and the social sciences have also diverged. In these interpretations of the notion of the virtual; the "new technologies" linked to the virtual have helped both to reveal and to catalyze these divergences. Marcus Doel and David Clarke (1999) offer a particularly useful synthesis of these different thought streams, noting that "the most important error [generally committed] is the reduction of reality to actuality and virtuality to possibility: as if the actual and the virtual were the *given* and the *pre-given*, respectively" (p. 262). They continue: "it is the need to rethink space-time rather than any new-fangled technologies, which poses the most pressing challenge".

Starting from Doel's and Clarke's observations, themselves based on a vast theoretical corpus, we have retained three principal approaches to virtuality for categorising the different discourses on "virtual communities". In preparing a schematic, these approaches may be distinguished by the types of relationship they pose between the real and the virtual and by the shifts in meaning which they favour. In the first approach, the virtual is "subordinated to (...) the real" and refers to *re-presentation*; in other words, to the simulation and therefore the "false approximation" of reality constituted by virtual images and computer-generated virtual reality (p. 262). The latter is perceived as a "facsimile of the real" (p. 265)—a *copy*, but "necessarily degrade[d]" (p. 263), "a reality divorced from the world" (Slouka, 1995, p. 13), a "false reality" (Lebrun, 1996), a "simulacrum" or a "double" of the real (Baudrillard, 1981, 1996), to be considered pejoratively given the inherent "duplicity" of any duplicate (Doel & Clarke, 1999, p. 264).

Diametrically opposed to this discourse of denigration, the second approach sees virtuality as the "resolution" of a world overwrought by imperfection as the very consequence of its presence, which is but a subset of the universe of possibilities—and therefore an unavoidable impoverishment. "In this case, the virtual is to the real as the perfect is to the imperfect", in Doel and Clarke's formulation (1999, p. 268). Those adopting this approach inverse the relationship between the virtual and actual-present invoked above. For Pierre Lévy (1995), to virtualise an entity or a process is to return to its essence, to its abstract and general being, and in so doing, to the matrix of its possible actualisations. Here, computer simulation is no longer considered a degradation but a tool for exploration, to "auscultate reality" (Weissberg, 1999, p. 49), even to amplify or reduce it. As for global communication networks, they emancipate human activity from the constraints of materiality, space, and time, opening onto unprecedented opportunity. In this sense,

the virtual is "fuller" than the actual, it is "hyperreal", and the technologies of the virtual are perceived as *liberatory* to the extent that they offer a portal to the richness of the real: "The real world has always been marked by scarcity. On this basis, evolution figures as a painfully slow attempt to 'fill out' the world a little, and to realise a few more of its possibilities" (Doel & Clarke, 1999, p. 267).

As we see, the two schools of thought discussed above "rest upon a strict [though fallacious] separation of the real and the virtual" (Doel & Clarke, 1999, p. 263). We might add that each is imprinted with technological determinism, since in each case, the irruption of the virtual into the everyday coincides with technological progress. Yet we might usefully imagine a far more complex relationship between virtuality and actuality by considering the virtual as something more than the derivative of a technical apparatus: "everyday life itself is always already a virtual reality" (p. 279). The third approach we have gleaned from Doel and Clarke is thus strongly Deleuzian. It harks back to the *hybridisation* of the real and of the virtual, or more precisely, to the immanence of the virtual in the real and a conception of the real in which the actual and the virtual are in a circular and productive relationship. From their perpetual interaction springs a real which is in constant "creation and experimentation" (p. 280).

To better schematise this reading of contemporary discourses on virtuality, we might note that our grid oscillates between two extreme visions, the ersatz and the sublime. The first, "*paranoid*" (Boal, 1995, p. 9), tends to discredit the virtual as an "artificial reality", opposed somewhat naively to a "mythical" nature (Woolley, 1992, p.8). Even Brook and Boal (1995), who talk of resisting any simplistic idealisation of the "natural life", wind up calling for "resisting the virtual life", for "virtual technologies are pernicious when their simulacra of relationships are deployed societywide as substitutes for face-to-face interactions, which are inherently richer than mediated interactions" (p. viii).

The second version of the virtual is, in contrast, utopian, even euphoric (Bardini, 1996; Robins, 1996; Weissberg, 1996). It apprehends virtual worlds as the pioneers of the American Old West talked of the "frontier" (Eudes, 1996; Wilbur, 1997, p. 8), or again as the "quest for the Holy Grail" of technology (Heim, 1993, p. 124). Kevin Robins cannot resist waxing ironic in his description of these "dithyrambic discourses […] about virtual reality" (Bardini, 1996) that participate in an ideology that typically accompanies new information and communication technologies (Breton & Proulx, 1989):

> a faith that (...) a new technology will finally and truly deliver us from the limitations and the frustrations of this imperfect world. (...) The utopian space – the Net, the Matrix – will be a nowhere-somewhere in which we shall be able to recover the meaning and the experience of community (Robins, 1996, p. 2).

Some authors do speak out against what they see as a spurious dichotomy posing virtual against real, proposing instead a third way "towards more textured understandings of the varying forms of virtuality worked through different technologies in different times and places" (Crang et al., 1999, p. 3). Similarly, Michael Ostwald (1997, p. 127) notes that "the rise in virtual technologies is a natural extension of the way in which twentieth-century urban communal spaces already constitute virtual environments." He further points out that "there is often little or no gap between the so-called 'real world' and the 'virtual world' " and consequently, declares it urgent to pay closer attention to "that zone where the boundaries between the physical and the virtual are completely blurred" (p. 128).

Simulated Communities or Stimulated Communities?

In picking up the three perspectives laid out above, we shall try and show that they underpin the principal viewpoints expressed in the literature on virtual communities. First, however, we shall dally on the context in which this notion emerged within public space.

If the origins of the expression "virtual reality" may be situated with relative precision—the term was worked out by computer engineer Jaron Lanier around 1989 (Pimentel & Teixeira, 1993; Woolley, 1992)—the origin of "virtual community" remains as nebulous as its definition. Sandy Stone (1991) attributes the moniker to a group of networking pioneers who created one of the first Bulletin Board Servicesiv[4] (BBSs), CommuniTree: "[They] had developed the idea that the BBS was a virtual community, a community that promised radical transformation of existing society and the emergence of new social forms" (p. 88).

We might surmise that the expression "virtual community" appeared as a synthesis between, on the one hand, the growing fascination with the very word *virtuality*—as much in the popular imagination of engineers as in the imagination of "gurus" like Timothy Leary—and on the other hand, the term *online community*. The latter was introduced toward the end of the 1960s by two of the "fathers" of computer-mediated communication, J. C. R. Licklider and Robert W. Taylor (1968 [1990]), in a visionary text entitled "The Computer as a Communication Device", and described as follows: "they will consist of geographically separated members (...). They will be communities not of common location, but of *common interest*" (pp. 37-38).

In all cases, it was through the Sausolito, California-based BBS called the WELL (Whole Earth 'Lectronic Link), founded in 1985, that the notion of virtual community gained rapid notoriety (Hafner, 1997), thanks especially to the widely-discussed book written by one of its most famous members, Howard Rheingold (1993). Rheingold defined virtual communities as "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" (p. 5).

In another passage, he describes them more vividly, and more concretely:

> People in virtual communities use words on screens to exchange pleasantries and argue, engage in intellectual discourse, conduct commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games, flirt, create a little high art and a lot if idle talk. People in virtual communities do just about everything people do in real life, but we leave our bodies behind (p. 3).

Also a well-known WELL user or "member", John Perry Barlow (1995) saw the online community as an anchor—virtual or not—which might restore to the U.S. a social contract under attack from a growing nomadism: "Once again, people (...) had a place their hearts could remain as the companies they worked for shuffled their bodies around America. They could put down roots which could not be ripped out by forces of economic history. They had a collective stake. They had a community."

But the Electronic Frontier Foundation co-founder, author of a "declaration of the independence of cyberspace" (Barlow, 1996), was also inspired by the idea that virtual communities could permit civil society to re-appropriate a governmental function monopolized by an omnipresent State. In this sense, he positioned himself within a political tradition associated in the United States with Thomas Jefferson, a figure to whom Mitch Kapor, EFF's other co-founder, referred explicitlyv[5]: "Life in cyberspace seems to be shaping up exactly like Thomas Jefferson would have wanted: founded on the primacy of individual liberty and a commitment to pluralism, diversity, and community" (1993, p. 53).

For Stone (1991), the constant mention of trees in Barlow's discourse and in names like CommuniTree are significant, referring not only to the logical tree structures used in computer science, but "also the organic qualities of trees as such appropriate to the 1970s" (p. 89). As should be clear, the notion of virtual community was directly inspired by the values of the Californian counter-culture of the 1970s, presenting itself as a new federating myth capable of regenerating the communitarian dream: "The conferencees saw themselves not primarily as readers of bulletin boards or participants in a novel discourse but as agents of a new kind of social experiment" (p. 90). Stone goes on to underscore the fact that these socio-technical experiments were built upon the use of *shareware* software similar to what is now called "free software": "The idea of shareware, as enunciated by the many programmers who wrote shareware programs, was that the computer was a passage point for circulating concepts of community" (p. 88).

Yet Sherry Turkle (1995) picks out a significant ambiguity in these communitarian aspirations. Comparing microcomputing's first users to the first users of MUDs (Multi-User Domains)—virtual realities shared via a text-based interface—Turkle notes that where the former saw in "their relationships with the computer—building safe microworlds of transparent understanding—(...) a political metaphor" transposable to society at large in order to install "a more participatory political system", the MUD world started out quite differently: "When nearly twenty years later, another group of people has turned to computation as a resource for community building, the communities they are thinking of exist on and through the computer" (p. 243).

Developing this idea, Turkle notes that "if the politics of virtuality means democracy online and apathy offline, there is reason for concern" (*op. cit.,* p. 244). Her remarks highlight a distinction between virtual community and community networksvi[6]. While "virtual community" refers to social forms built upon communities of interest rather than geographic proximity, "community networks" translates citizen appropriation of interactive networks into the context of *local* democratic development (Schuler, 1996).

This distinction vis-à-vis virtual communities poses the problem of their "reality". What is their sociological "consistency", and especially, what is the scope of the role that such communities can play at the macro-social level? In other words, "to what extent do most virtual communities provide individuals with opportunities to contribute to the greater collectivity?" (Fernback, 1997, p. 42). A review of the three conceptions of the relationship between virtual and real noted above—representation, resolution, and hybridisation—helps establish a framework for thinking through these questions.

Let us start with representation, which conjures forth several notions. One is *fiction:* Margaret Morse, for example, imagines mediatised relations as "fictions of presence" (1998, p. 17) without denying them an obvious efficiency. But representation also evokes the idea of imitation, or—to slip into computers—of emulation. That is the meaning that the word "virtual" has acquired in computer science, notes Benjamin Woolley (1992, p. 58), following IBM's commercialisation in 1972 of a product called *virtual memory,* "a simulation (...) that is perfect in every detail, except that it might be slower than 'real' memory" (p. 60). In this sense, a virtual community might be interpreted as the "functional simulation" of community—with the accompanying danger of a certain loss of meaning in translation.

Such an idea might seem overly exaggerated. Note, however, Turkle's thesis (1995) that the "culture of simulation" has penetrated our civilization, and restructured our daily lives, as profoundly as have the computer and the television before it. She calls this process a "Disneyland effect" (p.236) that promulgates the aberrant belief in shopping malls and other recreational complexes as convincing replies to the small villages of yesteryear, with their marketplaces and church towers. That leads into a highly critical charge against virtual communities: "Is it really sensible to suggest that the way to revitalize community is to sit alone in our rooms, typing at our networked computers and filling our lives with virtual friends?" (p. 235).

Others go further, abhorring the notion that "simulacra of community" might replace "real" communities. Fernback and Thompson (1995) reproduce the remarks of Ed Schwartz, for example, advanced in an online discussion forum on the topic of "Communet": "[Computer bulletin boards] add the final mechanism needed to insure that we never talk to people beyond our immediate friends and family on a personal level about anything. The global community, linked by terminals, replaces community where we are." Frank Weinreich (1997) makes a similar argument: "I don't see that we have already gone so far that we have lost 'real' contact to each others. But the danger is imminent if we go on believing that we might constitute and run communities solely in the virtual world."

To complete the portrait, note Michael Heim's position (1993), very much inscribed in what is a dark and, ultimately, determinist vision of the virtual:

> Computer communication cuts the physical face out of the communication process. (...) Even video conferencing adds only a simulation of face-to-face meeting, only a representation or an appearance of real meeting. (...) Face-to-face communication, the fleshly bond between people, supports a long-term warmth and loyalty, a sense of obligation for which the computer-mediated communities have not yet been tested (p. 102).

If the second, opposing approach to the virtual is that of resolution—that is, a virtuous role in which the virtual provides what the real lacks—it is easily recognized in the enthusiastic and even proselytising discourse of Rheingold (1993). Though he acknowledges an absence of critical distance triggered by ongoing immersion in the experience, he nonetheless assigns to virtual communities some "liberating potentials" (p. 4), since CMC "enables people to do things with each other in new ways, and to do altogether new kinds of things—just as telegraphs, telephones, and televisions did" (p. 6). Pierre Lévy (1997) goes further in this direction, proposing a vision which might be called promethean:

> Mexican cuisine fans, Angora cat lovers, fanatics of a given programming language, or passionate readers of Heidegger, once dispersed across the planet, now have a familiar place to meet and to talk. We may therefore support the notion that so-called 'virtual communities' do in

> fact manage a veritable actualisation (by putting them in touch effectively) of human groups which existed only in potential before the coming of cyberspace (p. 154).

It is unsurprising to see this brand of discourse prophecying the dawn of a new era each time a new communications technology arrives on the scene (Carey, 1989). Indeed, in a text translating a rare skepticism on the part of its author, Barlow (1995) admits that his enthusiasm for virtual community has cooled.

That said, the conception of virtual communities as instances of *liberation* persists, and with it a subtler version of utopia. This conception does not restrict itself to spatio-temporal considerations, of course, and extends to gender, ethnic attachment, social class, sexual identity, and various physical conditions. In short, virtual community is seen by some authors as a means for setting individuals free of the prisons which are their *bodies* and, by extension, of equalizing disadvantages and emancipating social minorities (Plant, 1996; Willson, 1997), notwithstanding the statistical studies computer-mediated communication which continue to reveal significant divides in terms of social class and ethnic origin in Internet access, notably in the United States, and reports showing the persistence of gender and race indicators (Smith and Kollock, 1999), the reproduction of relations of dominance (Herring, 1993), and forms of elitism (Gimenez, 1997).

The approaches to virtual communities described here have to this point placed special emphasis on two aspects in particular: correlation between virtual communities and the emergence of computer networks, and the essentially "abstract" nature (Willson, 1997) of these communities from which bodies are absent. These two propositions are the object of a growing critique which is supported by at least three epistemological arguments. The first concerns the weak articulation between theory and fieldwork. "There have been few detailed ethnographic studies of virtual communities", lament Wellman and Gulia (1999, p. 170), while Beckers (1998) notes that "although the interest on virtual communities is large, the overall quality and depth of the research can be questioned". Smith and Kollock (1999, p. 16) consider that "opinion rather than analysis and evidence characterizes much of" the academic discourse on virtual communities.

The second epistemological critique of the ersatz and sublime arguments sets its sights upon the over-emphasised relationship between virtuality and actuality that permeates much work on virtual communities. In this vein, Wellman and Gulia (1999) recall that:

> both enthusiasts and critics of virtual community usually speak of relationships as being solely online. Their fixation on the technology leads them to ignore the abundant accounts of community ties operating both online and offline, with the Net being just one of several ways of communicating. Despite all the talk about virtual community transcending time and space *sui generis*, much contact is between people who see each other in person and live locally (p. 179).

Sandy Stone (1991, p. 112) broadens this perspective, suggesting that

> participants in the electronic virtual communities of cyberspace live in the borderlands of both physical and virtual culture (...). Their social system includes other people, quasi people or delegated agencies that represent specific individuals, and quasi agents that represent 'intelligent' machines, clusters of people, or both.

This third figure of the virtual community is characterized by hybridity. Indeed, and this is the third epistemological critique, virtual communities may be said to transcend particular technologies or even eras. Stone distinguishes between four eras, each characterized by a typical form of "virtual community", since the formation of the first intellectual and scientific communities in the 17th Century, through radio and television publics, and on to the Internet's MUDs. In developing this framework, Stone defines virtual communities as "incontrovertibly social spaces in which people still meet face-to-face, but under new definitions of both 'meet' and 'face' " (Stone, 1991, p. 85).

Conclusion

A close examination of current Internet events makes it difficult to avoid the conclusion that new collective forms are in the process of being invented. In these new communities, communal resources are

framed, not simply by information, but by the very "presence" of others, be this presence abstract, mental, or paradoxically distant, to borrow a title from Jean-Louis Weissberg (1999). The virtual context of these communities might be grasped through the metaphor of a desert watering-hole, or a "passage point", in Sandy Stone's term (1991). It is a precarious pole of attraction where individuals of diverse and divergent provenances "meet", allowing "unfocused interaction" favourable to the development of collective dynamics to take form.

Unlike classical communities, which are constrained to remain bound by a promiscuity without alternatives, the commitment of electronic collectives is (generally) more fluid. The boundaries are blurred, and so, in a certain sense, their reality may be considered virtual. But let us not fool ourselves: virtuality should not be understood as a distortion of the social, but as one of its aspects, an optical effect of its growing complexity, amplified by its own technological artifacts. That, at least, is one of the ideas that we hope to have pried loose in this brief and limited review of the various uses to which the virtual might be put as a category for thinking through contemporary societies.

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i[1] Sfez (2001, p. 103). Our translation.

ii[2] This study is to a large extent inductive. Inspired by qualitative methodology, it is based on an exploratory sample of current work in the social sciences, rather than an exhaustive sampling. We have

attempted to achieve a certain coherence in retaining mostly academically-oriented writing (monographs, chapters in edited books, peer-reviewed articles, conference presentations) which had set out to take stock of the new social spaces issuing forth from the intersection of digital technologies and communication networks as emerging objects of investigation. We believe that, despite of its exploratory nature, our sample is in this sense quite representative of intellectual production in this field.

iii[3] Most citations of French-language texts here are our own translations.

iv[4] Computers offering asynchronous messaging, to which users connect directly via modem. BBSs were successful in Canada and the U.S. due to the flat-rate pricing of local telephony, but their local "enclosure" and drastic limits on the number of users connected simultaneously—each user monopolising a telephone line and modem—were their chief disadvantages in comparison to distributed networks such as Usenet.

v[5] Also founder of software firm Lotus.

vi[6] Sometimes referred to in French using the recently-coined adjective "communautique" (Harvey, 1995).

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Free internet as an agent of community transformation

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Abstract

Does the internet empower communities or perpetuate the status quo? Can universal internet access resolve education, employment, and other social gaps? We report on our longitudinal assessment of low income community access to free internet in New Zealand, in terms of new internet users' (1) community belonging, (2) internet connectedness, and (3) civic engagement. Findings show internet connectedness may have only a minimal impact on community capacity due to constraints such as family transience, difficult domestic circumstances, inadequate project resourcing, and poor literacy. Internet ubiquity may not be a strategically useful social objective unless contextual limitations are recognised and addressed.

Introduction

An intriguing book title by contemporary British artist Damien Hirst is cited by John Naisbitt in *High Tech/High Touch*:

> I Want to Spend the Rest of My Life Everywhere, with Everyone. One to One. Always. Forever. Now. (Hirst, cited in Naisbitt, 2001, p. 28)

In an era of seemingly omnipresent cell phones, text messaging, 'pxt' and new generation videophones, widespread technological convergence, and digitisation and computer-mediated communication, Hirst's bug-eyed vision of hyper-connectivity aptly expresses the communications technology zeitgeist. Naisbitt describes Hirst's title as "an almost perfect metaphor for the internet, and for how most of us feel as we stay connected through cell phones, e-mail, and modems" (Naisbitt, 2001, p. 29). He goes on to argue though that our increasing reliance on all kinds of technology is causing us to "live our lives distanced and distracted" (ibid., p. 28). As we seek to become increasingly engaged with the world via technology, we afford less time to traditional face-to -ace interactions. Naisbitt's argument typifies concern about changes in socialisation that appears related to a global proliferation of advanced communications technologies.

Interested in investigating whether such pessimism is warranted, in 2003 we began to research community outcomes of Computers in Homes (CIH), a New Zealand scheme in which free computers and internet access are given to selected low-income, non-internet households for a very small joining fee. Our goal in this longitudinal study is to contribute to scholarly and practitioner understanding of the interface between information and communication technologies (ICTs) and 'community'[i], in a setting where little in-depth research has occurred.

Our orientation in framing this study is somewhat critical, for while not wishing to fault the communitarian philosophy, purpose and strategic approach of this free internet scheme, we have also become aware of situational factors that can compromise its benefits. In this article we review the literature concerning community capacity and the internet, providing background on the ICT strategy of the New Zealand government, before presenting our early findings and conclusions.

The Community Building Question

Of particular interest for our study are the claims of, for example, the New Zealand government, that ICTs are an imperative in strengthening communities, and on the other hand the view that ICTs add so much pace to our lives that there is no time left for 'connections', and social fabric suffers. This observation implies that digitally-mediated forms of connection are inauthentic, or at least much less desirable than face-to-face interactions. The latter view is typical of discourse on the sceptical side of the debate, although it is vigorously disputed (Quan Haase, Wellman, Witte, & Hampton, 2002; Wellman & Gulia, 1999) and vulnerable to challenge on the basis that it represents a value judgement about what 'connecting' actually means.

Yet trenchant criticism comes from such as Noam Chomsky, who asserts that the internet is a tool of totalitarian ideology and the cause of social fragmentation, commenting "it'll be used as another technique for control and manipulation, and for keeping people in their roles as mindless consumers of things they don't really want" (Chomsky, Mitchell & Schoeffel, 2002, p. 278). Others ask whether the digital divide is a cause du jour, and whether addressing it might be beneficial to groups such as business and academia more than the digitally marginalised (Luyt, 2004; Rampersad, 2004). Why not talk about a healthcare divide instead?

Shepheard (2004) and others (Green, 2001; Lasen, n.d.) point out that public anxiety about the effects of digital communications is one in a long tradition of moral panics over technological innovations. Lasen has researched mobile telephony and compared its diffusion with the introduction of landline telephony, and found similarities in public response to these ICT innovations despite the fact that they arrived a century apart:

> The launch and spread of wireless phones have aroused some fears, as happened with … landline phones. A certain amount of 'moral panic' about its effects ensues *[sic]* the adoption of many new technologies. Some of these fears are similar in both cases: threats to … health, danger of addiction, the decline of traditional interactions, the loss of interest in taking part in social activities, or inconsiderate behaviour. Others are new, such as the privatisation of public space, the intrusion of work into the private sphere, or … increased possibilities for control (p. 42).

Lasen's point is that, to a large extent, public anxiety over ICTs is a normal part of the diffusion process. Like Lasen, Lelia Green refers to "internet moral panic" (Green, 2001) as "part of the ritual cycle of panics surrounding new technologies" (citing Marshall, 1997). Hughes and Hans (2001), assessing research on the impact of the internet on family life, cite a historical study of the automobile and the telephone in the early 20th century: Fischer found "numerous accounts that parallel the current debates". In 1926, for example, a "meeting called to discuss whether modern inventions help or hurt character and health included the following questions: 'Does the telephone make men more active or more lazy?' [and] 'Does the telephone break up home life and the old practice of visiting friends?'" (1992, in Hughes & Hans, 2001, ¶4).

'Diffusion of innovation' theory (Rogers, 1995) proposes five innovation characteristics (relative advantage, compatibility, complexity, trialability, and observability), with commentators such as Li (2004) noting that the diffusion model has been criticised for its pro-innovation bias. The theory predicts that a proportion of a population, possibly either risk-averse or isolated (as for example, socially or economically), remain resistant in the uptake of a technology. A degree of scepticism about the supposed benefits of a technology is expected from some—such as those who have neither a mobile phone nor the desire for one. Also, because pricing constraints dictate high costs for technologies when first launched, the less well off, the less educated, and those lacking interest, constitute a persistent "tail-end" group. Thus concern about consequences of ICT innovations, together with an access gap (such as the digital divide) are to be expected. However, even the chief architect of these principles, Everett Rogers, has commented that in the case of the internet and mobile phones, "new technologies that will have profound impacts are evolving very quickly … with promises to intensify the already clamorous cacophony of cyber-chatter in our ever-shrinking planet" (Martinez, 2003). There is a sense of resignation here about a significant downside to the ICT revolution.

Possibly a generational factor is involved in all this anxiety and scepticism. Marc Prensky has provided a fresh metaphor for today's young—"digital natives", those who have grown up with digital technologies and comfortable with them. "Digital immigrants" are those (often teachers and parents) who must learn new ways of thinking and behaving in a digital environment, as if learning a new culture (2001, p. 1). Prensky points to a fundamental shift in both behaviours and cognitive function, with implications for teaching and learning among today's generation. Perhaps the digital immigrants express most concern about the internet's impact.

So is there a 'right' in this debate? Should the evangelists who dismiss the risks of ICTs to community life, or the unbelievers who remain unconvinced about the benefits move us more? Does it matter? We think it does matter, given the large-scale investments in a digital future by key sectors including government, business, and education. And as noted in a recent Pew Internet and American Life Project report, "technological change is inevitable, and it will result in both beneficial and harmful outcomes" (Fox, Quitney-Anderson, & Rainie, 2005, p. 47). Continued research is needed so that social change via ICTs becomes clearer. We acknowledge some inclination towards the sceptics' arguments, noting that a recent meta-analysis of the relationship between social capital and ICTs "suggests that a degree of 'analytical scepticism' should be extended to those advocating the deployment of ICT for creating social capital" (Pigg & Crank, 2004, p. 69).

We have argued before that a binary paradigm of access, as in "haves" and "have nots", is an unhelpful approach to the digital divide (Williams, Sligo, & Wallace, 2004), as have others, like Eszter Hargittai, in the face of attempts to perpetuate the importance of access (Novak & Hoffman, 1998). Hargittai (2004) argues that we should distinguish between using the internet anywhere, using it at home, and using it through a high-speed connection, since these different access criteria determine different kinds of inequality. Accessing the internet at home, for example, permits a freer approach to web surfing than is likely at one's workplace or in a public library. Therefore, through community-based research an integrated assessment of the community-building dimension of increased internet access may occur. A priority for governments and associated agencies must then be to address the complex matter of access, and to neutralise barriers and risks.

The New Zealand government is taking an assertive position regarding the role of ICTs in the nation's future. According to the government's 2004 *Digital Strategy* draft policy document, universal access to "the power of ICT to harness information" for universal "social and economic gain" is the vision for the immediate future (*Digital Strategy: A Draft New Zealand Digital Strategy for Consultation (DS),* 2004, p. 2). "Internet Everywhere"–symbolising wireless internet and its promise of universal reach–is also to become a strategic goal for New Zealand, in the sense that those 'in' the digital divide, are to be systematically extracted from it. We now will review the universal access goal within New Zealand's *Digital Strategy*, and reflect on it using findings from our research within three ICT-targeted communities.

The Vision of Internet Ubiquity in New Zealand

The New Zealand government launched its draft *Digital Strategy* mid-2004 for consultation, aiming to present a final document to Cabinet in October 2004. According to David Cunliffe, Associate Minister for Information Technology, this strategy was to guide the government's work in positioning New Zealand as "the hub of the South Pacific" (community consultation, 30 July 2004) and "a world leader at using information and technology to realise our economic, social and cultural goals" (*DS*, p. 2) over the next three to four years. Ideally it will bring to fruition the government's commitment to

> bring the benefits of information and communications technology to all New Zealanders – to create a society where ICT empowers everyone to create, access, utilise and share information and knowledge, enabling individuals and communities to achieve their full potential (*D*S, Foreword).

The *Strategy* sets out to be holistic in its scope, addressing not just economic but also social and cultural goals. It is also intended to serve as a whole-of-government strategy, and so was developed by several central government departments, along with local government input from the organisation Local Government New Zealand, and was coordinated by the Ministry of Economic Development. Its hope is to formulate a framework that will foster so-called "smarter" uptake of ICT by government, business and communities.

An ambitious agenda includes completion of Project Probe, a provincial broadband extension project aiming to ensure that all schools and their communities can access broadband by the end of 2004 (*DS*, p. 95). Cunliffe admits "we can't have computers in every home tomorrow, much as we'd like to". However, within the broader ICT vision small-scale schemes intended to close New Zealand's clearly apparent digital divide (Archer, 2004) have been endorsed, including Computers in Homes (CIH). It is of interest that government-funded initiatives such as CIH are viewed uncritically as a means to "seize the opportunities for increased prosperity and greater social cohesion that the effective use of the tools of ICT can deliver" (*DS,* Foreword). Implicit in such rhetoric is an assumption that social cohesion will necessarily result from universal ICT access. Findings in some studies endorse this view, while others are less positive (Jackson et al., 2004; Kraut et al, 1998; Shah, Kwak & Holbert, 2001). The issue remains controversial.

Our study traces participant experiences in the CIH scheme. The CIH programme was initiated by the N.Z. 2020 Communications Trust, financially supported by the N.Z. Ministry of Education, supported by volunteers from universities, polytechnics and community groups, and provided with paid support technicians. The 2020 Communications Trust receives sponsorship from local government and business sources. A two-year pilot began in July 2000, based in schools in Cannons Creek (Porirua) and Panmure Bridge (South Auckland). Families in two rural schools in the North Island's East Coast were included in 2001, and in the same year Wellington's Newtown School was added. The variety of such applications now makes it desirable for longitudinal research into their effects, such as the current study, to be undertaken. Specifically, in each location 25 families are given recycled Pentium 75-100 computers with Windows 95, MS Works, MS Word, a package of shareware educational games, modem, internet connection and a phone line where necessary.

Worldwide, such recycling projects aim to democratise access to ICTs; studies show that children's learning can be extended into the home; literacy can be developed; and communication between home and school may be enhanced (Zardoya & Fico, 2001). While it has been said "the success of Computers in Homes is not disputed, but the task of consolidating the programme into government policy has not yet been achieved" (Das, 2003, p. 8), we are interested in probing the lived experiences of those involved to scrutinise the 'community transformation' rationale.

The strategy of having the CIH initiative spearheaded by a Trust, bankrolled by the Ministry of Education, and supported by enthusiastic volunteers looks on the surface to build on the strengths of diverse groups. Yet there would appear to be the potential for systemic failure should any of these entities lose funding, enthusiasm or momentum, or should significant differences in vision or direction emerge among these disparate parties. Ultimately a holistic plan as ambitious as the NZ government's Digital Strategy requires direction and resources of a magnitude which in the NZ context can come only from government sources. However, experience has been that building community capacity depends on a systematic and coherent central (or possibly local) government plan based on investment over a sufficient period of time for results to be seen.

The leadership role of the principal would thus appear to be critical to the success of the program through his (or her) involvement in such areas as publicising the scheme, finding ways to involve and encourage both parents and children, and offering ongoing support to families involved. Thus we, as researchers, were aware that the key leader in the CIH innovation would be the principal of each school, and in each case his or her own belief about the potential value of CIH would probably constitute the difference between success and failure.

The Community Connection Study

Findings from our study of internet and community in three suburbs in New Zealand's largest city, Auckland (population one million) are emerging in stages. Our study participants are new to the internet experience; are almost entirely low-income families of school-age children (selected by the schools), and they have become engaged in the research through the expanding CIH scheme which aims to get low-income people online[ii]. As our research orientation is primarily qualitative, we prioritise the internet user perspective; data has therefore been gathered principally by seeking the insights of adult family members in extended interviews.

Other elements of our snapshot of twenty-six volunteer participants at the preliminary stages (early 2004) of their internet access at home, are researcher field notes from community and other meetings, and interviews with project leaders and champions. Analysis of interview transcripts has been conducted using open coding (Strauss & Corbin, 1998) so that themes relating to dimensions of the internet experience can emerge. The interview also incorporates survey questions permitting numerical analysis referred to later. Here, we limit our discussion to initial phase results obtained between November 2003 and April 2004.

The sample group

Parents or caregivers of young children were approached for voluntary involvement in this research. Twelve of the initial 26 came from one school community, thirteen from another, and one parent is from a third school.

All participants (N= 26)	***Characteristic***	***Comment***
85% mid-20s to mid-40s	Comparatively young parents	*Reflects the primary (junior) school community population from which the sample is drawn*
77% Female, 23% Male	Generally female	*Women caregivers tended to take responsibility for the computer at home*
50% no formal qualifications	Low educational attainment	*Low socioeconomic status of these communities*
61% below NZ average household income	Below average household incomes	*As expected in "low-decile" areas*
42% Maori 35% European 23% Pasifika[iii]	Higher percentages of Maori and Pasifika families than NZ overall	*Reflects social characteristics of these suburbs*

Connectivity: Three Ways

We aim to assess interactions between three dimensions of connectivity in a population of inexperienced internet users. Our three dimensions, as shown above, include (1) neighbourhood belongingness, (2) internet connectedness and (3) civic engagement. It is believed that the first and third types are linked: civic engagement, producing strengthened community, is a by-product of networks of community members who feel comfortable in their communities, as argued in the literature on "social capital". Social capital is theorised as a dimension of community function inherent in strong networks of reciprocity, and is said to be in decline in developed countries (Putnam, 1995a, 1995b, 1996, 2000; Stone, 2001; Winter, 2000a, 2000b). As explained previously, claims are asserted in favour of harnessing ICTs to rebuild community capacity.

Our remaining dimension, internet connectedness, may impact on the other two, for example, in enhancing people's sense of belonging to a community of interest, increasing neighbourhood connectivity, and providing tools to enhance civic engagement. Research on linkages between internet use and civic engagement has shown that "overall internet use was found to be positively … related to civic engagement" (Shah, Kwak & Holbert, 2001, p. 149), although the motive for using the internet is more important than the amount of time spent online. In particular, an informational motive is "related positively to social capital production" whereas a social-recreational motive "appears to diminish *[it]*" (p. 154). Yet, we wonder, might internet use undermine neighbourhood networks in favour of online networks, thus eroding local social capital? To draw conclusions on such questions and produce as rounded and robust an assessment as possible, our data on individuals' digital connectivity encompasses goals (motives) in using the internet, activities, time online, and several more. We now summarise our early findings on the three dimensions of connectivity.

Neighbourhood ties

There is an apparent disjuncture between our participants' sense of local community, and that of community leaders such as school principals involved in driving the ICT project (Williams, Sligo, & Wallace, 2004). One principal views his role as transformative, and his mission to lift community aspirations, but the new internet users themselves display "a strong sense of local community and a pride in belonging, despite transience, travel distance and lack of property ownership" (p. 13).

Our finding arises from analysis of survey variables modelled, in part, on the Metamorphosis study in Los Angeles (Ball-Rokeach et al., n.d.), in which "belonging" was assessed on indicators such as home ownership: "increased investment into a community by owning a home is thought to increase…the likelihood of belonging" (Appendix p. 5). Yet although the large majority of our respondents rent their homes, have spent fewer than five years living in the neighbourhood, and travel a minimum of ten kilometres to work or for daily activities, we found strong indications of people very comfortable in their immediate neighbourhoods.

Two-thirds of our group felt quite proud or very proud of where they live, reported feeling positive or strongly positive about interacting with neighbours, and know a minimum of five neighbours by name and to talk to, with an average number reported of over nine. Participant 25 reflects this neighbourly feeling: "we care about each other … you know the more I meet people here the more I stay here". Three quarters of the group agreed or strongly agreed that "I am very satisfied with the way things are going in my life these days".

On the other hand, a father regarded as a conspicuous success by his CIH school in acquiring the skills to find a route out of his social environment reported

> I'm a born-again Christian, and I was going to suggest not at all proud, but I think because of the situation I'm in and where I'm at I can see that this street here needs fixing up, needs pulling

> together … I'm here for a reason, to clean the street up and be drug-free, because it's a predominant street for P and marijuana and … this is The Bronx.

He clearly wanted to live in better circumstances, and had mixed feelings about his neighbourhood. The school principal is convinced that the CIH computer has been instrumental in the family's transformation. We wonder if a number of factors including the man's keen involvement in a popular charismatic church, sustained personal encouragement from the school principal, together with the arrival of the internet in the family, all contributed to the change.

Internet connectedness

Our next layer of data is provided by questions concerning internet use. After a longer period of time using the internet our participants may demonstrate more 'connectedness' as they discover more ways in which to use the technology, so we are tracking this with interest. However in the early period of being online, we might expect a range of degrees of enthusiasm due to varying levels of confidence, interest, motivation, keyboard skill, and information literacy and digital literacy. We distinguish between the last two, given that people need to be educated to achieve better understanding of the digital knowledge management environment and its broader effects, as well as the more instrumental skills of information-searching and keyboard use. It has for example, been observed that "computers have the potential to engage youth in new types of mathematical and scientific thinking" (Resnick, Rusk, & Cooke, 1998, p. 5), moving them beyond technical know-how to the use of computers as heuristic tools.

To obtain a benchmark measurement of internet connectedness (to support the subjective process of assessing change through anecdotal evidence, and to compact a wide range of variables into a single rating for each user) we designed an Internet Connectedness Index (ICI). Although such a rating is of limited validity outside our small sample, it produces a useful single index from 1-12, where 12 is a "high connector".[iv]

We used eight items covering internet behaviours and attitudes we believe to be sufficiently comprehensive, including participants' evaluation of the internet, internet dependency (how much one would miss it if it vanished), frequency online, and time spent on email. Our ICI offers an alternative method to measure internet connectedness, adding robustness to our findings through triangulation. It is also an instrument to be invoked again in Phase 2 after later participants' visits, revealing if any change has occurred.

The indices appear to underscore our interview findings. For example, a 'high connector'[v] participant has a Phase 1 ICI rating of 8.9, the highest index in the group. The ratings are interesting because they reinforce observations regarding which participants were already high connectors; a point expanded on below. In Phase 1 of the study our six high connectors share other characteristics, such as sociability and confidence in interviews. Analysis of survey data on "belonging" shows these individuals are interested in knowing their neighbours, and enjoy meeting and making friends with them. They are sufficiently familiar with their neighbours to know their names and say hello; and they were very unlikely to leave the neighbourhood. They were more likely to have visited or phoned someone just to talk (on the day of or the day prior to the interview), and were in the habit of phoning their families every day. These factors suggest that a predisposition to enjoying engagement with people generally might predict higher levels of internet connectedness, a possibility briefly considered but rejected in the Netville study in Toronto (Hampton & Wellman, 2000). Of further interest is that these high connectors are also substantial consumers of media, in particular television (three to four hours per day) and radio (more than five hours per day).

Five individuals are in the low connector category (scoring an ICI of less than 5 out of 12). To this group we add a further five people who were either unable to connect to the internet by the time of their first interview despite being part of the CIH scheme (and for whom therefore an ICI calculation was not possible), or for whom there was missing data for various reasons. We sought patterns in the data for these ten participants but results were less conclusive. These respondents on the whole, knew fewer neighbours to talk to than the high connectors, but there was a slight tendency to report being interested in knowing neighbours, an enjoyment of meeting them and a sense that it is easy to become friends with them. They, too, mostly were unlikely to leave the neighbourhood. However although they were unlikely to have

visited anyone on the day of, or the day prior to, the interview, they too regularly phoned their families, either weekly or daily.

Low connectors spend little time as media consumers and demonstrated one or more characteristics that may explain their low connector rating. These include less self-confidence; preoccupation with family matters such as young children or an unwell child; having a rental home viewed by potential buyers, thus facing uncertainty over where to live; adjustment to unemployment; juggling of two jobs plus children; being a grandmother and caregiver of two girls; and fearing the internet. Such pressing contextual factors may outweigh a predisposition towards social engagement generally, and erode either motivation or time available for media such as television and the internet.

The ICI data may be put to community use in reports back to schools. For example, one school featured a smaller proportion of low connectors than in the whole group. This may be suggesting conditional success in "bedding in" the CIH programme, in this setting, a finding of potential interest to school managers. Yet selection error may have occurred, so that simply by chance those involved in CIH in this instance were confident and motivated in working with technology. On the other hand, at a second site a high proportion of participants had low ICI scores. In other words, more participants at this site were less connected, which may signal that more support is needed for the CIH parents to enable them to more fully use their internet connection.

On the whole our respondents regarded facilitation of family and social networks as exciting and positive. Our findings reflect other studies in underlining that email continues to be "the dominant single activity on the internet"[vi] (Lebo, 2004, p. 13) , and number 1 of "the top ten most popular internet activities"[vii] (p. 29). Furthermore, a "clicking cousins" phenomenon may be discerned among internet users, since email "helps extend family networks" (Horrigan & Rainie, 2002, p. 14). The University of Southern California's Annenberg Centre for the Digital Future claims that "internet users have healthy social lives" (Lebo, 2004, p. 100) and that they spend more time in person with friends than do nonusers. It has been suggested that the communication, or relationship-building, function of the internet may be more important than the information function of ICTs in building community (Pigg & Crank, 2004).

Distanced and Distracted?

As earlier implied, John Naisbitt's assertion about families now "living together in isolation" (2001, p. 30) "distanced and distracted" (p. 28) disputes the metaphor of the television as the new family hearth. In his view, family members are more likely to be in their own rooms, listening to their choice of music or pursuing niche media interests. Would our study find ICT fostering undesirable household changes? Our data-gathering included capturing narrative, asking questions about telephone and media use, and seeking participants' perception of observed changes in their communication behaviours.

Civic engagement

The civic engagement section of our survey included questions on organisational involvement, volunteer or community work, and whether respondents felt their behaviours had changed since their first log-on. For example, had time spent watching TV decreased, stayed the same or increased? Were they reading newspapers less, the same or more? Were there differences in the amount of time spent visiting friends and family?

On the whole, respondents were already little involved in civic activities like volunteering or community projects. Around half had some involvement in sports clubs, and fewer than half belonged to a cultural or religious group. After having the internet installed, about one-quarter reported reading the newspaper less (although some were doing so online instead) and half were watching less television. This finding is congruent with the Pew Internet and American Life Project, which reported "fully one-quarter of internet users said that surfing the internet has led to a decrease in television time" and "…fourteen percent say the internet has decreased the time spent reading newspapers". In the Pew study, these proportions are greater among internet veterans (online for three years or more).

A small number said family time had now increased (such as through all being together at the computer), and only one person said they had less time with family. However a quarter of the group now spent less time with friends, and about one-third were talking less on the telephone with friends and family, occasionally because the single household telephone line was employed by the internet. Generally, internet use has slightly eroded civic engagement[viii] in that respondents were now less actively engaged in maintaining social networks.

However, just under half also reported that the Internet had increased their *feeling of connectedness* with interpersonal networks, while our interviews add to the picture of civic engagement by highlighting *potential* community building. One example is a grandmother who anticipates the internet helping her because "I do a lot of *marae*[ix] business… because I'm in the committee" (Participant 23); the younger grandmother, our very high connector and focal point of family and neighbourhood, saying "it's changed my way towards other parents… I'm online now to this other lady… I took one lady home that night, and, um, we were chatting away and it was really cool learning more and more and it's like, keeping in touch more" (Participant 25). Some parents are more connected to their church communities through the internet; and at all three research sites the local school, the hub of the community, is strengthening its ties with parents by hosting the CIH meetings and trying to encourage email contact with the school (although little of this interaction seemed to be occurring).

Challenges to Inclusion and the Next Steps

Phase 2 of the study involves follow-up discussions with the original participants, especially a sub-group of high connectors in the early stages of their internet experiences who are highly sociable, and a second sub-group of low connectors who may struggle to become more than that because of their circumstances. We continue to meet as many of these as possible, noting whether any changes occur over time.

Various unanticipated difficulties occurred in bringing low-income families into contact with ICTs. Even an apparent strength of the CIH scheme whereby more digitally literate parents mentor the less skilled, is potentially problematic, and may be too much to ask of participant parents. One mentor reported of another parent who, "instead of listening to what he was supposed to do, he went and hooked himself up with Xtra" (the wrong Internet Service Provider, so he was billed for internet time). "So," said Participant 9, the mentor:

> he's wasted a whole lot of time… I've been to his house, I've asked him, I've rung him…weekly…, asked him if everything was going all right, and then he rings me up and tells me he's got this bill for Xtra …. And I am not sure whether that was because I'm a woman and he's got a thing about women telling him what to do ….or he just….went and did what he wanted….. I mean I really don't know where he was coming from".

Barriers also include lack of confidence, frustrating hardware and software, slow dial-up access and slow download,[x] inadequate telephone connections and cabling, and anxiety over perceived internet dangers. For instance, concerns exist among some interviewees, particularly older ones, that the internet represents some kind of threat to their family lives. Although Participant 24 comments

> the more I use it the more I see the possibilities you know … I'm talking about the wealth of information on it … like booking online and all that talking through email you know …

he is also anxious about rushing into it:

> But ohh at the same time I'm wary. I just want to work my way through and have a look. I'm not going to rush into things. Because I don't really understand it.

His concern is also that

> actually I try and … make sure I don't let the Internet take over my family… I don't want to be like that – I just want to use it. …. Because I think the more I rely on it the more I want to watch it all the time, you know … Because … other people get too involved in it,

> and then their families suffer. … I got to be careful, I got to be – have a balance, that's what I mean.

Similarly, a grandmother who cares for her young granddaughters and is therefore the responsible party in regard to the CIH computer, wants it to benefit the family but views it as somehow dangerous. Not only is it behind a closed bedroom door rather than in a family living area on the day of the interview, it is too far from the telephone jack for the internet cable to plug in, and she remarks

> No, I heard all about this internet – some time I don't even really… but I got to use it for school…I want to be careful of these two you see… I think they got a fair idea of what it's about, this Internet – these two here…just want to find out more about it you see, because they know how to do it all right, even her *[meaning the 7 year old]*...

We therefore signal several challenges to project leaders and government departments that look to community ICT projects as achieving "the full benefits of ICT… through the widest participation" (*DS*, p. 8) because participation is the end point of a path that merely begins with putting the computer into someone's home. Thus, "It is now clear that technological tools themselves, no matter how well they are conceived and designed, are not enough" (Resnick, Rusk & Cooke, 1998, p. 13).

A careful balance must be struck between a governmental agenda for ICT saturation aimed at social and economic transformation, and a loosely articulated intention to involve business and communities. The "transformative" power of the internet (*DS*, p.11) is reverently but uncritically invoked. Moreover our government is set to pursue a strategy devolving ICT leadership to communities themselves. In our view, this is the critical point. Perhaps considerable community benefit will accrue from internet access, but only if it is so resourced that the community itself is not left to manage with minimal support. The government's *Digital Strategy* relies heavily on a philosophy that the will, leadership and skill will arise from the grassroots: it is to be a devolutionary strategy. It seems to us, however, that questions need to be answered in view of research by the (US) Pew Internet and American Life Project showing that over half of Americans without internet access have no plans to log on (Rainie & Packel, 2001).

At two of our research sites, community leaders do view themselves as digital missionaries, even though the uninitiated appear content with their lot and have not yet recognised their digital baptism as a path to salvation. Instead they view the computer quite pragmatically as another household convenience, a gadget—not necessarily investing it with powers to conjure up miracles, as some rhetoric seems to imply. If the gadget works, fine; if it does not work, well, we have other things to attend to in our lives…

Education to create understanding of the reasons why people should want internet access, or what they can do with it, is clearly lacking. The government admits it is missing too: "raising community awareness of ICT" (*DS*, p. 59) is, reassuringly, listed as a particular role of central government.

Technological forms do not develop independently of the social, economic and political spheres; cannot be invoked as external agents; and do not themselves bring about predictable social change. Rather, they are intrinsic to a social context including its economics, culture, political processes and history. People will do with the technology what suits them. We believe a transformative role for ICTs is a tall order without attention to government collaboration with businesses and communities.

Most particularly, our communities require significant resources for education (rather than 'training') of those targeted for ICT assistance. Perhaps as we continue to track our participants' stories, they will equip themselves to make better use of their computers, but it is clear that the early connection period has had mixed success. Insufficient resources are available to each school community to give more than minimal support to families who need hands-on and active coaching (such as by trained mentors) to continue to use their PC's with success.

We referred earlier to the need for digital literacy as well as information literacy. By way of example, the Computer Clubhouse concept (Resnick, Rusk & Cooke, 1998) articulates the need for "technological fluency … not only knowing how to use technological tools, but also knowing how to construct things of significance with those tools" (p. 2). The clubhouse concept, a worldwide network of community access centres for inner-city youth aiming for participants to "learn to express themselves fluently with new technology" (p. 2) and organised by The Computer Museum in collaboration with the MIT Media Lab, is being imported to New Zealand. Clover Park Middle School is to have a "purpose-built facility…*[for]*

children aged 10 to 18 *[to]* create digital artwork, produce their own music CDs, film, write and edit their own short movies, design websites and even build robots" (Otto, 2004).

So far as in other research, we have seen considerable enthusiasm among our participants for the way email facilitates social networks, at least in the early period of connection. However, we tend to agree that

> Human nature doesn't change, but social and technological progress tends to amplify its effects. Simply put, the more ways we have to do what comes naturally, the more we do it. (Bonabeau, 2004).

One of the things that comes most naturally to humans is the desire to communicate; the internet amplifies our ability to do so (Tyler, 2002). Tyler makes the point that research is showing people how to "incorporate the internet into their social 'toolkit' and use it … to deal with personal and interpersonal issues in their lives" (p. 204).

A predominant agenda in New Zealand is for social transformation so that the country may compete more vigorously in economic terms. If this is to happen, a digital strategy will need to go beyond heightened social networking, easily available even to the non-initiated through email, to more advanced understanding of the digital environment required for entrepreneurial activity among the 37% of New Zealand households equipped to link to the internet from home, as well as the remainder who are not (Archer, 2004). Anecdotal comment from a community worker we spoke to in connection with this research indicates that many households in the low-income area in which she works (and where many of our research participants live) already have a computer at home, but it is not used.

Further, low-income families who have had a brief taste of the internet become targets for marketers keen to sign them up to still-expensive broadband and more powerful computers, even though economic constraints are practically insurmountable for families such as Participant 15 who remarks "This is the first time I've ever got a computer, and … I can't afford it – I really can't". If not for CIH with its free internet, this family would have remained unconnected – and may well revert to this, once the six months of free internet is up.

Neither ubiquity of access nor saturation of communities with broadband is enough. The New Zealand government wishes to raise awareness of how ICTs can be transformative and expresses this in its digital strategy document. Our research into Computers in Homes suggests that this programme has value in providing the most basic ICT access, and it is being used by school communities to attempt to broaden people's world-views. Yet claims for community transformation need to be more rigorously assessed. In particular, the dimensions of such transformation must be more precisely articulated by its proponents: a vision of what a community could be, were it to be enhanced by ICT, would provide a mechanism for moving communities toward positive change.

Is social capital really to be enhanced via access to new technologies, and if so, which claims can be justified and which cannot? Researchers must continue to address such questions through longitudinal community research.

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[i] "Community" is here associated with a feeling of belonging in a geographical neighbourhood, meaning "place-based community" (Meegan & Mitchell, 2001, p. 2167) rather than "virtual communities" as first popularised by Howard Rheingold (1993). Therefore we research community as neighbourhoods connected to a particular social context (the low socioeconomic urban primary school). However, we are also interested too in the broader, non-geographical networks that cohere to form other dimensions of community for individuals, households and neighbourhoods.

[ii] Basic IT training and technical support is made available, and certain expectations are spelled out in a family agreement such as, parents are to: give children up to one hour of supervised internet time per day, look after the computer, and train someone else to use it.

[iii] Of Pacific Island origin.

[iv] Our ICI is based on one created for the Metamorphosis study in Los Angeles (Ball-Rokeach, et al., n.d.), which featured eleven survey items, standardised to a 12-point scale and averaged for a single index.

[v] For within-sample purposes a rating above 7 (out of 12) indicates a high level of internet connectedness, similar to the Metamorphosis study, and a rating of under 5 suggests a 'low connector'.

[vi] It may be relevant to note here that in the Pew Internet and American Life Project series of studies "a majority of women in the group… tend to email more often than men" (Horrigan & Rainie, 2002). This is also true of the present study, which inevitably focuses on at-home mothers. The gender profile of our sample is 20: 6, women to men.

[vii] By percentage of people who report online weekly time with these activities: email and instant messaging top the rankings, with 90.4% of people spending time on these.

[viii] This finding may be related to the well-known "Internet Paradox" study (Kraut, et al., 1998), in which in the early months, new users experienced increased depression and isolation; however follow-up work with the same participants found that this was a short-term effect (Kraut, et al., 2002).

[ix] *Marae* is a Maori (New Zealand indigenous) word that roughly translates as the sacred place of belonging where a tribal/kinship community meets for important occasions, discussions and rites of passage. It is a formal place of welcome, debate, discussion, and includes traditional buildings and a large area of open ground for welcome and ceremony.

[x] These factors have led to families giving up their involvement in the CIH programme; such instances lend weight to the view that "the binary division of the population between 'online' and 'offline' is misleading" (Hargittai, 2004). Increasingly present is the view that "the type of connection is more important than other digital divide demographics such as education, race or gender" and a refinement of the digital divide is required on the basis of many criteria, not least of which is a differentiation between use of dial-up and use of broadband (Hargittai, 2004; Kwak, Skoric, Williams & Poor, 2003). Hampton and Wellman's (2003) Netville study of a wired suburb in Toronto found that "always on" high speed

internet *enhances* contact with one's neighbours. High speed or broadband increasingly appears likely to be a prerequisite to positive internet experiences.

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Community Security With Widely Available Information Technology

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Abstract

We contend that a community will have a strong ability to prevent crime only if some residents keep watch on what happens around their houses with the aid of their own home computers, inexpensive and commercially available cameras, and free software. Under this scheme, residents would view their surroundings using cameras as their "eyes" and home computers as their "brains" Community safety would thus be realized by the voluntary cooperation and altruism of ordinary citizens using widespread technology.

A community with some residents keeping occasional watch around their houses has the potential to inhibit crime. In days gone by, there were many communities like this. However, in our times, individualism has become increasingly common, resulting in a lack of eyewitnesses to crimes in our communities. At the same time, security camera systems are now widely used and have an important role in reducing crime and identifying suspects. As for the typical usage of the security cameras, many problems seem to arise from the fact that they are introduced only for the benefit of their owners. One problem is that it is expensive to obtain a complete surveillance of an owner's property. A second problem is that the typical system usually keeps watch only inside the owner's property, so it cannot help with the overall safety of the community. A third problem is that neighbors may have concerns about their privacy if their property is under surveillance by someone else's security system. We argue that these problems may be solved if the camera systems are introduced within an altruistic community-minded framework.

We contend that a community will have a strong ability to prevent crime only if some residents keep watch on what happens around their houses with the aid of their own home computers, commercially available and affordable cameras, and free software. Many types of software for capturing video images are available; however, we could not find any that were available at no cost and would be suitable for the concept of community-wide security. Therefore, we have developed an application that provides the minimum functions needed, and currently distribute it free of charge through our Society for e-JIKEI Network website (http://www.e-jikei.org/index_e.htm). The software, written in English and in Japanese, selects relevant pictures from a security camera and saves them to a hard disk (Fujii, Yoshiura, Chigira, & Hagiwara, 2004). Our community-wide security concept, and the e-JIKEI Network system that embodies it, have been discussed from the viewpoints of social science (Fujii, Yoshiura, & Ohta, 2005a) and homeland security (Yoshiura, Fujii, & Ohta, 2005b).

If the concept of the e-JIKEI Network is accepted, the security of the whole community would be covered, with the voluntary cooperation of the many residents who use the system. The main features of the e-JIKEI Network Project can be summarized as follows. Each constituent element of the network is voluntarily introduced and maintained by each citizen not for personal benefit, but on behalf of the entire community. Each element watches not the interior of a property, such as a house or shop, but around the outside of the property. All of the tools and resources provided through our web site are offered free of charge. Most types of commercial cameras can be used in the system. The role of mass media is very important; the e-JIKEI Network Project has already been heavily covered by newspapers, TV and radio, even though only preliminary experiments have been conducted in and around the city of Kiryu. Finally, we assume that the formation of a watch system covering the whole community can contribute to national security.

The first version of our free software, called "Dairi EYE standard," has been formally released. Its features are very limited, but they adequately cover the essential functions for community-wide security:

- High stability: Continuous running of more than 100 days has been confirmed.
- High operationality of file storage: The file name and its path express time and location information.
- Minimal required storage: Simple picture selection software has been adapted. The software saves a picture only when the difference between two consecutive images exceeds a specified threshold.
- Automatic delete: Folders that are older than the save period set by the owner are automatically deleted. Compatibility with many types of camera: Software can operate in the VFW mode (PC cameras and USB video adapters) and FTP mode (network cameras).
- Simultaneous operation: Software can operate several cameras connected to a single PC.
- No Internet connection: Due to privacy concerns, the software we have distributed does not connect to the Internet. Nonetheless, the e-JIKEI Network can be formed, in which the word "Network" refers not to the Internet but to the social network of the residents.

If the system of security cameras connected to computers and the Internet spreads nationwide, it could result in a powerful and flexible sociotechnical infrastructure whose participants help reduce crime through the use of software that is easy to install and upgrade. This infrastructure offers an important testbed for both social research and application development. In the near future, more intelligent functions could be achieved, such as detecting ambiguous motion, sending alerts to the police, and the comparison of facial images with the photos of known criminals. In serious crimes, such as kidnapping, improved rates of rescue and apprehension might be possible, if the majority of citizens give the police permission to access their individual surveillance systems. A country with many local communities having this facility could obtain improvements in homeland security. In this realm, our project (Yoshiura, Fujii, & Ohta, 2005b) complements others, such as the more usual security camera systems and the US Home Guard (http://www.ushomeguard.org/), in which ordinary citizens register and then keep watch over critical infrastructure facilities from their homes, with the use of internet cameras.

The technology required to realize the e-JIKEI Network is not novel, but it was not available a decade ago. Today, the realization of the e-JIKEI Network will be much easier and its functionality stronger and more varied. For example, since the concept of the Network is that citizens should remain vigilant and not miss crimes that may occur right in front of their houses, automobile-based (and even wearable) systems might also be desirable. The performance of computer systems in cars is increasing rapidly; in the near future, keeping watch from cars will be quite feasible.

Although the e-JIKEI Network Project is in its early stages, some applications have been introduced into settings of realistic practice. For example, the city of Kiryu has decided to introduce the e-JIKEI Network in all 40 public schools of the city within the next two years. In this introduction in schools, the e-JIKEI Network was introduced as an inexpensive, high-performance security camera system. However, we proposed that the system introduced in schools could also be used as an example for parents who would, in a united effort, watch the school district by installing the system in their homes. The Gunma Housing Supply Corporation has introduced the e-JIKEI Network in an exclusive residential district with 200 new

houses. They have asked the homeowners who reside at important positions to use the system for the security of the whole district.

We have conducted many experiments in cooperation with a variety of other partners, such as the Kiryu Police Department, the city of Kiryu, and the NPO Higumi. Through the experiments, it has been proven that the system is easy to realize with widely available modern technology and that the e-JIKEI Network is efficient for crime prevention. When citizens have been informed of the potential effects of using available technology for crime prevention, each person will need to think carefully about whether and how to adopt the system and participate in its use. Moreover, improved technology in the near future will make it much easier to realize the e-JIKEI Network. Every person could have multiple cameras, controlled by high-performance computers, integrated in locations such as their cars, houses, and cell phones. Based on the e-JIKEI Network concept, people would have the ability to keep watch themselves, if they chose to participate, with very little additional cost. This means that each citizen will have strong monitoring power and will have to be responsible for it. Sooner or later, careful consideration and clear decisions by all citizens will be required.

In promoting the concept of the e-JIKEI Network, privacy protection will be a serious and delicate issue. We have generated user guidelines as part of the conditions of use for the software, in which careful consideration of privacy issues is required. The users of the software are asked not to view the pictures obtained from the system unless they have a valid and pressing need to do so, so as to prevent them from accessing information about neighbors' behavior unnecessarily. If the concept becomes more widespread across the nation, new laws will be required for defining the rights of, and constraints on, the owner of each system, including their access to the large volume of information obtained.

In the e-JIKEI Network, no one can control the whole system, since each element in the system is under the strict control of an individual citizen. In other security camera systems typically in use today, however, such as those in London, a small number of owners have the ability to control the entire system. Thus, the society that introduces the e-JIKEI Network is a society controlled not by a single organization or person but by every citizen. In such a society, it is very difficult to commit a crime without being reported. We are currently surveying citizens to find out how they compare the responsibility of watching what happens around their houses with the risk of privacy violations. It is in this context that we are now commencing tests on the true value of our community-wide security concept.

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A Review of New Zealand's Digital Strategy

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Abstract

The advent of New Zealand's world-leading Digital Strategy underpins the increasing importance of ICTs in community settings. It also marks a significant change in government policy and the first time a government has adopted a whole of government approach to ICTs. This article provides a personal view of the policy process for creating the Digital Strategy, presented by one of the participants in that process. It contextualises the Digital Strategy in CI initiatives in Aotearoa/New Zealand, and identifies important issues attending its implementation and future.

Introduction

The advent of New Zealand's world-leading *Digital Strategy* underpins the increasing importance of ICTs in community settings. It also marks a significant change in government policy and the first time a government has adopted a whole of government approach to ICTs. As the introduction to the *Digital Strategy* says, it is about Aotearoa/New Zealand becoming "a world leader in using information and technology to realise its economic, social, environmental and cultural goals, to the benefit of all its people" (New Zealand Government, 2005, p. 4). In order to contextualise the *Digital Strategy*, this article will look briefly at the context for Community Informatics (CI) initiatives in Aotearoa/New Zealand, identifying the issues facing such projects. It then goes on to position the new *Digital Strategy* from its evolution as a draft strategy, through a consultation process to the final release. It will describe some of the ideas behind the strategy, the processes for its implementation (where these are known) and some of the potential limitations, including a project-centric focus and a lack of framework for implementation. Finally, the funding made available to CI initiatives through the strategy is discussed.

By necessity, this is a brief (and personal) review of the *Digital Strategy*. You can read the strategy for yourself at www.digitalstrategy.govt.nz. You can also read another perspective, by Williams, Sligo and Wallace, in this issue of the *Journal of Community Informatics*.

The Aotearoa/New Zealand Context

Many local CI initiatives exist in Aotearoa/New Zealand, including literacy and training, access to websites, telecentres, management tools and discussion forums. Many of these appear highly successful and some world-leading and local research indicates that ICTs are improving outcomes for stakeholders of community organisations by making services more inclusive and accessible (Craig, Dashfield, & Thomson, 2003; Craig & Williamson, 2005). Research indicates that local CI initiatives tend to be over-reliant on goodwill and voluntary resources and, because of this, their existence can be perilous (Day, 2004). This is certainly the case in New Zealand and a primary issue must be workforce development (using the term in its broadest sense). In a recent summary of four of my own CI research projects (Williamson, 2005), I identified key themes across the projects: Funding; access; planning and partnerships.

Funding

Funding is a significant concern for most community-based projects. Problems associated with funding have a flow-on effect in terms of the sustainability of the project and with regards to staffing, training and the acquisition of appropriate and up-to-date equipment. ICTs are now considered to be 'core business' by many community-based organisations, yet funding is still in most cases only available on a project-by-project basis.

Access

Appropriate and timely access to ICTs is an obvious need and there is a clear requirement in New Zealand to provide solutions that can bridge socioeconomic divides, allowing all citizens who wish to use ICTs to be able to access them. It is not simply access that is important but the immediacy of that access in terms of fully utilising ICTs for both personal and community activities.

Planning

Planning is seen as important to the success of CI projects. However, the over-reliance on volunteers coupled with a lack of funding means that there is seldom the time or skills available in a CI project to do sufficient planning. Solutions must be planned and outcomes described and agreed upon at the community level. A top-down approach does not work well for community ICTs. This points to an obvious need to share knowledge and information about initiatives; not only those that are successful but the lessons to learn from those that are not. It suggests a need for a 'knowledge base' or 'toolkit of ideas' but does not promote the flawed idea of 'best practice' or a one-size-fits all approach.

Partnerships

If resources are limited, then sustainability is difficult to obtain. A solution to this is to encourage the sharing of ideas and resources and to support the building of partnerships that can offer sustainability. Such partnerships can exist between community-based organisations, local government, central government and the NGO sector. Where communities can work together, additional benefits and economies of scale can be realised (Williamson, 2003). If the *Digital Strategy* is to succeed, it must address these four themes.

Locating CI in a Policy Context

The potential value of CI was first recognised at a policy level through the Connecting Communities Strategy (Community Employment Group, 2002), which aimed to improve access to, and the effective use of, ICTs amongst communities. More recently, the *Draft Digital Strategy* and, evolving from that, the newly released *Digital Strategy* (New Zealand Government, 2004, 2005) have been developed to "provide an integrated framework for existing and future initiatives to encourage the uptake and effective use of ICTs for economic, social and cultural gain"(New Zealand Government, 2004, p. 2). It is significant because it sets the policy and funding agendas for CI initiatives in Aotearoa/New Zealand. The *Digital Strategy* signals a realisation that a whole of government approach to ICT is required and that, even in a 'developed' country such as New Zealand, ubiquity and sustainability of ICT, or innovation through ICT, cannot be assumed. The model used in the strategy is internationally significant because it is has emerged after the First World Summit on the Information Society (WSIS, 2004) and adopts the WSIS tri-sectoral model of government, business and civil society (or community).

The *Draft Digital Strategy* (New Zealand Government, 2004) was a discussion document, setting out what the government thought it needed to do. Publication of this document was followed by significant consultation with business, government and community stakeholders through meetings, presentations and the opportunity to make written submissions. It was my personal opinion that the *Draft Digital Strategy* was an excellent first step but that it was weak in a number of areas. Particularly, an overt focus on

replicating 'best practice' risked being paternalistic and limiting, and no attempt was made to address the ongoing sustainability of CI initiatives. Perhaps the greatest omission was the lack of any tangible delivery mechanism. These issues are addressed to some degree in the final *Digital Strategy* (New Zealand Government, 2005).

The Digital Strategy

The final version of the *Digital Strategy* is surprisingly brief. It (rightly) refrains from repeating much of the background information present in the *Draft* strategy, instead focussing on the way forward. The *Digital Strategy* addresses social and cultural good, however, there is significant emphasis on economic benefit. In this regard it differs from traditional approaches to the digital divide, which identify exclusion as a primarily social problem (Thomson & Craig, 2004). The *Digital Strategy* builds on the *Draft* strategy by describing an ongoing funding mechanism for project-based initiatives. Whilst it is not clear how the fund will operate at this early stage, an Advisory Group has been formed and it is evident that a framework will need to be developed to manage the allocation of funding. Whereas, in this regard, the *Draft* strategy appeared *laissez-faire* and subjective, the final strategy is a significant improvement but still fails to explicitly promote frameworks for evaluating outcomes or effectiveness. However, it appears anecdotally that this might be remedied in the implementation. The naïve and somewhat flawed assumption that what works in one location will be successful in another, inherent in the *Draft* strategy, is gone in the final version. This is fortunate since CI initiatives generally disprove the myth of 'best practice'; they are not the result of technological determinism but of the appropriate social construction of technology in a specific and localised context (Williamson, 2003). One problem remaining in the *Digital Strategy* is the lack of any distinction between projects and ICTs as a 'business as usual' component of communities. Whilst the *Digital Strategy* does provide project-based funding, it still does little to address how projects can become operationalized and sustainable. Unfortunately, the economic model privileged in the *Digital Strategy* reinforces a short-term approach to competitive funding and the high risk of technocratic/bureaucratic intervention on a project basis at the expense of sustainability and operationalisation. As Day (2004) cautions, this short-term approach has historically been detrimental to CI initiatives and it is hoped that this issue can be resolved in the implementation. Particularly significant in this regard is the appointment of an Advisory Board who can promote the importance of long-term sustainability.

Funding for CI projects

Words and grand ideas are one thing. Money is quite another. Fortunately, the *Digital Strategy* does contain significant new funding allocations for CI related initiatives. It is evident that New Zealand lacks the fiscal and economic resources to fund projects on the same scale as Canada and the UK; we are simply too small. However, it is often said that what we lack in dollars we can make up for in ingenuity and commitment. This is, perhaps, the key driver behind the funding component of the *Digital Strategy*. The key here is partnership: Partnership is a key component underpinning the new *Digital Strategy* and is perhaps the best opportunity for individual communities to achieve effective solutions with limited resources. Funding will be provided to projects that can demonstrate working partnerships between communities, government agencies or the private sector. This implies that funding is to seed what has already been evaluated as a viable initiative and will hopefully ensure that sustainability can be achieved. For CI initiatives, there are two key funds:

- Broadband Challenge: NZ$24m of contestable funding to support partnerships to deploy open-access fibre networks.
- Community Partnership Fund: NZ$20.7m of contestable funding to build capacity in communities and develop strong local partnerships.

In addition, NZ$1.44m is available for remote areas to access broadband and some funding remains in the Connecting Communities strategy. This is significant and real money going into CI initiatives for the first time in New Zealand.

Impact on Research

The *Digital Strategy* will require an evaluation framework to monitor money spent and this presents CI researchers both locally and internationally with an opportunity to influence what good CI research means. Successful community informatics projects are embedded within communities and support the aspirations of the community that they serve (Day, 2003). Research and evaluation is important for learning and sharing. It is itself an aspect of partnership. However, it is of critical importance in a community-based setting that the researchers are seen as participants in the process as well as observers within the study. This process is like "paddling a *waka* [canoe] alongside [the community]" (Williamson & DeSouza, 2003, p. 20), acknowledging our own role as guests but also developing relationships with the participants. This approach is consistent with that recommended by Guba and Lincoln, who promote that "participants [are] accorded the privilege of sharing their constructions and working toward a common, consensual, more fully informed and sophisticated, joint construction, [where] they [are] accorded a full measure of conceptual parity" (Guba & Lincoln, 1989, p. 11). In particular, we need to promote the value of rigorous qualitative research and the use of participant's stories as being equally as important as more traditional quantitative studies.

Conclusion

Whilst it is still early days the *Digital Strategy* is an exciting document that offers significant potential for CI practitioners and researchers in Aotearoa/New Zealand. The *Digital Strategy* is a whole of government approach to ICTs and the Advisory Group will advise and, hopefully, influence a number of Ministers and Ministries. This presents us with a serious opportunity to increase the importance and knowledge of ICTs in developing our communities through a broader policy setting. At the grassroots, the *Strategy* appears to support locally emerging solutions and partnerships that can lead to sustainability. It contains funding for access and education, which are critical if all sectors of society are to be brought along. Whilst there are some limitations, this is to be expected in such a new and wide-ranging strategy. The pattern so far has been one of evolution through consultation and it is hoped that this process will continue, allowing the Strategy to be fine tuned as it is rolled out.

This *Digital Strategy* clearly has the potential to position Aotearoa/New Zealand as a world leader in CI initiatives. It offers direct solutions to issues of funding and access and, through the promotion of partnerships that can lead to increased collaboration and better skills, it supports long-term sustainability. Whilst only time will tell whether this works, I suspect that what we do next will be watched very closely.

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