Alison Powell

WiFi publics: producing community and technology

Article (Accepted version)
(Refereed)

WiFi Publics:

Producing Community and Technology

Alison Powell

Concordia University

Abstract

Drawing on community expertise, open-source software and non-hierarchical organizational strategies, community wireless networks (CWN) engage volunteers in building networks for public internet access and community media. Volunteers intend these networks to be used to reinvigorate local community. Together these two purposes: to engage volunteers in discussing and undertaking technical innovations, and to provide internet access and local community media to urban citizens create two distinct mediated publics. To better address the potential of CWN as a form of local innovation and democratic rationalization, the relationship between the two publics must be better understood. Using a case study of a Canadian CWN, this paper advances the category of "public" as alternative and complementary to "community" as it is used to describe the social and technical structures of these projects. By addressing the tensions between the *geek-public* of WiFi developers, and the *community-public* of local people using community WiFi networks, this paper revisits questions about the democratic impact of community networking projects. The paper concludes that CWN projects create new potential for local community engagement, but that they also have a tendency to reinforce *geek-publics* more than *community-publics,* challenging the assumption that community networks using technology development as a vector for social action necessarily promote greater democracy.

Key Words

Community networks

Internet access

Socio-technical

Wireless networking

New media

Democracy

Introduction

On a steamy evening in August 2004, I walked into an organic vegetarian co-op bar to meet Montreal's community WiFi activists. Over pitchers of beer, they told me about their volunteer technology project: they were setting up free wireless connections to the internet in parks and cafés, funded by a small arts grant. The young men and women I met that night talked about covering the city with WiFi to create an alternative communications infrastructure based on WiFi hotspots offered free of charge in public places that anyone could use to access the internet. They thought this network could also provide a platform for new media art projects. With intelligence and passion, they described how the technical flexibility of WiFi would make it possible to create such a community-based infrastructure. They debated ways to organize themselves to solve the technical and political challenges of this project as a "community" rather than a large hierarchical organization. By 2007, this volunteer organization had built their project into a network of 150 WiFi hotspots that were used to deliver local information and new media art. Meanwhile, WiFi evolved from a little-understood, "kludgy" technology

more suitable for experimentation than reliable service delivery (Mackenzie, 2003), to a main component of municipal-scale networking projects. In this context, could these activists succeed in establishing WiFi as infrastructure for more democratic communications?

When I walked into the bar in 2004, theorists and proponents of WiFi had been describing it as a disruptive technology associated with decentralized, local projects undertaken by small-scale organizations: neighbourhoods, community organizations, and municipal governments (Bar and Galpernin, 2004a, Bar and Galpernin, 2005, Bar and Galpernin, 2004b). Like the internet (Abbate, 1999), the cable television system (de la Sola Pool, 1977), and radio (Douglas, 1987, Haring, 2006) this interpretation of WiFi focused on its flexibility, its interoperability, and the fact that many innovative experiments with WiFi were emerging from community groups like the one I met in Montreal. The first assessments of these projects (Auray et al., 2003) focused on their technological choices, and argued that WiFi was particularly appropriate technology for small-scale, local networking.

In the intervening years, Wi-Fi and other wireless technologies have sometimes been described as infrastructure for a more democratic digital media landscape (Meinrath, 2005), but are more often represented as means of providing internet connectivity cheaply to broad areas (Lehr et al., 2006). Large-scale WiFi projects are now being rolled out across North America by municipalities defining WiFi as essential local information and communication infrastructure (Daggett, 2006). By November 2007, some of the people I

met in 2004 presented a partnership project with the city of Montreal that would provide

sustainable funding and a more conventional organizational structure to support the

expansion of their hotspot network onto city-owned property.

The transformation of WiFi

The transformation of Montreal's community WiFi from a grassroots project spearheaded

by a loose volunteer community to a municipal "public WiFi" project highlights how

WiFi projects reestablish the local community as a site for political and social action.

This raises some key questions addressed in this paper. What is the social and political

significance of community WiFi projects? Who develops and uses them? How might

they contribute to more democratic communications? In addition to the social category of

"community" which can refer both to the "WiFi geeks" who share a common interest in

hacking and reformulating WiFi technology, and to local residents, the category of

"public" describes how these groups establish shared discourses and practices that can

inspire what Feenberg and Bakardjieva (2004) refer to as "democratic rationalization."

Democratic rationalizations of technology are "user interventions that challenge harmful

consequences, undemocratic power structures, and barriers to communication rooted in

technology" (2004, p. 186). The political nature of democratic rationalizations suggests

that local WiFi projects produce not just "WiFi communities" but "WiFi publics" as well.

I argue that these WiFi publics establish shared commitments to social and political ideas

through speech, writing, and technology development. Many different publics might be

created, but two are discussed here: a *geek-public* created through speaking, writing and

creating WiFi technology, and a *community-public* constituted through shared

participation in a local community that is perceived as being augmented by WiFi

connectivity.

Participants in a community WiFi projects may be members of one or another public, or

both. These overlaps have political implications. To help describe them, I consider how

WiFi technology provides the potential for a public to develop *recursively*: to create its

own means of engagement. After introducing concepts related to WiFi publics, I focus

more closely on urban Canadian settings, using Montreal's community WiFi project to

further explore the tensions and possibilities provoked by ideas of geek and community

publics, and the concept of recursivity. I conclude by assessing the potential for WiFi

projects – as community technology and as community media projects – as vectors for

social and political action in North American urban centres. I offer the paper as a

contribution to critical debate concerning the social consequences of community

technology development. It should interest engaged academics, grassroots technology

advocates, and community organizers interested in insights from North America's WiFi

transformation.

Methods: Examining community technology development

This paper assumes that technology and society mutually construct one another, and that

technologies are cultural products (Latour, 1996, Latour, 2005, Latour, 1991).

Its main themes emerged from a participant observation I conducted from 2004-2007 with

Montreal's Ile Sans Fil ('wireless island') community WiFi network. As part of this

research I participated in regular volunteer meetings, attended board meetings, supervised

a student intern, and contributed to the group mailing list. Throughout the observation

period, I identified both as an Ile Sans Fil member and as a researcher. The participatory

nature of this portion of the fieldwork necessarily drew from my own subjective

experience of participation, and thus reflects all the benefits and shortcomings of such a

necessary subjectivity.

In addition to these observations, I conduced two sets of in-depth, semi-structured

interviews with ten core members of Ile Sans Fil, one in 2004 and one in 2007. To gain a

broader Canadian context, I conducted structured, hour-long interviews with leaders of

four Canadian Community WiFi networks in June 2006. I also conducted two surveys of

the users of the network: in 2004 and in 2006.[i] The 2004 survey was conducted by hand-

distributing printed questionnaires to hotspots. It received 56 responses, primarily from

volunteers. The 2006 survey was conducted online, advertised on and linked to the portal

page visible at each hotspot.   It ran from January to April 2006 and received 370

responses, providing a better general description of the wider community that uses ISF

hotspots. To explore more subjective aspects of the use of the ISF service I conducted 15

minute structured interviews with users of the ISF system: eight in 2005 and, as part of a

larger research project, twelve in 2007,[ii] when I also interviewed three members of

community organizations and research groups who collaborated with Ile Sans Fil,

including some of the architects of the municipal partnership.

I transcribed field notes and interviews, and analyzed the resulting text documents using

the NVivo 7 qualitative software. My coding and analysis concentrated on how ideas of

community and technology were interrelated in the discourse and practice of community WiFi groups. Survey data was used for descriptive statistics and to guide user interviews. This analytic approach produced multiple contexts (Hammersly and Atkinson, 1995) and situated perspectives on how WiFi (and, by extension, other communication technologies) is imagined, designed, built, used, and contested (Law, 2002, Miller and Slater, 2001, Suchman, 1987) for other examples of similar approaches).   This approach draws from an interpretive epistemology (Guba and Lincoln, 1989) that is grounded in a desire to contextualize the "ways of others" in discourse (Balka, 2007). As Clark (2004) notes, framing stories are important in contextualizing the multiplicity of perspectives encountered in producing any kind of knowledge. This paper provides such a framing story for the development of community WiFi in Canada, one that benefits from a deep and sustained engagement with this process.

New Concepts of Geeks, Communities, and Publics

Philosopher Charles Taylor (2002) defines a "social imaginary" as "ways in which people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations" (p. 106). Unique social imaginaries, Taylor argues, emerge out of particular moments of history. In contemporary society, social imaginaries are constituted or reinforced through the process of communication. Both communities and publics are forms of social imaginary. In the following section I distinguish the expansive, politicized conception of a *public* from the more contained, affective concept of *community*, and introduce WiFi geeks as key actors

in creating community WiFi. I then create two hybrid categories that permit me to assess

community WiFi projects: geek-publics and community-publics.

Communities

Anderson (1991) argues that communities are imagined by their members and that they

can be constituted around forms of media like newspapers, maps, or even monuments.

The concept of community seems to have a naturally bounded character, even when it is

imagined as transcending the geographic and cultural constraints that characterized the

first social scientific definitions of community. Tönnies (1887, trans. 1955) defined

community (*gemeinschaft*) as a "unity of will" in opposition to society (*geschellschaft*).

This traditional sociological definition takes village and family as primary sites for

development of community, and even though social research now concentrates on a

profusion of types of community including "geographic communities, virtual

communities, communities of circumstance that grow from situations of need, and

communities of interest" (Fraser, 2005). Substantial research literatures have discussed

the potential of distributed, internet-based *virtual communities* as potential sites for

transcending or ameliorating urban public space or local community (Bell, 2001,

Wellman and Gulia, 1999). Within the domain of *community networking* (CN) or

community informatics (CI), research on facilitating interaction within these online

communities has emerged alongside a social justice analysis of the impacts of ICT

development and use in local communities (Stoecker, 2005). Gurstein (2000) defines

community informatics as "the application of information and communication

technologies (ICT) to enable community processes and the achievement of community

objectives including overcoming 'digital divides' both within and among communities"

(cited in Marshall et al., 2004 p. 3). I shall use CN and CI interchangeably in this paper.

As a way of integrating virtual and local communities, WiFi hacking envisions a potential

space of non-commercial control, grassroots restructuring, and citizen participation in

communications. As Mackenzie (2005) writes:

> The constant appearance of new gadgets, devices, and practices that
>
> modify, alter, or hybridize Wi-Fi suggests that hopes for other forms of
>
> sociality and openness associated with communication technology still
>
> persist. That hopefulness is conditioned by the recent history of new
>
> media, particularly by a consciousness of the almost total commercial
>
> ownership and control of Internet and communications infrastructure (p.
>
> 207).

This situates community WiFi projects somewhat problematically within a larger

trajectory of CN and CI endeavors. The first WiFi communities focused on explicitly

technical goals, putting energy into hacking rather than addressing social or policy issues.

Sandvig (2004) argues that these early WiFi communities failed to challenge the

dominant political-economic structures of internet provision. A second wave of WiFi

communities (called community wireless networks or CWNs) described by Meinrath

(2005), Powell and Shade (2006) and Cho (2006) developed a discourse and practice that

contextualized WiFi as communication infrastructure built by and for citizens. Like

previous community networks, these projects hope to mobilize ICTs to create social and economic development in local geographical communities (Schuler, 1996).

O'Neil (2002) argues that the values of   (1) "strong" democracy, (2) social capital, (3) individual empowerment, (4) sense of community, and (5) opportunities for economic development should characterize CN initiatives. Wal Taylor (2004) writes, "CI is based on the assumption that geographically-based communities (also known as 'physical' or 'geo-local' communities) have characteristics, requirements, and opportunities that require different strategies for ICT intervention and development from the widely accepted implied models of individual or in-home computer/internet access" (p. 4). In the past, these strategies included integrating computing and information tools into the local community at neighbourhood centres, libraries, or language schools (Clement and Shade, 2000) so that they could be used to access the internet and build skills. Community WiFi networking encompasses a similar broad range of goals, with "more connectivity, better speeds, and a lower cost" cited by advocates as reasons for creating a community wireless network (Flickenger, 2003 p. 4).

WiFi communities (like some older CNs) are also closely connected to free and open-source software development, and to the "hacker ethic" of technical experimentation described by Levy (1984). Non-hierarchical, action-oriented, and meritocratic, this culture valorizes decentralization, "conspicuous contribution" and argument-by-technology. This culture and its values suggest that members of WiFi communities also form WiFi publics.

Publics

Publics are socio-political entities self-organized through discourse. Charles Taylor

(2002) and Michael Warner (2002) argue that publics are formed through discourse –

speech and writing - that reflects the "ways in which people imagine their social

existence, how they fit together with others, how things go on between them and their

fellows, the expectations that are normally met, and the deeper normative notions and

images that underlie these expectations" (Taylor, 2002 p. 106). Warner understands this

exchange of discourse as being the site of pure political engagement, outside of the

framework of the state: "speaking, writing, and thinking involve us—actively and

immediately—in a public, and thus in the being of the sovereign" (Warner 2002a, p. 51–

52). Speaking, writing, and thinking are the foundations of sovereignty, and the creation

and use of media to communicate them is politically important.

Every form of media has its public: readers of newspapers, viewers of debates,

participants in political rallies or commentators on blogs.   However, most publics do not

normally focus their engagement on debating the very structures through which they

speak or write. Kelty (2005) argues that the Internet has permitted the development of a

specific public composed of "geeks": "technically competent individuals concerned with

and engaged in defining, developing, and debating the technical and legal structures of

the Internet and other computer networks" (Kelty, 2005 p. 185). Community networking

literature might describe geeks as a community of practice. However, Kelty argues that

they are a public because their interest in discussing the structure and standards of the

Internet has political importance, as well as importance for sustaining the geek public. He argues that geeks create a recursive public -- "a particular form of social imaginary through which this group imagines in common the means of their own association, the material forms this imagination takes, and what place it has in the contemporary development of the Internet" (p. 186). Kelty's recursive geek public communicates using the internet while also constructing the communicative space of the internet, extending "the activities of 'speaking writing, and thinking' which have defined [publics] classically, to include building, coding, compiling, patching, hacking, redistributing, and sharing" (2005 p. 203). These activities make "argument-by-technology" that supplements the "argument-by-talk" that characterizes other mediated public speech. Through these activities, geeks are potentially engaged in a democratic rationalization of the Internet, using their own debates and coding practices to retain the space in which they can relate to one another.

Local WiFi geeks are distinct from Internet geeks. First, WiFi geeks are not a demographically broad group: most – though not all -- of the geeks I describe in this paper are white men, under 40, with post-secondary education. Second, unlike Internet geeks whose primary concern is the structure of the Internet, these WiFi geeks are interested in developing wireless technologies that not only connect to the Internet but also create local networks that can be used as forms of community media. Thus in addition to creating a *geek-public* constituted through argument-by-talk and argument-by-technology, WiFi geeks potentially also create a unique media platform for an even broader public composed of the people living in the area covered by WiFi. The actions of

WiFi geeks in Canada suggest an interest in using WiFi to serving this *community-public*: volunteer associations of WiFi geeks have developed, creating collaborations between artists and members of community organizations, as well as other forms of civic engagement. This draws the community WiFi project close to previous CN projects and democratic rationalizations that have leveraged information and communication technologies to inspire change in local community-publics by providing more just and equal access to the means of communication (Feenberg and Bakardjieva, 2002). The expanded access to the Internet and to local information through public WiFi promises a similar democratic rationalization. The hope is that through decentralized, inexpensive infrastructure installed by community members, the community-public can develop and circulate new discourses.

Still, there are some potential tensions between geek-publics and community-publics. Warner (2002) argues that publics are created through discourse, through the ability to speak, read, or write to others who share the same social imaginary. As a form of community media, WiFi can be used to share writing, speech, and other forms of mediated communications, but argument-by-technology requires more technical expertise than argument-by speech. The following sections distinguish between the publics mobilized by WiFi.

Conceptualizing WiFi Publics

Table 1 details the differences between the "geek-public" and the "community-public." Each is created through discourses and practices that define shared identities such as "geek," neighborhood resident, parent, or citizen. Both publics can be created through

different types of community WiFi activities: the geek-public is brought together by organizing a "geek group" and talking about the importance of geeky activities, and the community-public could be mobilized by greater access to media that communicates local issues. A WiFi network is often perceived as being a way to augment or improve local communities by expanding access to the internet, and through the development of a new community media source built and managed by the community itself.

(TABLE 1 HERE)

The geek-public and the community-public can overlap. WiFi geeks building local networks are part of their local community; working to create networks they hope will be useful to their community. One way of assessing the distinctions between community-publics and geek-publics is to consider how each uses WiFi *recursively*. A *recursive public* develops when a public's speaking, writing, or coding produces the means by which that public's engagement is made possible. For geek-publics, this occurs when the public discusses and creates the technologies that help geeks define themselves as such. Kelty (2005) demonstrates how Internet geeks create Internet's rules and standards, and then use these rules and standards as subjects for discussions online. WiFi geeks also recursively create their own means of engagement by debating and creating modifications to WiFi standards and to WiFi hardware and software. More fundamentally, though, both Internet and WiFi geeks create recursive publics by using arguments about (and by) technology as means of making social links. WiFi hacking makes better WiFi tools that can better connect geeks to each other, but hacking is also a means of making a WiFi group, and defining a WiFi geek.

In a democratic rationalization of WiFi technology, we would expect the community-public to also develop recursively. A *recursive* community-public could develop a shared sense of belonging to a local space by contributing to the media platforms that reflect its members shared identity. Ideally, WiFi hotspots like those developed by Canadian CWNs play this role by providing local information and displaying artistic projects that take advantage of the local reach of WiFi. WiFi hotspots are imagined as being able to deliver extremely targeted local information: for example displaying the results of recent local council votes and filtering information based on the location of the hotspot and the interests of its visitors. A platform like this could provide a way for the community-public to develop in the spaces of WiFi hotspots, drawing on the capacity for WiFi to operate as a form of community media.

(TABLE 2 HERE)

Case studies: Canadian WiFi projects and Montreal's Ile Sans Fil

Canadian community WiFi projects present a unique case demonstrating the tensions between geek publics and community publics. Canada's early policy focus on broadband provision for all citizens[iii], has prevented a municipal WiFi explosion like the one the United States experienced. While Canada's universal broadband programs were not entirely successful in providing broadband service in all areas (many rural and remote areas are still without broadband access) they have provided very good broadband connectivity at reasonable prices to subscribers in most Canadian cities. Canadian CWNs in cities like Montreal, Toronto, and Vancouver have therefore focused on

experimentation with WiFi's technical, social, and policy representations, drawing from their specific social context, as well as contributing to it. For example, in Canada's largest city Toronto, WirelessToronto contributes to a culture of social innovation: it is a virtual tenant of the nonprofit Centre for Social Innovation, the site of its first hotspot and a partner on grant applications. The centre rents space to social mission organizations, and offers seminars on technology, and social enterprise to which members of WT contribute. In another example, on the West Coast in Vancouver, the British Columbia Wireless Networking Society engages with a charged political landscape by directing its activities to bridging the digital divide between Vancouver's urban areas and the rural islands nearby and submitting briefs to decision-makers on community technology issues. In Montreal, Ile San Fil's efforts resonate with a culture of community action and grassroots projects. The city has a long tradition of grassroots organizing and mutual aid, extending back to the organizing efforts of the Catholic religious colonists. More recently, decades of Quebec leftist governments have solidified in citizens the concept of a "shared good" and a connection between radical politics and community media (Raboy, 1984). Community action is sometimes associated with self-determination of French-speaking Quebec. The following section examines how Ile Sans Fil (ISF) draws on these influences in its construction of geek-publics and community-publics through the development of WiFi networks.

Examining CWN complexities: Ile Sans Fil

Volunteers as a Geek-public

The vision of ISF has been to "use new technology, especially wireless technology, to empower individuals and to foster a sense of community" (Ile Sans Fil, 2003)[iv]. To put this vision into practice its members have engaged in four main activities: building software, installing network nodes, building relationships with other community organizations, and creating and managing art and media content to be displayed at its hotspots. ISF members believed that these activities should be organized non-hierarchically, and decisions made by consensus – as within other open-source mobilizations. These organizational elements, combining argument-by-technology and argument-by-talk, helped to create a geek-public of experts from its volunteers.

Volunteers at ISF are students, professionals, or retired. Most speak both French and English fluently. Since 2003, there have been over 100 volunteers involved for various lengths of time. Individual volunteers express different kinds of interest in WiFi: for example, some consider it a medium for artistic interventions while for others it is a practical service lacking in Montreal or a platform for community media. Yet all volunteers described ISF as "geeky." One female ISF member described herself almost apologetically as "lacking any geeky skills" (Female Ile Sans Fil volunteer, Interview Feb. 12, 2005) although she was a multimedia artist and curator comfortable both with programming software and with modifying computer hardware as part of her work. Another volunteer described ISF as "primarily a social club for geeks . . . a club of passionate workers[v]" (Interview with Laurent Maisonnave, December 8, 2007). Most ISF

members also said that one of their main reasons to participate in ISF was to contribute to

their community. Many meetings finished with members introducing themselves and

chatting, saying things like "we are really a nice bunch of people – we are the good

ones[vi]" (Field Notes, March 21, 2006). The volunteer interviewed above said that groups

like ISF were important because "they provide access to something that's important, like

water, electricity [smiles] . . . well it's not more important, but it lets you get informed[vii]"

(Interview with Laurent Maisonnave, December 8, 2007).

Activities: Building Public WiFi Access, Augmenting local community

ISF has focused on installing WiFi in locations that are open to the public (though not,

strictly speaking, public) including parks, cafés, bars, restaurants, artist and community

centres, and the public areas of some hospitals and academic institutions.   Backhaul

bandwidth is provided by the organization where the hotspot is located. Many ISF

hotspots were originally installed in locations that volunteers regularly visited. Members

are encouraged to "adopt" a hotspot by visiting it and assuring its functionality, and

public ISF meetings are held every two weeks in one of the hotspots, where members test

the network connection while holding discussions and drinking beer.   Drinking beer, and

socializing in general, plays an important part in the culture of ISF volunteers.

Membership in the group offers them a chance to gather in a "third space" away from

work and home (Oldenburg, 1989) and get to know others with similar interests.

The idea of using WiFi networks to support electronic "third spaces" was part of ISF's

vision. Many volunteers said that one goal of ISF should be "get people out of their

basements" (Field Notes, 2004; 2005; 2006) - in other words, it should establish WiFi

connectivity as a way of encouraging geeks and other people who might be working in

public spaces to get to know each other. This goal has influenced ISF's software project.

"WiFiDog" is open-source software that transforms off-the-shelf WiFi modems into

nodes in the group's network, each of which displays a unique opening page ("the portal

page"). The software also helps to manage images and content to be displayed on this

opening page. WiFiDog has become a standard piece of software for WiFi hotspot

networks -- both commercial and community-based. WiFiDog was created to facilitate a

unique, WiFi-delivered media environment at each hotspot. Its designers added a

network-wide news feed, linked to photo-sharing site Flickr so that photos tagged with

the hotspot name would automatically be displayed, and also attempted to build a music-

sharing system where hotspots provided libraries of music chosen to fit their specific

culture. To promote social interaction between people using the same hotspot, the

opening page for each hotspot displays a list of all of the users who are logged in, with

links to profiles showing their website, name, or other information. These projects were

explicit interventions that attempted to establish WiFi hotspots as unique social and

cultural spaces where WiFi could create a missing "third space" for public social

interaction. The idea that WiFi connections in cafes could bring isolated people together

resonates with the goals of community networking projects, in that it connects an interest

in inspiring virtual communities with a focus on development and use of ICTS for local

social and economic development. In these plans at least, democratic rationalization

seems possible.

Hacking as a form of social engagement

ISF's activities add a new cultural element to community networking. The image of youthful, volunteer geeks installing their own software as a contribution to their community casts a friendly, trendy image over computer networking. Reframing hacking as legitimate form of social engagement establishes geeks as a potentially powerful category of social and cultural actors. One of the ISF founders writes,

> We are hacking the built city. This statement is based on the idea that as wireless devices and services proliferate and ubiquitous computing becomes a reality, the physical environment (especially the built city) is rapidly becoming enhanced space or mixed-reality. The supposedly separate existences of off-line and on-line are intersecting and overlapping - most rapidly in cities. (Lenczner, 2005)

This argument connects virtual communities – or geek-publics - with local place-based community-publics, establishing hacking as a means of altering public life by transforming technology. For ISF members and other geeks who use WiFi hacking as a means to get to know each other and contribute to their city, "hacking the city" provides a new way of engaging with civic life, even as it helps develop a recursive geek-public. However, hacking may not have the same influence on the non-geeks in the community-public.

Geek-publics and Community-publics

Warner (2002) argues that a public must continually extend its discourse to "indefinite strangers" outside of the centre of its discourse production if it is to be sustained: otherwise, the would-be public remains a closed group. ISF attempts to extend its discourse as well as its WiFi networks by maintaining partnerships with artists and community organizations to develop content for the portal page, and by appealing to the people who use WiFi hotspots, the "indefinite strangers" (Warner, 2002 p. 120) who are meant to be creating media and socializing through the portal pages. However, the design and management of the physical network has been more successful than the mobilization of the community-public. A former member of the administrative council of ISF reflects: "It's as if we reproduced a production line [for the deployment of WiFi hotspots] - we reproduced an industrial model . . . . But it could have been a noble project . . . In this there was a problem of governance, the problem was that the people with the artistic projects were always outsiders[viii]" (Daniel Lemay, interview Dec. 6, 2007). A collaborator at a university arts project echoed this reflection on the challenges of collaboration with ISF, and the group's distributed organizational structure:

> It's a bit challenging because it's [a], purposefully distributed control structure out
>
> there which is . . . great for some things and sort of difficult if you are on a
>
> production timeline and you are not sort of really within the inner circle. So you

don't . . . know all the people and you don't know who you have to go to to get

what done. (Anonymous, interview July 17, 2007)

The recursive nature of ISF, where discussions about and experimentation with WiFi

helped geeks to define a "geek-public" also complicated the development of the

collaborations that helped make their project relevant to a broader community-public that

included the users of WiFi hotspots.

New publics: Using the Ile Sans Fil network

Over 40,000 people are registered as users of the ISF network. Survey data from 2006

suggests that the "users" are not far different from the "geeks": forty-eight per cent are

aged twenty-five to thirty-four, and sixty-seven per cent have at least a bachelor's degree,

and higher proportions worked in education, media, and telecommunications than in other

fields. Sixty-eight per cent said that they used Wi-Fi hotspots "to get out of my home or

office." Although the availability of WiFi influenced which cafés and bars respondents

visited, many also reported that they used free WiFi wherever it was available, not

necessarily only at ISF hotspots.

Observations and interviews conducted in November 2005 and May 2007 with people

using ISF hotspots support these insights from the survey. They indicate that while the

discourse of "community" is important to users, some user practices oppose ISF's social

goals. ISF users primarily want to gain access to the internet freely – one user described

himself as "opportunistic – but aren't we all? (Male Ile Sans Fil user, interview Nov 5,

2005)." These opportunistic users were more interested in connectivity to the internet

than in socializing with people sitting nearby in a café. In addition, many of the people I

interviewed preferred accessing WiFi networks anonymously, and were annoyed with

ISF's authentication procedures. The fact that the service was "free" – as in, free of

charge – was considered more important than the fact that ISF's technical and social

structure were open to participation: while the network users I interviewed knew that ISF

was a community organization, none of them had attended meetings, although one

respondent said that he had "given them [ISF] my opinion on a couple of things, but they

always ignored me" (Male Ile Sans Fil user, interview Nov 5, 2005). For the broader

community of users, ISF's projects were "a good idea that should be replicated

elsewhere" (Female Ile Sans Fil user, interview November 10, 2005) but not something

that inspired profound connection to the local community. This suggests that members of

the non-geek community-public in Montreal are not necessarily interested in using

technology as a means of creating social links – or at least not in the recursive manner

that ISF's geeks might have expected.

The use of the ISF portal page suggests that there is an important difference between the

recursive geek-public brought together by designing and using the WiFiDog software and

the (still imaginary?) *recursive* community-public that has so far failed to use the portal

page as a platform for social interactions. According to interviewees, viewing local

content on the portal pages is perceived as a necessary impediment to connecting to the

internet to send email or surf the web. Most users interviewed said that they did not use

profiles, and some were opposed to the idea of putting personal information online where

it would be visible to strangers. One person explained that he used the number of user names appearing on a hotspot's portal page as a gauge for the amount of bandwidth available, avoiding locations with too many people online (Male Ile Sans Fil user, 2005). ISF users seemed more interested in getting free WiFi than in participating in a mediated version of café society. Like Habermas' (1989) bourgeois public sphere composed of men encountering one another in cafés, the recursive geek public in Montreal reinforces its own social connections in public spaces: the hotspot with the highest number of visitors between 2004 and 2007 (now closed) catered to mobile workers, and on most days at least one ISF member could be found working there. While the geeks are in the cafes, the users may be elsewhere: Crow et al. (2007) suggest that a significant number of Ile Sans Fil users are accessing the internet from adjacent office buildings, restaurants, or homes rather than the publicly accessible hotspots. This means that ISF's plans to use WiFi to augment an experience of physical space have been undermined by WiFi's own technical structure: it passes easily through walls and windows.

Democratic Rationalization: Limitations and Possibilities

Despite hopes that ISF's delivery of free WiFi could inspire Montreal's community-public to contribute to new forms of community media, ISF's most significant social consequence may be the development of the geek-public. Economically, ISF has virtually eliminated the market for pay-for-use WiFi in public spaces in Montreal. In the words of one of its founding members, "we have done a great job of domesticating free WiFi in Montreal" (Michael Lenczner, personal communication November 17, 2007). As WiFi technology becomes more widely diffused, the geeks who first explored and developed

the technology begin to be considered experts. This process can be compared to the development of "electrician" as a profession in the early period of electrification. Marvin (1988) describes how discourses of expertise helped electricians to establish the legitimacy of their new profession. Similarly, geeks may be legitimating their own expertise in WiFi networking through the development of recursive geek-publics. Despite an admirable commitment to ameliorating a broad local community, CWNs may primarily build social capital for their members (Cho, 2006). Considering that the community-public has yet to use ISF portal pages to engage in recursive discussions about each hotspot's community, the legacy of community WiFi networking may be in mobilizing geeks, and in discouraging consumers from paying for WiFi.

Nonetheless the expertise of WiFi geek-publics may be maintained by emerging organizational structures. In November 2007 I spoke with one of the members of the city of Montreal's municipal economic development office about their proposed partnership with ISF. He referred to ISF complimentarily as "a group of geeks" – and felt that the partnership structure should support, not replace, what he saw as a fragile organizational form that was unique to Montreal (Bill Tierney, personal communication Nov. 18, 2007). The city of Montreal's initial interest in the ISF project came in response to local mass media's enthusiastic coverage of the project. Between 2004 and 2007 thirty-eight articles, most in the dominant French-language press, discussed ISF. Many of them identified ISF's community innovation as an important part of the city's identity. Supporting the further development of this innovative group would thus reinforce this positive image of the Montreal community. The proposed partnership between ISF and

the city of Montreal will not create a ubiquitous broadband network. Instead, it will provide funding for a full-time employee to manage ISF's volunteers, in return for an expansion of the network to 400 hotspots, some of them in city parks and public squares. By attempting to gently institutionalize rather than replace the ISF network, the city of Montreal is supporting the further development of the geek-public. The community-public will presumably be served through expanded availability of WiFi in public places including city parks. Still, this project aims primarily to provide better options for occasional use of WiFi rather than provide a municipal WiFi infrastructure.

Conclusion

In the broader context of community networking and community informatics projects, the activities of ISF indicate that building WiFi can be an activity that creates and reinforces new categories of social actors: WiFi publics.

The energy I felt in 2004 upon first meeting Montréal's WiFi geeks convinced me that this group could redefine local culture and communications, making them more democratic. The social goals espoused by these projects demonstrate that new communication technologies can be developed outside of institutional channels, and in ways that foreground social and cultural contributions. In the broader North American context, yearly meetings of WiFi activists have focused on the broader political implications of WiFi, particularly the political necessity for local control of communications infrastructure. While these meetings introduce WiFi geeks to new potential roles as policy experts, they also highlight the local specificity of community

WiFi projects. These local variations may keep WiFi projects relevant to the democratic life of local communities. Worldwide, local iterations of WiFi projects created by community organizations impact rural and urban communities (Powell and Meinrath, forthcoming). As Dean (2002) argues, mass politics and mass publics may be waning as sites of political influence. While Dean advocates the creation of "issue networks" to connect people together, the community WiFi phenomenon provides another example of how the community can become a site of creative engagement with media and information infrastructures.

However, this development of a broader "WiFi movement" and local projects like ISF is still marked by incongruities between geek publics and community publics. In light of increased corporate control of telecommunications infrastructure and the paucity of community media developed for new media platforms, an important role remains for community WiFi projects where knowledgeable geek-publics develop community-based communications infrastructure. Nevertheless, at the local community level and within broader advocacy projects, the potential for community technology to benefit a broad community-public must be balanced against its tendency to primarily mobilize a recursive geek-public, or as has occurred in Montreal, to appeal to a supposedly "broader" public that is demographically very similar to the geek-public. Warner (2002) notes that to survive, publics must expand – otherwise, their discourse turns inward. The strong recursive tendency of geek-publics suggests that this may be a risk for community WiFi projects. While this seems to be occurring at Ile Sans Fil, the project has had impacts outside the Montreal community: it has inspired not only WirelessToronto but also two

other WiFi projects in the province of Québec, both of which have established funding and partnerships that formalize relationships between geek volunteers, local governments and cultural producers.

Community wireless networks are part of a new generation of projects that politicize communication technology, creating a potential democratic rationalization of WiFi networking. However, if this democratic rationalization is to fulfill its promise, WiFi publics must create and distribute discourses and practices that mobilize not just geek-publics but community-publics too. They must also create different kinds of collaborations to prevent new kinds of divides from forming between educated, professional users of WiFi and other people in the local community. These could be collaborations between local governments and geeks, like the one beginning in Montreal, or community-based media projects using WiFi and other mobile technologies. As complex as the internal relationships may become, policy-makers and community organizers should attempt to leave space for visionaries, idealists, artists and geeks to think, talk, and hack their way into new publics.

Acknowledgements

References

Abbate, J. (1999) *Inventing the Internet,* Cambridge, MA: MIT Press.

Anderson, B. (1991) *Imagined Communities: Reflections on the origin and spread of nationalism,* London and New York: Verso.

Auray, N., Charbit, C. & Fernandez, V. (2003) WiFi: An Emerging Information Society Infrastructure. *Socio-economic Trends Assessment for the Digital Revolution.* STAR project, IST Programme, European Commission. Milan, Italy,

Balka, E. (2007) Ways of Knowing: Presidential Plenary Address. *Society for the Social Studies of Science.* Montreal Quebec,

Bar, F. & Galpernin, H. (2004a) Building the wireless internet infrastructure: From cordless Ethernet archipelagos to Wireless Grids. *Communications and Strategies,* 54**,** 45-67.

Bar, F. & Galpernin, H. (2004b) Wireless Internet Infrastructure: Alternative Models. Annenberg Research Network on International Communication, University of Southern California. Los Angeles,

Bar, F. & Galpernin, H. (2005) Geeks, Cowboys, and Bureaucrats: Deploying Broadband the Wireless Way. *The Network Society and the Knowledge Economy in Context.* Lisbon,

Bell, D. (2001) *An Introduction to Cybercultures,* London: Routledge.

Cho, H. (2006) *Explorations in Community and Civic Bandwidth: A Case Study in Community Wireless Networking*, Master of Arts Thesis Communication and Culture, Ryerson University and York University, Toronto.

Clark, A. (2004) *Locating Medical History: The stories and their meanings,* Baltimore, MD: Johns Hopkins Press.

Clement, A. & Shade, L. R. (2000) The Access Rainbow: A social/technical architecture for community networking. in Gurstein, M. (Ed.) *Community Informatics: Enabling Communities with Information and Communications Technologies.* Hershey, USA: Idea Group. 32-51.

Crow, B., Powell, A. & Miller, T. (2007) Examining Wi-Fi Network Infrastructure: Insights from Canadian case studies. *Annual Conference of the Canadian Communications Association.* Saskatoon, SK,

Daggett, B. V. (2006) Ownership Matters. April 2006 ed. Institute for Local Self Reliance. Minneapolis, MN,

de la Sola Pool, I. (1977) *The Social Impact of the Telephone,* Cambridge, MA: MIT Press.

Dean, J. (2002) Why the Net is Not a Public Sphere. *Constellations,* 10**,** 95-112.

Douglas, S. (1987) *Inventing American Broadcasting, 1899-1922,* Baltimore: Johns Hopkins University Press.

Feenberg, A. & Bakardjieva, M. (2004) Consumers or Citizens? The Online Community Debate. in Feenberg, A. & Barney, D. (Eds.) *Community in the Digital Age: Philosophy and practice.* Oxford: Rowman & Littlefield. 1-30.

Flickenger, R. (2003) *Building Wireless Community Networks, Second Edition,* Sepastopol, CA: O'Reilly Media Group.

Fraser, H. (2005) Four different approaches to community participation. *Community Development Journal,* 40**,** 286-300.

Guba, E. G. & Lincoln, Y. S. (1989) *Fourth Generation Evaluation,* Newbury Park: Sage Publications.

Habermas, J. (1989) *Structural Transformations of the Public Sphere: An Inquiry into a Category of a Bourgeois Society trans. T. Burger and F. Lawrence,* Cambridge, MA: MIT Press.

Hammersly, M. & Atkinson, P. (1995) *Ethnography: Principles in Practice,* London: Routledge.

Haring, K. (2006) *Ham Radio's Technical Culture,* Cambridge, Mass.: MIT Press.

Ile Sans Fil (2003) Ile Sans Fil - English. Montreal, QC. [online]. Available at: www.ilesansfil.org. Accessed April 21, 2005.

Kelty, C. (2005) Geeks, Social Imaginaries, and Recursive Publics. *Cultural Anthropology,* 20**,** 185-214.

Latour, B. (1991) Technology is Society Made Durable. in Law, J. (Ed.) *A Sociology of Monsters.* New York: New Press.

Latour, B. (1996) *Aramis, or the Love of Technology,* Cambridge, MA: Harvard University Press.

Latour, B. (2005) *Reassembling the Social: An introduction to actor-network-theory,* New York: Oxford University Press.

Law, J. (2002) *Aircraft Stories: Decentering the Object in Technoscience,* Durham, NC: Duke University Press.

Lehr, W., Sirbu, M. & Gillett, S. (2006) Wireless is changing the policy calculus for municipal broadband. *Government Information Quarterly,* 23**,** 435-453.

Lenczner, M. (2005) Building Soccer Fields in Downtown Montreal. Montreal. [online]. Available at: http://mtl3p.ilesansfil.org/blog/archives/2005/09/26/building_soccer_fields_in_downtown_montreal.html. Accessed June 16, 2007.

Levy, S. (1984) *Hackers,* Garden City, New York: Doubleday.

Mackenzie, A. (2005) Untangling the Unwired: Wi-Fi and the Cultural Inversion of Infrastructure. *Space and Culture,* 8**,** 269-285.

Marshall, S., Taylor, W. & Xinghuo, Y. (Eds.) (2004) *Using Commmunity Informatics to Transform Regions,* London: Idea Group Publishing.

Marvin, C. (1988) *When Old Technologies Were New,* Cambridge, MA: Harvard University Press.

Meinrath, S. (2005) Wirelessing the World: The battle over (community) wireless networks. in McChesney, R. (Ed.) *The Future of the Media: Resistance and Reform in the 21st Century.* New York: Seven Stories Press. 219-242.

Miller, D. & Slater, D. (2001) *The Internet: An Ethnographic Approach,* London: Berg Publishers.

O'Neil, D. (2002) Assessing community informatics: a review of methodological approaches for evaluating community networks and community technology centres. *Internet Research: Electronic Networking Applications and Policy,* 12**,** 76-102.

Oldenburg, R. (1989) *The Great Good Place: Cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts and how they get you through the day,* New York: Paragon House.

Powell, A. & Meinrath, S. (forthcoming) Editorial. *Journal of Community Informatics.*

Powell, A. & Shade, L. R. (2006) Going Wi-Fi in Canada: Municipal and Community Initiatives. *Government Information Quarterly.*

Raboy, M. (1984) *Movements and Messages: Media and radical politics in Quebec,* Toronto: Between the Lines.

Sandvig, C. (2004) An Initial Assessment of Cooperative Action in Wi-Fi Networking. *Telecommunications Policy, 28***,** 579-602.

Schuler, D. (1996) *New community networks: Wired for change,* New York: Addison-Wesley.

Stoecker, R. (2005) Is Community Informatics Good for Communities? Questions confronting an emerging field. *Journal of Community Informatics,* 1**,** 13-26.

Suchman, L. (1987) *Plans and Situated Actions: the problem of human-machine communication,* Cambridge: Cambridge University Press.

Taylor, C. (2002) Modern Social Imaginaries. *Public Culture,* 14**,** 91-124.

Taylor, W. (2004) Community Informatics in Perspective. in Marshall, S., Taylor, W. & Xinghuo, Y. (Eds.) *Using Community Informatics to Transform Regions.* London: Idea Group Publishing. 2-17.

Tönnies, F. (1887, trans. 1955) *Community and Association (Gemeinschaft und Gesellschaft),* London: Routledge.

Warner, M. (2002) *Publics and Counterpublics,* New York: Zone Books.

Wellman, B. & Gulia, M. (1999) Net Surfers Don't Ride Alone: Virtual Communities as Community. in Wellman, B. (Ed.) *Networks in the Global Village.* Boulder, CO: Westview Press.

Notes

---

[i] The 2006 survey was developed along with Laura Forlano, Columbia University, who deployed a similar survey in New York City and Bucharest. Comparative findings from all three surveys are presented in Forlano (forthcoming), and I am extremely grateful for her generosity in co-developing and sharing the Montreal survey with me.

[ii] The 2007 interviews were conducted as part of a research contract with the Community Wireless Infrastructure Research Project (CWIRP). The semi-structured interview script was developed to touch upon the same themes as the 2005 interviews. 13 interviews with users were conducted as part of this project. An agreement with the CWIRP project has provided me access to raw data collected as part of the ISF case study.

[iii] The National Broadband Task Force adopted as its overarching principle in 2001 that "as a matter of urgency, that all Canadians should have access to broadband network services so that they can live and prosper in any part of the land and have access to high

levels of education, health, cultural and economic opportunities" (Report of the National Broadband Task Force, 2003). In 2002, the Industry Canada Broadband for Rural and Northern Development program launched, with one objective to incite providers to expand broadband connectivity to rural areas at prices equivalent to urban subscribers.
[iv] This vision has recently changed to: "We believe that technology can be used to bring people together and foster a sense of community. In pursuit of that goal, Ile Sans Fil uses it's (sic) free public access points to promote interaction between users, show new media art, and provide geographically- and community-relevant information." (2007)
[v] Original French: "C'est principalement un club de geek, ah, je pense que c'est un club de passionnés"
[vi] Original French: "On est une belle gang . . . il y a du beau monde ici"
[vii] Original French: "Pour moi, c'est donner accès a quelquechose qui est important, comme l'eau, l'éléctricité – ce n'est pas plus important que l'eau mais ça permet de s'informer"
[viii] Original French: C'est comme on a créé une chaine de production, on a répéter le modèle industriel . . . .La problème c'est qu'il n' y a pas vraiment des buts nobles . . . En dedans il ya une problème de gouvernance. Les gens avec les projets artistiques étaient toujours les "outsiders."

Manuscript date: Amended version, April 29, 2008

Table 1: Geek-publics and Community-publics

Geek-public – geekiness is a global category of identity	Community-public –sense of belonging to a (geo-local) community
Constituted through discussions about being a geek, discussions about technology, and technology-oriented activities: "[People volunteer] because it's a good opportunity for them to flex their geek muscle and at the same time create strong relationships with community leaders" (Gabe Sawnhey, founder of WirelessToronto CWN, interviewed in wirelessNorth, January 16, 2008)	Constituted through speech and writing that allows discussion about local issues and a sense of shared belonging. Access to information through internet or network access is perceived as developing the community: "The goal [of the WiFi project] is to position Montreal as a welcoming, connected city, and a leader in wireless communications[viii]" (Service de la mise en valeur du territoire et du patrimoine, Ville de Montréal, 2007)

Table 2: Recursive elements of geek-publics and community-publics

Recursive Geek-public	Recursive Community-public
Created through speech, writing and hacking that themselves establish platforms for subsequent social engagement. Hacking WiFi, and debates about WiFi technical structures help create more WiFi equipped areas where geeks can meet: "Some people play the guitar, or they paint. This is what their life is about. . .what some people like to do is code" (Ile Sans Fil volunteer, interview Feb. 14, 2005) "We just wanted to create the Swiss Army knife of authentication servers . . .something really good and really cool" (François Proulx, Ile Sans Fil volunteer software developer, interview Nov. 5, 2005)	Created through discourse or technology that presents the public to itself and allows the public to create a platform for its own engagement: for example, a participatory community media where the public defines its own issues of interest. Idealized and imagined as being created through the development of a community media portal provided using WiFi: "We want to create an intervention, and question people's private use of the internet" (Michael Lenczner, founder of Ile Sans Fil, interview Aug. 20, 2006)

Biographical and Contact information

Alison Powell is a PhD Candidate in the Joint Programme in Communication Studies at Concordia University in Montreal, Canada where she holds a Canada Graduate Scholarship and the R. Zarboni Graduate Fellowship.

Postal Address: Communications Studies Department, CJ 321 3rd Floor 7141 Sherbrooke St. W, Montreal Canada
E-mail: a_powell@alcor.concordia.ca
Telephone: +44 (0)780 717 912