

Digital Backchannels in Shared Physical Spaces: Experiences at an Academic Conference

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ABSTRACT

There are a variety of digital tools for enabling people who are physically separated by time and space to communicate and collaborate. Widespread use of some of these tools, such as instant messaging and group chat, coupled with the increasingly availability of wireless Internet access, have created new opportunities for using these collaboration tools by people sharing physical spaces in real time. Such 'digital backchannels' affect interactions and experiences in a variety of ways, depending on the spaces, the participants, and the relationships among them. We focus on the space of an academic conference, a physical space designed for voluntary participation by people with shared interests, seeking to share knowledge and connect with others. We present and analyze system logs and interview data from a recent conference, highlight some of the advantages and disadvantages experienced both by those who used the tools and by those who did not, and discuss implications and considerations for future use and research.

Categories and Subject Descriptors

H.5.3 Group and Organization Interfaces: Computer-Supported Cooperative Work.

General Terms

Management, Design, Human Factors.

Keywords

Social computing, groupware, shared spaces, chat, IRC, instant messaging, backchannels, computer-mediated communication.

INTRODUCTION

The use of technology, specifically computer-mediated communication (CMC) tools such as instant messaging (IM) and short message service (SMS), to create synchronous channels of communication between or among remote participants is receiving increasing attention in the research community. Studies have revealed interesting patterns in the use of such tools among distributed groups in a variety of contexts, e.g., the workplace [2, 9], a university lab [12] and more informal contexts [4]. However, there has been little research on the use of these kinds of tools among participants who are in a shared physical space, and how the tools are co-opted for contexts and uses for which they were not originally intended (cf. [3]).

We are particularly interested in gatherings of people in which there is a single, primary focus of attention—or, at least, an intended focus of attention—of those who are physically co-present, such as in a classroom lecture or a conference presentation. CMC tools in such contexts typically assume a secondary, or background, role, forming a digital *backchannel*. Some research has been reported on the use of CMC tools in the classroom [6, 10], but very little research has addressed the use and impact of these tools in the context of an academic conference¹, where the motivations of and power relationships among participants are different than in classroom settings.

The potential benefits of the use of digital backchannels in shared physical spaces include an ability to ask questions and receive answers without having to physically interrupt the presentation or meeting, provide pointers to information that augments the meeting topic(s) in useful ways, and better organize and coordinate the activities of some of the participants in a meeting. Potential problems with the use of such tools include the distraction (both for the audience and the speaker), the negative or disrespectful form or content of some of the comments made in the backchannel, and the potential unevenness of participation among those who are physically co-present (e.g., if separate chat channels are known or used by some but not others).

At the ACM 2004 Conference on Computer Supported Cooperative Work (CSCW 2004), the conference organizers provided wireless Internet access (WiFi), and setup and advertised four designated Internet Relay Chat (IRC) channels, one for each of three parallel session rooms and another one for plenary sessions. Attendees could use the WiFi and IRC to experience digital backchannels in the shared physical space of a conference; for many, this was their first such experience.

We report on some of the ways that these digital backchannels were used at the conference, incorporating data collected in the log files at the conference, comments made in other digital forums, and informal interviews we have conducted with some of the conference attendees, including some who participated in the backchannel and some who did not. An exhaustive analysis of the effect of these backchannels on the conference experience is beyond the scope of this paper; however, we will highlight some important themes that are emerging, and suggest future research directions for more thoroughly exploring this exciting new space.

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¹ Rekimoto, *et al.*, [11] describes a workshop context in which the contents of a chat channel are projected on a large screen for all participants to see, but there is little analysis of the impact of the tool on the participants' experiences.

HOW THE BACKCHANNEL WAS USED

The IRC logs provide a rich source of data for illustrating how the backchannels were used at the conference. Due to space limitations, rather than conducting an exhaustive analysis of the logs, we instead focus on some of the high level statistics we have collected from the logs, categorize some of the usage patterns and provide some examples that highlight some of the ways that the backchannels were utilized in the shared physical space at the conference

Approximately 450 people attended CSCW 2004, which was held November 6-10 in Chicago. The technical program consisted of three parallel tracks over three days, with an opening plenary session on the morning of the first day and a closing plenary session at the end of the third day. The parallel tracks included 22 paper sessions and 5 panel sessions, each lasting 90 minutes.

The CSCW 2004 Computing Chair created an 802.11b wireless network at the hotel, with access points positioned in each of the three meeting rooms used by conference. Four IRC channels were created on Freenode to support backchannel communications at the conference: #cscw, #cscwA, #cscwB and #cscwC. The first was designated for the opening and closing plenary sessions (when multiple rooms were combined into one larger room); each of the other three was designated for one of the three meeting rooms used for the parallel sessions. The CSCW 2004 web site (and a printed flier included with registration materials) provided instructions on how to use IRC, as well as links to software that attendees could download in order to access the IRC channels. When users joined any of the four designated channels, they were informed that all messages were being logged.

IRC Log Statistics

All of the activity on the four channels was collected in a single IRC log file with 15,277 entries. The file contains a record of each time a participant joined a channel, left a channel or posted a message, as well as a number of other events mostly having to do with administration. Each time someone joins an IRC channel, they are required to provide an identifying handle, known as a 'nick'. At the conference, most participants chose nicks that were based on either their actual name or a commonly used digital handle. The nick, along with the IP address through which the participant was connected to the wireless network, was recorded in the log file for every action taken by that participant on any of the channels.

Over the course of the three days, 249 unique nicks were recorded as having joined one or more of the channels. An examination of those nicks reveals that many of them are simple variations on a common root, altered by adding underscores and/or numbers.² Eliminating such duplicates results in approximately 120 distinct participants. We assume that most participants were physically present at CSCW, although we know of at least two IRC participants who joined remotely to see how the conference was going.

A total of 2411 messages were posted to the four channels during the conference. The number of messages per nick follows a power law distribution, with the four most prolific nicks associated with 409, 383, 144 and 141 messages, respectively. 112 nicks—which

² Some participants experienced technical difficulties wherein they lost connection to the IRC channel. Upon reconnection, they could not reuse their original nick—it appeared to be in use—and so chose a new nick that was similar to the old one.

represent what we estimate to be approximately 60 participants—are not associated with any messages. In interviews, participants who did not post any messages indicated that they joined the IRC channel simply to know what was being said, not to contribute.

Table 1: Users & Messages Per Session

| | Min Users / Session | Max Users / Session | Avg Users / Session | Min Msgs / Session | Max Msgs / Session | Avg Msgs / Session |
|-----------|---------------------------|---------------------------|---------------------------|--------------------------|--------------------------|--------------------------|
| Plenaries | 23 | 36 | 29.5 | 164 | 194 | 179.0 |
| Panels | 6 | 56 | 23.2 | 16 | 753 | 266.8 |
| Papers | 0 | 26 | 14.5 | 0 | 132 | 24.3 |

When we partition the messages according to the sessions in which they were posted, as shown in Table 1, we see that the highest number of participants joined the channels associated with the plenary sessions, and the highest numbers of messages were posted during the panel sessions. This is hardly surprising, given that the plenary sessions have no parallel sessions to compete with and panel sessions are explicitly designed to provoke discussion. However, given that there is often a similar proportion of time allocated for questions and answers for each type of session (panels averaged 30 minutes of Q&A time following opening statements, and the combined Q&A periods of paper sessions typically added up to 30 minutes), the order of magnitude difference between the average number of messages in the panel and paper sessions seems more significant.

Categories of IRC Use

People utilized the IRC channels for a variety of different purposes during the conference. An examination of the log reveals a few general categories that appear to be the focus of many of the messages posted throughout the conference, corresponding closely to the categories used in an analysis of chat use among distributed work teams [5]: greetings (and farewells), logistics (including availability), work (the presentations and topics relating to the presentations), and other (including non-work and humor). Greetings on the conference channels were not significantly different than those in channels used by remote participants, but we did observe some interesting differences in the other categories, which we will highlight below.

Logistics

Conference Logistics: The backchannel allowed attendees to make inquiries about physical aspects of the conference (events, locations and times), provide feedback to conference organizers, and to coordinate on-site actions by members of the conference committee.

- *where is tomorrow's backchannel panel at? continental or international?*
- *coke? are there cokes out there?*

One particular exchange highlights how information can be exchanged and properly targeted:

- *to whom should the suggestion that panelists should always try to have materials available online and begin their talks with a URL be directed?*
- *Panel Chairs: cscw2004-panels@acm.org (Pam Hinds and Tom Finholdt)*
- *<Conference Co-Chair>: I'm sitting with Tom right now; I've made the suggestion*

Another interesting exchange involved people trying to decide which physical session to attend:

- *are you guys in C physically?*
- *C is the room for panels, which means it's more likely that attention will be spotty. with lots of people talking, some will be more relevant to the audience members than others*
- *no. I'm in B, but no one is using that channel.*

Technology Logistics: People used the backchannel to seek help on how to best use IRC, complain about problems they were having, and—occasionally—thank the people who were supporting these tools.

- *for those of you haven't seen them, we've got a couple of extension cords in the crowd today*
- *where can I get channel logs?*
- *is anybody else getting regularly knocked off the network? i've had 3 disconnects from cscw-c*

People Logistics: The backchannel was also used to track down other people who were at the conference, or to encourage other participants to take certain actions.

- *mark, is leysia in the room?*
- *If <list of people> from <company> are reading this chat, please contact Sean McNee in the SV Office after the opening plenary has finished*

Work

At this conference, the vast majority of messages posted to the backchannel were focused on the shared work: what was being presented in the sessions, the way it was being presented, and/or information related to the presentation. This finding is consistent with Isaacs, *et al.*'s [7] finding that chat in the workplace is primarily used for work.

People: Several participants used the backchannel to make inquiries about who was speaking in the frontchannel, either at the podium or on the stage (especially during panels) or from the audience (during a question and answer period).

- *this is Robert Kraut?*
- *who's the panelist on the far right?*
- *whats the name of the question asker again?*

Content: Many messages were posted about the information communicated by one or more people on the stage during papers, panels or plenary addresses.

- *strong words: microsoft crushed competition and innovation faltered*
- *can we use his conclusions in non-gaming environments?*
- *what was the site he just mentioned?*

Form: Several people made comments about the presentation itself, e.g., the speaking and/or audio/visual aids being used by speakers.

- *how much of what he's showing is in the proceedings??*
- *nice use of media*
- *louder*

- *font on the main screen isn't large enough for the back of the room* [This was during a panel; the panelist immediately changed her font and typed “*Is that better?*” to which the original poster replied “*Yes*”]

Related Work: There were many references to other work relating to work being presented in the frontchannel, including over 100 messages that referenced specific URLs.

- *The paper I linked to has a good definition of capital, and compares with other types of capital*
- *i'm surprised barry hasn't mentioned keith's work here*
- *Have you seen this viz of temporal patterns in edits of wikipedia pages - it was at CHI 04*
<http://researchweb.watson.ibm.com/history/>

Other

Participants also used the backchannel to bond with other conference attendees through meta commentary on the backchannel, humor, sarcastic commentary known as ‘snarks’, polls to get others’ opinions and introducing non-CSCW topics for conversation, as shown in these different fragments of IRC messages:

- *don't talk mutiny - "Your conversations will be logged!"*
- *what I like about back channeling: creates social connections/community feeling in an environment in which it would not normally occur, while listening to talks.*
- *backchannel is slowing down - she must be interesting*
- *How many in this room blog? How many are blogging now?*
- *in unrelated news that should make people happy: Attorney General John Ashcroft and Commerce Secretary Don Evans have resigned, the White House said. Details soon.*

DISCUSSION

The backchannel usage at the conference had a variety of effects on the experiences of different groups of attendees, both positive and negative. We conducted a set of informal interviews with a number of attendees, including those who were formally presenting and those who were not, and those who used the backchannel and those who did not.

Based on ingroup/outgroup [1] concerns that have arisen at previous conferences where IRC was used, we made every effort to make all CSCW attendees aware of the IRC channel and to provide them with instructions on how to join should they be interested. We learned that awareness and capability are not the only concerns. One attendee felt that he was ignored when he tried to participate; he attributed this to his lack of IRC experience and his unfamiliarity with the norms. Others expressed concerns that not everyone has a laptop, is capable of multi-tasking, or is comfortable chatting in this context.

In lieu of multi-tasking, some participants use the term “continuous partial attention” to describe the cognitive model for allowing simultaneous front- and backchanneling. Attention issues were frequently mentioned in the backchannel itself:

- *leaving now - can't take notes and do IRC*
- *Crap, I was reading this and missed everything he just said*
- *wait, I was distracted, can you summarize his question for me?*

At a panel on digital backchannels at CSCW 2004 [8], one of the panelists discussed this as continuous partial *inattention*, an important potential obstacle to the success of backchanneling, affecting both participants and speakers.

Speakers—in our interviews and in IRC posts—expressed dismay at the number of people using laptops during their presentations. Skilled presenters often look for cues from their audience, adapting their presentation based on perceptions of audience engagement. Several presenters were uncomfortable with so many people attending to their laptops, and no way to distinguish those who were engaged in the backchannel from those who were using their laptops for tasks unrelated to the presentation. During one series of IRC exchanges, a debate was held on whether speakers would prefer audience members sleeping or reading a novel rather than using a laptop (knitting emerged as the preferred activity).

The occasional instability of the WiFi channel was also a barrier to participation, resulting in confusion and frustration among some of the attendees. This also contributed to an increase in inattention, as participants focused on solving their technology issues rather than the material being presented.

The first-time CSCW conference attendees we interviewed told us the IRC channels were particularly valuable, helping them get acquainted with other attendees, the canon of CSCW research and the norms of the conference. Even recognizing the concerns above, our interviewees believed that the backchannel “experiment” at the conference was provocative and valuable.

CONCLUSION

CSCW provided a unique opportunity to experience and experiment with collaborative tools in the context of a shared physical space, with a group of participant-observers who routinely study the use of such tools. Given the increasing prevalence of WiFi in hotels and other meeting venues, we expect that the use of such tools in conference settings will become as common as microphones and projectors. Those who participate in conferences—as organizers, presenters or attendees—will need to determine how these tools can best be used to help these different groups accomplish their goals.

We have highlighted some of the advantages as well as disadvantages experienced by attendees at CSCW 2004. A number of issues warrant further study, such as the nature of the social bonding that takes place via backchannels among collocated (vs. distributed) groups and the development of effective strategies for coping with multiple channels of information exchange on the part of the both the audience and speakers in such contexts. By sharing some of our experiences and raising awareness of these issues, we hope to encourage more researchers interested in the effects of technology on group interactions to join us in exploring this exciting new area.

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