DRAFT: Preece, J., Maloney-Krichmar, D. and Abras, C. (2003) History of Online Communities In Karen Christensen & David Levinson (Eds.), E*ncyclopedia of Community: From Village to Virtual World.* Thousand Oaks: Sage Publications, 1023-1027.

History of online communities

Jenny Preece, Diane Maloney-Krichmar, Chadia Abras
Information Systems Department, and Language, Literature & Culture Program
University of Maryland, Baltimore County
Baltimore, MD 21250

<preece,abras>@umbc.edu, diane.krichmar@verizon.net

1. Introduction

An online community is a group of people who interact in a virtual environment. They have a purpose, are supported by technology, and are guided by norms and policies (Preece, 2000). However, other authors may use different definitions. The problem with the term 'online community' is that it refers to a wide range of online activities.

In this chapter we use the term 'online community' broadly to refer to all communities that exist predominantly online. A number of factors shape the character of an online community. The purpose of the community (e.g., health support, education, business, neighborhood activities) and the software environment supporting it (e.g., listserver, bulletin board, chat, instant messaging, or more often these days – some combination) greatly influences the nature of the community. The community's governance structure and the types of norms and rules that develop provide a framework for social interaction within the community and vary widely among communities. Other factors that contribute to the variability of online communities include the size of the community (small communities of fifty people are very different from those of 5000 or 50,000); the age and stage in the life-cycle; the culture of the members of the community (e.g., international, national, local and influences that may be related to politics, religion, gender, professional norms, etc.), and whether the community has a physic-virtual presence (physical component as well as the virtual one) (Lazar, Tsao & Preece, 1999).

The characteristics of an online community are determined by the social interactions of the members, and the policies that guide them, a concept known as *sociability*. Software design also contributes to the character of an online community. A community that communicates via a synchronous chat system will have quite a different ambiance from one that uses an asynchronous bulletin board. The ease with which the software can be used is known as its *usability* and this depends on how well the user interface supports human-computer interaction (HCI) (Preece, 2000; Preece & Maloney-Krichmar, 2002). Attention to social policies and software design is therefore an important component in community development and evolution.

In the remainder of this chapter we first briefly describe the history of technology that supports online communities and the changes in user populations. Then we outline some key research issues.

2. Evolution of technology that supports online community

Email, the first and still the most frequently used communication tool on the Internet (Project, 2002), was developed by ARPANET in 1971. Ray Tomlinson of Bolt Beraneck and Newman, Inc. (BBN) choose the @ sign for use in email addresses in 1972. Early systems were point to point – one person could send a note to just one other person. Listservers, invented in 1975, allow one to many postings. The basic form of this technology has not changed much since that time, although email readers have improved greatly. Listservers are used in two ways: trickle through and digests. Trickle through systems distribute each message as it is received. Digests comprise a list of messages presented one after the other, usually in chronological order of receipt. All through the 1970s, small, technical, and insular communities developed on the Internet to facilitate communication between researchers. The first emoticon was a smiley made by using "-)" was invented in 1979, by Kevin Mackenzie, in order to soften the impact of the

otherwise dry text of e-mail. In the mid to late 1980s, systems with improved graphical user interfaces started to appear. Dictionaries of emoticons followed throughout the 1990s (Lehnert, 1998)

Bulletin boards, in existence for a similar time, are designed based on the metaphor of a physical bulletin board. People post messages to the board and they are displayed in various ways. Usually the messages are threaded which means that messages on the same topic are associated with each other. The first message forms the beginning of the thread and later responses are stacked beneath it. During the last five years, systems have appeared that offer many fine enhancements: search engines enable users to search on topics, user name, date; emoticons; private conversation spaces; links to email, user profiles and web pages; and graphical two dimensional pictures and avatars.

Usenet News, like a bulletin board, provides open areas for discussion of topics clustered in hierarchies. Moderated newsgroups were introduced on Usenet in 1984. Email, listservers, bulletin boards, Usenet News, and their web-based cousins, are asynchronous communication technologies, which means that communication partners do not have to be co-present in time. Messages can be read and then responded to, hours, weeks or months later. The most famous and first widely recognized non-technical online community, The Whole Earth 'Lectronic Link (WELL) was established in 1985 (Rheingold, 1993).

Chat systems, instant messaging and texting systems are synchronous, which means that correspondents must be co-present online. Typically, conversations are rapid and each individual comment is short. In busy systems messages scroll off the screen as they are replaced by more recent ones. Internet Relay Chat (IRC) was developed in 1988 by Jarkko Okarinen. Instant messaging made famous by ICQ and AOL Instant Messenger, is somewhat similar to chats in

that communication is synchronous and very rapid but individuals can control who participates in a particular conversation. ICQ was developed in Israel by Mirabilis in 1996 and purchased by AOL in 1998. Texting, a related technology, occurs across phone lines. Texting is popular in some parts of the world, particularly Europe, parts of Africa, and the Middle East. Interestingly, it has taken longer to become widespread in the USA, where cell phones are used predominantly for voice messages. However, new models are coming on the market with additional functionality that supports texting, digital photography, email and web access.

In 1991, one year after ARPANET ceased to exist, the World-Wide Web (WWW), developed by Tim Berners-Lee, was released by CERN (European Organization for Nuclear Research). This event facilitated the widespread use of web sites and the development of online community groups supported by web pages and various forms of communications software. Online communities appeared in a variety of media, which were gradually integrated into single environments. In the early 1990s, highly sophisticated gaming worlds emerged, e.g., Doom, Quake, and Everquest. In these worlds, participants represented themselves on the screen as graphical characters known as avatars, which can move through the world accompanied by sound, messaging, and streaming video. Graphical, three-dimensional environments such as the Palace (www.palace.com), established in 1995, and Activeworlds (www.activeworlds.com), established in 1995 as AlphaWorld, started to appear. However, these features come at a cost; they require state of the art computers with fast processors, large memory and high-bandwidth Internet connections. Some developers admirably address the issue of universal access that such environments raise by offering high and low bandwidth versions (e.g., www.activeworlds.com) so that those without access to sophisticated equipment may participate too.

A U.S. patent was granted to Fraunhofer, a German company, for MP3, January 26, 1995. This technology innovation also impacts the concept of community. It provided an interesting example of how a community can form around a particular technology designed to facilitate distribution, sharing and, some would say, stealing music! The open source movement too has stimulated strong dedicated technical communities, such as slashdot.

Internet telephone, streaming video, photographs, sound, voice, web cam, blogs (i.e., web logs), and wikis (an open source collaborative server technology that enables users to access, browse, and edit HyperText pages in a real-time context) are all available on today's machines and can be used by online communities. As computers morph and migrate into all kinds of places (e.g., into clothing, phones, upholstery) – a concept known as 'ubiquitous computing', online communities will have to contend with smaller devices, and therefore, WebPages will have to be adaptable to accommodate various sizes of screen displays and bandwidth.

3. Changes in user populations

Even though the technology that supports online communities has changed tremendously over the years, the biggest change lies not in technology but in who is using it. Early online communities for education (Hiltz, 1985), networked communities (Rheingold, 1993; Schuler, 1996) and office communities (Sproull & Kiesler, 1991), were developed for groups of users with similar goals and experience and who used similar communications software. From the late 1990s, the combination of less expensive computing power, the Web, and several successful Internet service providers, enticed tens of thousands of people online (Rainie & Packel, 2001). "The increase in online access by all kinds of Americans highlights the fact that the Internet population looks more and more like the overall population of the United States" (Rainie &

Packel, 2001).

According to a 2001 Pew Internet & American Life Project report, 84% of all Internet users indicated that they contacted an online community and 79% identified at least one group with which they maintained regular online contact (Rainie & Packel, 2001). Many used the Internet to extend their contact with churches, schools, local clubs and organizations. Sociologist Barry Wellman refers to this phenomena as "glocalization"—the ability of the Internet to both expand user's social contacts and bind them more closely to the place where they live (Wellman, 2002). The Internet provides virtual 'third places' (different from home and work) that allow people to hang out and engage in activities with others in, for example, hobby groups, gaming communities, and sports leagues online. Figure 1 shows the percent of Internet users who have contacted various types of online groups.

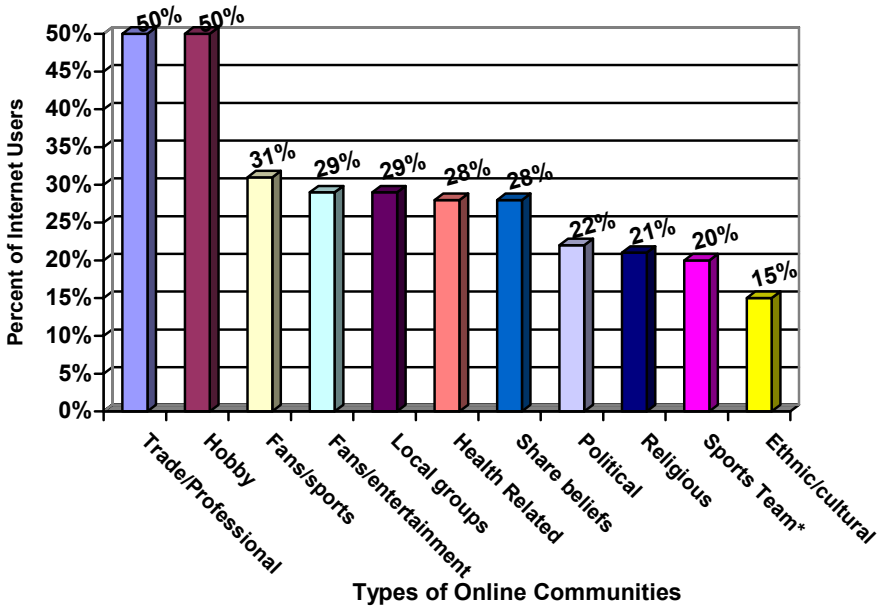

Figure 1: Percent of Internet Users by Online Groups to Which They Belong

(Source: Pew Internet & American Life Project, Jan.-Feb. 2001 (Survey, Internet users, n=1,697. Margin of error is + or – 3%)

The Internet has transformed some work practices; groups of professional scientists,

engineers, health professionals, and researchers can now join forces informally to share their expertise, experiences and knowledge to foster new approaches to problems. These communities of practice (Wenger & Snyder, 2000) are emerging as new organizational forms that promise to change the way we work, learn, and share resources. The Linux operating system kernel is a good example of a product developed by a community of practice, whose members are motivated by shared philosophy (Moon & Sproull, 2000).

Education has also felt the effects of the Internet. Online learning communities have sprung up in the form of distance education classes, knowledge-building communities, and technological samba schools - a kind of virtual clubhouses where children can experiment with technology and learn. Numerous online health communities that provide support and information for members who are facing health problems have also come into existence. A survey of search engines shows a staggering number of health related Internet sites, many of which are associated with online communities. Yahoo alone provides 43 health subcategories linking to 19,000 sites (Rice, 2001). Unfortunately the Internet also provides an ever growing platform for hate groups which use it to create a sense of community, disseminate information (e.g. instructions for building bombs), recruit new members, and sell hate paraphernalia (books, T shirts, posters).

Today's online community participants come from all walks of life and cultures. Furthermore, an increasing number of people from across the world are becoming networked; particularly as small, handheld, relatively inexpensive telephones and other devices come onto the market. In parts of Africa, for example, many users have gone straight to this technology, by-passing conventional computers, because it is affordable (Rheingold, 2002).

4. Emergence of research

There is an increasing body of research on online communities coming from a variety of

disciplines including: communication studies, sociology, psychology, American studies, information systems, business studies, computing, information science and newly formed departments of cyber or Internet studies. It is impossible to do justice to the array of research being produced. Some will be featured in other chapters so we have mentioned a few examples that relate particularly to our area or interest, which is online community development.

Early seminal research set the scene with anecdotes and comparisons to face-to-face communities (Rheingold, 1993; Turkle, 1995; Schuler, 1996). Online communities were seen as exotic and fundamentally different from face-to-face communities. However, emailing, chatting, working together, and participating in online communities has become a normal part of many people's lives (Rainie & Packel, 2001) making strict demarcation between online and offline activity less meaningful. Having said this, it is important to point out that there are meaningful differences, such as the lack of non-verbal cues in online textual environments.

Case studies, observation and various forms of Internet ethnography have provided rich descriptions of life online. For example, Baym (1997) described the activities of a soap opera community and Markham (1998) discussed real experiences in virtual space.

Questions about who relates to whom and about what has been examined using network analysis (Wellman, Boase & Chen, 2002) and various forms of data logging have also been used to track communication activity. Nonnecke and Preece (2000) logged activity in 100 Discussion Lists (DL) over a three month period and showed that lurking (i.e., not posting) behavior correlated with type of community, membership size, and message traffic.

Fundamental psychological and communications issues of importance to online communities' research are also being investigated. Some examples include development of friendships (Fagin, 1998; Jensen, Davis & Farnham, 2002), the nature of trust and empathy

online (Preece, 1999) and online group dynamics (Maloney-Krichmar, 2003).

Lack of social presence in textual online communities has been noted as a problem by several researchers. While avatars can compensate to some extent, limitations of screen real estate make it difficult to show more than just a few individuals at any one time. A range of ingenious visualization tools have been developed to support social presence (Erickson & Kellogg, 2000; Smith & Fiore, 2001), which may enable participants to develop a better sense of others. This may help participants to form cooperative relationships and assume responsibility for their actions (Erickson & Kellogg, 2000).

A number of books have tried to draw together important themes. Wallace (1999) synthesized work relating to the psychology of the Internet. Edited collections by Kiesler (1997) and Smith and Kollock (1999) provide overviews of many salient issues, Kim (2000) offers techniques for creating online communities, and Preece (2000) examines how supporting sociability and designing for usability can help produce successful online communities.

5. Conclusions

To-date there has been little attempt to evaluate and measure the success of different types of communities from participants' and as well as commercial sponsors' perspectives. A step towards this is a proposal for an initial set of evaluation heuristics (Preece, 2001), which will be refined and validated (Abras, et al., 2003). While research and development of high bandwidth community software infrastructures continues, a second important strand of research, that is just starting to gain momentum, is investigating lightweight applications that will improve universal access and will also cater to different linguistic and cultural needs. For example, the HCI International 2003 Conference has a track entitled 'design of inclusive groupware systems'. Hopefully we will see other efforts to reduce the international digital divide.

References

Abras, Ozok & Preece (2003 in press) Evaluating success in discussion forum communities from the participants' perspective.

Baym, N. (1997) Interpreting soap operas and creating community: Inside an electronic fan culture. In S. Kiesler (Ed.), *Culture of the Internet* (pp. 103-119). Mahwah, NJ: Lawrence Earlbaum Associates.

De Souza, C. S. and Preece, J. (2003). *A framework for characterizing online communities* (draft available from the authors).

Erickson T. A., & Kellogg, W. A. (2000). Social translucence: An approach to designing systems that support social processes. *ACM Transactions on Computer Human Interaction, 7*(1), 59-83.

Fagin, B. (1998). Liberty and community online. *ACM SIGCAS Computers and Society, 28* (2), 69-78.

Hiltz, S. R. (1985). *Online communities: A case study of the office of the future.* Norwood, NJ: Ablex Publishing Corp.

Jensen, C., Davis, J., & Farnham, S. (2002). Finding others online: Reputation systems for social online spaces. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems: Changing our World, Changing Ourselves, Minneapolis, Minnesota, USA* 447-454.

Kiesler, S. E. (1997) *Culture of the Internet.* Mahwah, NJ: Lawrence Erlbaum Associates.

Kim, A. J. (2000) *Community Building on the Web: Secret Strategies for Successful Online Communities.* Berkeley, CA: Peachpit Press.

Lazar, J. R., Tsao, R. and Preece, J. (1999). One foot in cyberspace and the other on the ground: A case study of analysis and design issues in a hybrid virtual and physical community. *WebNet Journal: Internet Technologies, Applications and Issues 1*(3), 49-57.

Lehnert, W. G. (1998) *Internet 101: A Beginner's Guide to the Internet and the World Wide Web.* Reading, MA: Addison Wesley Longman, Inc.

Maloney-Krichmar, D. (2003). *The meaning of an online health community in the lives of its members: Roles, relationships, and group dynamics*. Unpublished doctoral dissertation, University of Maryland Baltimore County.

Markham, A. N. (1998) *Life online: Researching real experience in virtual space.* Walnut Creek, CA: Altamira.

Nonnecke, B., & Preece, J. (2000). Lurker demographics: Counting the silent. *Proceedings of CHI 2000,* 73-78.

Preece, J. (1999). Empathic communities: Balancing emotional and factual communication. *Interacting with Computers, 12,* 63-77.

Preece, J. (2000). *Online communities: Designing usability, supporting sociability.* Chichester, England: John Wiley & Sons.

Preece, J. (2001) Sociability and usability in online communities: Determining and measuring success. *Behavior and Information Technology, 20*(5), 347-356.

Preece, J. and Maloney-Krichmar, D. (2002). Online communities: Focusing on sociability and usability. In J. Jacko & A. Sears (Eds.), The *Human-Computer Interaction Handbook* (pp. 596-620). Mahwah, NJ: Lawrence Earlbaum Associates.

Project, P. I. A. L. (2002). Getting serious online: As Americans gain experience, they use the Web more at work, write e-mail with more significant content, perform more online

transactions, and pursue more serious activity. *Pew Internet & American Life Project* [On-line]. Available: http://www.pewinternet.org/reports/poc.asp?Report=55

Rainie, L., & Packel, D. (2001). More online, doing more. *Pew Internet & American Life Project.* [online]. Available: http://www.pewinternet.org/reports

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

Rheingold, H. (2002). *Smart mobs: The next social revolution.* Cambridge, MA: Perseus Publishing.

Rice, R. E. (2001). The Internet and health communication: A framework of experiences. In R. E. Rice & J. E. Katz (Eds.), *The Internet and Health Communication: Experiences and Expectations* (pp. 5-46). Thousand Oaks, CA: Sage Publications.

Schuler, D. (1996). *New community networks: Wired for change.* Reading, MA: ACM Press & Addison-Wesley Publishing Co.

Smith, M., & Fiore, A. (2001). Visualization components for persistent conversations. *Proceedings of CHI 2001, 3,* (1), 136-143.

Smith, M. A., & Kollock, P. (1999). *Communities in cyberspace.* London, UK: Routledge.

Sproull, L., & Kiesler, S. (1991). *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press.

Wallace, P. (1999). *The Psychology of the Internet.* Cambridge, UK: Cambridge University Press.

Wellman, B. (May 2002). Designing the Internet for a networked society: Little boxes, glocalization, and networked individualism. *Communications of the ACM, 45*(5), 91-96.

Wellman, B., Boase, J., & Chen, W. (2002). The Networked nature of community: Online and offline. *IT&Society, 1* (1), 151-165.

Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review, 78*(1), 139-146.