Online Communities

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INTRODUCTION

The Internet was not invented as a social technology, but it has certainly become one. From the earliest days of the ARPAnet (network of communicating computers established in the late 1960s with U.S. government funding), people have shaped and used the technology for social purposes. Today, millions of people use the Net as a means of making and maintaining social connections with people who share a common experience, interest, or concern. Social connections are found on the Net in contexts ranging from small family e-mail exchanges to fantasy games with hundreds of thousands of players. This chapter focuses on a subset of Net-based social contexts, which in the 1990s came to be called "online communities." In these Net-based social contexts, large numbers of people who share a common experience, interest, or concern interact with one another primarily, if not exclusively, over the Net. Most members have no preexisting ties with one another, and most of them will never meet face to face. Online communities range in technical sophistication from Usenet discussion groups to complex multiplayer fantasy games supported by proprietary software. They range in purpose from entertainment to political dissent to developing free software. They range in accessibility from completely open to anyone with Net access to accessible only through paid subscription to completely hidden behind corporate firewalls.

This chapter describes how technical and social factors mutually interact to produce and sustain online communities. It also begins to offer a differentiated view of online communities. Online communities share some underlying attributes and processes, but they differ in member interests, goals, processes, and consequences for their members, sponsors, and society. A more differentiated view will make possible more productive theorizing, research, and design.

DEFINITION AND COMPONENTS

Definition

Communities in the offline world are defined as collectivities of people who share a common experience, interest, or conviction; who experience a positive regard for other members; and who contribute to member welfare and collective welfare (Bender 1978; Etzioni and Etzioni 1999; Knoke 1986; Putnam, 2000). Not all social collectivities in the offline world are communities: people may share a common experience or interest, such as shopping at the same grocery store or reading the same newspaper columnist, with no positive regard for others or commitment to the collective welfare of all who share that experience. Examples of communities in the offline world include neighborhood communities, religious communities, civic and social communities such as youth scouting or service clubs, and collections of like-minded enthusiasts such as fans of particular sports teams. Communities in the physical world can be described by structural attributes such as rules, roles, and resources that exist independent of any member (e.g., Lin 2001). Thus, one can talk about the size of a community, membership requirements and obligations, community resources and amenities. Communities can also be described by observable member behaviors such as attendance, rule following, donation, and interaction. And they can be described by member psychological orientation to the community and its members, such as feelings of trust, alienation, identification, and commitment. In the physical world, structural, behavioral, and psychological attributes exist along a continuum, so one can find more or less well-structured communities with more or less active and committed members. In casual usage, the term *community* usually suggests positive feelings, prosocial behavior, and choice. (People rarely talk about a "prison community," even though its inmates interact and have experiences in common.) Analytically, however, the term is a neutral one. Communities and their members can do physical and economic damage to members, neighbors, and enemies, just as they may produce beneficial outcomes.

The definition of *online community* used in this chapter is also based on shared experience, interest, or conviction; positive regard for members; and members' voluntary contribution to member welfare and collective welfare. An *online community* is defined as a large, collectivity of voluntary members whose primary goal is member and collective welfare, whose members share a common

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interest, experience, or conviction and positive regard for other members, and who interact with one another and contribute to the collectivity primarily over the Net. Online communities can have more or less structure and more- or less-committed members. They may yield positive or negative consequences for their members, sponsors, and society. It is difficult to tightly bound the concept of community, because all human interaction occurs in a continuum of social organization—from the dyad to the nation-state. Nevertheless, the definition of *electronic community* used in this chapter excludes some forms of organized online social interaction for reasons of focus and because they are deserving of consideration in their own right. Table 1 shows the attributes of organized online interaction that are emphasized or deemphasized in online communities. As shown in Table 1, our definitional focus excludes electronic work groups and teams, whose primary goal is economic, whose members are paid employees, and whose size is relatively small. It excludes ad hoc friendship groups and buddy lists, which are relatively small, with members who interact primarily in the offline world. These two exclusions highlight our focus on shared interest groups of large size with voluntary members who interact primarily on the Net. The definition also excludes nominal groups such as "all the people who use Google" or "all Netizens" (who neither share a common interest nor interact with one another) or "all the people who read a particular Web log" (who may share a common interest but do not interact with one another). This exclusion highlights our focus on social interaction around a common interest and positive regard for other participants. Others who have offered definitions of electronic communities include Figallo (1998), Kim (2000), Porter (2004), Powazek (2002), Preece (2000), Rheingold (2000), Werry and Mowbray (2002).

Until the mid-1990s, almost no one used the term *online community*. Instead groups that today might be named "online communities" were named after the technology that supported them and were called "newsgroups," "listservs," "mailing lists," "BBSs," or "Free-nets." In some ways, online communities that are the focus of this chapter bear little resemblance to communities in the physical world. They own few tangible resources; they require no visible or tangible commitment from members (such as taxes, dues, attendance at meetings); and members may never see or meet one another face to face. Yet some online communities have resources that may be economically valuable: their domain name, the wisdom accumulated in their FAQs (frequently asked questions), the intellectual property created by their members. Fantasy game characters and properties have yielded nontrivial sums of money for their creators on eBay auctions. The members of one voluntary online community collected enough money in member donations to buy a new server to host the community (Boczkowski 1999). Nevertheless, calling any electronic site where people may gather an

Table 1: Descriptive Attributes Characterizing Online Social Collectivities

Type	Shared Interest	Size	Interaction among Members	Primarily Electronic	Voluntary Participation	Concern for Member/Collective Well-Being
Corporate electronic work groups	Strong	Small	Extensive	Sometimes	No (part of employment)	Economic well-being of collective
Buddy lists	Modest to strong	Small	Minimal to extensive	Sometimes	Yes	Member, but not collective
People who read a particular blog	Modest to strong	Small to large	Minimal	Yes	Yes	No
People who use Google	None	Large	None	Yes	Yes	None
Social network	Modest to large	Small to large	Minimal to modest	Often	Yes	Rarely
Discussion community	Yes	Large audience; smaller contribution core	Minimal for readers; extensive for posters	Yes	Yes	Varies by level of participation; significant for contribution core
Online collaborative work community	Yes	Large audience; smaller contribution core	Minimal for readers; extensive for contribution core	Yes	Yes	Varies by level of participation; significant for contribution core

Note: Online communities, denoted by shading, are a subset of online social collectivities.

"online community" does not make it one. As in the offline world, in common parlance the term carries positive connotations, and some who have used it are guilty merely of wishful thinking. This wishful thinking characterizes many of those who, in the late 1990s, aspired to create online communities for profit (e.g., Bressler and Grantham 2000; Hagel and Armstrong 1997).

Supporting Technologies

In addition to the packet-switching technology of networked communication, many online communities rely on message-based group communication applications to support member interaction. These applications generally support asynchronous or synchronous discussion and interaction. In asynchronous interaction, people do not have to be logged on at the same time because messages are saved for later reading. In synchronous discussion, people must be logged on at the same time because messages are not stored. Asynchronous discussion is often supported via mailing lists or bulletin board applications. Mailing lists, a push technology, send group messages to a person's e-mail inbox, where they intermingle with the person's other e-mail and are saved until the recipient logs on to read them. With bulletin boards, a pull technology, a person reads group messages organized by topic in a file exclusively devoted to that group. (Some people establish filters to move all mailing list messages into separate folders, thereby making distribution lists function somewhat more like bulletin boards.) Synchronous discussion may be supported via talk programs such as IRC (Internet relay chat), Instant Messenger, or text-based virtual reality (VR) environments. MUDs (multi-user dungeon, domain, or dimension) and MOOs (MUD object-oriented) began as text-based virtual reality games, a computer-based version of fantasy games such as Dungeons and Dragons. Today, some are still organized as fantasy games; others are organized for professional or social purposes. Their spatial metaphors and programmable objects and characters are the precursor of today's graphically based fantasy games. With the spread of the Web and graphical browsers in the late 1990s, many online communities, which previously would have used only text-based message applications, created Web sites to support more varied forms of interaction. Some include real-time chat for discussions that are scheduled and announced in advance. Some use special file formats to share image, sound, or video files. Online game communities are supported by more or less elaborate software that supports play in board games like chess or supports character creation and interaction in fantasy worlds. Most discussion among members on online community Web sites still occurs in message-based discussions, however. Even the fantasy games have discussion boards.

In the early years of the twenty-first century, technologies for preparing, publishing, and linking Web pages became easier to use and spread widely to support large social collectivities. The "blogosphere" consists of everyone who uses applications for preparing and publishing Web pages to publish a Web log (blog), which consists of an online journal with time-stamped entries displayed in reverse chronological order. The blogosphere is merely a very large nominal group, and not a community by our definition, but some bloggers who share a common interest in a topic may interact with one another indirectly through commenting on one another's blogs. Much of the "interaction" resembles online journalism or columns with linked letters to the editor, rather than the more interpersonal interaction found in message-based communities. (Nardi and colleagues [2004] identify five broad motivations that drive people to publish a blog, only one of which is related to community formation and maintenance.) However some groups of blogs may be considered a community by our definition. These topical groups may crystallize in "Web blog rings" created by an application that places a banner at the bottom of related participant blogs; upon clicking on the banner, the reader is taken to another, randomly chosen blog that is a member of that "ring." Over time, blog-ring members may develop a psychological affiliation with the Web blog ring and interpersonal bonds with one another that go beyond merely posting and reading blog entries on a common topic. (Herring et al. [2004] report that fewer than 5 percent of blogs belong to a blog ring.)

Social networking Web sites allow their members to establish, develop, and maintain "social networks" through publishing and linking "profile" pages created by their members. These are structured Web pages in which members share information about themselves. The "social" nature of these sites essentially results from three features. First, the software allows users to add links to other peoples' profiles, thereby adding "friends" to one's network. Once in the same network, site members have easy access to one another's profiles through an automatically generated list of "friends" on their home page. Second, users are able both to exchange asynchronous messages among themselves and to "chat" synchronously online. The ability to broadcast a message (called "bulletins" on some of the sites) to all "friends" is also provided, as are "comments," which can be attached to a member's profile (thus becoming visible to all who visit that profile). Third, these sites typically support "groups," which members with a common interest or experience can join. This feature allows users to self-organize along lines other than those defined by their preexisting social networks and explore their "extended network" (the term used by one social networking site, MySpace, to characterize members who do *not* belong to a member's list of "friends") in yet another way. Social networking sites and applications are enormously popular (MySpace was the third most frequently visited Web site during July 2007) But like blogs, most social network sites do not exhibit all of the attributes enumerated in our definition of online community. Although creating a profile is an entirely voluntary act, the ability to join someone else's social network occurs only by invitation. Moreover, the concept of community welfare, a necessary attribute in our definition of online community, is rarely prominent in these sites. One sociologist commented that these sites are characterized by "voyeurism and exhibitionism … [like] hanging out at the mall or lounging on the quad … seeing and being seen" (Cassidy 2006).

A wiki is a software system that serves Web pages while providing site visitors the possibility to easily add, modify or delete their contents. At its simplest, wikis merely

generate HTML code that includes discrete links labeled "edit" interspersed along the page. If a user follows such a link, she will be presented with a form that allows her to edit the contents of the page that she was previously reading. The page is edited using a simple markup language; modern wiki implementations also provide a set of buttons through which the same functions (e.g., italicize text, create a hyperlink, etc.) can be accomplished without knowledge of that markup language. Either way, once a modification is done it is immediately reflected in the original page. The fundamental change introduced by the use of a wiki in comparison with traditional Web sites is that the authors and readers of a site are no longer two distinct groups: instead, active participant visitors can create and directly edit the content that attracts those same visitors to the site. Wikis are successfully used both by large online communities—the best-known example being Wikipedia (http://en.wikipedia.org), a collaborative effort to create an online encyclopedia; the English edition contained 1.9 million entries as of July 2007—as well as by work groups within organizations.

General Attributes and Processes

The Social Psychology of Text-Based Communication

Typically, online community members interact with one another while sitting alone at a computer keyboard. This solitary social behavior is characterized by fewer social context cues than are available in face-to-face gatherings. Weak social context cues mean that people who compose and send messages have few explicit reminders of the number of people who will read them. They have few reminders of their physical appearance, social status, or nonverbal reactions compared with face-to-face or telephone communication. Similarly, people who read messages or Web pages have relatively few reminders of the social attributes of people who create them in comparison with face-to-face gatherings. (In virtual reality communities, people can create entirely new personas. See Turkle [1995] for an exploration of multiple online identities.) Social context cues help to regulate communication in face-to-face and telephonic interaction. They provide feedback as to who is receiving communications and how those communications are being received and interpreted. People adjust the style and substance of their communications as a function of these cues. When those cues are attenuated, communication tends to be relatively frank and open (Kendall 2002; Reid 1999; Sproull and Kiesler 1991). Weak social context cues can lead to different effects, even within the same community. They can increase affiliation and commitment among members because objective differences among members are obscured while subjective similarities, based on members' common interest, are magnified (Galegher, Sproull, and Kiesler, 1998; Mackenna and Bargh 1998; Sproull and Faraj 1995). Alternatively, they can increase disaffection and dropout because it may be more difficult to establish common ground or consensus and manage conflict (Carnevale and Probst 1997; Cramton 2001; Dibbell 1998; Herring 1994; Kollock and Smith 1996). Weak social context cues condition communication in many online communities. They allow for a potentially greater geographic and social diversity of participants than many physical communities do. At the same time, they offer few cues to that social diversity in interaction, except those revealed through language and linguistic cues (e.g., Herring, 2001). Increasingly, Web-based community applications encourage members to upload profile files, which can display enduring personal information about members' identities and interests. Still, in 2007 most interaction among community members takes place via text messages in the absence of other individuating information.

Microcontributions

Many of the tools for electronic community participation are based on a relatively fine granularity of time and attention—the text message, the blog entry, the page edit. Although contributions can be any length, messages sent to asynchronous discussion communities typically range between ten and thirty lines, or one to two screens, of text. For example, Winzelberg (1997) reported a mean of 131 words; Galegher et al. (1998) reported a mean of eight to twenty lines of new text; Wasko and Faraj (2000) reported a mean of twenty-five to thirty lines of text; Sproull and Faraj (1995) reported a mean of twenty-two to forty-two lines of new text. The average blog entry, according to Herring et al. (2004), has a length of approximately 210 words. Wikipedia articles on average run to 415 words (Wikipedia: Size comparisons 2006). In asynchronous applications, people can read one or more messages or pages and post or send one or more messages/pages at their convenience. The message can be thought of as a microcontribution to the community. When people are online much of the day as a part of their work, voluntary microcontributions can be interspersed throughout the work day. For those who have Net access at home, participation can also be interspersed with other activities at home. Even in synchronous communities, some members report that they keep a community window open on their screen while they are doing other things. Every once in a while they "check in" on the community (Kendall 2002). Some people may devote hours a week to an online community, but they can do so in small units of time at their own convenience.

Voluntary communities based on microcontributions have relatively low barriers to entry. It is fairly easy to read enough microcontributions to know whether a particular community is relevant or appropriate. If so, that same reading readily demonstrates the appropriate form that a newcomer's own microcontributions should take. The production and posting of initial microcontributions takes relatively little effort. Then, if all goes well, the newcomer receives positive reinforcement in the form of (easy-to-produce) responding microcontributions from other community members. Whereas microcontributions create low barriers to entry, they may also create high barriers to commitment. It can be difficult to develop complex arguments or achieve nuanced understanding through microcontributions. Communities that are easy to join are often just as easy to leave (Butler 2001).

Aggregation Mechanisms and Management Processes

Although people can make ad hoc contributions to online communities at random, microcontributions must be

aggregated and organized into larger units for efficiency and social effectiveness. Both technical and social mechanisms are used to organize the smallest unit of contribution into larger units that are useful to participants. Software for asynchronous discussion lets people indicate that their contribution is a response to a previous one. All contributions so designated can be aggregated by the software and displayed as "threads"—a seed message and all reactions to it. Forms of threads common from the earliest days of the Net include a question with replies and a proposal or statement with comments. Threads organize microcontributions so that everyone can see their constituent parts, making it easy for potential contributors and beneficiaries to see what has already been said. Software also allows readers to mark threads they have already read or to display only unread messages.

Asynchronous discussion communities may have tens or hundreds of threads active at the same time, necessitating a layer of organization above the self-organizing thread. In these cases, a human designer may suggest or impose a topic map or architecture to organize threads into more general topic categories. (In some older bulletin board systems, people would vote to create a new top-level topic, which would get its own separate bulletin board.) Web-based software can display these maps graphically so that users may click on a topic that interests them and see all threads related to that topic. The shared interest of a group usually suggests the type of topical map that may be created. For example, many communities centered on medical concern have topics for symptoms, medications and side effects, negotiating the health care system, and managing relationships with family and friends. Movie or television fan communities have topics for major and minor characters, actors who play those characters, past and future episodes. Communities that build software have categories for different types of code, bug reports, patches, and documentation.

Threads and topic maps may be insufficient to structure extremely large numbers of messages. Another form of microcontribution, the rating message, adds a quality dimension to message structuring. Some Web sites now give members the opportunity to rate the contribution of others' messages. Software then aggregates and displays these ratings in an overall quality index for contributions (e.g., Slashdot) or contributors (e.g., MotleyFool). Explicit ratings of contribution quality have been shown to increase economic trust within electronic markets like eBay (Kollock 1999). It is an open question whether they increase or inhibit emotional trust and cohesiveness within an electronic community setting, but at least some research suggests that they increase the average quality of messages and increase participant duration (Moon and Sproull 2006).

Software for synchronous interaction may organize contributions in channels or use a spatial metaphor to organize contributions in "rooms," (e.g., Schlager and Schank 1997). Online communities associated with a geographic locality may organize contributions around civic functions, like the garden club or public library (e.g., Sproull and Patterson 2004). As these communities increase in size, the organizers or members themselves construct new rooms, buildings, and territories to organize interaction. Some also offer rating and review functions to rate characters or contestants and properties.

In online software development communities, two technologies, in addition to mailing lists, support managing and aggregating contributions: revision control systems and a "diffing and patching" mechanism. Revision control systems allow developers to work independently on code in parallel and then automatically "merge" all the changes they have made, so that the result is a single, consolidated version of the code. Core developers and regular contributors will be granted "write-access," meaning that their account in the revision-control system allows them to introduce changes to the code (as opposed to only being able to download it). Those who lack write-access to the code repository download the latest version of the code, modify it, and then present the changes they introduced to one of the core developers for acceptance. They do so by running a program called "diff," which generates a small file describing the changes between two versions of one or more files. These small files are called "patches." The core developer who receives a "patch" can then use a second program (itself called "patch") to obtain the modified version of the code and determine whether it should be added to the code base.

Most wiki systems include several additional organizing features with the aim of addressing difficulties arising from disagreement over the site's contents and the risk of "wiki vandalism." First, each page on the wiki has an associated "talk page," where contributors can engage in a discussion of the changes they have introduced (or wish to introduce) on that particular page. Second, the system includes a "page history" function, through which participants can see a log of all changes introduced to a particular page. Most importantly, that same mechanism allows pages to be easily "reverted" to a previous state; it is through this mechanism that "edit wars"—in which groups with different views on an issue repeatedly try to modify the wiki's contents so that it reflects a particular group's perspective—take place. Third, and although it is often seen as being in contradiction with the democratic ideals of the wiki system, several platforms also allow the administrator(s) of the wiki to restrict the ability to introduce changes to certain pages. A well-known instance is that of Wikipedia and its several levels of protection: some pages can be edited by any visitor; others require an account on the Wikipedia Web site that is at least 4 days old but is otherwise unrestricted; and, finally, some other pages can be edited only by Wikipedia administrators.

Norms and Motivations

In addition to organizing mechanisms provided through software, norms of community behavior and motivations of community members serve to organize and influence member behavior. Some norms of community behavior, which were visible from the early days of the ARPAnet, prevail across many types of online communities. Most important is the norm of altruism. Online community members freely offer information, advice, and emotional support to one another with no expectation of direct reciprocity or financial reward. The fundamental dynamic supporting discussion communities is that someone asks a question or makes a proposal or statement and other

people provide answers or comments. Utilitarian self-interest may be all that motivates the askers—a personal need for information. But pure self-interest does not explain the behavior of people who reply. By definition, volunteer members are not paid for their replies. Because they are unlikely to have a personal relationship with the person they help, neither friendship obligation nor the expectation of direct reciprocity is likely to compel their behavior. Indeed, an early influential paper (Thorn and Connolly 1987) predicted that computer-based information exchange systems that relied on volunteers would be doomed to failure. The authors argued that people who could give the best replies would have no incentive to participate because they would receive few benefits for doing so—it was unlikely that anyone could answer their questions; their time would be unrewarded. (In social dilemmas, helping in these situations is known as the "sucker's choice.") Over time, therefore, the quality of help would decline until people no longer even bothered to ask questions. The fallacy in this argument is the assumption that rewards to people who provide help must come in the same form as the help they give. Yet motivations for helping behavior can be quite complex. In studies of volunteers in the physical world, motivations include commitment to the cause or interest associated with the community, the desire to help others, benefits from displaying expertise, and the personal satisfaction and self-esteem derived from helping others (e.g., Clary et al. 1998; Omoto and Snyder 1995). Studies of electronic discussion communities document a similar combination of motivations for people who answer questions and otherwise support their online community (e.g., Butler et al. 2007; Kollock 1998; Lakhani and von Hippel 2003; Wasko and Faraj 2000). Self-expression and identity display are important motives in blogs and social networking sites.

A second extraordinarily important norm is peer review of content (Benkler 2002). In most volunteer online communities, there are no "authorities" to certify the accuracy of all content. Instead, it is expected that members themselves will comment on the quality, accuracy, completeness, and so on of one another's contributions. Similarly, peer review of behavior is also expected: it is normative for members to chastise or complain about inappropriate behavior and praise helpful behavior.

In virtual reality communities, the VR environment indexes participants' motives (Reid 1999). In VR game communities, the motives are tied to the rules of the game: amass property, kill enemies, design an award-winning room, and so on. In VR professional communities, the motives are tied to the profession: contribute to shared databases, review articles, participate in policy discussions. In VR social communities, the motives are tied to exploring social worlds. In collaborative work communities motives are tied, at least in part, to furthering the goals of the community such as building better software, distributing digital books, organizing volunteers, etc.

HISTORY OF ONLINE COMMUNITIES

Both the technical and social trajectories of electronic communities began with the design and early deployment of networked computing in the late 1960s and early 1970s. (See Table 2 for time line.) Whereas computer networking was initially conceived as a way to share scarce computing resources located in one physical place with researchers at other places via remote access, it soon became a convenient way for people to gain access to people at remote sites as well as to remote computers (Licklider and Veza 1978; Sproull and Kiesler 1991). During the 1970s and 1980s, people created additional networks and wrote e-mail and bulletin board software, which represented technical innovations and improvements that made networked computing more useful for supporting human communication. During the 1990s, the technical innovations of the Web and the graphical browser supported the broad diffusion of electronic communication to millions of U.S. households and hundreds of millions of people worldwide. In the first years of the twenty-first century, easy personal publishing and page linking undergirded an explosive growth in social networking and blogging.

The social trajectory of electronic discussion communities had its beginnings in the same technical community that invented and refined the ARPAnet. By the mid-1970s, ARPA program officers and researchers around the country had begun using group e-mail to share results, discuss plans, and organize meetings. Some of these researchers also began using group e-mail for purposes unrelated to work: for example, to share opinions on cheap Chinese restaurants in Boston and Palo Alto, favorite science fiction books, inexpensive wine, and new movies. This research community invented both the technology (networking and group communication tools) and the new form of social organization (the voluntary electronic group). They appropriated technologies that were created for utilitarian purposes to create self-organizing forums for the voluntary discussion of common interests. The social trajectory of VR communities began in 1979–1980 with an effort to program a game that would be like the fantasy game Dungeons and Dragons that was played in the physical world. The first multi-user VR game was accessible on the ARPAnet in 1980.

By the twenty-fifth anniversary of the ARPAnet in 1994, electronic group communication had become a taken-for-granted process, and voluntary electronic discussion communities had become a taken-for-granted organizational form in universities, technical communities and scientific disciplines, and some corporations (e.g., Finholt and Sproull 1990; Kiesler & Sproull 1987; Orlikowski and Yates 1994; Walsh and Bayma 1996). Multiplayer games were also becoming popular on university campuses. Despite their growth, at this point both discussion groups and games were still in large measure the province of young, technically adept men. The final years of the twentieth century saw Net-based communication enter the mainstream of U.S. life because of a combination of technical and economic developments. The technical developments were the Web and the graphical browser, which made it much easier for ordinary people to find and access information and groups on the Net. The economic developments were the commercialization of the Net and AOL's business model. Once the Net began to be commercialized, corporations began to see potential economic value in electronic communities and so endeavored to support them

Table 2: Timeline for Community-Oriented Group Communication on the Net

DATE	NAME	TECHNICAL DEVELOPMENTS	SOCIAL DEVELOPMENTS
1965–1968	ARPA projects	Research on networking to share scarce computing resources	Networking research community forms across small number of labs
1969	ARPAnet	First four ARPA sites connected	
1972	RD	First ARPAnet e-mail management program	
1973			75 percent of ARPAnet traffic is e-mail
1975	MsgGroup	First ARPAnet mailing list	
1978	BBS	First bulletin board system	
1979	Usenet	Free software to share bulletin board discussions	
1979	MUD	First multiuser VR game	
1979	CompuServe	Began offering e-mail to customers	
1980	MUD	MUD first played over ARPAnet	
1981	Bitnet	Computer network for non-ARPAnet universities	University computer center directors band together to support this
1981	Sendmail	Free software to send mail across networks	
1984–1985	Delphi, Prodigy, AOL	Commercial information services founded that offered e-mail	
1985	Listserv	Free software to manage e-mail lists	
1986	IETF		Volunteers focused on technical operation and evolution of Internet
1988			>1000 public listservs
1990			>1000 Usenet groups; >4000 posts per day
1990	World Wide Web	Invented by Tim Berners-Lee	
1990	LambdaMOO	VR environment created at Xerox PARC	
1991	Linux	Free computer operating system	First message about Linux posted to Usenet group
1992	AOL	Connects to Internet	
1994	Netscape	Introduced graphical Web browser	
1994			>10,000 Usenet groups; >78,000 posts per day; Estimated 3.8 million subscribers to commercial online services
1995	wiki	Software that allows for collaborative writing and editing of Web pages	
1999	blog	Term coined as contraction of "Web log," Web page journal with timestamped entries	
2000			34 million AOL subscribers; 44 million U.S. households online
2001			90,000 Usenet groups; 54,000 public Listserv groups
2001	Wikipedia		Anyone can creat or edit and publish encyclopedia article on any topic
2002	Friendster	Social networking site founded	
2004			65 percent of U.S. citizens are online 600 million people worldwide are online
July 2006			MySpace was most visited domain on the Internet 1.3 million Wikipedia articles published 97 million Americans use the Internet on an average day

IETF = Internet Engineering Task Force; MUD = multi-user dungeon, domain, or dimension; VR = virtual reality.

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and, indeed, to "monetize" them (e.g., Hagel and Armstrong 1997). The commercial online game industry began to grow. AOL's business model emphasized e-mail and member discussion forums, in contrast with that of other commercial services that were still emphasizing access to databases. By 2000, AOL had 34 million members—more than all the other commercial services combined—many of them participating in electronic forums and communities of interest. That year, 44 million U.S. households were on the Net. (By 2004, nearly two-thirds of Americans were online [Fallows 2004].) Despite the enormous influx of people very different from the ARPAnet pioneers, four themes evident from the earliest days of the ARPAnet continued to characterize electronic communication at the beginning of the twenty-first century: access to people as much as to databases, group communication as well as dyadic communication, personal interest topics as well as utilitarian ones, and self-organizing voluntary electronic communities.

TYPES OF ONLINE COMMUNITIES

Until the early-1990s, most electronic communities used similar technology and their members had similar attributes. Highly educated, young, technically adept people congregated electronically with similar others who shared similar interests. These congregations were relatively homogeneous in structure, process, and membership. At the beginning of the twenty-first century, however, the diversity of Internet users and group goals and processes is so great that it is helpful to differentiate types of communities to understand their costs and benefits in more detail. This section categorizes and describes types of online communities based on the interests that members or sponsors have in common. (See Table 3 for examples.) It is neither an exhaustive nor a mutually exclusive characterization, but it does represent some prevalent types. Despite the differences across types of shared interest, all of these communities are characterized by any-time, any-place

Table 3: Examples of Online Communities

Consumer Communities	
www.audifans.com	Fans of the Audi marque
www.lugnet.com	Adult fans of Lego
www.Britney-Spears-portal.com	Fans of Britney Spears
http://Rec.arts.tv.soaps	Soap opera fans
(A)vocation Communities	
www.mastersrowing.org	For masters rowers and scullers
www.bikeforums.net	For the avid cyclist
www.Everquest.com	For EverQuest players
http://secondlife.com	Virtual reality world built and occupied by its inhabitants
www.chessclub.com	For chess fans
www.tappedin.sri.com	For K–12 teachers and teacher educators
www.LambdaMoo.info/	Virtual reality environment for social interaction
http://boogaj.typepad.com/knitting_blogs/	Knitting blogs Web ring
Place-Based Communities	
www.bev.net	Blacksburg Electronic Village
www.guerrillagardening.org	Volunteers who stealthily plant shrubs and flowers in London
http://web.mit.edu/knh/www/downloads/khampton01.pdf	Wired suburb of Toronto, Canada
www.backfence.com	"Do it yourself local news"
Condition Communities	
www.seniornet.org	For people over age 50
www.systers.org	For female computer scientists
www.deja.com/group/alt.support.depression	Usenet group for sufferers of depression
www.geocities.com/heartland/prairie/4727/bhnew.htm	Mailing list for people with hearing loss
www.deja.com/group/rec.soc.argentina	Mailing list for Argentinian expatriates

(continued)

Table 3: (*Continued*)

Concern Communities	
www.clearwisdom.net	For practitioners of Falun Gong
www.419legal.org	For Internet antifraud activitists
www.dailykos.com	Daily political news and commentary with a liberal perspective
www.moveon.org	For online political activists
www.deja.com/group/talk.guns	Usenet group for handgun advocates
www.deja.com/group/soc.religion.mormon	Usenet group for believers in Mormonism
Collaborative Work Communities	
http://vger.kernel.org/	Mailing list for developing the Linux kernel
www.wikipedia.com	Collaborative project to produce an online encyclopedia
www.ietf.org	For maintaining and improving the Internet
www.rhizome.org	For creating and discussing new media art
www.pgdp.net	For digitizing public domain books
www.OhmyNews.com	Online newspaper with contributions by "citizen reporters"

communication with relatively weak social context cues, aggregated microcontributions, and norms of interaction. The boundaries across types can be fuzzy; the descriptions indicate central tendencies within types.

Types by Member Interest

Consumer Communities: Brands and Fans

Consumer communities are composed of people who share a common interest in and are loyal to a particular brand, team, entertainer, or media property. Although people organized fan clubs prior to the Net, it was difficult to arrange fan club activities on a large scale and frequent basis. Online customer communities have a much broader reach. People voluntarily share their information and passion with thousands or hundreds of thousands of others who share their interests in a particular product, entertainer, or media property. AudiFans, for example, is composed of more than 1000 Audi enthusiasts who exchange information about parts suppliers and mechanics, post photos of their cars, and share the joys and sorrows of Audi ownership. The Britney Spears portal contains pictures, MP3 files, news, and forums where thousands of people comment (positively or negatively) on all things having to do with Britney. For most members of consumer communities, the shared interest may be an intense one, but it typically represents a fairly small and often short-lived portion of members' lives.

(A)vocation Communities

Experts and enthusiasts form and join voluntary (a)vocation communities to increase their pleasure and proficiency in their hobbies or work. Whereas a particular product may be a means to advancing a common interest in an (a)vocation community, the product is not the primary focus of attention, as it is in a consumer community. From bicycling to computer programming, dog training to quilting, karate to the Civil War, there are online communities for people who share these interests. "How-to" information prevails in (a)vocation community discussions; members who share their expertise are greatly appreciated. Network and Internet security are a topic for some (a)vocation communities. Usenet, for example, supports more than twenty-five groups on the topics of cracking, hacking, and network security where people discuss how to make or break secure systems. BikeForums, for example, has more than 3500 members who discuss and debate bicycle commuting, mountain biking, tandem biking, racing, training, and so on. The knitters web blog ring connects more than 900 authors of blogs about knitting. Tapped In is a professional VR community for K–12 educators whose 20,000 members, as of 2006, discuss curriculum, share lesson plans, and so on. The Internet Chess Club had more than 30,000 members in 2006 who play chess with other members, take lessons, play in tournaments, watch and discuss grandmaster competitions, and so on. EverQuest and Ultima are large online communities for people who delight in fantasy games. Second Life is a virtual world with more than 2 million inhabitants. The shared community interest in (a)vocation communities may represent a relatively enduring part of members' lives.

Place-Based Communities

These online communities are organized by and for people who live in a particular geographic locale. Their genesis in the early 1980s had a political agenda—to give residents a(n electronic) voice in the local political process (e.g., Schuler 1996; Schuler and Day 2004). More recent versions, such as Backfence, have had the broader goal of building social capital by increasing the density of electronic social connections among residents of physical communities (Hampton and Wellman 1999; Kavanaugh 2003; Sproull and Patterson 2004). In principle, the

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interest shared by place-based community members should last at least as long as people reside in the community. (Recent developments like MeetUp.com let people use the Internet to find others in their geographic area who share a common interest for the purpose of scheduling face-to-face meetings. These applications are not emphasized in this chapter because they focus primarily on arranging face-to-face meetings, not on sustaining broader electronic participation.)

Common Condition Communities

In these communities, people share the experience of, and interest in, a common condition. The condition may be based on a demographic characteristic such as race, age, or ethnic background; a medical or psychological condition such as arthritis or depression; or being an alumnus/a of a particular organization such as a college or branch of the military. People join condition communities to learn how others experience or are coping with their condition and to share their own experiences. Along with practical information and advice, a "you are not alone" sentiment prevails in many discussions. BeyondHearing, for example, has more than 1000 members who have a hearing loss or who have a loved one with a hearing loss. Topics range from cochlear implants to the best audiologists to funny stories about lip reading mistakes. Systers' membership is more than 2300 female computer scientists and engineers, as of 2006, who discuss female-friendly graduate schools and employers, how to manage male subordinates in the workplace, and so on. The shared community interest is often a long-term or lifetime one for members.

Concern Communities

In these communities, members share an interest in a common political, social, or ideological concern. Because members often wish to influence the state of affairs in the physical world, these communities usually have multifaceted ties to that world. They may announce and comment on real-world events and organize letter-writing campaigns, rallies, fund-raisers, and so forth. They may use click-and-donate applications to raise money or pledges of volunteer time. MoveOn, for example, began as an online petition drive to censure, but not impeach, U.S. President Bill Clinton and has grown to include many online advocacy groups that organize volunteer campaigns. The Howard Dean presidential candidacy used the Net for organizing in 2003–2004. More than 1000 members of alt.religion.mormon discuss and debate Mormon doctrine and practices. A number of blogs support concern communities, particular political concern communities (e.g., Dailykos supports Democratic and liberal/progressive policies and politicians). The shared interest underlying concern communities is likely to be a deep and abiding one for their members, although active participation may ebb and flow in concert with external events.

Collaborative Work Communities

Unlike other community types whose primary output is talk or self-expression, members of collaborative work communities use the Net to voluntarily produce real products, be they software, literary works, or other creations. Much open source software is produced in online voluntary communities today, despite the growing interest of the corporate sector (e.g., Raymond 1999). Indeed, much of the design and engineering of the Internet itself is accomplished by a voluntary community that conducts much of its business electronically, the Internet Engineering Task Force (n.d.). "Citizen journalists" contribute stories to an international online newspaper. Poets participate in writers' communities whose members thoroughly critique one another's work. A pragmatic writing community, Wikipedia, is creating a new encyclopedia. The community project has produced more than 1.7 million English language articles as of July 2007. The distributed proofreaders project has digitized, proofread, and posted more than 5000 public domain books. The shared interest of collaborative work communities is likely to be deeply involving for members, although it need not be as enduring as the shared interest in concern communities.

Types by Sponsor Interest

Only within the past 10 years have online communities been sponsored or organized by anyone other than members themselves (with a few exceptions such as The Well and geographically based bulletin board systems called Free-nets). Many recent third-party sponsors or organizers have been motivated by the profit potential of online communities, with revenue models based on either sales (of advertising, membership lists, products, etc.) or subscriptions. During the dot-com boom, third-party sponsors of some customer and demographic condition communities used sales-based revenue models. Profit-oriented community sites were created for, for example, L'eggs panty hose, Kraft food products, women (iVillage), Asian Americans (Asia Street), and African Americans (NetNoir). Some third-party-sponsored communities based on subscriptions experienced some years of economic health; arguably a substantial (but unknown) fraction of AOL's growth in the 1990s was a function of online community memberships. (In 2006 AOL abandoned its subscription-based model.) Within the game industry, subscription-based revenue models continue to be successful. Several multiplayer game communities have thousands or hundreds of thousands of members. Members of one game, EverQuest, report spending an average of more than 22 hours a week playing it (Yee 2001). At least one professional social networking site, LinkedIn, reports profitability based on subscription revenue. Other social networking sites, based on advertising revenues, do not disclose their financials. But one such site, MySpace, was purchased by News Corp., in 2005 for $580 million.

Some corporations have avoided revenue-based models and instead have supported online communities to build market share or increase customer satisfaction and loyalty. Sun Microsystems sponsors the Java Developer Connection, an (a)vocation community designed to support and expand the Java software developer community worldwide. The Lego Corporation supports several "adult-fans-of-Lego" sites, in addition to sponsoring its own site, to support loyal customers. Various software companies support voluntary technical discussion and support communities in the interest of increasing high-quality,

inexpensive tech support. Harley-Davidson uses H.O.G., its online members-only group, to reinforce the brand loyalty of Harley owners worldwide. Whatever the motivation of corporate sponsors, if people do not experience enduring community membership benefits they will not participate, and the community will die.

In the not-for-profit sector, foundations and service organizations have sponsored communities for their target populations with the goal of improving their well-being. For example, the Markle Foundation sponsored the creation of Seniornet, a not-for-profit online community for people over age 50, which currently has 39,000 members. The National Science Foundation sponsored Tapped In, a not-for-profit online community for K–12 school teachers and teacher educators, which currently has more than 20,000 members.

CONSEQUENCES OF ONLINE COMMUNITIES

Positive Effects

Benefits to Members

Not surprisingly, most studies of online communities report that information benefits are important to their members (e.g., Baym 1999; Lakhani and von Hippel 2003; Wasko and Faraj 2000. What is noteworthy is the form that the information takes. It is not the disembodied, depersonalized information that can be found in databases or official documents, which are themselves easily accessible on the Web. Instead, it is often profoundly *personalized* information. Its form and content are personal—personal experiences and thoughts—whether they take the form of reflections published on blogs, profiles on social network sites, or posts on discussion sites. Likewise, its audience is personal. Questions or requests for comment do not look like database queries: They are framed for human understanding and response. (A discourse analysis of Usenet groups found that almost all questions included a specific reference to readers; the few that did not were much less likely to receive replies; Galegher et al. 1998.) Replies typically address the person or situation engendering the request and are based on the replier's own situation or experience. In consumer communities, personalized information can increase members' pleasure in using or experiencing the product or property. Personalized information can increase members' pleasure or competence in practicing their (a)vocation. It can also challenge one's assumptions and beliefs (e.g., Kendall 2002).

Members derive more than information benefits from online communities, however. Some also derive the social and emotional benefits that can come from interacting with other people: getting to know them, building relationships, making friends, having fun (e.g., Baym 1999; Butler et al. 2007; Cummings, Sproull, and Kiesler 2002; Kendall 2002; Quan y Hasse et al. 2002; Rheingold, 2000). Of course social benefits are the primary benefit of social networking sites. Occasionally these social benefits are strong enough that they lead some members to organize ancillary face-to-face group activities, such as parties, rallies, show and tell, reunions, or meetings at conferences or shows.

Members of medical and emotional condition communities may derive actual health benefits from their participation in addition to information and socio-emotional benefits. The evidentiary base for these benefits is small, but it comes from carefully designed studies that use either random assignment or statistical procedures to control for other factors that could influence health status. Reported benefits for active participants include shorter hospital stays (Gray et al. 2000), a decrease in pain and disability (Lorig et al. 2002), greater support seeking (Mickelson 1997), a decrease in social isolation (Galegher et al. 1998), and an increase in self-efficacy and psychological well-being (Cummings et al. 2002; Mackenna and Bargh 1998).

Membership benefits do not accrue equally to all members of online communities. Passive members—those who only read messages—may derive the least benefit. This observation is consonant with research on groups and communities in the offline world that finds that the most active participants derive the most benefit and satisfaction from their participation (e.g., Callero, Howard, and Piliavin 1987; Omoto and Snyder 1995). Most studies of online communities investigate only active participants because they use the e-mail addresses of posters to identify their research population; they have no way of identifying or systematically studying people who never post but only read. The few studies that have investigated passive members systematically find that they report mostly information benefits; their total level of benefits is lower than that for more active participants; they are more likely to drop out (Butler et al. 2007; Cummings et al. 2002; Nonnecke and Preece 2000).

Among active participants, people who participate more extensively report having a greater sense of online community (Kavanaugh 2003; Quan y Hasse et al. 2002). More frequent seekers of information report receiving more helpful replies than less frequent seekers (Lakhani and von Hippel 2003). More frequent providers of information report greater social benefits, pleasure in helping others, and pleasure in advancing the cause of the community (Butler et al. 2007).

Benefits to Third Parties

Many attempts to directly "monetize" online communities through sales revenue from advertising or commerce have been relatively disappointing (Cothrel 2001; Figallo 1998; Sacharow 2000). Although the potential customer base could be quite large for brand or demographic communities, attracting and retaining customer/members is difficult. By contrast, subscription revenues—in the online game industry at least—have been relatively robust with $2 billion in subscription revenue reported in 2005 (DFC Intelligence 2006).

In consumer communities and (a)vocation communities, substantial nonrevenue benefits may accrue to corporations through reinforcing customer brand loyalty, increasing customer satisfaction, and even generating input to new product development. Voluntary personal testimonials about a product or experience in the context of giving help can be quite persuasive, both to the person who asked for help or comment and to others reading the exchange. Motivational theories of attitude

formation (e.g., Festinger, Schachter, and Back 1950) and information-processing theories of decision making (e.g., Nisbett and Ross 1980) both point to the influential nature of voluntary personal testimonials. The process can be so powerful that there have been unsubstantiated reports of paid shills masquerading as community members in consumer communities (Mayzlin 2001), a practice known as "astroturfing."

Much of the help offered in consumer communities and (a)vocational communities is personalized customer support—and potentially quite high-quality support at that. In the software industry, online communities have been recognized as the Best Technical Support Organization of the Year for 1997 and 1999 (Foster 1999). Information that solves customer problems or enhances their product experience is likely to increase customer satisfaction and loyalty. When it is provided by self-organized volunteers, the corporate cost is minimal and the benefits are substantial.

Some online communities offer potential product-development benefits. Most remarked are probably open source software communities that have generated product revenues for companies like Red Hat and product enhancements for companies like IBM and Sun Microsystems. Some game and hobby communities offer extensive product testing before widespread product release (e.g., Wallich 2001). Some actively propose, design, and discuss new product features (von Hippel and Krogh 2003; Jeppesen and Frederiksen 2006).

The strategic question for corporations today centers on what type of corporate involvement in online communities is likely to bring the greatest benefit. With few, but important, exceptions, direct corporate ownership and control of online communities is unlikely to be the answer. (This is not to say that corporations will not benefit from Web-based sales and customer support; e-commerce can be profitable even if online community revenue models are not likely to be.) Forging positive and productive relationships with independent online communities can be challenging, however. (See, for example, Moon and Sproull 2006.)

Benefits to Society

Rigorous empirical evidence is almost nonexistent for online community benefits to society. If members of communities formed around medical conditions achieve improved health status, the cost of their medical care to themselves and society could decrease. Alternatively, better informed members may seek out additional tests or treatments, thereby increasing the cost of their care. If members of targeted populations such as K–12 schoolteachers or senior citizens derive cognitive, social, and emotional benefits from participating in online communities, then the larger society may benefit as well. Data from Blacksburg Electronic Village suggests that participation in online community activities can increase offline civic involvement (Kavanaugh 2003). If members of online concern communities can more effectively mobilize, then the causes served by their advocacy are likely to benefit (e.g., Gurak 1997; Quan y Hasse et al. 2002). Note, however, that online communities can advocate for harmful causes just as easily as they can for helpful ones.

Negative Effects

Although anecdotes are widespread, systematic evidence on the negative consequences of online communities is sparse. Members can be harmed by erroneous, malicious, or destructive information. In social networking sites, lighthearted or unthinking profile information can later be used by potential employers as a reason not to hire someone. The norm of peer review of content in discussion communities acts as a damper on harm from erroneous or destructive information but cannot prevent it entirely. Assessments of the quality of information in online communities are difficult to produce; one study reported that the error rate in Wikipedia articles on scientific topics was essentially indistinguishable from that in the *Encyclopedia Britannica* (Giles 2005). Beyond information-based problems, individual members can be harmed by unhealthy, dangerous relationships that can form via online communities. Unscrupulous or criminal intent can be masked by an online persona that inspires trust and friendship within the community context. If a relationship moves away from community scrutiny and into private e-mail, it can lead to emotional harm, economic damage, or even physical danger. This is a particular concern when predators use online communities to identify and contact minors (e.g., Eichenwald 2006). In social networking sites such as MySpace, young people may be particularly vulnerable because of the disconnect between the perceived experience of "hanging out with friends" and the actuality of loose or nonexistent access controls that allow anyone to view profiles and contact their owner. Within VR communities, there have been a small number of widely publicized "attacks" that caused emotional harm to their members (Dibbell 1998; Schwartz 2001). A group itself can harm its members: cults can exist in cyberspace as well as in the offline world. One such, Pro-Ana, extols the joys and personal freedom of anorexia. Its members share tips on how to hide weight loss from family and friends, discuss the value of personal choice, and praise members' announcements of their weight loss.

Although participating in an online community may not be directly harmful to its members, involved members may withdraw from their relationships and responsibilities in the offline world. People who spend a great deal of time online must be spending less time doing something else. The research thus far has only examined the effects of aggregate number of hours spent online, not the effects of time spent specifically in online communities. One study found that the number of hours spent online was associated with a small decrease in social involvement and psychological well-being for a particular group of new users (Kraut et al. 1998), but that effect was erased with continued use (Kraut et al. 2002). Some studies have found the number of hours spent online to be associated with an expanded social circle in the physical world (Katz and Apsden 1997; Quan y Hasse et al. 2002; Kraut et al. 2002).

Just as members may be harmed by erroneous or malicious information, so too may be corporations. Corporate security weaknesses may be described and disseminated through cracker communities; network attacks may be organized in the same way. Companies may fear liability if advice promulgated in an online community leads to

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product failure or product-related damages. Customer complaints can be shared very rapidly with large numbers of people and can snowball into widespread mobilization. The Intel Corporation had to manage a wave of Internet protest, much of it organized through Usenet groups, as it learned about and took steps to correct a flaw in its Pentium processor in 1994. Ultimately, of course, fixing the error benefited Intel and its customers (Uzumeri and Snyder 1996). In a different case, members of a number of Internet groups mobilized to protest the introduction of a new household database product created by the Lotus Development Corporation, a protest that led to the withdrawal of the planned product (Culnan 1991). Online communities are not the only means of mobilizing discontent on the Net (e.g., Gurak 1997), but when they are characterized by member commitment, they can be particularly potent. In some countries, corporate desire to protect reputation or other assets or government desire for citizen control may collide with individuals' rights to freedom of expression (see Kranich 2004).

Intellectual-property infringement is another area of potential harm for corporations. Trademark infringement is widespread in many consumer communities. Copyright infringement can be particularly troublesome for media property companies. Fan community members create and discuss fan fiction—that is, new story lines or alternative plot endings for their favorite shows, movies, or characters. Corporations routinely issue cease-and-desist orders against these groups, fearing loss of copyright control (Jenkins 2002; Silberman 1996). As with mobilizing discontent, online communities are not the only mechanism on the Net for intellectual-property infringement. Unauthorized media file sharing represents a larger area of intellectual-property harm for media companies at the moment, but the social reinforcement that is generated when community members praise or critique one another's (arguably, intellectual-property infringing) creative work can be potent.

RESEARCH METHODS AND ISSUES

Much of the research on online communities is supported by two broad research traditions, which can be caricatured as "insider studies" and "outsider studies." Participant observation studies began with Howard Rheingold's (2000) description of The Well, a Northern California online community begun in 1983. Examples of scholarly ethnographies include those of a soap opera discussion community (Baym 1999), a social MUD (Kendall 2002), a lesbian café (Correll 1995), an IRC arts community (Danet 2001), and an online game community (Steinkuehler 2006). In each case the writer/analyst was a member of the community for an extended period. The ethnography evokes the language, personalities, beliefs, interpretations, and daily lives of people inhabiting these worlds from the perspective of a member/researcher (Wilson and Peterson 2002).

"Outsider studies" typically extract records of online behavior or attitudes for study outside the community context. Linguists may extract text records for linguistic analysis of online talk (e.g., Herring 1996, 2001). Sociologists may analyze text records to understand norm development and strength or identity development (Forman, Ghose, and Wiesenfeld 2006; Sassenberg 2002; Moon 2004). Social psychologists may use questionnaires to survey community members about their social support systems in the online world and the offline world (e.g., Cummings et al. 2002; Mackenna and Bargh 1998). Sociologists and political scientists may use questionnaires to survey members about their social and civic activities and attitudes (Kavanaugh 1999; Wellman and Haythornthwaite 2002).

Online communities are appealing subjects for researchers. New or newly visible social phenomena are intrinsically interesting to the social scientist. Moreover, online access to one's subject of study offers beguiling efficiencies. Ethnographers can do ethnographic work without leaving the office. Survey researchers can administer questionnaires to multinational samples of respondents without buying a single postage stamp. Linguists have access to entire cultural corpora in digital form. The efficiencies are not problem-free, however. Ethnographers have a missing or incomplete picture of their community members' offline lives. Survey researchers often have no access to passive community members—ones who never post (e.g., Nonnecke and Preece 2000). Linguists do not see private or back-channel communication. Still, despite the drawbacks, the past 10 years have seen a substantial growth in social science research oriented toward understanding online communities.

Whether researchers use insider or outsider data-collection methods, they must confront issues of base rates and generalizability. Researchers typically study active communities and active members within those communities. It is easy to overlook the fact that many, if not most, online communities exist in name only, analogous to ghost towns in the physical world. For example, most open source projects hosted on SourceForge have no users; fewer than half of all Usenet groups are active; more than 60 percent of blogs have not been updated in more than 2 months (e.g., Henning 2003). Even within active communities, many members are free riders, and requests for interaction may not be reciprocated. For example, even though Wikipedia has more than 200,000 registered contributors, fewer than 3500 of them do 70 percent of the work. In some Usenet groups, 25 percent of questions go unanswered. In their designs and reports, researchers should acknowledge the likely base rates of the phenomena they are interested in and take care not to imply greater frequency or impact than the base rates warrant.

Whereas general principles of ethical research are widely shared within the academic social science community (and are governed by federal regulation), procedures for implementing those principles in research on online communities are under debate. Consider just the principles of informed consent and participant anonymity. If a person's words in an online community discussion are considered private, consent should be obtained before analyzing them. If they are considered public, consent should be obtained before quoting them (except for fair use). If a researcher plans a participant observation study, she or he should seek permission from community members before beginning the study. Because most communities are open, members who join after the study has begun do not have

the same opportunity to give or revoke permission, however. When publishing results, the researcher must honor promises of anonymity by disguising participant identity. Yet powerful full-text search engines can use verbatim text, even with no identifier, to find the original (identified) source. Bruckman (2002) pointed out that norms in the humanities, in contrast with those in the social sciences, encourage attribution and reproduction. Several scholarly and professional associations are currently grappling with the ethics of online research (Frankel and Siang, 1999; Kraut et al. 2003; Thomas 1996).

CONCLUSION

The Internet has been a home for self-organizing voluntary groups since its inception. As the Net grew, so did the pace of people and technology, mutually adapting to form and support new online communities of interest (e.g., Boczkowski 1999). Despite the large number of online communities and online community members today, the social form has been widespread for less than a decade. The nature of the Net means that experimentation and evolution into new variants of the social form can occur rapidly. The next 10 years should see more new community types, new ways of aggregating microcontributions, and new community processes.

The social form is also immature in terms of impact on members and on the offline world, but with a more differentiated view of community types, we should be able to better specify which types of online communities should or could have which kinds of impacts on which types of members. Nevertheless, people also live in the offline world. The biggest online community design payoffs may come from supporting online extensions of the places where people live, work, send their kids to school, recreate, vote, and worship (e.g., Hampton 2001). Television has had an enormous impact on family communication patterns, teen culture, political activity, and consumer behavior. Most of the decisions that led to those impacts were made by relatively small numbers of wealthy and influential individuals. In online communities, by contrast, everyone has the opportunity to shape the processes that will make a difference.

GLOSSARY

Dot-com: Internet sites or businesses designed to make money during the late 1990s.

Internet Relay Chat (IRC): A program for simultaneous text communication among two or more users.

Listserv: A program for managing a distribution list of e-mail addresses.

Multi-User Dungeon/Domain/Dimension (MUD): A text-based virtual reality environment, initially used for fantasy games, now also used for social and professional purposes.

MUD Object-Oriented (MOO): Text-based virtual reality environment in which users can program objects that have persistence.

Seti@home: An activity organized over the Net in which people donate idle CPU cycles to process data looking for radio signals.

Usenet: A system of electronic bulletin boards.

Virtual Reality (VR): A text-based or graphics-based environment that evokes a self-contained world.

Wiki: A specific type of editable Web-based document collection.

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