Chapter Three: Île Sans Fil and WiFi Publics

Introduction

On a steamy evening in August 2004, I walked up some rickety stairs into an organic vegetarian co-op bar to meet the members of Île Sans Fil (ISF). 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 in partnership with an arts organization. The young men and women I met that night talked about covering the city with WiFi to create an alternative communications infrastructure that anyone could use to access the internet; one that would also provide a platform for new media art projects. They felt that this infrastructure could connect local community organizations to one another, allowing them to exchange information without having to pay for expensive, commercialized internet services. 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. They showed me the Linksys WiFi routers that they "flashed" with open-source software, transforming the routers into nodes on the ISF network that would display a special "portal page" unique to that router – and thus to that hotspot.

I was at the bar that night because Michael Lenczner, at the time an undergraduate student and one of the founding members of ISF, had wanted to recruit an "academic researcher" to provide more credibility to his community wireless networking project.

After doing community work building technological infrastructures in West Africa through the federal government's Netcorps program, he had decided to create a community technology group to develop social software applications. At the same time, he wanted to have better access to the internet in public places, so he partnered with David Vincelli, an engineering student, to create a community organization that could deploy WiFi while also developing social software applications that could bring people together in local places. He was charming, well-spoken, confident but self-effacing. Convinced that technology "had values," he was determined to put these values (community empowerment, social engagement) into his WiFi design. He wanted to motivate people to participate in their community by building technology that would itself encourage participation. He could not have imagined that a few years later, ISF's network would be the largest in the city, and considered to be one of the most successful community WiFi networks in the world. The transformation of ISF provides an example of how the community WiFi phenomenon acts like a new social movement by establishing a locally relevant WiFi project for Montreal.

Between 2004 and 2007, ISF created a network of over 150 WiFi hotspots; with backhaul bandwidth donated by local businesses or community organizations that provided free WiFi to people using laptops in publicly-accessible areas. Without hiring any paid staff, the ISF volunteers developed software that assisted in maintaining this network, as well as forging partnerships with arts and cultural organizations to use each of the hotspots as a potential site for the distribution of community media and civic information using the "portal" page that all WiFi users saw when logging in. Representatives of ISF were

invited to discuss their approach at international meetings of community networking practitioners in the United States and overseas[i]. They also spoke to representatives of municipalities interested in wireless networking in Florence, Italy and Toronto. Media coverage of ISF focused on the usefulness of the free WiFi project in a city without much public WiFi connectivity, as well as the unique "community" aspect of the project. An article in the Globe and Mail, for example, described ISF as a "Montreal WiFi collective" (Patriquin 2004). In late 2007 the Economic Development Commission of greater Montreal (la Commission de l'agglomeration de Montréal sur le développement économique) proposed a partnership with ISF to fund the expansion of the network to 400 hotspots including 150 on city property, but requiring the constitution of a more formal organization, including a full-time, paid manager. As of July 2008 the partnership was awaiting approval. The activities of ISF over the three years, as well as the partnerships it formed – especially with arts organizations – illuminate the process of first contextualizing and institutionalizing community WiFi.

When I walked into the bar in 2004, theorists and proponents of WiFi networking had been describing it as a disruptive technology associated with decentralized, small-scale local projects: neighbourhoods, community organizations, and municipal governments (Bar and Galpernin 2004b, 2005, 2004a). This interpretation of WiFi focused on its flexibility and interoperability. The first assessments of these projects (Auray, Charbit, and Fernandez 2003) focused primarily on the technological choices that characterized community WiFi projects, and argued that WiFi was a particularly appropriate technology for small-scale, local networking, but that these networks would not

necessarily provide substantial challenges to larger policy or organizational structures. More recent work has begun to examine the connections between social and technical choices (Powell and Shade, 2006), and the impact of community WiFi on innovation and social capital building (Cho, 2006).

In the intervening years, WiFi 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, Sirbu, and Gillett 2006). Through 2006 and 2007 over five hundred municipal WiFi projects launched in North America (Tapia and Oritz, 2006), many of them defining WiFi as essential local communications infrastructure (Daggett 2006; Middleton, Longford, and Clement 2006; Clement and Potter 2007). These broad projects would seem to contradict the grassroots, "do-it-yourself" ethos of community groups like ISF. The transformation of Île Sans Fil 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, but also how they contribute to establishing institutions around new communication technologies.

ISF's evolution between 2004 and 2007 provides a fascinating example of the development of a computerization movement creating innovation from the ground up. This chapter describes how ISF's volunteer members built the network of hotspots, developed a popular open-source software package, and partnered with arts and cultural

organizations. I argue that ISF inspires the development of different social categories: both "WiFi geeks" who share a common interest in hacking and reformulating WiFi technology, but also 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 rationalizations . . . user interventions that challenge harmful consequences, undemocratic power structures, and barriers to communication rooted in technology" (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 discussing 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.

Geeks, Communities, and Publics

This chapter introduces the ISF project as a means to assess this slippage, concentrating on three elements: first, the way that many of the people who were centrally involved in ISF defined themselves with relationship to the category of "geek", where an idealized "geek" is a technically skilled person who mobilizes their skills in order to participate in the community; second, the contribution of activities – software production, network building and maintenance, and artistic collaborations – to the creation of geek-publics and community-publics; third, the tensions that emerge between these two publics, both within ISF and for the broader public using the network. I also consider how WiFi

technology provides the potential for a public to develop *recursively*: to create its own means of engagement. The chapter's examination of the consequences of Île Sans Fil's project for its volunteers using the concepts of communities and publics clarifies the dialectic of computerization movements: volunteers become technical experts at the same time as their project disrupts existing forms of computerization and media in Montreal.

The chapter is divided into four sections. In the first section I introduce the ISF project and its geek volunteers, describing how ISF fosters their expertise, and also how they perceive their work with WiFi as contributing to the broader Montreal community. The second section outlines ISF's main activities and then introduces "geek-publics" and "community-publics" as specific social forms leveraged through these activities. The third section addresses some of the limitations of "geek-public" enthusiasm about mobilizing "community-publics." Fourth, I consider the use of ISF's WiFi networks, examining the extent to which the imagined "community-public" communicates using the media platform developed at WiFi hotspots. In the concluding section I reflect on how the tensions between the geek-public and the community-public reproduce the dialectic inherent in computerization movements, as well as how various forms of institutionalization, especially the forthcoming partnership with the city of Montreal, reinforce the less disruptive, more conventional aspects of ISF's organization and technical innovation.

Methods

This chapter draws from a long-term participant observation conducted between 2004 and 2007. 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 Île 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 Île 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 ISF network in 2004 and in 2006.[ii] The 2004 survey was conducted by hand-distributing printed questionnaires to hotspots. It received 56 responses, primarily from ISF members themselves. The 2006 survey was conducted online, advertised on and linked to the "portal page," the opening page visible on every device accessing the ISF network. 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[iii] when I also interviewed three members of community organizations and research groups who collaborated with Île Sans Fil, including some of the architects of the municipal partnership. When possible, I recorded interviews and transcribed them. Otherwise I made notes and immediately transcribed them afterwards. Many of the interviews were conducted in French. My translations appear in the text and the original speech as I transcribed it appears in the endnotes.

ISF volunteers: "A Somewhat Geeky Group"

This section describes the volunteers at ISF, and their relationship to the idea of being "geeks." Volunteers at ISF are students, professionals, or retired. They come from different cultural backgrounds, and most speak both French and English fluently. Since 2003, over 100 people have participated in ISF, some for months, others for years. ISF volunteers expressed interest in three overlapping themes: engagement with emerging technology – especially developing software for WiFi routers, leverage of new technology for community development, and the investigation of the potential of WiFi to explore the nature of local places through location-based art and media. Three of the volunteers I met in 2004 – Benoit Gregoire, Michelle Kasprzak, and Daniel Lemay, became, along with Michael Lenczner, important players in negotiating these diverse interests.

Benoit Gregoire, a software engineer who ran his own company, joined ISF because he wanted to work with his laptop somewhere more interesting than at home. Gregoire developed the WiFiDog software that managed the ISF network and permitted it to be

used as a community media. He was one of the first 'techy' ISF volunteers to work with artists as part of a collaboration with a Canadian Heritage funded arts project called the Mobile Digital Commons Network (MDCN) which remained one of ISF's main collaborator until 2006.[iv] He maintains that this was the most fulfilling part of his involvement with ISF. When I first met Benoit I was struck by the unrelenting logic and sense of justice with which he approached any problem, whether it be technical or social. Benoit was the "technical" or "Research and Development" director of ISF from 2004 to 2006. He developed WiFiDog, the captive portal system that allowed each ISF WiFi hotspot to distribute its own media content to people in the immediate local area. Three years after its deployment, the software is widely used by community and commercial WiFi companies globally. Its main features are that it allows for location-based information to be delivered to WiFi users, and it facilitates the management of WiFi networks.

In early 2005, Daniel Lemay was in the midst of a career change; taking a break after managing the IT program for a labour union, he opened an open-source software consultancy, dedicated to bringing the low cost and flexibility of open-source to community organizations in Montreal. By late 2007, he had taken a position as a director of information technology for the city of Montreal. Calm, diplomatic, and truly dedicated to introducing technology to the community sector (he single-handedly installed almost all of ISF's hotspots in 2004 and 2005) he saw ISF as a bridge between the open-source software development community and the established community sector in Montreal that consisted of community-based organizations and non-profits.

When I met Michelle Kasprzak in 2004, she was beginning a Master's degree at the Université du Québec à Montréal after having worked as a curator and coordinator of new media art projects at the Habitat New Media Lab in Toronto. She joined ISF because she was interested in exploring the potential for the local coverage of WiFi hotspots to be used as community media or art project platforms. Outspoken, opinionated and persuasive, she was instrumental in securing almost all of ISF's funding by convincing other arts organizations to partner with the group, and writing ISF into arts grants. In 2006, Michelle became Programmes Director for New Media Scotland and relocated to Edinburgh. She curated her last ISF-related project in 2007.

These three volunteers – not to mention Lenczner – described their interest in WiFi as stemming from its integration of technical innovation, community service, and interventions in art and cultures. Yet they and many other ISF volunteers typically described their involvement in ISF with reference to the term "geek", with the exception of Michelle Kasprzak, who described herself almost apologetically as "lacking any geeky skills" (Interview Feb. 12, 2005). Although she was reluctant to call herself a "geek" Michelle used software development in her own art practice and her collaboration and consultation with multimedia artists. Another volunteer described ISF as "primarily a social club for geeks . . . a club of passionate workers" (Interview with Laurent Maisonnave, December 8, 2007)[v]. Most ISF members I interviewed 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 guys[vi]" (Field Notes, March 21, 2006). The volunteer I 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).

Creating Social Capital and Expertise

For many ISF volunteers, meeting every two weeks and discussing WiFi technology and its social impact created ISF's most significant outcome. One ISF group member wrote on the group's mailing list, "I'm very happy at how Wireless internet has taken me away from my indoor computer to the outside world. Today I meet many people, discuss how this technology can help communities, develop new potentials for people" (Robert Crecco, posting to ISF-vol list, 24 November 2004). For this volunteer, "wireless internet" itself impacted his life, by introducing him to new people. For him and others, being close to wireless internet, and understanding its complexities at a time when few others could make sense of its technological "kludges" (Mackenzie 2003) made WiFi geeks into experts. A "kludge" is a system whose component parts do not necessarily fit together perfectly but that is made to work anyway. As their network expanded across Montreal, ISF members became viewed as experts within their field. Many of the volunteers I spoke to worked in the IT industry, and felt that they developed indispensable skills through their work with ISF that was not available in their paid work.

ISF has created a place to "play" with technology, and through that play, to gain social status and power, creating a gathering place where members could share thoughts and information and build their expertise. Writing about engineering studies, Downey and Lucena note that "engineers routinely feel powerless themselves but are viewed as highly empowered by outsiders" (1995 p. 187). At ISF, engineers as well as technicians and hobbyists occupy the same social space where the hierarchies of the business world are laid aside for the pleasure of sharing a common interest. Outside of institutions of work, the pleasure of working with technology reinforces the status of ISF members as "experts" even if they do not hold expert positions professionally.

This process of legitimization of WiFi and WiFi experts through experiment and experience can be compared to the process of legitimizing "electricians" (Marvin, 1988) or "ham radio operators" (Haring, 2007). Social capital building helps to explain one aspect of participation in ISF, since participants benefit from getting to know people with similar interests, as well as building their technical skills. However, the WiFi geeks in Montreal are proud of the fact that they are "do-ers, not talkers." The next section describes what the "do-ers" were doing to establish an interest in community WiFi in Montreal.

ISF's Activities

Building a Network

As I described in the last chapter, the perception that existing forms of computer-mediated communication could close down or limit access to communication has motivated not only hackers and geeks, but also artists interested in locative media[viii], and

social justice advocates committed to expanding access to communications. As a cultural practice, 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 WiFi 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. (207)

The geeks at Île Sans Fil acted on this hopefulness. Their vision statement reads: "We believe that technology can be used to bring people together and foster a sense of community. In pursuit of that goal, Île 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" (Ile Sans Fil 2007). In pursuit of this vision, ISF's network of over 150 WiFi hotspots provides 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. The idea of using WiFi as an electronic "third space" away from work and home (Oldenburg 1989) has been central to ISF's vision.

Many volunteers I interviewed said that one goal of ISF should be to "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 alone – to gather in public space. Some social research argues that the decline of third spaces in North America is linked to a wider decline in democratic participation

(Putnam 2000) and from this perspective ISF's rethinking of WiFi is a political intervention. Creating WiFi hotspots accomplished this intervention in two ways: it provided WiFi geeks with a reason to meet one another, as well as the opportunity to collaborate with artists, academics, and community workers who were interested in the social and cultural alternatives of a community WiFi network. In addition, the hotspot network suggests an alternative to commercial systems, and a way to more fully explore the potential of WiFi as an emerging technology.

ISF members created a non-profit business model for WiFi hotspots, offering businesses and community organizations a WiFi system at wholesale cost, plus a fifty-dollar annual donation. In exchange, the organizations signed a "social contract" guaranteeing that they would not charge end users for the WiFi connection. Since Montreal had not been well served by commercial WiFi providers, this offer was compelling for many independent cafes, bars, and community organizations who wanted to offer WiFi to their visitors, or who wished to cut costs by sharing internet connections wirelessly. Over time, the sponsors of ISF hotspots came to include not only bars, restaurants and community organizations, but also two downtown Business Improvement Areas, one on the portion of the St-Laurent Boulevard between Sherbrooke St. and Mont-Royal Avenue, lined with restaurants and trendy cafes and popular with tourists and hip young Montrealers, and the other in the Village, a predominantly gay inner-city area with a thriving commercial strip lined with cafés and restaurants. Both of these organizations considered that WiFi coverage was a relatively inexpensive way of providing a competitive advantage to their

business members. The importance of these partnerships is visible through the expansion of the number and distribution of the group's hotspots.

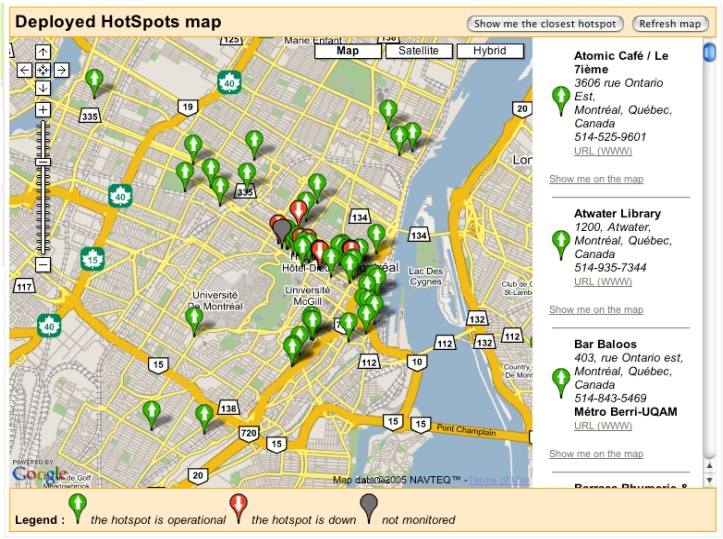

Figure 1: ISF Deployed Hotspots October 2006

Figure 2: ISF Deployed Hotspots May 2008

However, although these large projects provided technical challenges for ISF's geeks, the original vision for the network proposed designing hotspots to act as local media hubs.

Software Development

This broader vision shaped ISF's software project. "WiFiDog" is open-source software that transforms off-the-shelf WiFi modems into nodes in the group's network that display a unique opening page ("the portal page"). Members of ISF instigated this project in 2003. The software is meant to provide a unique media environment for each of the group's hotspots. Each modem equipped with this software connects users to a central server where their access is authenticated, and displays a portal page containing specific content related to the location. WiFiDog's first version, completed in 2004, displayed a unique opening page at each hotspot that included the name of the hotspot and a list of users who were online. Over the following years, ISF members modified the page by adding additional news feeds, changing the visual layout, and attempting to develop a social software application.

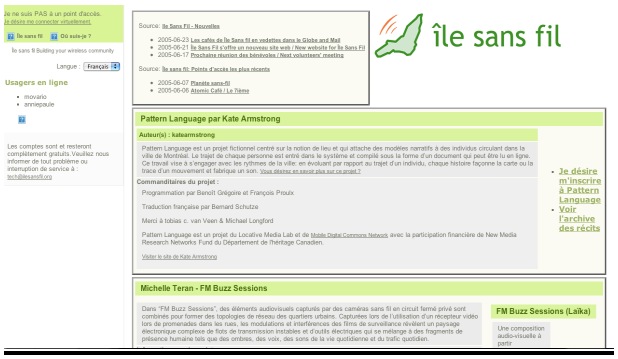

Figure 3: ISF Portal Page May 2005, including Pattern Language Art Project

Figure 4: Île Sans Fil Portal Page October 2007 including Flickr photo aggregator

In 2006, a new portal page launched, including not only the names of users online, but optional links to profiles showing their website, name, or other information. The portal pages also acted as a platform for a series of interventions: first, a series of curated location-specific art projects, then a distribution of emerging Canadian artists funded by Heritage Canada's Terminus1525 program[ix], and finally an aggregation of political information in the weeks leading up to the 2007 Quebec provincial election. The WiFiDog portal page also hosted a "local radio" multimedia distribution project at five ISF hotspots[x]. These projects, which I discuss in more detail below, were viewed as explicit interventions that established WiFi hotspots as unique social and cultural spaces, but also as applications that expanded the functionality of WiFiDog, providing its programmers with greater technical challenges.

Figure 5: Île Sans Fil Portal Page May 2007

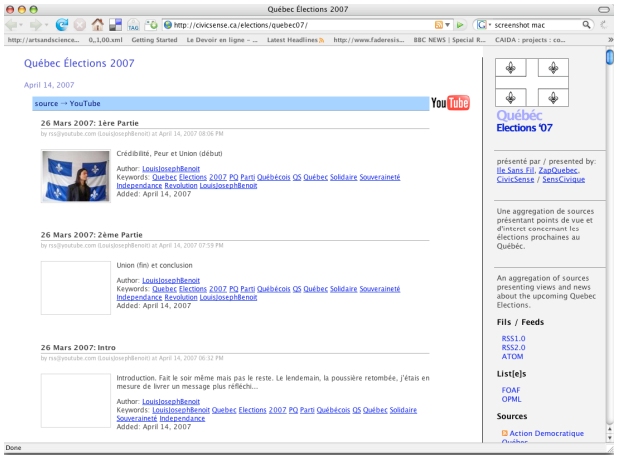

Figure 6: Quebec Elections '07 Site Linked from Portal Page

The WiFiDog software included the functionalities that supported the portal page, but also acted as a network management software tool that authenticated ISF's users, providing a way to both centrally manage the network by monitoring which nodes were functioning, and to shape network traffic by permitting or denying access to particular devices connected to the network. These functionalities helped to build a community of software developers around the world. Since WiFiDog was itself a piece of open source software, it was adapted for a variety of purposes by developers all around the world, including private or corporate WiFi networks.

Partnerships

Many technically inclined members of ISF joined the group in order to participate in challenging software development projects. Many of the projects that geeks considered challenging were created out of partnerships with universities, research groups, and other community organizations. ISF's first institutional collaborators were artist organizations like the MDCN project, and one of the first uses of the portal page was to deliver artistic content, especially locative media that explored the nomadic practices of Montreal's laptop users; for example Kate Armstrong's "Pattern Language" presented one paragraph of a novella at each of five hotspots, visible in Figure 6. The novella's plot unfolded as WiFi users moved between different hotspots. In 2006 Michelle Kasprzak curated In-Site Montreal, supported by the Canada Council for the Arts, which presented location-specific artwork at five different ISF hotspots (see http://www.year01.com/insite). Also in 2006 ISF, along with community wireless networks in Toronto and Ottawa, received funding from Heritage Canada to distribute artistic content curated by Terminus1525, a

project promoting the work of young Canadian artists. The works (mostly images) were displayed on hotspots across the networks in Toronto, Montreal and Ottawa.

Through my involvement, ISF became a partner with the SSHRC-funded Canadian Research Alliance for Community Innovation and Networking (CRACIN) project, explained in Appendix Two. However, this partnership, although it financially supported my research, did not provide any funding to ISF as per the terms of SSHRC. Another academic partnership, the Infrastructure Canada-funded CWIRP project, compensated ISF for time spent assisting researchers. This funding required someone to assist the CWIRP researchers, a task which most often fell to Michael Lenczner, since few other volunteers were interested.

Unlike its relationships with federally funded research programs, relationships between ISF and community organizations were more tenuous. In 2005 ISF proposed to install a connectivity project using recycled computers in a low-income housing project, but the partnership with the housing association never took off because the housing development managers did not see the utility of the proposal. The development of a community infrastructure in Montreal initially attracted interest from Communautique, a Quebec umbrella organization dedicated to supporting the collective appropriation of information technology by community organizations (Proulx and Couture 2006). Although ISF was recognized as a winner of the Prix d'Innovation Sociale (social innovation prize) in 2005, its official partnerships with Communautique have been few: ISF provides WiFi in Communautique's offices, and their director general now holds a seat on ISF's board of

directors. In exchange for providing WiFi coverage in boardrooms and public areas, ISF received office space at the Centre St-Pierre, which provides offices for religious and community organizations. While ISF's partnerships have connected it with the community sector in Montreal, as an organization it has combined a "community" image with influences drawn from open-source organizations more focused on technology development than on social change.

Open-source Organization

A sense of being an "open-source project" was important to ISF. In 2004, it presented itself as an organization inspired by open-source values. Rejecting structures like meeting protocols for running meetings, the group held open meetings in bars where all decisions were made based on consensus. Anyone attending three or more meetings was considered a member and encouraged to find some way of contributing, as there was no formal structure for involving volunteers. The innovation structure was open: any new idea was accepted if it was presented as a convincing improvement on another idea. This open structure attracted highly skilled volunteers from many different backgrounds whose various positions and demands were initially organized horizontally, in a set of competing goals that is sometimes described as a heterarchy (Stark 2001). Some volunteers wanted a more robust network. Others wanted to use WiFi hotspots to create network art. Still others wanted to build software. The result of these very different reasons for involvement and different understandings of why WiFi might be important or interesting created what Daniel Lemay called an "improvisational, spontaneous" (Interview December 7, 2007) organizational culture. This improvisational culture was

created out of a shared interpretation of open-source culture and the "geek" identity, but also contributed to the development of a "geek-public."

ISF's Communities and Publics

As I outlined in Chapter 1, the concepts of communities and publics are important in the study of computerization movements like community WiFi where progressive visions of technology are mobilized. ISF attempts to engage in community development by creating a network of hotspots that provide an alternative to WiFi commercial media and communication systems while at the same time bringing together new publics, including WiFi geeks. I argue that two publics are envisioned and then form through the development of community WiFi in Montreal: one a "geek-public" that volunteers aspire to become part of, and another a "community-public" composed of people living in the same area who might use WiFi networks as means of discussing locally significant issues. Each is created through discourses and practices that define shared identities such as "geek," neighborhood resident, student, 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 is mobilized by greater access to media that communicates local issues. Building a WiFi network is often perceived as a means to augment or improve local communities by expanding access to the internet, through the development of a new community media source built and managed by the community itself. As Scheller (2005) explains, these publics crystallize around the potential provided by various types of mobile media, including WiFi.

The rest of this section describes how ISF created a "geek-public" of participants who created community WiFi networks, as well as a vision of a "community-public" using WiFi to socialize in public places. The notion of "geek-public is drawn from Kelty (2005), who 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" (p. 185). Although community networking literature might describe geeks as a community of practice, Kelty instead argues that they are a public because their interest in discussing the structure and standards of the internet has political importance. Using the internet to discuss and modify the functioning of the internet creates 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" (2005p. 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 spaces in which they can relate to one another.

Geek-publics and community-publics

Escobar writes (1994)., "any technology represents a cultural invention, in the sense that it brings forth a world; it emerges out of particular cultural conditions and in turn helps to create new ones" (p. 14). The social, economic and cultural world of Montreal provides the site for the emergence of ISF's "world" and the social forms that are part of it. This world influences what kind of "community-public" designers envision as using their network. For example, ISF's focus on developing WiFi "third spaces" in public locations may be influenced by the city's "café culture": a product of long winters and one of North America's largest student populations, and by the success of other novel forms of media distribution in public places[xi]. ISF's promotion of new media art may also fill a gap in new media art distribution: the province of Quebec has good funding for new media production, but does not support distribution of new media art (Michelle Kasprzak, Interview March 5, 2005). The local culture may have inspired ISF's social goals: Montreal has had 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), a commitment exemplified by Communautique's work. Since 1995, the non-profit group Communautique has facilitated the integration of ICTs into community organizations. Communautique is now a large umbrella organization that assists with the integration of ICTs into the entire community sector. Through their work they have established community-based ICT provision as integral to local values. Therefore, ISF's contribution to the community public resonates with Montreal's local history and culture. At the same time, by being oriented around action, it applies an "argument-by technology" that makes

a claim for including technological development in efforts to create social change. The way that ISF's volunteers envision "community WiFi" reveals the relationship between a community-public and a geek-public.

Responses to the question "Who is community WiFi for?" indicate how ISF members think about types of WiFi publics. Some thought that WiFi was mainly for geeks – "for us, for people like us", and others described it as useful for the group's partners – "for community organizations," "for artists", while others claimed that community WiFi was "for everyone" (Interviews with Philippe April, Francois Proulx, Michael Lenczner, and Daniel Lemay, February and November 2005). Each of these respondents envisioned their "building, coding, and compiling" (Kelty, 2005) as being not only for the benefit of a recursive public composed of WiFi geeks interested in talking about and experimenting with WiFi technology, but also for a greater internet-enabled public in Montreal. Striking a real balance between these how these two publics are envisioned has fuelled ISF's project throughout its development. As the following sections explore, the balance between vision and reality reveals the difficulty of mobilizing both geek-publics and community-publics.

Table 1 summarizes how WiFi networking projects engage with ideas of community and public. Although it focuses on ISF, it also draws on interviews with other Canadian community WiFi projects, detailing the differences between the "geek-public" and the "community-public." Each is created through discourses and practices that define shared identities, some of which overlap. A list of these different identities might include

"geek," neighborhood resident, student, parent, or citizen. Each has a slightly different connection with WiFi: a geek-public might form around the project of constructing a WiFi network, while a local community might be mobilized by the expanded access to the internet that a WiFi network could provide, or by the innovation that having such a network might symbolize. In fact, the City of Montreal's proposal for a partnership with ISF suggests that a WiFi network can help the community to better connected, and also acknowledge that such a "geeky project" is a good example of innovative local culture. Geek-publics and community-publics suggest that there may be some relationship between the shared identity of geeks, and the media reality of a broad, community-public.

Table 1: Geek-publics and Community Publics

▪ **Geek-public – geekiness is a global category of identity** ▪ ▪ 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) ▪ ▪	▪ **Community-public –sense of belonging to a (geo-local) community** ▪ ▪ 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" (Service de la mise en valeur du territoire et du patrimoine, Ville de Montréal, 2007)

WiFi geeks building local networks are part of their local community and 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 the internet's rules and standards, and then use these rules and standards as topics for online discussion. WiFi geeks also recursively create their own means of engagement by debating and creating modifications to WiFi standards and to WiFi hardware and software, or what is more frequently referred to as WiFi hacking. 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 – of software, hardware, and discourse – enables more robust WiFi tools to better connect geeks, but the process of hacking can be applied to other areas.

A recursive community-public can develop a shared sense of belonging to a local space by contributing to the new media and communications platforms. Ideally, ISF's WiFi hotspots play this role by providing local information and displaying artistic projects that take advantage of the local reach of WiFi. This draws on a community-based vision of WiFi where hotspots 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 can 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 presents the recursive elements of ISF's publics. As the following section explores, the geek application of "argument-by-technology" to the community-public does not necessarily mean that community members will use WiFi tools in the same way as the geeks imagine.

Table 2: Recursive elements of publics mobilized by community WiFi

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" (Île 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, Île 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 Île Sans Fil, interview Aug. 20, 2006)

The next section of the chapter discusses the contributions of this geek-public to the community sector in Montreal, assessing the outcomes of ISF's network building, software development, and creation of partnerships. It argues that the most successful of

these activities has been the establishment of the hotspot network, followed by the development of the WiFiDog software. However, within the software development project, the functionalities that facilitated network management were developed more thoroughly than the functionalities that allowed for the development of WiFi hotspots as community media sites. The least successful activity was the establishment of partnerships to create locative media content, even though this activity garnered ISF the majority of its funding and attention from media and academic researchers. All of these activities, ISF members felt, were ways of creating an alternative to the existing forms of communication.

Applying "Argument by Technology" in the Community – Hacking the City

Members of ISF were inspired by the idea of making a positive contribution to Montreal's culture by using their technical skills to develop new tools. Michael Lenczner described ISF's geek contribution to Montreal's cultural life as "hacking the city." In a widely distributed blog post, he wrote:

> 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 . . . Where this get's (sic) exciting is that by citizens, artists and non-profit groups developing and adapting these technologies (portable devices, wireless connectivity, mobile- and location-based applications) and their model (who is supposed to use them and for what purpose) we are able to impact and change this enhanced space and through that have an actual impact on how the built city is experienced.(Lenczner 2005)

Lenczner goes on to equate community WiFi deployment with building soccer fields: it offers the potential for people who share the same local community to build their skills

and expertise, and to share information and ideas that encourage self-organization. He concludes:

> With basically no money and only the intellectual and time resources of it's (sic) volunteers, ISF is trying to convert our 55 hotspots into great big soccer stadiums all around Montreal -hopefully complete with locker-rooms, art galleries, chalkboards, swingsets, libraries, booths to tell your city councillor what you think she should be doing, recording studios, and massage booths. It's a grand vision, and I don't know if we'll succeed, but I guess that's why we're all a part of this - because it's audacious and exciting and it's supposed to be beyond us.

Lenczner's evocation of hacking WiFi as being equivalent to creating community centres with art galleries and playing fields establishes ISF's activities as contributions to broader local social goals (including, presumably, the psychological well-being of its volunteers, who may need "massage booths" to relax . . .). Other members of the group also envisioned ways that the WiFi hotspots would provide service to a broader public; they discussed how the portal page could act as a form of "alternative press" that would help people get to know their neighbourhoods better: "it could be very simple: in each neighbourhood, with each cafe we could go around and find one interesting person . . . take a picture and help people get to know someone. It could be very interesting. Did you know that your taxi driver was a brain surgeon in Iran before he had to flee . . .?" (Interview, Daniel Drouet, February 15, 2005). These ways of thinking about ISF's contribution focused on the potential of the network to transform the city by acting as a new platform of civic engagement. Other volunteers saw the media content delivered on the portal pages as means of inspiring a broad public of WiFi users to think about their local area differently.

Benoit Gregoire described the purpose of delivering artistic content on the portal as being: "to get people to look at content they are not initially interested in or did not previously know exists. Toward that end, how much can/should or can't/shouldn't [we] control what people see. Not from a layout or even from a content organisation (sic) perspective, but the context in which it is displayed, what is chosen, and why" (Île Sans Fil volunteers list posting 25 Sept 2005). The portal page would encourage people using the ISF service to explore their neighbourhood, its residents, and shift the way they experienced internet-based media, perhaps contributing to creative, collaborative uses of media that had not been previously possible. Through locative media content, the community-public would develop a deeper understanding of their city culture, and even a new experience of the local spaces of cafes and bars. ISF's contribution to this new experience of WiFi would be to develop the functionality of the portal pages through WiFiDog, and to build partnerships and strategies to develop the potential for WiFi to serve the local community as a type of media to augment their experience of place, ideally provoking them to socialize or to discuss political issues.

Experimenting with Locative and Community media: The Portal Page

The development of WiFiDog and the portal page allowed ISF's geek-public to debate, both through talk and through technology, how its members envisioned the community-public would use its WiFi hotspots. Debates concerned what kind of information should be provided on the portal page, and whether or not the owner or manager of the hotspot should be able to control it. From 2005 to 2007 some of these suggestions were integrated into a series of different portal page designs (See Appendix Three). Many of these designs were tested on the portal page for Cafe Laika, a trendy café in the Plateau

district of Montreal where mobile workers (and many members of ISF) worked daily. The Café Laika portal page included automatic updating of photos from photo-sharing site Flickr that had been tagged with "ISF-Laika." However, many ISF members disliked this content aggregation, finding it too similar to existing corporate portals like Yahoo! and MSN. Other ISF members disliked the fact that the personal profiles that made up the "social software" section of the portal page did not permit users to opt out. In many ways, the development of the portal page challenged ISF geeks without facilitating participation by hotspot owners or end users.

A major drawback of the portal page was that modifying it was extremely difficult. Hotspot hosts could not modify their own portal page, although they could inform ISF members if they had a blog they wished to syndicate on the portal page. Giving many people the ability to modify portal pages was perceived as a management problem requiring volunteers to act as intermediaries between hotspot owners and the portal page interface (Field notes, Jan 14, 2005), but at the same time, making too many small modifications was time consuming for volunteers, so portal pages were not often updated. Some hotspot owners did not even realize that they could request modifications to the pages belonging to their cafés. To prevent volunteers from getting frustrated by making modifications for individual owners, it was easier to inform owners that customization of portal pages was limited to syndicating news feeds from other sources and aggregating these on the portal pages.

Over time, developing the portal page as a locative media became secondary to expanding the ISF network. In 2006, a partnership with the Village Société du developpement commercial (SDC, or in English, Business Development Area: an organization similar to a local Chamber of Commerce) called for ISF to cover two kilometres of St-Catherine Street, a major commercial artery at the heart of the Village, with WiFi. To meet this demand, ISF established hotspots inside any businesses willing to host them, regardless of whether they created "third spaces." The SDC, which paid for internet access at participating businesses, displayed its logo on every portal page associated with the project (see below).

Figure 7: Village Portal Page

Accessing a hotspot in the Village neighbourhood thus introduced an ISF user to the SDC brand, rather than to content connected to a specific place and culture. The SDC project, a large and complex installation, marked a turning point at ISF. New volunteers with skills and interest in network management arrived, while many of the people interested in arts and content drifted away. At this turning point in the project, geek experiments with

expanding and managing the network became more important than locative media development for the community-public.

Points of Tension

Balancing Geek Interests and Community Development

As the interests and practices of volunteers shifted towards expanding the network and developing a group of experts, ISF's technology development shifted away from locative media, and tensions within the group became more pronounced, including tensions related to gender. This section discusses these tensions, first though a description of how the shifting interests of ISF members reshaped which types of labour were associated with the geek-public.

Since argument-by technology was part of ISF's culture, one way of convincing someone of the utility of an idea was to build it: preferably, by developing software or hacking hardware. Initially, setting up hotspots was time-consuming and not considered very interesting. Volunteers in charge of setting up hotspots and performing network maintenance had difficulty motivating people to contribute to this less valuable "dogwork" (Michelle Kasprzak, Interview 2005). This changed when volunteer Alexis Cornellier was elected as "operations" representative to the ISF administrative council in 2006. He renamed the operations volunteers the "ninjas" and provided stickers, prizes, and public recognition for "Feats of Ten-Ninjas" – extraordinary efforts made by volunteers setting up hotspots, especially in the Village project. Cornellier also convinced software developers to design an easier interface to facilitate hotspot installation so that the Village project could be completed on time. Instead of improving

the interface for modifying the portal page, which was a low priority, volunteers spent time programming this administrative interface. With the "ninjas" now receiving more attention at meetings, and social events like an ISF "pub crawl" usurping discussion of modifications to the portal page (Field Notes October 12, 2005), volunteers interested in the social and artistic potential of ISF withdrew from active involvement. Daniel Lemay 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"[xii] (Daniel Lemay, interview Dec. 6, 2007).

More significantly, ISF's "do it yourself" ethos conflicted with an art project created as part of the MDCN. That project created a location-specific chat for each hotspot; with the most recent chat messages displayed on the portal page. After months of collaboration with ISF, including payment of an ISF volunteer for time spent developing software to integrate the chat, the project launched at the same time as a chat client developed by other members of ISF, who had not been in touch with the developer or with Michael Lenczner, who was managing the collaboration. The artist's chat client remained as the only chat interface, but the collaboration proceeded delicately afterwards. One participant reflects:

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

In this case, the geek public's argument-by-technology derailed a collaboration, and demonstrated how ISF's fluid organization made technology development easier and collaboration more complex. Relying on argument-by-technology also contributed to a gendering of labour within ISF, which further limited the diversity of the geek-public.

A Gendered Geek-public?

Many social and cultural practices have marked ISF's culture as predominantly masculine. Members meet in a bar to drink beer and talk about technology. They use jargon and technical language to communicate, and often spend their time together gazing at their computer screens. They like to make things work well or better, and are fascinated with new technological developments. From 2004 to 2007 around ten per cent of the volunteers were women, and many of them made significant contributions to ISF's projects by raising grant money, curating art projects, proposing usability studies of the portal page, coordinating media relationships, and creating marketing packages. Yet no female members of ISF were programmers or software developers – nor identified as "ninjas" – although all of the women I encountered at ISF could competently flash WiFi routers and install them. A subtle gendering of work activities seemed to be occurring, with women's "non-technical" contributions to technical development not recognized as "actual work" (Suchman 2005).

Similarly, the modes of relation between ISF were also gendered, with direct and assertive communication styles prioritized – in the "talk louder and faster" mode of relationship that has been observed in engineering schools (see Hacker 1990). Male ISF members were concerned about the lack of diversity of their group, but considered it

primarily as a problem of "how to get more girls to be geeks," presuming that "girls" in ISF would behave, conceive of, and communicate in the same manner as the "boys" who made up most of its membership. Faulkner (2000) refers to this essentializing of male and female qualities as the "women in technology" perspective, arguing that it focuses on a lack of women in science and technology, rather than on the culture of science and technology work. In terms of creating a geek-public, this perspective situates girls as "non-geeks" and therefore already outside of the public. To counter this essentialist perspective, Suchman (2005) calls for an inclusion of feminist frameworks in technology to provide a wider interpretation of work roles in technical development. She writes:

> Feminist research displaces traditional preoccupations with abstracted and decontexualized forms of knowledge in favour of particular, specifically situated practices of knowing in action . . . it directs attention always to the labours (particularly those previously ignored) that are an essential and ongoing aspect of sociotechnical assemblages (p. 6).

Sexism, Difference, and Barriers to Participation in Geek-publics

Sometimes the gendered nature of ISF seemed sexist. In June 2005, a well-respected member[xiii] of ISF distributed a message on the listserv implying that the women members might be willing to perform sexual favours to promote ISF. It was a joke, of course, but the women members (affectionately called 'les filles sans-fil' or 'wireless girls') were not amused. Responses ranged from quiet shock to a questioning of one's implication in ISF. The member who originally posted the message apologized in due course, and several 'filles sans fil' continued to work with ISF, but the email underlined the difficulty of working for progressive gender politics at ISF.

In all-male spheres, sexual humour is often tolerated and considered to be the norm; likely the author of the e-mail considered us as being part of the "ISF gang." Still, the difference presented by integrating women into an environment marked as masculine made this assumption difficult to support. In short, the "wireless girls" were not men, and our troubled response to the e-mail reiterated that our presence required a different kind of social code than the "natural" sexual humour of an all-male social group. The tension that this difference created, and the sense that ISF remained, despite apologies and attempts at inclusion, a masculine space, reveals the deeply complex cultural engagements between gender and technology. The environment created at ISF provoked in its female members "extraordinary juxtapositions of positive and negative feelings about technologies" (Faulkner, 2000). This "othering" of the female members of ISF recalls Fraser's (1992) description of how the Habermasian democratic public sphere excludes women and other people who do not conform to expectations about who should comprise a public. The geek-public at ISF solidifies around the potential for social transformation imagined in WiFi. Like the ideal public sphere, the geek-public suggests openness to participation, but still creates barriers to that participation.

The Imagined "Community-public" – Uses of the ISF Network

Could the same barriers emerge in the community-public? The visions and goals of ISF hinged in many ways on the way that geeks expected people would use their WiFi hotspots. The network has experienced unprecedented use, especially considering that it was built for free, but it remains to be seen whether the community-public has used it in the way the geeks expected. 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) or community-public, envisioned as accessing media and social software through the portal pages.

This section presents results from surveys and interviews with people using the ISF network from 2005 to 2007. Over 40,000 people were registered as users of the ISF network as of January 2008. Survey data from 2006 suggests that the "users" are not much 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 work in education, media, and telecommunications than in other fields. Sixty-eight per cent said that they used WiFi hotspots "to get out of my home or office." Although the presence of WiFi was a determinant of where survey respondents said they would visit, users of the ISF network also indicated 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 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 Île 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 the WiFi network 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 everyone I interviewed knew that ISF was a community organization, no one had thought of attending meetings, although one respondent said that he had "given them [ISF] my opinion on a couple of things, but they always ignored me" (Male Île Sans Fil user, interview Nov 5, 2005). For the broader community of users, the geek projects are "a good idea that should be replicated elsewhere" (Female Île Sans Fil user, interview November 10, 2005) but not something that inspired profound connection. 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 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 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 in order to send e-mail 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

people in the same location. One person explained that he used the number of user names appearing on a hotspot's page as a gauge for the amount of bandwidth available, avoiding locations with too many people online (Male Île Sans Fil user, 2005). Many 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 comprised of men encountering one another in cafés, the recursive geek public in Montreal reinforces its own social connections in public spaces: Cafe Laika (now closed: technical issues caused interference and the owner established his own free WiFi) was not only a popular hangout for ISFers, but also the most-used hotspot between 2004 and 2007. While the geeks are in the cafes, the users may be elsewhere: Crow, Powell, and Miller (2007) suggest that a significant number of Île Sans Fil users are accessing the internet from adjacent office buildings, restaurants, or homes rather than the publicly accessible hotspots. This is even more frequently the case in the hotspots sponsored by the SDC Village. This means that ISF's plans to use WiFi to augment an experience of physical space have been undermined by the slippery nature WiFi's technical qualities: it passes easily through walls and windows.

Despite hopes that ISF's delivery of free WiFi could help Montreal's community-public to develop tools to recursively reinforce local social connections while providing access to the internet; the development of the geek-public may be this project's most significant social impact. Economically, ISF has virtually eliminated the market for pay-for-use WiFi in public spaces in Montreal: "we have done a great job of domesticating free WiFi in Montreal" (Michael Lenczner, personal communication November 17 2007). From

the perspective of new social movements (Hackett and Carroll 2006), ISF symbolically recast WiFi as a community technology. However, despite the symbolic connection between WiFi and community in Montreal, the convenience and ubiquity of free WiFi hotspots remained more important for users of the service than the symbolic association with community.

While ISF may have inspired its geek members to participate in the civic life of the Montreal community, it has also helped them to build their own expertise. As WiFi technology diffuses more widely, the geeks who first explored and developed the technology begin to emerge as experts. This process can be compared to the development of previous groups of experts from groups of amateurs, a process that Douglas (1987) noted occurred with the "radio boys" in the early 20th century, that Marvin (1988) observed in the electrical profession, and that Haring (2007) described in the context of ham radio operators. Haring notes that United States radio hams embraced the government's regulation of their hobby because it provided more value to the skill and knowledge required to operate a radio. Similarly, geeks may be legitimating their own expertise in WiFi networking through the development of recursive geek-publics. As Cho's (2006) research highlights, CWNs may also primarily build social capital for their members The relative homogeneity of ISF's geek-public also suggests that grassroots innovations may not create as radical a social interventions as initially envisioned. As Lovink and Rossiter (2007) point out, "free projects can be more exclusive than 'non-free' structures in terms of gender, race, qualification, class. You need institutions to be inclusive . . .as soon as you want gender equality in your network, as soon as you start to

practice gender mainstreaming, as soon as you enable gender autonomy . . . you're building institutions" (p. 87). As new institutions begin to build out of the innovations developed by ISF, perhaps the exclusivity of the geek-public will eventually be transcended.

Questioning Municipal-community Partnerships

The City of Montreal's partnership with ISF provides one possible way of institutionalizing the expertise developed by WiFi geek-publics, as well as reframing the symbolic associations between WiFi and innovation. In Touraine's (1977) terms, the partnership between ISF and the city of Montreal links the synchronic contribution of ISF's geeks to the symbolic interpretation of WiFi with diachronic changes that take place at the level of governance and regulation. The partnership straddles these two types of changes and perhaps suggests a unique means of reconciling the contributions of grassroots social movements with institutional and policy changes. Despite the limitations of the community media envisioned by ISF members, this institutionalization suggests that a broader community-public could be served through an expansion of WiFi networks, even though this has not yet occurred in Montreal.

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. In our conversation, he referred to ISF 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 interest in supporting the expansion of ISF emerged as a response to the substantial

coverage of the project by the local mass media, particularly the dominant French-language media[xiv]. Supporting the further development of this innovative group would thus reinforce this positive image of the Montreal community. However, the proposed partnership between ISF and the city of Montreal will not create a ubiquitous broadband network throughout the city. Instead, it will provide funding for a full-time employee to manage ISF's volunteers, in return for an expansion of the network to eventually include 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 primarily reinforcing the development of the geek-public.

The partnership with the City of Montreal will replace the "open" non-hierarchical structure of ISF with a more conventional organizational form. In March 2008, ISF reorganized its administrative council, appointing two external board members, one from a community organization and another from a new media organization, to work with four volunteers. This committee will complete the negotiations with the municipal government and hire the full-time project manager who will subsequently manage the municipally sponsored network. This more conventional structure may mitigate some of the inward orientation of the geek-public, but it may also establish a more conventional organization of ISF's goals, where the expansion and management of the network of hotspots becomes the group's primary goal. The project focuses primarily on increasing the number of hotspots rather than employing WiFi as a new type of community media – suggesting that creating a community-public is not a main priority.

As this partnership was being debated by the city council, I spoke to some ISF members about their views on the partnership. They were less enthusiastic than I had expected. Benoit Gregoire focused on the volunteer fatigue overcoming ISF, and the unlikely chance that funding would improve this situation: "The city will only help with the resources, but someone will still have to do something; it is always the same people at the meetings, people are not active or they don't feel they have time to really contribute. As a worst case the project will just justify its own existence and the work will be done by the paid people and there won't be any real community" (Interview November 24, 2007). Daniel Lemay worried about the new partnership because he feels that the open, innovative approach that made ISF so interesting and so much a part of Montreal's culture has already been lost, because the spirit of experimentation has been replaced by an industrial model of developing and deploying hotspots that work well, but is no different from what a commercial WiFi company would do. He says, "I really feel like we may be a victim of our own success. We don't have to try very hard to do this work" (Interview December 7, 2007).

Assessing ISF's Impact

ISF's vision of mobilizing new technology in the service of community has resulted, paradoxically, in the creation of a large-scale network. This has been its greatest success, along with the WiFiDog software, now developed into a robust software suite now used around the world. However, its most important contribution, culturally and socially, has been ISF's role in helping a restrained community of practice envision a way of contributing to a broader community. The relationship between the visions that ISF members developed for their network as a community media and social networking site

and the realities resulting from the success of their free WiFi hotspot network reiterate the ongoing dialectic of computerization movements. Unfortunately the ISF geek-public, like the idealized public sphere, presented barriers to participation, partly because of its focus on argument-by-technology, and partly because of the gendered nature of geek identity. The community-public never mobilized in quite the manner envisioned by the ISF geeks. Finally, as the geek-public adopted a more inward focus, the goals of ISF volunteers shifted towards expanding its network and fitting into a new institutional structure through its partnership with the City of Montreal.

ISF's innovation drew from the tension between vision and pragmatism, between an interest in transforming the structure of WiFi technology by hacking code, and in turn transforming WiFi's function by positioning WiFi hotspots as new kinds of community media. However, as WiFi became better-understood and volunteer interests changed, the group's working partnerships moved from arts projects to CWIRP's study of community WiFi as infrastructure. These shifts reflect the increasing institutionalization of WiFi technology beyond local grassroots experimentation. This institutionalization has shifted the focus away from the social goals that were originally intertwined with ISF's technical development. Daniel Lemay remarks, "The problem is that there are really no noble goals here. These projects could have been put forward by people with noble goals in mind, but it's not noble to put free WiFi in cafés. It's just cool" [xv] (Daniel Lemay, interview Dec. 6, 2007).

In Spring 2008, most of ISF's committed volunteers are network administrators (ninjas) motivated to keep the network up and running. None of the four volunteers introduced at the beginning of this chapter participate actively. No new artistic collaborations have been pursued, and although one of the new board members is a new media specialist, volunteers do not coordinate production of artistic or community content. There is one woman volunteer: in 2007 readers of Montreal's La Presse newspaper voted her "Montreal's sexiest geek"[xvi]. This suggests that ISF's gender culture has not shifted very far – and neither has its has its "geek culture."

Conclusion

The energy I felt in 2004 upon first meeting Montréal's WiFi geeks convinced me that this group could potentially redefine local culture and communications and make them more democratic. However, the tension that emerged at ISF between a geek-public who built social capital and skills through their engagement with each other, and a community-public solidified through access to robust communications infrastructure, suggested purposes at odds with each other. Initially, participation of a diverse group of volunteers balanced these purposes by discussing and building new forms of WiFi networks. ISF provided an alternative configuration for communications infrastructure through its WiFi network, but it also reinforced a technocracy by developing WiFi geeks as experts. Because argument-by-technology was linked with expertise and masculinity, geek-publics created barriers to participation, despite the fact that they were produced through non-institutional, non-hierarchical volunteer participation.

Computerization movements including community WiFi suggest potential democratic rationalizations of technology, but the social transformations they promised have been limited by the insularity of various WiFi publics. While geek-publics may mobilize new forms of civic participation by suggesting that technical development can contribute to the civic life of a community, the broader "community-public" did not use WiFi to develop the political dialogue that could have made ISF's hotspots sites of democratic engagement. This marks the limits of WiFi publics: in Warner's (2002) terms, ISF's public is not expanding but turning inwards to form a "group"; the gendered nature of the geek-public illustrates one aspect of this. Community wireless networks are part of a new generation of projects that envision ways to politicize and democratize communication technology. 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 also community-publics. 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. In turn, these collaborations could inspire new institutional structures that might possibly leverage the unique contributions of self-organized WiFi geeks.

As the next chapter indicates, WiFi's institutional structures depend on local context. The planned partnership with the city of Montreal suggests an institutional framework that could maintain ISF's innovative qualities by retaining the participation of geek volunteers in building the network, although it does not specifically address the broader

community-public. In comparison, municipal networks create different kinds of institutional forms around WiFi, offering another interpretation of its influence on communities and publics. Chapter Four examines how community – municipal – WiFi in Fredericton, New Brunswick, is transformed into a public service. The case describes how city government officials envisioned a WiFi network as contributing to their existing government-owned telecommunications network, but more importantly, how they leveraged the symbolic connection between WiFi and innovation.

Bibliography

Auray, Nicolas, Carole Charbit, and Valérie Fernandez. 2003. WiFi: An emerging information society infrastructure. In *Socio-economic Trends Assessment for the Digital Revolution* Milan, Italy: STAR project, IST Programme, European Commission.

Bar, François, and Hernan Galpernin. 2004a. *Wireless internet infrastructure: Alternative models*. edited by Secondary ———. Place Published: Publisher. http://arnic.info/workshop04/WirelessInfrastructure_FB_HG.pdf.

———. 2004b. Building the wireless internet infrastructure: From cordless ethernet archipelagos to wireless grids. *Communications and Strategies* 54 (2nd quarter): 45-67.

———. 2005. Geeks, cowboys, and bureaucrats: Deploying broadband the wireless way. Paper presented at The Network Society and the Knowledge Economy in Context in Lisbon.

Cho, Hanna. 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.

Clement, Andrew, and Amelia Bryne Potter. 2007. A desiderata for wireless broadband networks in the public interest. Paper presented at 35th Research Conference on Communication, Information, and Internet Policy in Arlington, VA.

Crow, Barbara, Alison Powell, and Tammy Miller. 2007. Examining Wi-Fi network infrastructure: Insights from Canadian case studies. Paper presented at Annual Conference of the Canadian Communications Association in Saskatoon, SK.

Daggett, Becca Vargo. 2006. Ownership matters. Minneapolis, MN: Institute for Local Self Reliance.www.newrules.org/info/wireless-ownership.pdf.

Downey, Gary, and Juan A. Lucena. 1995. Engineering studies. In *Handbook of science and technology studies*, edited by S. Jasanoff, 167-188. Thousand Oaks, Calif.: Sage.

Escobar, Arturo. 1994. Notes on the anthropology of cyberculture. *Current Anthropology* 1994 (4): 211-231.

Feenberg, Andrew, and Maria Bakardjieva. 2004. Consumers or citizens? The online community debate. In *Community in the digital age: Philosophy and practice*, edited by A. Feenberg and D. Barney, 1-30. Oxford: Rowman & Littlefield.

Fraser, Nancy. 1992. Rethinking the public sphere: A contribution to the critique of actually existing democracy. In *Habermas and the public sphere*, edited by C. Calhoun, 109-142. Cambridge, MA: MIT Press.

Habermas, Jürgen. 1989. *Structural transformations of the public sphere: An inquiry into a category of a bourgeois society*. Translated by T. Burger and F. Lawrence. Cambridge, MA: MIT Press.

Hacker, Sally. 1990. *"Doing it the hard way": Investigations of gender and technology*. Edited by D. E. Smith and S. M. Turner. London: Unwin Hyman.

Hackett, Robert A., and William K Carroll. 2006. *Remaking media: The struggle to democratize public communication*. London and New York: Routledge.

Ile Sans Fil. 2007. "Ile sans fil - english", www.ilesansfil.org (accessed March 20 2008).

Kelty, Christopher. 2005. Geeks, social imaginaries, and recursive publics. *Cultural Anthropology* 20 (2): 185-214.

Lehr, William, Marvin Sirbu, and Sharon Gillett. 2006. Wireless is changing the policy calculus for municipal broadband. *Government Information Quarterly* 23 (3-4): 435-453.

Lenczner, Michael. 2005. "Building soccer fields in downtown montreal", http://mtl3p.ilesansfil.org/blog/archives/2005/09/26/building_soccer_fields_in_downtown_montreal.html (accessed June 16 2007).

Lovink, Geert, and Ned Rossiter. 2007. *Mycreativity reader: A critique of creative industries*. Amsterdam: Institute of Network Cultures.

Mackenzie, Adrian. 2003. "The infrastructural-political" *M/C: A Journal of Media and Culture*, http://www.media-culture.org.au/0308/05-infrastructural.php (accessed October 25 2007).

———. 2005. Untangling the unwired: Wi-Fi and the cultural inversion of infrastructure. *Space and Culture* 8 (3): 269-285.

Meinrath, Sascha. 2005. Wirelessing the world: The battle over (community) wireless networks In *The future of the media: Resistance and reform in the 21st century*, edited by R. McChesney, 219-242. New York: Seven Stories Press.

Middleton, Catherine A., Graham Longford, and Andrew Clement. 2006. ICT infrastructure as public infrastructure: Exploring the benefits of public wireless networks. Paper presented at TPRC 2006: Research Conference on Communication, Information, and Internet Policy, September 29, 30, and October 1st in Arlington, VA.

Oldenburg, Ray. 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.

Patriquin, Martin. 2004. Isf 'collective' helps montreal go wireless. *The Globe and Mail*.

Proulx, Serge, and Stéphane Couture. 2006. Pratiques de coopération et éthique du partage à l'intersection de deux mondes sociaux : Militants du logiciel libre et groupes communautaires au québec. Paper presented at Rencontres Intelligence Collective 2006, 22-24 May in Nîmes, France.

Putnam, Robert. 2000. *Bowling alone: The collapse and revival of american community*. New York: Simon and Schuster.

Raboy, Mark. 1984. *Movements and messages: Media and radical politics in Quebec*. Toronto: Between the Lines.

Stark, David. 2001. Ambiguous assets for uncertain environments: Heterarchy in postsocialist firms. In *The twenty-first-century firm*, edited by P. DiMaggio, 69-104. Princeton and Oxford: Princeton University Press.

Suchman, Lucy. 2005. "Agencies in technology design: Feminist reconfigurations", http://www.lancs.ac.uk/fss/sociology/papers/suchman-agenciestechnodesign.pdf (accessed April 11 2006).

Warner, Michael. 2002. *Publics and counterpublics*. New York: Zone Books.

Notes

[i] Overseas meetings included the World Summit on Free Information Infrastructures in London in 2005 and a series of "national" and international wireless Summits in the United States. I will discuss these "Summits" in more detail later.

[ii] 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 (2008), and I am extremely grateful for her generosity in co-developing and sharing the Montreal survey with me.

[iii] 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. For full details of research project support of the research involved in this thesis, see Appendix One.

[iv] The Mobile Digital Commons Project (http://www.mdcn.ca), funded by Heritage Canada and led by Michael Longford of Concordia University, was the first partnership created by ISF and provided funding for equipment to establish the first 15 WiFi hotspots.

[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] Locative media are digital media applied to real physical places and meant to inspire social interactions. Locative media depends on the ability to target media or interactive content to a specific location (Russell, 2004).

[ix] A funding program that supports the development of artistic content produced by artists aged 15 to 25.

[x] Hub des Artistes Locaux is a partnership project between a community radio station, Île Sans Fil, and the campus television station of Concordia University. The project uses ISF hotspots to host music and video servers that broadcast music and video content curated so as to relate to the specific culture of the hotspot. See http://www.ilesansfil.org/tiki-index.php?page=HAL

[xi] For example, the distroboto project developed by Archive Montreal reappropriated cigarette machines that now dispense pocket-sized art: http://www.distroboto.archivemontreal.org/

[xii] 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.'"

[xiii] In spite of its supposed lack of hierarchy, some members of ISF were more influential than others. One rather marginal group member consistently posted slightly sexist comments on the mailing list (for example, about how he would like to have blondes in the afternoon and redheads in the evening), but since he did not have much influence, these were mostly ignored. However, sexist comments by a more "powerful" group member had a different weight.

[xiv] Between 2004 and 2007, thirty articles appeared in the Canadian press referring to ISF. In 2005 each of the three French daily newspapers in Montreal: Le Devoir, La Press, and le Journal de Montréal each published one article: Dumais, Michel (2005) "Le boulevard St-Laurent à l'heure du sans fil." *Le Devoir* – January 31, 2005; Boisvert, Pierre (2005) "Une Île Sans Fil presque partout à Montréal." *Le Journal de Montréal* – May 18 2005; Cardinal, François (2005) "Une île, pas de fil". *La Presse* – May 28 2005. ISF was also discussed in a feature article in the national newspaper *The Globe and Mail*: Patriquin, Martin (2005) "ISF 'collective' helps Montreal go wireless" - December 9 2004. Montreal's English-language daily, *The Gazette*, never published an article on ISF.

[xv] 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."

[xvi] See http://communities.canada.com/montrealgazette/blogs/tech/archive/2007/12/28/vote-for-montreal-s-sexiest-geek-in-2007.aspx