

Community Portals and Collective Goods: Conversation Archives as an Information Resource

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Abstract

Prior research investigating online communities has revealed several different types of communities, including those that are formed to support members with shared professional interests. One characteristic of these online communities is the creation and stewardship of collective goods. One particularly interesting example of such a collective good is the archive that is created out of the online conversation among the group members. In this paper, an online community of news reporters is examined in order to understand the use and general awareness of the archived conversation as a valuable information resource. A content analysis of a sample of the archived messages was completed and revealed considerable awareness and use of the archive among the community members. In addition, there was evidence of developing social norms that included searching the conversation archive for information before posting a new question. As the value of the archived conversation increases for a community, so does the need for better ways to browse and search the contents. A new data display, called a conversation map, was developed and is presented as a means to better grasp the rhythms and patterns of the archived discourse. These conversation maps illustrate temporal patterns of the group as a whole, as well as the message patterns of individual participants.

1. Introduction

The recent research in virtual communities has demonstrated that there are many different types of online groups. Some online communities, for example, are grounded in a physical place or location. These include groups that were formed to support a specific town or village [9, 22], a university and its local community [3], and residents from nearby school districts [12]. Whereas geographically distant members often join these online communities, much of the online interaction is grounded in several aspects of the physical place. For example, online discussions topics are often focused on local news, community events, and local business activities (see, for example, [3]).

Another distinctive type of online community is formed around a shared interest among the members. Naturally, there is great variety in the topics of interests that can be found. For example, online communities have formed to support a variety of shared medical conditions (see, for example, [19]). Other groups, such as Systems, have been formed to discuss issues that are more gender-related (see, for example, [24]). Still other communities, such as SeniorNet, are more focused on issues of interest to a specific age group [16].

Shared professional interests have also been the basis for the creation of several vibrant online communities. Examples include a group of journalists [15], health care professionals [2], a group of engineers [5] and groups of scientific and medical researchers [21, 25]. In many cases, these online groups were comprised of members who have never met face to face, but had nevertheless developed strong friendships and emotional ties. In other cases, the online community supported a specific professional organization and the community members meet regularly face to face at professional conferences.

1.1 Characteristics of Community

While there are admittedly many kinds of online communities, there has been considerable discussion about the general *attributes* or *characteristics* of online communities. The term "community" strongly suggests that the interaction dynamics of these groups are clearly distinguishable from other kinds of online discourse or activities. In his influential study of the emergence and growth of The Well, Rinehold [20] wrote that "virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace." Figallo [8], another community researcher who is intimate with the culture of The Well, argued that true community exists when a "member feels part of the larger social whole," when "there's interwoven web of relationships between members," an "ongoing exchange between members of commonly valued things," and when "relationships between members last through time, creating shared

histories." He further argued that the four attributes just mentioned are mutually reinforcing and necessary for a sustainable community. Taken together, the distinguishing characteristics of online community seem to include sustainability, emotional intensity and the creation of personal relationships.

Other community researchers have elaborated on the distinguishing social characteristics of online groups. Erickson [7] examined several definitions of community and argued that online communities are typically concerned with issues of membership, creation of personal relationships, generalized reciprocity, shared values and practices, creation of collective goods, and expected duration or sustainability. Dray and Siegel [6], have similarly argued that the distinguishing characteristics of community include "multidimensionality, constraints on behavior, institutions and behavioral conventions, interdependence, and shared stewardship of shared resources."

In this paper, one of the distinguishing characteristics of community, that is, the creation and management of collective goods, will be examined within the context of a specific online community of news reporters. Furthermore, the use of the archival record of the online discourse will be examined as a special case of a collective good. In order to examine and understand the archived conversation, a representational schema called a *conversation map* will be described, and its more general applicability for browsing community discourse will be discussed.

1.2. Community Portals

Many professional organizations, not-for-profit groups and industry associations have developed a presence on the Internet in the form of what may be conveniently called *community portals*. Very simply, these portals provide a visible presence on the web and an aggregation of information resources through a web site. These sites typically have a ".org" domain name, and a contain a collection of both content and links that are relevant and presumably valuable to the members of the organization. A prototypical form of such a *community portal* is provided in Figure 1.

The characteristics of this archetype were developed based up the results of an analysis of 47 professional organization or associations with a web presence. The sites that were analyzed were randomly chosen from those categorized as part of the communications industry in an index maintained by the American Society for Association Executives [1]. The results of the survey are presented in Table 1.

Table 1. Contents of Community Portals

Type of web content	% of sites
Description of organization and contact info	100
Listing of events (including conferences)	93
Membership information (for prospective members)	87
Publications (actual content and/or means of acquiring)	78
Directories (includes both individuals and businesses)	59
Job announcements	54
Discussion forums	20

The site content analysis revealed that the contents of a typical community portal included information about the mission and goals of the organization and specific information about becoming a member. In addition, there were notices about group events, annual conferences (past and future), and educational programs. A majority of the portals also included directory information about organization members, as well as job advertisements and related job information. A small but significant number of the sites (20%) provided access to a discussion forum. In most cases this was information about how to subscribe to the forum, but in several cases, an archive of the discussion was also visible.

It should be noted that in many of the web sites that were examined, there were both public and private spaces. The private spaces were password protected and access was restricted to the members of the organization. The results of the site analysis, therefore, may underreport some kinds of content, which may have been available only within the private portion of the site. This may be especially true for access to discussion forums and related archives.

The prototypical representation of a community portal shown in Figure 1 has been rendered to specifically illustrate the presence of an archive of the online discussion of the community. It is my belief that such an archive, or persistent conversation, will become increasingly important, and increasingly valuable to online communities. It is through the group discussion that many of the distinguishing characteristics of the community, described by Figallo [8], emerge. It is through the sustained conversation that group members create personal relationships, share information of mutual value, and develop a sense of shared history. Other more commercially oriented investigators of online communities have also argued that member-generated content is a defining characteristic of online communities [10]. Furthermore, this member-generated content, some

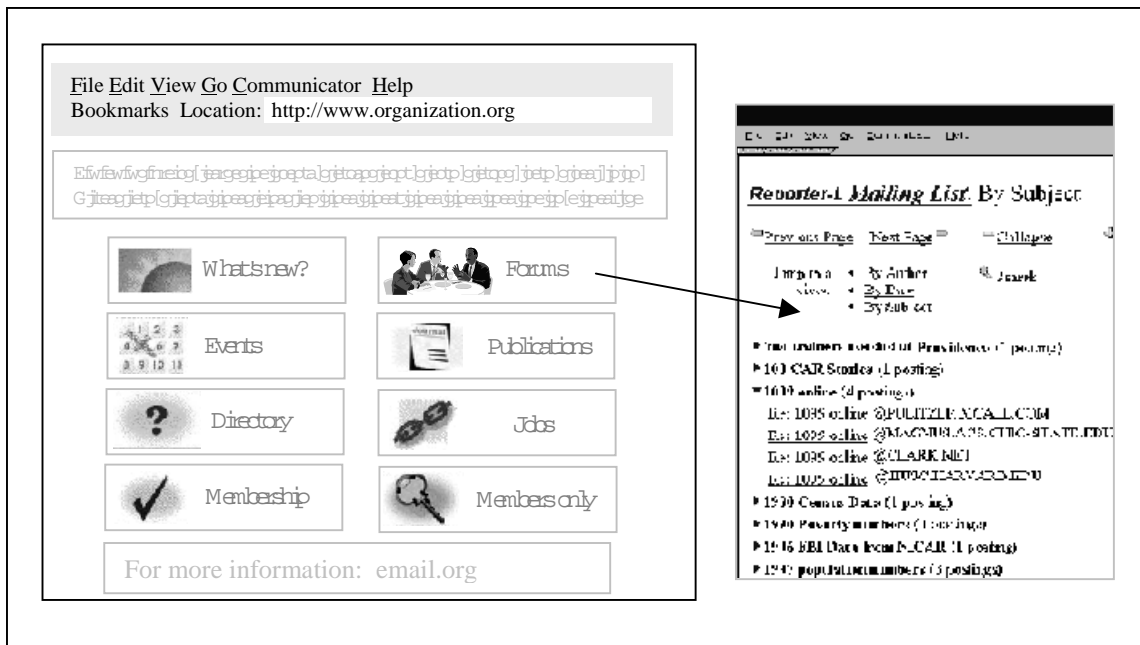


Figure 1. Prototypical Community Portal

of which is aggregated in postings to shared communication spaces (e.g., bulletin boards), will become as valuable to the community as other forms of published content.

The social issues and motivations for creating public goods in general, and on the Internet, in particular have been of considerable interest to social scientists [11,17]. Kollock [11], for example, argues that there are several reasons why people are motivated to contribute to the creation of public goods using the Internet. Among the reasons are future reciprocation, personal increase in reputation, a desire to increase efficiencies of the group, and because of a personal feeling of commitment to the group.

In the next section, the results of a careful examination of one online community of news reporters will be presented. The objective of the analysis was to determine whether the participants were cognizant of the value of the archived conversation. Of particular interest was any reference in the discourse to the earlier threads or to the list archives.

2. Case Study of a Community of Online Reporters

In earlier work, members of an online community of journalists were shown to be technological leaders within their respective news organizations. Furthermore, they were pioneers in the use of information technology to gain access to new information sources through the Internet

[14]. This geographically disbursed group of journalists went online in 1994, and their online discussion exhibits many of the traits of a vibrant online community [14,15]. This group has exhibited sustained membership, commitment and generalized reciprocity and the creation and sharing of collective goods.

2.1.A Note on Method

My understanding of this online group has been based on visits to several newsrooms and interviews, both online and in-person, with several of the members of this professional group. In addition, at the invitation of one of the news reporters, I subscribed to the group discussion list (Reporter-L), and directly observed the online interaction over a period of approximately six months. I have also examined and analyzed the online discourse of this group, covering a period of 30 months, which has been archived and is publicly accessible on the web. A sample of approximated 1800 messages was examined and coded using two commercially available qualitative analysis tools, which allowed the conversation corpus to be indexed, searched, and coded.

The online conversation within this community is supported by a group mailing list. To protect the privacy of the group, a pseudonym will be used for the list (Reporters-L) and the portal web site (www.reporter.org). Individually identifying information in the conversation transcripts has been masked. Underlines and italics have been added selectively in messages that are presented here for emphasis.

2.2 General characteristics of the Group

The content analysis of this online conversation revealed that this group of news reporters arguably creates two kinds of collective goods: 1) research methods and practices for computer-assisted reporting and 2) information referrals, including hyperlinks, to important data sources, subject matter experts, and story resources. These goods are created informally, over time, and are embedded in the electronic conversation of the group.

To better understand the content of the conversation within the group, a two-week sample of the messages that were posed were examined and classified. Each message was assigned to one of the primary categories listed in Table 2. About one out of five messages were a request for assistance of some kind. 12% of the postings were requests for technical help concerning the various analytical tools, while 7% were requests for information on various topics.

Table 2. Classification of Messages

Type of posting to Listserv (% messages)	
Technical questions	12%
Technical answers	51%
Request for information sources, ideas, etc.	7%
Reply with information sources, ideas, etc.	8%
Job announcements	5%
General announcements	10%
Professional group business	4%
Personal and other	3%
Total	100%

The requests for help are quite varied and range from very specific questions about a particular piece of software to general questions about sources and approaches for a story that was underway or under consideration. Portions of several of the messages are presented below in Table 3 to provide a sense of the kinds of questions that were posted to this group.

Table 3. Examples of questions posted to Reporters-L.

- (1) Have any of you attempted to FOI the e-mail of public officials? I know it has come up before; I can't remember details or outcomes. For those who have tried, what have been your results? Has this issue gone to court anywhere? Has anyone come up with a good, solid, compelling rationale for why the e-mail of those in taxpayer-funded positions (sent over the Internet, not on an

- agency's intranet) is, or should be, considered public record? Are there instances in which e-mail sent by public officials should be considered public record -- and instances when it should not? Please share your stories, advice, philosophies and general input.
- (2) Hey.... Anyone know of a site where there is historical weather data? For example, minimum and maximum temps, humidity, precip, by state or city? Thanks.
- (3) I am very interested in reading more about the dos and don'ts of mapping, particularly about how to break up numbers in thematic maps to offer the fairest look. When do you use equal interval breaks vs. quartile breaks vs. percentages or count breaks, etc. What are some do and don't use of colors in thematic mapping?"

The message classification presented in Table 2 also revealed that this was a particularly helpful and supportive group, as over 50% of the messages provided answers to other member's questions. Multiple responses were frequently offered for a question and some of the message threads exceeded twenty messages. Examples of some of the responses to the various questions are provided in Table 4.

Table 4. Examples of answers in Reporters-L.

- (5) Maptitude by Caliper Corp. is a pretty good product on which to cut your teeth and when I purchased it less than a year ago it was about \$600 including shipping. It doesn't have all the bells and whistles of MapInfo or ArcView or the late great Atlas GIS, but it's got enough so you can use it often and well, and maybe convince your editors to invest in a more expensive program in a couple of years. *Also, check the archives of the [REPORTER-L] list.* I did a review of Maptitude, detailing its strengths and weaknesses a number of months ago, that might help you.
- (6) The Raleigh News and Observer just did a series on just that topic. We did a piece here in Maryland earlier this year but it sounds like the N&O piece is more what you're looking for. I think it's available on the web. *If not, the folks at [REPORTERS.org] should be able to track it down for you. I'm sure it's included in the resource center archive...*
- (7) i'd suggest you just foi a tickets database for the

cops you are interested in, and hope that race is recorded in it. if they don't record race in the db, but the driver's license number is there, you could use that number to link to a driver's license database to determine race. a hassle: the highway patrol database in my state, s.c., is huge - 30 MB per month - and extremely sloppy. but other than that, i found it to be a straightforward process. in n.c., the charlotte and raleigh papers just did this story. call t** m***** in charlotte. don't know contact in raleigh

All three of the answer postings illustrate the awareness of and use of community collective goods. The first response offers a professional opinion and then refers the questioner, and the entire community of readers, to look at the conversation *archives* to find a more complete review. The second posting similarly refers the reading audience to have someone look in the resource center archive of reporters.org. And the final posting points the reader(s) to a specific subject matter expert at another newspaper. While in each case, the content of the message seems to be directed at the poster of the original question, the information pointers are potentially of interest and of benefit to a much larger audience.

Another, somewhat lengthy thread further illustrates the community awareness of the archival value of the online conversation. One participant posted a question about a troublesome quirk in a data analysis program that he was trying to use. Several replies were posted each proposing a slightly different technical solution to the problem. This prompted the message exchange presented in Table 5:

Table 5. Importance of the archive.

- (8) Can't people please write each other back and forth privately when they go on a thread like this ??? I know it's not as easy as hitting that reply button, but I know you can do it! I feel like I'm listening in on someone's cellular phone call.
- (9) Nonsense. Perhaps folks should step outside for some of the off-topic arguments and opinions and definitely for most of the flaming and spamming. But let's keep all of the how-to questions AND answers on-line. I may not care right now about someone else's problem. But if I run across the same problem next week or next year, I'd like to be able to find some of the answers in the archives. Or sometimes I read tips on a list that help in ways I wouldn't even have thought of asking about. Keep the tips coming, and those who feel like they're getting too much e-mail can unsubscribe.

This last posting clearly revealed one participant's belief in the future value of the archived conversation. While it is not clear exactly how widespread such a sentiment is, there are several other participants expressing similar views. For example, another participant specifically mentions search the archives in a list of specific steps to follow in order to learn about a new topic. Others refer to the archives in their responses to specific questions. The sheer number of archived postings on a particular topic was even used one occasion to bolster an argument. A good summary, shown in Table 6, offers additional evidence of the perceived value of the archives.

Table 6. Value of archives (con't.).

- (10) The archives are a useful tool I've used them often and I encourage everyone to check them out. It reminds me that what I say will be forever on the web (you can search by author). It also caused a few audible groans when I revisited some of my posting.

Perhaps the best evidence for reasonably widespread understanding of the value of the archived messages is found in the conversation etiquette of many of the participants. It is not uncommon for a person to mention that they have first searched the archive *before* they post a question. Those who don't are often referred to the archive in a reply to a question.

A final bit of evidence showing the groups' understanding of the value of archived conversation is revealed in their discussion about other conversation archives. On several occasions, the answer to a question also includes a recommendation to search the archives of a particular newsgroup or discussion list. For example, readers are often told to access Dejanews to search the archives of various Usenet groups.

The conversation snippets presented above were selected in order to provide both a general sense of the online conversation and to provide evidence that many members of the group understand the value of the archived content. Evidence for such awareness was shown in three ways. First, the meta-discourse about the Reporters-L archive explicitly speaks about the future value of the contents. Second, a social norm to search the list archive before posting a question supports the notion of the conversation archive as an information repository. And finally, referrals to other conversation archives are illustrative of the community's journalistic predisposition to value dialogues that persist.

In many respects, the value of the conversation archive is tied to the efficacy of the tools that are used to browse and search the archive. Unfortunately, most of the

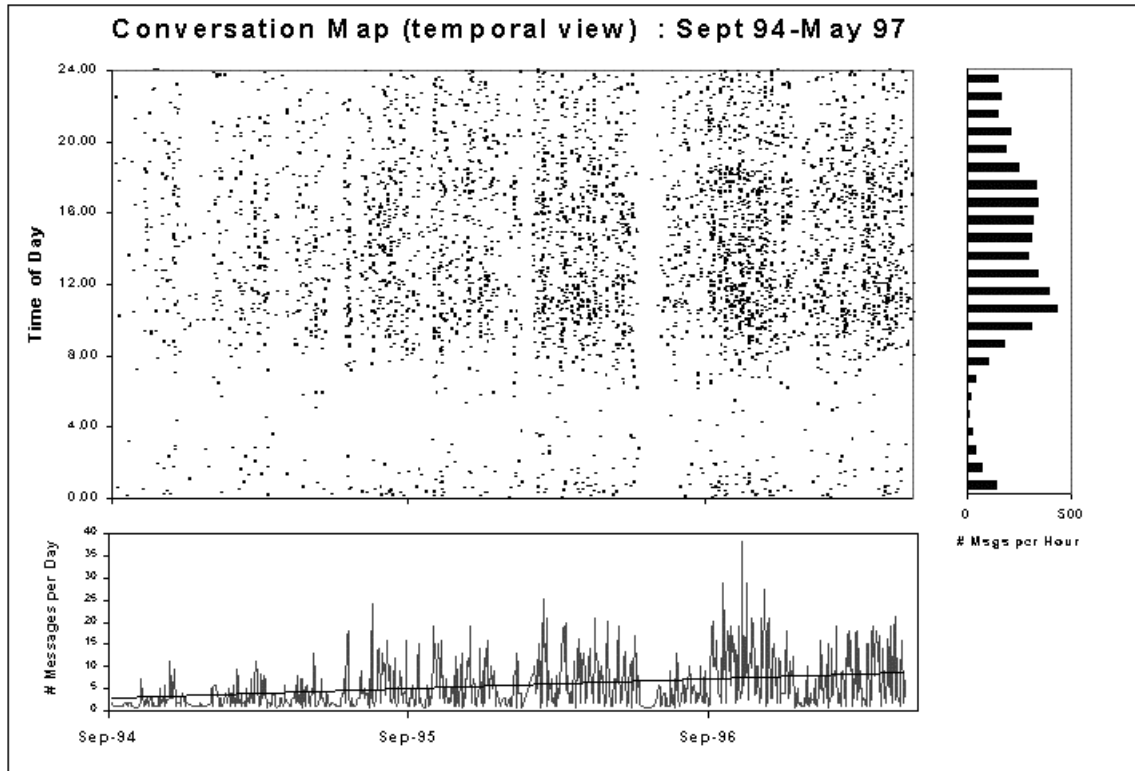


Figure 2. Conversation Map of Reporters-L - temporal view.

currently available tools to browse the archives of text conversations do not readily communicate the social rhythms and patterns of the discourse [4].

The conversation maps that are presented below grew out of my personal need for data displays that would allow me to more completely understand an online community. The conversation maps that are presented below have been called maps, in part, because they are intended to show the bigger picture - the ten thousand-foot perspective. Conversation activities, at a macro level become visible. These maps are also helpful in that they point me to interesting parts of the conversation and highlight the community members who should be interviewed as part of my research.

3. Conversation Mapping

To understand and characterize the conversation of a large online group is big challenge. This is especially true for a group that was formed several years ago and contained thousands of messages. One visualization technique that was found to be useful was to examine the conversation through the use of *conversation maps*. These maps help show multiple dimensions of the conversation in the same data display. The conversation map in Figure 2 is useful to generally understand the conversation density as it changes over time. The main

panel of the map is a scatter plot of all of the individual messages submitted to the discussion list as a function of the time and the day that the message was sent. The bottom panel is a summary of the total number of messages per day and includes a simple linear trend line. The panel on the right is a summary of the number of message posted as a function of the time of day that the message was sent.

The conversation map reveals that there has been a general increase in message activity over time. This is evident in the increasing density of postings in the top panel, and in the increasing daily totals in the bottom panel. The linear trend line also revealed a modest positive slope, with the daily number of message postings was between 10-20 messages by the end of the analysis period. The message postings in the hourly summary panel revealed that this community was largely active during the traditional business hours with some activity during the evening. This pattern is markedly different from some of the more consumer oriented online communities, which have heavy after-school and evening activity.

The conversation map above (Figure 2) revealed a substantial gap in message activity in the summer of 1996. This is the kind of a conversation "marker" that is of interest. One plausible explanation for the conversation gap was the substitution of real world conversation for of

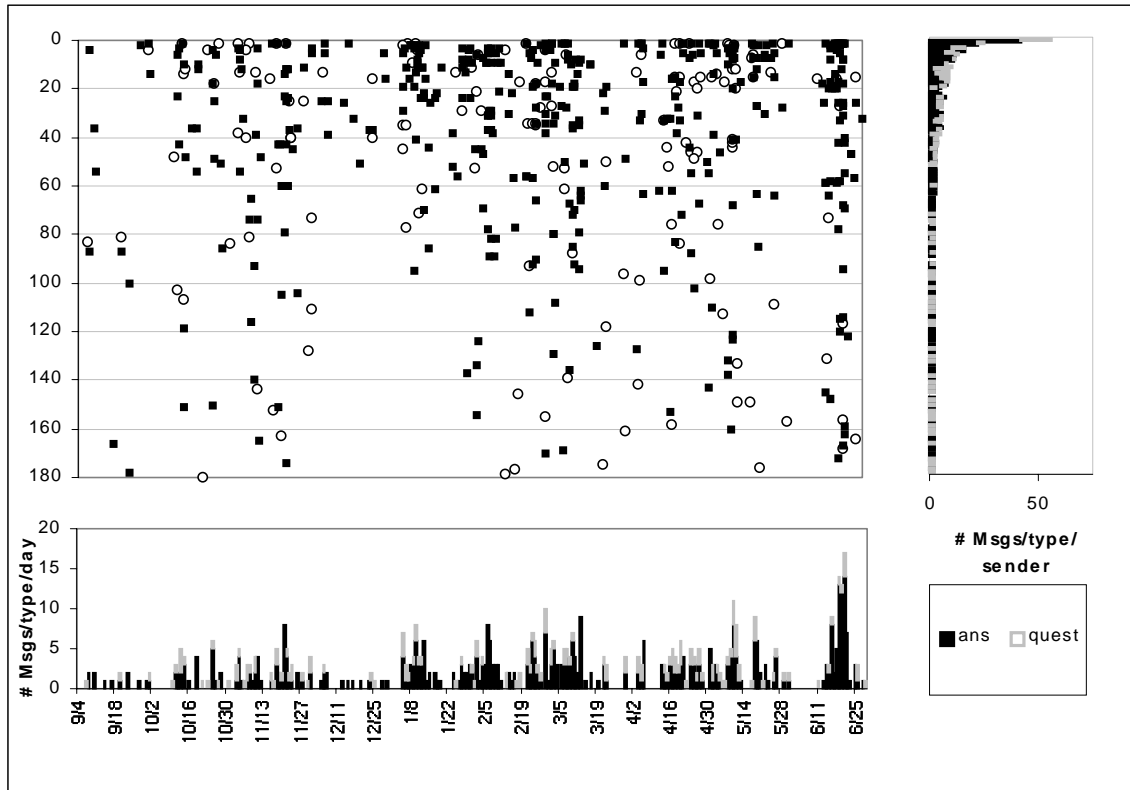


Figure 3. Conversation Map - Participant View

the online activity as would be the case if the group convened at a professional meeting. Another plausible explanation was that the gap was caused by technical problems with the discussion server. It turns out that the latter was correct. An analysis of the message content showed that the gap was due to problems that resulted from a change in the discussion list software. It would be of interest to understand how such technological disruptions affect community participation.

A second conversation map, which shows the message activity of this community as a function of each participant, can be found in Figure 3. In this map, community members are rank-ordered by the total number of messages that they have posted. The individual postings for each individual are then plotted as a function of day. This display is very similar to the loom display, which was created by Donath and colleagues [4]. The conversation map in Figure 3 has been enhanced by the addition of two summary panels. The upper right panel reveals the total number of messages per participant. This summary showed a clearly identifiable conversation leader in this group, and several members who were frequent contributors. The bottom panel is a summary of the total number of messages per day, and reveals days when there is great activity in the group.

The explanatory value of the conversation maps can be greatly increased by color coding the contents of the

individual messages. As my interest was in understanding the information seeking and helping behaviors, the messages displayed in Figure 3 were coded to indicate whether the posting was a question or an answer to a question. More precise content coding might reveal topics that are discussed repeatedly, or topics that are cyclical or tied to some calendar event such as a holiday or professional conference. Patterns based on emotional intensity have also been studied using the loom display [4].

The conversation maps presented above were used to understand the patterns of activity within this online community of news reporters. These maps could perhaps be extended to provide additional value to current newsreader applications. Such maps, could help a reader pinpoint particular threads that are of interest, to identify particular participants to seek (or avoid), or to give the reader an overall impression of the vitality or life cycle of the group.

4. Summary

Work groups have long been trying to find ways to better manage meetings, to create and share information among project teams. Groupware tools have been developed to allow better communication among group

members, better project scheduling and indexing and archiving of project documentation. One class of tools, electronic conferencing software, has proliferated in an effort to support asynchronous conversations. One important characteristic of these electronic conferencing tools is that some record of the conference is archived and accessible for project members to search and browse. These archive serve to record important decisions, as well as document the context of the decision by capturing important points in the related discussion. These conversation archives also provided new team members with important historical context and allows for more rapid assimilation into the project team.

In a similar way, community portals are emerging to provide structure and to informally bind online communities together. These portals provide event calendars, conference advertisements and archives, access to information resources such as publications and other web links, and a mechanism to enroll new members. Furthermore, many of these community portals are providing conversation spaces in which the members can freely discuss topics of shared interest.

In this paper, an online community of news reporters was examined in order to provide evidence of community awareness and perceived value of the archived conversation. Several participants explicitly mentioned the importance of the archived conversation, and a search of the archive was frequently mentioned at the introduction of a thread. In the future, better conversation browsing and search tools will undoubtedly increase the harvesting of information from the conversation records. Conversation maps and other discourse visualization techniques (e.g., [4]) may generally help new members to learn about conversation rhythms and patterns, while at the same time, help long time participants find items of specific interest.

5. Future Directions

Most of the discussion in this paper has been centered on text-based conversations. As 3-D virtual environments become more accessible and popular, conversation archives will become much more complex. Conversation representations will need to incorporate a record of place, in addition to the time and person. Nonverbal conversational elements such as gestures, gaze and posture will also become part of the archive. Further research is needed in order to build useful and usable conversation tools for indexing, browsing, searching, and reading this kind of conversation archive.

Further work is also needed to allow conversations to persist in an orderly and reasonable manner. It can be argued that value of some archives diminishes over time. The idea that electronic contents should visibly show their

age, like paper archives, is already under investigation [23]. Systems need to be built that allow for some parts of the conversation to persist, while other parts are purposefully ephemeral.

6. Acknowledgements

The work presented here grew out of a earlier project undertaken with Susan Dray, investigating changes in organizations and work practices that resulted from pioneering uses of the Internet. Our conversations, albeit not archived, have greatly influenced my thinking about online communities.

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