Information, Communication & Society 5:2 2002 207–224

BRIDGING TEMPORAL AND SPATIAL 'GAPS'

The role of information and communication technologies in defining communities

Paul M.A. Baker and Andrew C. Ward

Georgia Institute of Technology, Atlanta, USA

Abstract

The diffusion and use of digitally based information and communication technologies (ICTs) offers the opportunity to redefine and reconceptualize 'community' both in terms of delineating the boundaries of community, as well as the modes of communication used between members. The creation of an electronic infrastructure, the Internet, permits the possibility of widespread public communication that is inexpensive and relatively easy to access. A second consequence builds on the first; the emergence of (virtual) communities based on geographically distributed sources of information production and exchange rather than the geographic proximity of community members to one another.

An assessment of three cases of ICT-linked communities suggests that one component of sustainability of these virtual communities of interest may be a geographic linkage. While interests not based on geography are, at least at present, more transitory and less important than those created by the use of the Internet and similar kinds of ICTs. While we may join a virtual community because of an interest we have, unless that interest affects us in our daily lives, in our lives as physically-instantiated and geographically-centred individuals and citizens, there is no good reason to believe that we will long continue an active membership in the virtual community. Indeed, this is precisely what the three case studies presented in this paper suggest.

Keywords

information and communication technologies (ICTs), community, geography, virtual, social

COMMUNITIES: VIRTUAL AND REAL BOUNDARIES

The development of digitally based information and communication technologies (ICTs) has had a number of important consequences, including a re-conceptualization of what it means to be a 'community'. Another consequence of no small import is the role of these technologies as a facilitating component of communication, and hence, a change agent. A third consequence, with special

Information, Communication & Society
ISSN 1369-118X print/ISSN 1468-4462 online © 2002 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI: 10.1080/13691180210130789

social significance results from the transformation of what were originally closed: electronic channels of information exchange designed for highly specialized academic and governmental uses into commercially viable products.[1] This transformation has sparked widespread public communication that is inexpensive and relatively easy to access. In turn, this has permitted the development of communities based on characteristics other than the traditional, geographic proximity of community members to one another; communities where the 'binding' factor is one of common interests rather than a default condition of sharing common space.

In this connection, Virilio, in his 1991 book *The Lost Dimension*, speculates that the cities of today – the 'Neo-geological . . . fossil of past societies whose technologies were intimately aligned with the visible transformation of matter' (1991: 27) – will be displaced by electronic (virtual) constructs generated by use of the Internet.[2] He writes:

> From here on, urban architecture has to work with the opening of a new 'technological space-time' . . . Instead of operating in the space of a constructed social fabric, the intersecting and connecting grid of highway and service systems now occurs in the sequences of an imperceptible organization of time in which the man/machine interface replaces the façades of buildings as the surfaces of property allotments.
>
> (Virilio 1991: 13–14; also see Ostwald 1997: 128–30)

Virilio's 1991 speculations are well on their way to becoming reality in the early part of the twenty-first century. The simple, well-defined geographical boundaries and transportation-limited neighbourhoods are no longer the only natural limits of community.[3] People geographically distant from one another are able to readily communicate with each other[4], and with institutions such as banks[5] and department stores (see Ignatius 1999), though the mediation of the Internet. Social organizations and interactions are no longer bound exclusively by the traditional limitations of geography, but have been offered new possibilities within the vast electronic matrix of cyberspace, the virtual world (see Rosenau 1992: 70–6).

A cursory review of the effects brought about by the public deployment of the Internet seems to support many of these speculations. In virtual communities, the role of the individual is shaped more by the intensity of shared interests than by the mere coincidence of geographic proximity. The connection between individuals in virtual communities is not one primarily characterized by shared spatially proximate events like the weather turning stormy, the neighbours being too loud or the trash collectors going on strike. Instead, what ties people together is their interest in engaging in relationships of receiving, creating and exchanging

certain kinds of information that are not tightly tied to their geographical location. That I am interested in osteoporosis or recent developments with the International Thermonuclear Experiment Reactor does not depend on my being in the USA, or even on the face of the earth. To vary a remark by Hayles (1993: 72), the boundaries of the virtual community are defined less by physical geography than by feedback loops. Thus, my 'location' or 'place' in such collections of people does not depend on my geographic location. Rather, if we think of people being engaged with one another in terms of their desire to access, create and exchange information, then one's place in a virtual community can be thought of in terms of one's role within a large, complex web of engagements.[6]

Observing these effects has led some of the most ardent proponents of the Internet to speculate that it can provide solutions to many of our social problems. For example, Dertouzos, in his 1997 book *What Will Be: How the New World of Information Will Change Our Lives*, suggests that use of the Internet will promote what he calls 'computer-aided peace'. 'Once governments really begin using the Information Marketplace to alter their internal practices,' writes Dertouzos, 'they will be a short step away from improving intergovernmental activity'. The 'common bond reached through electronic proximity,' he continues, 'may help stave off future flare-ups of ethnic hatred and national breakups' (1997: 218, 282–3).[7] The same sentiment is echoed in Mulgan's *Connexity: How to Live in a Connected World*, where he writes that '[A] more connected world would be a more moral one, or at least more sophisticated about morals' (1997: 124). The thread that connects Dertouzous, Mulgan, and writers like them is, as Giddens notes, the idea that the 'emptying of time and space' (1991: 27), first by the printed text and later by the 'electronic signal' 'set in motion processes that established a single "world" where none existed previously'. In this single world 'humankind in some respects becomes a "we", facing problems and opportunities where there are no "others"' (1991: 27).

While a more peaceful, moral world is surely something we would all welcome, even a perfunctory examination of the history of science and technology reveals that such claims almost always follow the introduction of new information technologies. For instance, in 1898, in his book *Submarine Telegraphs*, the British electrician and telegraph expert Charles Bright wrote:

> An entirely new and much-improved method of conducting diplomatic relations between one country and another has come into use with the telegraph wire and cable. The facility and rapidity with which one government is now enabled to know the 'mind' – or, at any rate, the professed mind – of another, has often been the means of averting diplomatic ruptures and consequent wars during the last decade.
>
> (quoted in Standage 1999: 161–2)

Given that use of the telegraph, and other 'modern' forms of communication such as the telephone, has not 'created' any sort of idyllic community, it seems reasonable to be wary of claims that, by itself, increasing public use of the Internet will create new, morally advanced communities.[8]

But if we cannot reasonably expect the creation of new and morally improved communities from increasing public use of the Internet, what should we expect? What we have already seen reported in the popular press and in professional journals is that use of the Internet facilitates the tendencies of latent, or potential communities to become self-aware by providing a way for individuals and groups of individuals to regularly interact with one another. Use of the Internet also provides opportunities for communities that already exist to expand and better serve the members of that community. The Internet allows community members to be anywhere and, to some degree, 'any-when', while retaining their membership and the possibility of some measure of participation in their community. It permits members of a geographically defined community to interact and maintain the communications flow of 'community interest' without requiring a concurrent proximate physical or temporal presence. Moreover, the Internet allows people with temporary or permanent handicaps, who might otherwise be excluded from community membership, to be active participants (see Bock 1994).

However, in spite of all these advantages, what the Internet does *not* do is create a community if there are no pre-existing common interests. A central theme of many political theorists, ancient and contemporary, is that people living in physical proximity with one another do not, just by their proximity to one another, constitute a community. What happens is that such people come together and create communities because the satisfactions of many of their day-to-day interests depend directly upon their cooperation within their shared physical environment.[9] Once people form themselves into communities because their satisfaction of shared interests requires co-operative efforts, additional interests arise because of the dynamics of the community they have created. This, in turn, reinforces the shared interests and creates new ones, and encourages further levels of co-operation. The key point, though, is that communities do not simply spring up for no reason. Rather, it is because of the co-operative satisfaction of shared interests that are directly affected by the physical environment – and more specifically, because of real or perceived deficiencies in the physical environment – that geographically defined communities come into existence. What an examination of virtual communities reveals is that, in terms of their origins, there is no reason to suppose that they are any different than geographically-based communities. Accordingly, without the affect of geographic proximity both

demanding and permitting co-operative behaviour, a necessary condition for the existence of virtual communities is the presence of some other kind of cohesive force. What this strongly suggests is that while a pre-existing geographically defined community can be reinforced and enhanced by use of the Internet, ensuring that everyone is 'hooked up to the Internet' cannot, by itself, create a community that does not, in one sense or another, already exist. Wires do not a community make.

COMMUNITIES – VIRTUAL AND GEOGRAPHIC

The animadversions above require that we now directly address the question: 'What exactly is a community?' On the one hand, the word 'community' has, as noted by Graham, 'become a vogue word on almost every lip, a word now used, or abused, to the point of meaningless' (1999: 131; also see Talbott 1995: 63). On the other hand, what these animadversions suggest is that the concept of community can be operationally defined as a self-organizing group of individuals whose organizing principle is the perceived need for co-operation so as to satisfy a shared interest or set of interests (see Castells 1996: 32; Rheingold 1993: 4, 24; Talbott 1995: 65). Sometimes communities will self-organize because of minimal outside influences – e.g. communities of scholars, and organized soccer teams where the shared interests provides a gravity of attraction. Sometimes they will self-organize in direct response to an invasive outside influence, for example, unions. Though frequently used in a geographic sense, there is nothing that necessitates the meaning of 'community' be narrowly linked to a specific spatial location. For instance, a metropolis is often best characterized functionally in terms of shared services, governance and the economic relationships amongst its constituent components. A similar story can be told of a community of subscribers to a published magazine, journal or newspaper, or a community of people who follow their favourite sports teams on television or radio.[10] It is, in fact, the story that Rogers tells about 'the invisible college of rural sociology diffusion researchers' in *Diffusion of Innovations*. As Rogers writes:

> In the 1950s, a decade after Ryan and Gross set forth the diffusion paradigm in 1943, an explosion occurred in the number of diffusion studies by rural sociologists . . . New PhD's in rural sociology, produced at Madison, Columbia, and Ames in the 1950s, then became professors at other state land-grant universities where they, in turn, established diffusion research programs . . . The [resulting] invisible college of diffusion researchers in the rural sociology tradition was a highly interconnected network of scholars who shared a common theoretical-methodological framework.
>
> (1995: 55)

What makes Rogers' 'invisible college' and other such collections of people a community is a shared set of interests, the perceived need for, and interest in co-operation to satisfy those interests as a community organizing principle, and a set of guidelines for what counts as appropriate or inappropriate interactions.[11]

Rogers' observations about the role of shared experiences and academic pursuits that generate communities of interest are ones that predate the current fascination with the role of information communication technologies (ICTs) such as the Internet in facilitating change. Likewise, the expression 'community networks' appears in the literature of several disciplines and frequently is as likely to refer to the communication flows between actors in a community, as to digital technologies, and computer networks. Thus a discussion of 'community networks' carries embedded in the phrase a conceptualization of the inter-linkages between individuals both purposeful and coincidental (the connections) and well as the content of the flow (communication and/or content).

We make a distinction then with 'virtual community' representing a *special case* of 'community network', used in discussions of information infrastructures (digital networks), that is non-spatially oriented. In this latter usage, a *virtual community* connotes a gestalt of content, communication, context, as well as the actors that 'flow' through a non-geographic space ('cyberspace', 'webspace', 'the Net, etc.') – the Internet matrix represented by an electronic co-ordinate system used for routing communication protocols. Thus, virtual communities can be thought of as digitally enabled information overlays that may or may not map onto the extant geographic community networks, made possible by the development and implementation of ICTs such as the Internet. A 'virtual community' might have a proximate linkage (for instance, virtual community of gay and lesbian users of AOL that identify with living in the city of Atlanta, but may never have met face to face) or a purely conceptual linkage (the community of members of the Religious Society of Friends (Quakers) who interact via threaded listserve computer mediated communication, but do not live in a common geographic area). In either case, while the common binding element 'interest' has the dimension of intensity, a key component of sustainability of these communities is the development of common set of practice, and beliefs. The special case of communities in which electronic modalities of communities allow for multiple types of connection lead to a new speculation: that there are several components of 'binding' operative in the sustainability of communities. In geographic communities there are multiple components of interest: cultural, geographic, educational political etc. In a virtual community, the *connection* has frequently substituted *intensity* of interest for the more common multiple points

of interest traditionally found in geographic community. We speculate then that the ecology (and thus sustainability) of communities may be influenced by two sets of factors: the intensity of interest exhibited by the members of the community, which then relates to sustainability by key actors; and the diversity of interest, as indicated by the multiple points of commonality (or connection). In the latter case, the greater the number or kinds of connections, the greater the depth of a community. So a community that has both intensity of interest as well as multiple points of types of connection will be more likely to continue and develop as a an ongoing entity.

THREE CASE STUDIES OF VIRTUAL COMMUNITIES

To give empirical content to our remarks about the dynamics of virtual information communities,[12] we now turn to three cases of community/city-oriented information networks as 'precursor forms' of virtual communities. In each case we see that unless the virtual information infrastructure (i.e. virtual community) links its inhabitants to one another by providing access to antecedently desired information, or creates the need for new information based on antecedently desired information, the community is likely to be abandoned. When this happens, the virtual information community becomes what has been termed a 'ghost town' in cyberspace or worse, vanishes without even a trace (Kanfer 1997). Such is the cold, clean reality of electrons. Virtual communities, as informational-functional entities, only exist as long as they serve one or more vital functions. For virtual communities, that is, community-oriented information networks created and sustained by the use of the Internet and other ICTs, this means that a two-fold commitment must exist. First, to identify and meet the pre-existing needs of the community members, however identified, and second, to identify and meet those needs that emerge as community members dynamically interact with one another. Without this two-fold commitment, participation rates decline and the virtual information community runs the risk of becoming irrelevant, and eventually abandoned.

Within this context, the first case we examine is *The Regional Information Infrastructure Policy Project (RIIPP)*, funded by the U.S. Department of Commerce's National Telecommunications and Infrastructure Administration.[13] The RIIPP was a 12-month policy demonstration project of the role, function and benefits of an information and communication infrastructure in community and commercial life. It represents an urban-exurban information infrastructure linkage between the City of Alexandria, and Fauquier County, Virginia, where the

creation and use of various information communication technologies were used to extend Internet access to an area where users had to make a long distance call to achieve Internet access. The second case is *The Rockville Community Network (RockNet)* in Rockville, Maryland.[14] *RockNet* represents the successful implementation of a local government initiated 'virtual community' with a geographic foundation. The third case, the *Potomac KnowledgeWay*, represents a private/public partnership focused on developing a regional 'virtual' community network that was centred loosely on the Northern Virginia portion of metropolitan Washington DC.[15]

Environmental Context

The three cases are especially instructive in that they demonstrate how virtual communities face problems with technologically-based policy innovations even in one of the most 'wired' environments in the USA. Lack of resources, capital, infrastructure and knowledge are frequently cited as significant factors that hinder the adoption of innovation (Rogers 1995). Results reported from studies conducted on the adoption of many of these types of information innovations indicate that putting the 'wires in places' – e.g. computers, networks, programmes and telecommunications links – appears to be, in the long run, the least difficult step in adopting innovation. In the cases under discussion, several variables, in addition to the purely technical factors, appeared to have influenced the implementation of the system. For instance, because of pre-existing commercial and political links, delivery of services and information is not only an innovation to specific segments of local government, but also to many potential users both internal and external to those segments. Bringing users up to speed, training, managing content and operational considerations all rapidly become more difficult challenges than merely achieving 'access' or connectivity. This is a matter more of awareness than access.

Besides geographic and structural variables such as population, connectivity, income, density, location and age of the locality (see Clingermyer and Feiock 1997), environmental (or 'context') variables also include political variables. Group activities included in this variable might be the involvement of various stakeholder groups, the presence of policy entrepreneurs (in either or any combination of the public, private or third sectors), and the regions' political culture[16] of the region. Unfortunately, just how these variables are to be accounted for in well-principled ways can be very difficult. Unlike variables that can be quantified using generally valid and reliable socio-demographic data, the standardized sources for data relevant to these variables is rare, and what data

there is, is frequently generated piecemeal by qualitative researchers examining specific, tangentially research questions, using in-depth field interviews, or, in some cases, surveys. In all three examples, both socio-demographic and more broadly political variables appeared to be influential.

Geographic Considerations

Frequently the virtual communities associated with community networks have a strong geographic element, usually reflecting an emphasis on the locality or underlying community. The Regional Information Infrastructure Policy Project of Northern Virginia was initially organized around community needs for education, training and public information. Here the organizational principle of the virtual community was an external agent that served to provide a cohesive energy though the provision of external resources and advanced technologies. It focused on community and educational access in Fauquier County, Virginia, a rural exurban county of Washington DC, and more narrowly, on educational Internet access in suburban Alexandria, Virginia. The primary institutional participants were public school systems in two geographically separate jurisdictions, an academic institution of higher learning, George Mason University, acting as a system integrator and policy consultant, and the Federal Government. The second case, the Rockville Community Network, represents an example of a system that was developed as a means of 'testing' a policy innovation by stimulating the formation of a citizen's group to develop an information network and outreach to members of the community.[17]

The third case, the Potomac KnowledgeWay, a virtual community in perhaps the most pure sense, though one organized externally rather than generated from an intrinsic underlying or unmet aggregation (or commonality) of interest.[18] It represented a hybrid of both geographic and non-geographically localized information networks. While physically based in the Northern Virginia suburbs of the Washington DC metropolitan area, its information reach was much broader due to the participation of Maryland's Public Library Sailor Project, the Blacksburg Electronic Village Project, and Washington DC's CapAccess System.

ASSESSMENT OF CASES

Key Actors

Each of the three examples represents a different organizational structure and set of objectives, relationships between the virtual community managers and

connection to a geographically-based community. Moreover, each case displays, to varying degree, limitations on community membership, shared norms of community members, and shared affective ties. Another context environmental variable of interest in assessing these cases is the role of centres of 'intellectual capital'. Independent of the generally higher education and income levels in the subject areas, the presence of networks of knowledge, or clusters of firms engaged in similar technological and/or professional activities, may be an influencing factor. The RIIPP project clearly indicated that a system that was optimized for technical objectives might not necessarily be optimized in terms of the needs or desires of the members of the community. There is also some evidence that this might ultimately be a factor in the demise of the PKW regional network with the least definable proximate linkages. Simply calling a communication network platform a community does not make it so.

Innovation Factors

Several units of analysis appear in the three cases depending upon the frame of reference one adopts. If the analysis focuses on the technology utilized by the virtual community, then the variables are principally system implementation ones. This interpretation is especially pertinent in those cases where the primary function of the virtual community is to provide a means of information exchange. In such cases, the members of virtual communities are characterized is a passive audience of broadcast information, rather than as creators of and participants in the information exchange. It is also important to remember that all three virtual communities were initially, and principally, superimposed as an additional information overlay on densely populated urban areas. Since at least one factor that bears directly on the interaction of members in any community, virtual or otherwise, is the role of jurisdictional boundaries; it is also imperative to understand the role of local governments in the delivery of information. In this connection, in the RIPP case there is some evidence that the initial reluctance of the exurban locality to participate may be related to its perception that, as an non-urbanized locality, there is less need to engage in the superimposed delivery service. In other words, what is illustrated by the RIIP example is, amongst other things, that without some antecedently perception of an 'information gap', there is little impetus to participate in the creation or on-going activity of a virtual community. In this case, the community consisted of those members of an underlying community (physical on one end of the RIPP project, a community of interest – educators on the other end), rather than having a formalized connection with a political power structure.

A related point is revealed by the other two cases, both of which were developed in densely populated urban areas. Specifically, if the primary intention behind the creation of a virtual community is to provide some sort of 'information connectivity', then it will generally be in direct competition with established information provider such as newspapers, radios, televisions or private sector Internet Service Providers. Moreover, if the virtual community conceives of its purpose exclusively as a source of local community/governance type information, it may either duplicate information that was already widely available, or run afoul of the localities efforts to disseminate information. In either case, the implication is that a necessary condition for virtual communities having justifiable and sustainable roles is their establishing unique identities based on extant unmet information needs. Once met, more needs to be done. Not only must extant unmet information needs be met, new and dynamic information needs must be created whose satisfaction can only be met by the continued operation of the virtual community. Without this, even a viable virtual community is doomed, like its geographical counterpart, to abandonment and eventual dissolution. Perhaps one of the most expeditious ways of satisfying both demands is to precisely determine what informational needs are *not* being delivered in a specific geographically based community, and then using cost-effective and efficient information technologies to create information links for members of the under-served population. What is important to see and appreciate here is the dynamic relation that exists between the geographically bounded community and the geographically distributed virtual community. The latter, pronouncements of many notwithstanding, do not arise *ex nihilo* out of the clusters and constellations of data composing 'cyberspace'. Rather, they evolve out of a geographic foundation to find life in the higher regions of the information-theoretic world.

Internal Organizational Factors

In general, the availability of personnel, and technical and fiscal resources is generally linked to higher levels of innovation (see Rogers 1995). The same link is also present with respect to the ability to react more quickly to changes in the needs of the networked community. It follows from this that the larger the served population, the more likely the variation in skills, talents and communities of interest will be conducive to the establishment and support of virtual community networks. Moreover, in a larger, densely populated urban environment, the ready presence of organizational resources permits a greater margin of error in the introduction of innovations and, in this regard, reduces the risk factor.

Previous studies on innovation have indicated that organizational redundancy is related to higher level of innovation (see Rogers 1995). This factor is relevant in the three examples being considered since organizational resources (at least capital resources) were not in critical shortage. On the other hand, certain operational areas such as technical support for users did exhibit some evidence of strain on resources. The results of these strains were various system problems. For instance, while implementation of the systems *per se* was generally unaffected, the requirements of the users were not always immediately met. In the case of the RIIPP, limited personnel initially delayed necessary training or support in either a technical support capacity or training. Another element present in all three cases is that these virtual communities were the result of multi-organizational collaborations and partnerships. Accordingly, it is difficult to clearly separate the influence of organizational culture from political variables related to agendas of the various participating stakeholders.

Political Factors

The virtual communities discussed in this paper were chosen for the apparent presence of a readily identifiable connection with a geographic locale. In each case, at least one of the participants was a locality, which added political variables to the operation of the systems. A review of the outcomes of these examples leads to the conclusion that political variables – such as the role of individual stakeholders, the political environment (*vis-à-vis* political risk) and high visibility of the projects – may have affected the projects' outcomes. In each example, there were clear roles for policy entrepreneurs or organizational visionaries either directly as key actors (system implementers such as the schools) and decision-makers, or as change agents (such as a university or elected politician).

At this point, without the development of more precise analytic tools, it is difficult to determine the role of other factors. As noted above, the three communities were realized in relatively resource-rich environments. However there is sufficient evidence from the literature on organizational innovation that these factors may also be important in resource constrained environments, where they serve to 'marshal resources' or generate sufficient community resources by encouraging collaboration. Alternatively, in environments that are not resource constrained, but in which organizational factors are key, the change agents or entrepreneurs may act as risk 'buffers' by expending sufficient political capital to absorb the policy risk generated by adopting innovations. In this case, the scenario would be one in which the administrative arm of the locality is reluctant to risk innovation, but acting under the leadership (or pressure) of the policy

entrepreneur, would implement the policy innovation. At the very least then, virtual communities need to consider the role and participation of governmental institutions in their operation. While often benefiting from the tremendous benefits from the reduced impact of distance and the boundaries of location, the crucial insight is that virtual cannot ignore the proximate.

CONCLUSIONS AND SUGGESTED AVENUES FOR FURTHER RESEARCH

The development and widespread dissemination of digitally based information and communication technologies such as the Internet for individual and private use has once again focused attention on the changing dynamics of communities and their functions. Such access has reminded us that there is more to the identity of a community than a specification of geographic boundaries. The growing deployment of sophisticated ICTs such as the Internet permits new modes of communication and information exchange, and the concomitant emergence of an entirely new array of relationships. In the assessment of the cases presented above, we have begun to see some of the dynamics of the new relationships. However, as is almost always the case in empirically based research, there remain many unanswered questions that merit more in-depth research. These questions include, but are not limited to the following:

- If the importance of 'place' and the effect of distance are significantly minimized by the introduction of increasingly sophisticated ICTs such as the Internet, then just what separates 'places' in a virtual context? For instance, do firewalls take the place of national boundaries, and moderated 'chat-rooms' the place of community forums? In a virtual community, does a metric of interest act as an analogue to a metric of distance? Is it more proper and less misleading to conceive of the Cyberspace concepts of 'there' and 'not there' in terms of how frequently a 'cybercitizen' communicates about a given topic?
- While the decentralizing effect of ICTs such as the Internet has been noted, conversely an opposite effect is noted with respect to concentration of the 'physical Infrastructure' – i.e. the actual wires, servers and access to bandwidth. The Internet, as a paradigm example of ICTs at the beginning of the twenty-first century, allows a user to be anywhere, but the density of physical infrastructure underlying communication technologies allows for a richer denser flow (in this case speed) of information. While a virtual community may spread over a large physical area, a fast link to the Internet

seems to provide a reason to re-centralize. Thus, just how do the limitations of physical infrastructure affect the formation, operation and dynamics of the virtual?

- As the physical infrastructure itself becomes more distributed – e.g. though the use of satellites and satellite telecommunication linkages – what will happen to the virtual community? If I no longer need a personal computer that is linked by physical wires (e.g. telephone lines) to a server in order to participate in a virtual community, what does this portend for the character and dynamics of such communities? In other words, what does the shift to 'wireless communication' portend for the creation, maintenance and character of communities?
- While not a community issue *per se*, the issue of governance, the context of community, has become more complex. Much of the legal operation of the world is geographically based. Taxes and regulation are generally applied at fixed points of place. At what point is information regulated on a global net? How does a virtual community regulate the interactions of the members, and to what standard are they held?

The creation and maintenance of virtual communities presents tremendous possibilities for geographic communities, as well as for those charged with governance of the polity. In addition, the potential exists for nascent 'virtual groups' who may not yet realize their commonality of interests to become significant competitors for the attention of citizens. Administrators, elected officials and other interested stakeholders must proactively attempt to 'colonize' the virtual world (Cyberspace) or risk being left behind by these other 'virtual interest groups'.

Even as telephones and automobiles did not eliminate geography, so too the Internet and other, similar kinds of ICTs will not replace the need to meet face to face. We see that in those places where a geographic sense of community exists, ICTs such as the Internet can serve as intensifiers or more efficient conduits for information flow – be it social or political. In this case, virtual communities provide an adjunct or additional information overlay that amplifies the existing geographic community interests. Moreover, ICTs such as the Internet enable and facilitate various types of interests to reach more readily a critical mass of survival within a geographic community that might not have been otherwise practical

While the development and dissemination of digitally based information and communication technologies will give rise to new ways of interacting and the exhilaration of finding communities of interest to participate in with a myriad of

ways, in the final analysis, we must anchor the virtual to the physical. When the thrill of finding individuals with similar, albeit relatively unimportant interests begins to wear off, we will realize that these communication flows, based primarily on the traffic of cold electrons offers thin communion without additional geographic or physical linkages. Interests not based on geography are, at least at present, more transitory and less important than those created by the use of the Internet and similar kinds of ICTs. While we may join a virtual community because of an interest we have, unless that interest affects us in our daily lives, in our lives as physically instantiated and geographically centred individuals and citizens, there is no good reason to believe that we will long continue an active membership in the virtual community. Indeed, this is precisely what the three case studies considered above show.

Paul Baker and Andrew Ward
Georgia Institute of Technology, USA
paul.baker@pubpolicy.gatech.edu
andrew.ward@pubpolicy.gatech.edu

NOTES

1. Access to the Internet has not always been public. For a short history of the origins of the Internet, see Castells (1996: 342–58). Also see Kitchen (1998: ch. 2), Miller (1996: ch. 3), Rheingold (1993: ch. 3 and 4) and Slevin (2000: ch. 2).
2. For an interesting, literate, personal account of the various forms electronic virtual constructs took in the late 1980s and early 1990s, see Rheingold (1992). Poster (1995: 31ff) provides a critical discussion of the meaning and significance of the real/virtual dichotomy.
3. Conceptually this could take the form of analysis of the type and context of information, or on visual constructs that attempt to convert the content, interrelationships and location of information flow into a multidimensional graphic representation. Work done along one of these dimensions is suggested by the sort of material present in Martin Dodge's Cybergeography website [http://www.cybergeography.org/] and in greater detail in Dodge and Kitchin (2000).
4. For a discussion of seniors' use of the Internet, see Masland.
5. For example, Gallagher (2000: 1) reports that Chicago-based Bank One, the fourth largest bank in the USA, launched 'Wingspan' in June 1999 with just four months planning, and by the end of 1999 had 106,000 accounts. Similarly, Carr (2000: 4) reports that by early 2000, Barclays had moved more than 7.5%, or 600,000, of its customers into online banking.
6. This way of characterizing location in a virtual community raises a host of interesting questions. For example, what kinds of conditions are necessary for engagements to be genuine and authentic? Do exercises of power over information result in inauthentic relations?
7. Also see Etzioni (1995) and Talbott (1995: 64ff). Mitch Kapor (1993: 53), founder of the Electronic Frontier Foundation, writes:

> Life in cyberspace . . . at its best is more egalitarian than elitist, and more decentered than hierarchical . . . In fact, 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.

8. Talbott (1995: 74) expresses an even more pessimistic view when he writes that '[C]ommunity is, in the first instance, something to be salvaged from information technology, not furthered by it'. Also see Doheny-Farina (1996: 123), who writes that 'the [Inter]net, in connecting everyone, furthers our isolation by abstracting us from place and virtualizing human relations . . . '
9. As Graham points out, shared interests are a necessary but not a sufficient condition for community formation. What is also necessary is some sort of organizational structure, what Graham calls a 'Rule'. Graham writes that: '[M]embers of the community properly so-called are subject to a Rule, and this Rule determines both what their objective interests *are* and what their subjective interests *ought to be*' (1999: 133).
10. Notice that what counts as co-operation, as well as the perceived need for co-operation, varies in the three cases. It is an interesting and important project to develop indicators and indices to measure co-operation within virtual environments.
11. See Slevin (2000: 93ff). Some people argue that it is here that the Internet shows itself to be a divisive force in community dynamics. Internet use seems to fracture to guidelines for appropriate and inappropriate interactions.
12. The reason we refer to these communities as 'virtual information communities' is to emphasize the fact that their existence depends on contemporary use of ICTs and that, as a result, there is no direct link between the communities' existence and their geographic instantiation.
13. The effort did not result in a viable community network, but did result in the implementation of a local government website [http://co.fauquier.va.us], and websites for the public school system, and two local newspapers providing community information, but no community network per se.
14. See http://www.rocknet.org/
15. See http://www.knowledgeway.org
16. See Elazar (1994) for a discussion of the influence of political culture in governmental policymaking.
17. As the mission statement says:

> The Rockville Community Network (RockNet) is dedicated to providing free community access to networked community information to promote the spirit of community and meet the information needs of Rockville City residents. RockNet concentrates its efforts on segments of the community and categories of information that have not yet been adequately served by the commercial sector, in much the same way that public libraries and public broadcasting stations operate.

18. The Potomac KnowledgeWay declared 'victory' in achieving its mission as defined and ceased operation as of November 1999 with the extant website operating only as an archive for materials.

REFERENCES

Baker, P. M. A. (2000) 'The Role of Community Information in the Virtual Metropolis: The Co-Existence of Virtual and Proximate Terrains', in Michael Gurstein (ed.) *Community Informatics: Enabling Communities with Information and Communications Technologies*, Hershey, PA: Idea Group Publishing.

Baker, P. M. A. (2000) *The Virtual Metropolis*. Available online: http://mason.gmu.edu/~pbaker

Baker, P. M. A. (1997) 'Community Networks: an On-line Guide to Resources'. Available online: http://mason.gmu.edu/~pbaker

Baker, P. M. A. (1997) Local Government Internet Sites as Public Policy Innovations. Unpublished Doctoral dissertation, The Institute of Public Policy, George Mason University, Fairfax, VA.

Baker, P. M. A. (1996a) "Community Networks and Regional Development", *Proceedings of Community Networking '96: 'Bringing People Together*, Taos, NM, 14–17 May.

Baker, P. M. A. (1996b) 'Community Networks: New Tools for Environmental Planning', *Environment and Planning*, May/June: 11.

Baker, P. M. A. (1995) 'Regional Information Infrastructure Project (RIIPP): The Development of Community Information Infrastructure through Leveraging of Community Resources', In *Proceedings of Telecommunities '95 – Equity on the Internet. First Annual General Meeting of Telecommunities Canada*, Victoria, BC, Canada, 21 August.

Balkin, J. M. (1998) *Cultural Software: A Theory of Ideology*, New Haven, CT: Yale University Press.

Bock, P. (1994) 'He's Not Disabled in Cyberspace', *The Seattle Times*, 21 February.

Carr, R. (2000) 'Survey Personal Finance Online', *Financial Times* (London), 25 March: 4.

Castells, M. (1996) *The Rise of the Network Society*, Cambridge, MA: Blackwell Publishers.

Castells, M. (1989) *The Information City*, Cambridge, MA: Basil Blackwell, Inc.

Clingermayer, J. C. and Feiock, R. C. (1997) 'Leadership Turnover, Transaction Costs and External Service Delivery', *Public Administration Review*, 57(3): 231–9.

Dertouzos, M. (1997) *What Will Be: How the New World of Information Will Change Our Lives*, San Francisco, CA: HarperEdge.

Dodge, M. and Kitchin, R. (2000) *Mapping Cyberspace*, New York: Routledge.

Doheny-Farina, S. (1996) *The Wired Neighborhood*, New Haven, CT: Yale University Press.

Elazar, D. (1994) *The American Mosaic*, Boulder, CO: Westview Press.

Etzioni, A. (1995) *The Spirit of Community*, London: Fontana.

Gallagher, J. (2000) 'This is What Your New Bank Could Look Like', St. Louis Post-Despatch: Business Plus Section, 17 January: 1.

Gibson, W. (1984) *Neuromancer*, New York: Ace.

Giddens, A. (1991) *Modernity and Self-Identity: Self and Society in the Late Modern Age*, Stanford, CA: Stanford University Press.

Graham, G. (1999) *The Internet: A Philosophical Inquiry*, London: Routledge.

Graham, S. and Simon, M. (1996) *Telecommunications and the City, electronic spaces, urban places*, New York: Routledge.

Hayles, K. (1993) 'Virtual Bodies and Flickering Signifiers', *October*, 66: 69–91.

Ignatius, D. (1999) 'Grinch may lurk on mountaintop of online products', *Atlanta Journal-Constitution*, 12 December: G1.

Imken, O. (1999) 'The Convergence of Virtual and Actual in the Global Matrix: Artificial Life, Geo-economics and Psychogeography', in Michael Crang, Phil Crang and Jon May (eds) *Virtual Geographies: Bodies, Space and Relations*, London: Routledge. pp. 92 – 106.

Kanfer, A. (1997) *Ghost Towns in Cyberspace*. National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign, IL. Available online: http://www.ncsa.uiuc.edu/Edu/trg/ghosttown/

Kapor, M. (1993) 'Where is the Digital Highway really Headed?' *Wired*, July–August: 53–9, 94.

Kitchen, R. (1998) *Cyberspace: The World in the Wires*, Chichester, England: John Wiley and Sons.

Masland, M. (2000) 'Net gives seniors new worlds to visit'. Available online: http://www.msnbc.com/news/178302.asp

Miller, S. E. (1996) *Civilizing Cyberspace: Policy, Power, and the Information Superhighway*, New York: ACM Press.

Mulgan, G. (1997) *Connexity: How to Live in a Connected World*, Boston, MA: Harvard Business School Press.

Ostwald, M. J. (1997) 'Virtual Urban Futures', in D. Holmes (ed.) *Virtual Politics: Identity and Community in Cyberspace*, London: Sage Publications, pp. 125–44.

Poster, M. (1995) *The Second Media Age*, Cambridge, MA: Polity Press.

Potomac KnowledgeWay (PKW) (1997) *Potomac KnowledgeWay* Available online: http://www.knowledgeway.org/milestones

Rheingold, H. (1993) *The Virtual Community: Homesteading on the Electronic Frontier*, Reading, MA: Addison-Wesley.

Rheingold, H. (1992) *Virtual Reality*, New York: Touchstone.

Rogers, E. M. (1995) *The Diffusion of Innovations*, 4th edn, NY: The Free Press, Simon and Schuster.

Rosenau, P. M. (1992) *Post-Modernism and the Social Sciences: Insights, Inroads and Intrusions*, Princeton, NJ: Princeton University Press.

Slevin, J. (2000) *The Internet and Society*, Cambridge: Polity Press.

Standage, T. (1999) *The Victorian Internet*, New York: Berkeley Books.

Talbott, S.L. (1995) *The Future Does not Compute: Transcending the Machines in Our Midst*, Sebastopol, CA: O'Reilly and Associates.

Virilio, P. (1991) *The Lost Dimension*, trans. D. Moshenberg, New York: Semiotext(e).