What are Community Networks an Example of?
A Response

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Abstract

The way that the community informatics researcher contextualizes their research site is a critical problem that is often ignored. To demonstrate, the chapter reviews four possible contexts that can surround community neworks: the network is an example of infrastructure creation, user protest, a desire for professionalization, or a learning community around technology. Each of these contexts poses different questions that the researcher should ask and each can also change their conclusions. In contrast, studying particular community networks as case studies (or for their own sake) will produce a thin and disconnected research literature of missed opportunities.

Keywords

Introduction

In a recent research project studying community wireless organizers in the U.K., I ran across a

case that changed my thinking about community networking generally. I was talking to a local

organizer who (with a group of confederates) had spent two years of painstaking effort lobbying

regional development authorities and local councils to make them aware of the economic and

community benefits that would come from an investment in wireless networking. His two years

of meetings, emails, and letters had just paid off, but my interlocutor was deeply unhappy. The

tide had turned, some elected officials fell into line, the bureaucracy was convinced, and a

regional development authority announced that it was going to pay BT to build a wireless system

(that is, British Telecom, the incumbent telecommunications operator).

His battle was won and lost on that day. The epiphany for me was that the community

organizers wanted the network but they would never be happy with a network operated or built

by BT. While one might say that he had just won a long fight—he had convinced the government

to make the investments that he wanted-- he felt that he had lost, and lost totally.

Most consumers love to hate the incumbent, and some of the organizers objected to BT in

ways that were not based on reason (not that they were *ir*rational, but that they unreflectively

objected to any relationship with the dominant commercial carrier because of their feelings about

large companies). He would continue to object to BT, it became clear, even if he got to write the

government's contract, and to specify exactly what BT was required to do. Even if the

community organized itself and, through representative government, used public funds to build

exactly the network that the people desired, in this view if the network was built by BT then the

community had failed.

Many of the reasons that community activists mistrust BT are entirely sensible and well-founded. But the larger point is that my own case study of these groups was hopelessly incomplete without consideration of this relationship with BT. The group's resistance to the status quo defined everything that they did, even when they didn't mention it. This chance to revisit my own change of perspective as a researcher is my response to the excellent research produced in this volume by CRACIN.

Choosing the context within which to contextualize CRACIN case studies is a difficult problem, but it is essential that we address it. The larger context helps to develop practical and policy suggestions, ensures that this writing will be useful to the next generation of researchers, and suggests ways to think about what the future might hold. For an academic researcher it might seem that the use of grounded theory, an exploratory perspective, or a pilot study avoids the hard problem of asking (or answering) larger questions, but in fact these tactics just delay the problem. (Grounded theory, for example, demands that new theory be the result of the research process—a tall order!).

More controversially, I think it is very difficult to usefully contextualize community networks in relation to each other. While comparison across similar projects might be practically useful, all of these cases still beg for some larger idea to sit inside. One way of considering this problem is to ask the question, "What are community networks an example of?" (Or even, "What is Wi-Fi an example of?" "What is the Internet an example of?" and so on). For community networks, there are many useful answers. Let me briefly introduce four.

The network as an example of revolutionary infrastructure creation

It may be that community Wi-Fi (or any architecturally-distinct form of community Internet) projects aspire to replace other systems of communication. Sawhney (1992, 1993, 1999) developed a theoretical model to explain the process by which infrastructures replace each other over time. For instance, railroads were originally seen as a "last-mile" solution for the canal network, and canal owners invested in the railroad technology that would ultimately usurp them because they could not foresee a long-distance railroad as a realistic technological possibility or as a threat. Similarly, telephones were the "last-mile" technology for the telegraph system, and roads were a "last-mile" technology for the railroads.

To take Wi-Fi as an example, we currently can't see Wi-Fi as a long distance technology, but it may be that research into long links and new protocol developments will cause Wi-Fi to follow the same pattern. For example, amateur experimentation includes Wi-Fi range contests at the annual DEFCON hacker conference, while WiMax is a more recent protocol that aims in part to increase the range of Wi-Fi. It isn't impossible to think that these small cases of wireless community networks may be the beginning of large networks that will usurp and replace today's infrastructure. Sawhney, the author of the model, has in fact made this connection between local wireless projects and revolutionary infrastructure development himself (Sawhney, 2003).

The Network as an Example of User Autonomy and Protest

In this second view, these networks are the result of specific features or services being unavailable to a given population. The network itself is a kind of user protest: the dissatisfied users probably do not want to operate their own telecommunications networks, but they see no other way to obtain any service at all—or access to specific features. Elsewhere (Sandvig, 2004)

I have previously developed the comparison between community wireless projects and the telephone cooperatives in Claude Fischer's (1994) work on the development of the telephone in rural America and Canada (Sandvig, 2006).

In history, community cooperatives have introduced a stunning array of important infrastructures, particularly in remote areas. While we think of "infrastructure" as inherently a project of big government or big business, the evidence suggests that big, elaborate systems often start small (Hughes, 1983). The first roads, telephones, and Internet services in many areas were introduced by community cooperatives, typically (according to Fischer) because these people were forced to act on their own if they wanted any service at all. Currently, many community networks pride themselves on offering services where no other options are available, or services that are unavailable from incumbent carriers, such as symmetric broadband Internet service, service that can be legally re-sold, or Internet access without port blocking. In this instance the Wi-Fi co-op is heir to the early Internet service providers with the same motives.

The Network as an Example of Professionalization

There was a time when "electrician" was not a recognizable job title, and electrical tinkerers were not popularly differentiated from electrical magicians who put on powerful shows with lights and electrical fire (Marvin, 1988). Partly as a response, a community of electrical "hobbyists" organized themselves in a quest for respect, better job opportunities, and class mobility. This motive, over a long period, transformed some electrical "charlatans" and tinkerers into professional "electrical engineers" with certification examinations, unions, professional associations (such as the IEEE), and high pay.

Although electrical history may seem far removed from the present moment, a variety of forms of "amateur" association related to technology have been found to comprise this drive for professionalization and upward class mobility. The same process can be seen in recent years, including the travails of those with the now-defunct job title "webmaster" or "web designer" (Kotamraju, 1999, 2002, 2003). To this perspective, community networks could be an attempt to professionalize and create respect and certification for a set of popularly devalued skills such as "community capacity builder" (see Peddle, Powell, & Shade, this volume, chapter 6) or "wireless network designer" (see Wong's example of Wireless NOMAD, this volume chapter 6, chapter 12). Another example could be the drive to legitimate community informatics itself in the curriculum of library and information schools.

To again take the case of Wi-Fi, founders of wireless community networks may have a big stake in the institutionalization of titles such as "wireless network engineer," a job that (at least in reference to computing) did not exist until very recently. There is evidence that despite their revolutionary or countercultural ideological commitments, at least some participants in community networks leverage their experiences into well-paid, mainstream information technology (IT) jobs (Sandvig, 2005, pp. 16-17).

The Network as a Learning Community

The instrumental value of tinkering with technology has been developed in some detail in the economics literature on "learning communities" (see, Greenstein 2004, esp., Ch. 3). Specifically, economists have found that technological systems spawn user groups that "learn by doing" (Rosenberg, 1982, see esp. ch. 6). Related work in economics has focused on the way that these communities return innovations as inputs into the process of product development (von Hippel,

1988, 2005). While this is a similar perspective to that of professionalization (discussed above),

the research on professionalization focuses on the individual's motivation for status and class

mobility, while within the learning community perspective from economics, in contrast, the

benefit is systemic (to the technology or to the user's organization). For instance, learning

communities create new "user-driven" (in von Hippel's phrase) innovations to the technology,

but these may not be commodified by the users themselves. Instead, entrepreneurs or dominant

firms in the area might "harvest" innovations by closely examining the learning communities

among their own users for new product or service ideas. The user-innovators may get nothing at

all beyond the pleasure of tinkering and the utility of the individual product that they built or

modified. In communication history, this perspective could be readily applied to the invention of

the mass audience for radio broadcasting—a practice pioneered by amateur groups that was then

commodified by large corporations and transformed into commercial broadcasting as we know it

today (Douglas, 1989).

The Alternative: Context of No Context

Although the chapter promised four perspectives, a fifth deserves mention: the context of "no

context."[1] Many projects compare community networks to nothing (the isolated case study) or to

each other via recent, similar examples. These researchers might answer that their particular

community network is an example of a community network (Schuler 1994, 1996; for a review,

see O'Neil 2002). This is not as useful as it at first appears. Rather than an analytic move, it is

instead a circular appeal to the way that these networks define themselves. And if community

networking is to be taken seriously as a perspective for analytic comparison, this demands

serious assessment and consideration of the successes and failures of earlier waves of community networking projects.[2] This rigorous evaluation has typically not happened.

There are other more practical problems with this approach. To yet again take wireless community networks as an example, if one wanted to argue that community wireless networks are examples of community networks or the community networking movement, why don't community networks and community wireless networks like each other very much? Why didn't the wired form adapt into the wireless form? Are wireless community networks a more recent example of the Freenet movement? Public access centers? Independent media centers? Universal service policy?

The most important point to be made here is that whatever you choose as an answer to the question, "What are community networks an example of?" has important implications. Although some answers are complementary and could be true at the same time, other answers logically preclude each other. Either a new infrastructure is revolutionary, or it is not.[3] For some answers to be right, some have to be wrong, though it may not be possible to know enough at this stage to determine which ones.

Let me again stress that there are many more useful answers to the questions of context. The contexts I have chosen are idiosyncratic and arise from my own reading. I notice now that they are also all crudely functionalist. I am not listing them here in order to endorse these specific answers to the question of context, but to raise the point that some choice needs to be made by Wi-Fi researchers. Here I have tried to suggest a few examples that seem readily applicable, and also to choose theoretical frameworks that offer some overlap but also some tension so as to highlight the necessity to choose one over another.

Choosing an answer to this essay's title should lead a researcher to ask different questions when conducting research, and to interpret the data that has already been collected in a different way. For instance, if Sawhney's revolution between competing systems is in the offing, researchers should focus on the development of long links and the complementarities of these systems with other systems. If Rosenberg or Greenstein are to be believed, researchers should look for technological features of these networks that grant users benefits the more familiar they get with them ("learning by doing"). That is, what specific skills are Île Sans Fil members building as they try to connect with each other (see Powell, this volume, chapter 10)? If Marvin is instead a guide, the status of the professions involved should be examined, and special attention should be paid to trans-group associations and the methods by which members delimit insiders and outsiders.

To return to the anecdote that introduced this comment, without addressing the larger context it may be impossible to make sense of these data, or a researcher may miss data that are essential to understanding a case. For instance, Fischer contextualized early telephone co-ops as resistance to the telephone companies of the day, and this led him to go beyond co-ops in his data collection. He unearthed memoranda in telephone company archives that explained why telephone companies did not serve the rural areas where co-ops began, providing a much more compelling explanation for the co-ops.[4] A key explanation for the existence of the co-ops wasn't located in the co-ops themselves, and could not be obtained without looking outside them.

Many ways of answering the question of context suggest that it might *not* be particularly useful to ask the people of community networking what they think they are doing. If we kept, for instance, von Hippel's model of user-driven innovation in mind, it would be entirely plausible that user-innovators would not see themselves in this role, or would even deny it. That is, user-

innovators may work for their own benefit, and not be able to see the external value of their own invention. While they might delight in tinkering, they may not be the ones who are able to eventually capitalize on their innovation. In a learning community as described by Rosenberg, the main benefit returned to a community network would be an increase in the group member's own skills, and any references they made to addressing the digital divide or other external goals would be simply beside the point (see Powell, this volume, chapter 10).

The answer to the question of context also has critical public policy consequences and implications for practitioners. If particular networks are examples of user autonomy and protest (after Fischer), we would expect the networks to go away as soon as the missing service or feature is made available by other carriers. The network's role in the development of the overall system would have been accomplished—perhaps by embarrassing a larger operation into offering a new feature or extending its service to a remote area—but the network that prompted the change would not need to survive, or to keep doing the same thing. Several of the perspectives outlined above suggest that these networks will not scale, that they are instead useful as influential examples or prototypes that are soon to be reconstituted within some larger sort of agglomeration. For a practitioner, creating publicity for one novel and influential example could be a far better use of resources than attempting to scale a service that is overly similar to offerings already provided by others.

In the policy context, if we see these networks as sources of innovation (von Hippel again) rather than service delivery, then most government programs funding these community networks are designed in the wrong way. That is, to spur innovation we should encourage diversity among sites, not homogeneity or "best practices." For innovation theory, giving grant money to unusually-organized (or disorganized) groups that fall outside what is normal for a

government program would be an asset, and not a drawback. Forcing the groups to modify their

organization to become more like everyone else could in fact eliminate their chance of producing

a useful innovation.

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Endnotes

[1] Apologies to George W. S. Trow for borrowing his excellent title.

[2] This insight is Michael Gurstein's.

[3] Although the work of both Fischer and Sawhney could be used to explain Wi-Fi as an example of infrastructure development, in Sawhney's model the power relationships among complementary infrastructures undergo a reversal or revolution, while in Fischer's framework complementary infrastructures only have the power to slow each other's growth. Fischer relates the telephone to the automobile in this way.

[4] Fischer makes a convincing case that rampant anti-rural sentiment led telephone companies to refuse service to rural areas. See Sandvig, 2006.