

GroupBanter: Supporting Serendipitous Group Conversations with IM

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Abstract. This paper describes GroupBanter, a tool for supporting serendipitous group conversations using instant messaging. We investigated the potential of ephemeral group conversations by providing awareness of friends' IM conversations, serving as an implicit invitation to join a group conversation. We present our vision and describe our prototype system. Results from two field studies carried out in different contexts show that users valued GroupBanter and that it provided new opportunities for communication that aren't well served by traditional IM, email, or face-to-face communication. Our results indicate there is potential in providing a lightweight communication channel that lies between traditional, private IM conversations and more public IRC-like conversations.

Keywords: Instant messaging (IM), chat, group conversations, Internet Relay Chat (IRC), Computer supported Cooperative Work (CSCW), Computer Mediated Communication (CMC).

1 Introduction

Instant Messaging (IM) has become a central part of many people's lives. However, with traditional IM applications, users have no way of knowing who is talking to whom, or what they might be talking about. Unless users are explicitly invited to join a conversation, they will have no awareness of the many conversations that might be of relevance or interest to them, even amongst their own contacts.

This situation contrasts with face-to-face conversations, where multiparty, opportunistic interactions have been shown to be valuable for team building [1], [2]. In face to face situations, nearby people see that the conversation is going on and may also be able to hear parts of it. This information gives people an awareness of the conversation which they can then "join", if desired. Additionally, non-verbal gestures and body language can provide an implicit invitation to others to join the conversation, e.g., making eye-contact with people outside of the conversation, or stepping aside to make room for someone to join [3]. And there are benefits to being

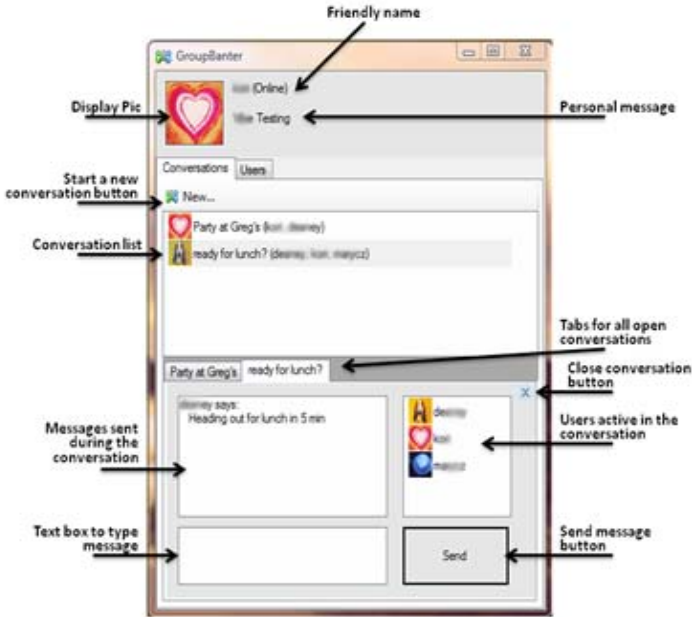


Fig. 1. A screenshot from the GroupBanter prototype. The conversation pane lists all the active conversations including the title and who is participating. The bottom pane provides a tab for each conversation, as well as a list of participants who are currently active in the conversation.

aware of what coworkers are discussing, even if users choose not to participate in the conversation themselves [4].

We developed GroupBanter, a system to encourage serendipitous group conversations. It allows users to publicize conversations as an implicit invitation for others to join the conversation (see Figure 1). It also provides conversational awareness information to users - such as who is talking to whom and the topics of those conversations. These provide opportunities for serendipitous group conversation and awareness like those available in the physical world but which are not supported by most IM clients.

GroupBanter is similar to Internet Relay Chat (IRC) systems where users create discussion threads that others can join. IRC systems enable users to enter a “room” and see who was talking as well as what they are talking about. However, IRC systems tend to be public in nature, with numerous channels persisting for long periods of time. In addition, those frequenting IRC rooms might not be known to the user. In contrast, we hypothesize that having a small number of more transient conversations, started by, and broadcast to people with whom users have an established personal connection can provide value over existing communication channels.

The notion of publicizing IM conversations to enhance group conversations has been explored in previous research such as Babble [5], BackTalk [6], the Community Bar [7] and SWIM [8]. A common theme across many of these systems is that they focus on making conversations persistent and visible to people within a predefined

group. We were interested in exploring whether we could achieve some of the same benefits of these systems with more ephemeral conversations while maintaining the lightweight nature of IM.

The goal of this research was to evaluate the utility of a lightweight mechanism to broadcast or receive conversation awareness information within users' social network. We also wanted to explore some of the subtle nuances of ephemeral communication. We conducted two separate short-term deployments where users could explore functionality within GroupBanter and better understand the concept and consequences of broadcasting conversation information. We collected usage data from GroupBanter, as well as user comments and reactions to the system. We also investigated how usage and perceptions differed depending on relationships within the group. Our first deployment was with a large, loosely connected social group, the second with a small, tightly connected team working on closely defined projects.

Results from our in situ field studies showed that users were indeed interested in using the functionality provided in GroupBanter. They found it provided new opportunities that don't exist with other media. In particular, users from the first study stated that GroupBanter enabled them to ask a quick question to a group of people allowing anyone in the group to respond. This freed users from having to decide whom to direct questions to and may have enabled faster responses. In our second study, users found GroupBanter beneficial for quick exchanges and group awareness relating to problems they were working on. The key contributions of this work include results from these field studies, which demonstrated a strong user interest in this kind of software tool, revealed clear conversational usage patterns, and design recommendations that should improve ephemeral conversation sharing.

We first describe related IM literature, focusing on group conversations followed by a description of the GroupBanter system. We next present our field studies along with the results obtained. We conclude with a discussion about the potential for supporting serendipitous group conversations using IM and discuss next steps.

2 Related Work

In 1992, when Dourish and Bly first introduced the notion of Portholes [9] to support distributed work groups, they defined awareness as “knowing who is around, what activities are occurring, [and] who is talking to whom”. They went on to state that “Awareness may lead to informal interactions, spontaneous connections, and the development of shared cultures”. Jumping ahead sixteen years, we see that although media spaces are not commonplace, Instant Messaging (IM) applications have become an important awareness and communication tool to support distributed work groups; however, most IM systems do not provide awareness of “who is talking to whom”. More recently, some systems have explored additional awareness cues such as broadcasting information via display names [10] and whether or not users are currently engaged in IM chat [11], [12]; however, these systems do not disclose who the users are talking to, nor what they are talking about.

Researchers who have studied the use of IM have examined both work contexts [7], [13], and [14] and social settings [15], and have characterized IM use in these environments. Although most messaging systems provide support for group

conversations, IM is primarily used for one-to-one conversations [16]. In addition, standard IM systems typically lack support for opportunistic multiparty interactions.

Previous research has identified group IM chat as an important communication component [17]. Herbsleb et al., [17] describes the benefits of group IM as providing “a lightweight communication channel, a way to find out who is available, a trigger for opportunistic communication, some degree of team context, and a way to query one’s entire team at once.” In our work, we explore techniques to enhance traditional IM clients to better support this type of opportunistic group communication.

A few researchers have also explored extensions to IM to better support group conversations [5], [6], [8], [13], and [16]. Notable here is Babble [5], which provides users with awareness information about ongoing conversations, the participants involved, and user control over their degree of involvement in the conversation. Babble supports persistent conversations, as well as a ‘social proxy’ to help users visualize conversations and the activities of others within the group. GroupBanter differs from Babble in that Babble was designed to support persistent conversations while GroupBanter conversations are ephemeral in nature. Additionally, the Babble display consumes considerable display space, while GroupBanter was designed to be lightweight, displaying only minimal information until more details are requested.

3 Group Conversations in IM

Group conversations are an important part of chat applications and are supported in most Instant Messaging (IM) clients. However, for most IM clients, group conversations require explicit invitations to all participants. Users must therefore anticipate who is welcome to join a conversation and explicitly send each of those people an invitation. Each invitee must then take action to respond, or dismiss the invitation. This process works well for small, focused group conversations, but becomes onerous if users want to have more large scale conversations, or if the initiator doesn’t know exactly who should participate in the conversation. From the recipient’s perspective, there may be IM conversations that they want to join, but are unaware that such conversations are taking place. Consider the following scenario:

Scenario. *Bob wants to check out the new Italian restaurant for lunch and is wondering if anyone wants to join him. He starts a new conversation called “Italian for lunch anyone?” and broadcasts the conversation to his work colleagues. Harry (who is from Bob’s group) as well as Sarah and Jessica (both of whom work nearby but in a different building) join the conversation and say that they would love to join him. The four decide to meet at 12:15 at the restaurant. Bob keeps the conversation open until he leaves for the restaurant in case someone else decides to come.*

In this scenario, if Bob used a regular group IM feature, he would need to explicitly decide who should be invited, potentially excluding some people and likely disturbing others who may not be interested. Additionally, other people may receive the request after lunch, which would be pointless since lunch was over. Similar issues arise if Bob used email to try to set up this lunch. If Bob’s colleagues don’t read their email until after lunch, they will have already missed the opportunity for lunch and

the email will be irrelevant, yet will still require attention, potentially contributing to email overload.

We define GroupBanter conversations to have the following features:

- Broadcast to a group of people (typically people that already have an established relationship such as those on a buddy list).
- Ephemeral, they only exist as long as someone is interested in the conversation;
- Low overhead. Easy to set up, join, and leave.

These features extend the functionality of IM systems, providing new opportunities for communication. The ability to broadcast conversations to others provides an implicit invitation to those people to join the conversation. Users can maintain an awareness of conversations their friends or colleagues are having and make a personal choice as to whether or not to participate. This is a subtle but useful difference compared to the explicit request-accept model used in traditional IM communication. Additionally, leveraging users' social networks lets people utilize their existing IM relationships.

Having conversations that only persist as long as needed is another GroupBanter feature. Because conversations don't have explicit requests, they disappear seamlessly when the originator (or others involved in the conversation) deem that they are over. Finally, we fit with the current IM model by ensuring interaction is lightweight.

4 GroupBanter Prototype

The GroupBanter prototype (see Figure 1) was developed as a custom stand-alone group conversation application using C#. The interface is divided into three sections: a personal identification section; conversation and user lists section; and a chat section. GroupBanter provides a list of ongoing conversations showing the conversation title and a list of users actively participating in that conversation. Users join GroupBanter conversations by clicking on the conversation title which causes a new conversation tab to open. Once in the conversation they receive all previous messages exchanged in that conversation. Users can leave a conversation by closing the chat window tab and their name is removed from the list of active participants. They can rejoin the conversation at any time if it is still active. Conversations are listed in the conversation pane as long as they remain active (i.e., at least one person has the conversation chat window open). Once all chat windows for a conversation close, the conversation ends and is removed from the conversation list.

5 Field Studies

To better understand the potential of GroupBanter to support ad-hoc serendipitous conversations, and to gain insight into how users would utilize this type of group conversation feature, we conducted two field study deployments. The first was a two week deployment during the summer of 2007 and the second was a four-week deployment during early 2008. We wanted to look at how the prototype was used in two different settings: (a) an informal context with a larger number of participants who

did not know each other well, and (b) a work context of a small team whose members were highly familiar with each other and engaged in collaborative work tasks.

5.1 Participants

Phase 1. Sixty-one student interns (18 female) from 39 different Universities at a large software company were recruited to participate in our field study. They ranged in age from 16–29 (median 23). Interns were chosen because they represent a loosely-connected social network of people who often have a desire to interact with each other for work and social purposes; however, there were likely people in the group that didn't know each other. In addition, an established communication channel already existed for the interns (a group email alias). All students who participated were given a \$50 honorarium or a piece of software.

Phase 2. Eleven software development engineers at a large software company volunteered to use GroupBanter for 4 weeks. The participants were a tightly integrated work group in their 20's and 30's. All participants were given a \$50 honorarium for participating in the study. The team members were distributed across two different buildings, and even for those within the same building, their offices were located in different parts of that building.

5.2 Procedure

Participants in both study phases first completed a background questionnaire which gathered demographic information as well as data related to their use of IM and other communication channels. They then installed and ran the GroupBanter prototype. Data logging recorded all activities related to GroupBanter conversations. In Phase 2 we also conducted a semi-structured interview with six members of the team mid-way through the study to gather usage feedback. At the end of the study, all participants were asked to complete a post-study questionnaire to report GroupBanter use and provide feedback on the communication opportunities GroupBanter provided.

5.3 Data Collection and Analyses

We recorded when a GroupBanter conversation was initiated, along with the name of the user that created the conversation, the conversation title, when users joined or left the conversation, the date, time, and sender for all messages sent within a conversation, and when the conversation ended.

Data logs were used to determine usage patterns, including the number of conversations initiated, the number of users per conversation, the number of messages sent in a conversation, and the conversation duration. In Phase 2 we also logged conversational content. The follow-up surveys were analyzed using descriptive statistics for the frequency, rank, and rating data while qualitative data was clustered into relevant groups

In both phases, users initially spent time exploring the functionality of the system and testing out various features. Additionally, in Phase 2, some participants didn't

install and start using the system until the second week of the study. Because we were interested in how people actively used the system for their normal communication, we exclude data from the initial exploration/learning period. Therefore, data is only presented for week 2 of Phase 1, and weeks 3 and 4 of Phase 2.

6 Results

In Phase 1, 61 GB conversations were initiated during the second week (on average, 12 conversations per day). The make-up of the conversations varied widely with the number of users per conversation ranging from 1 to 18 ($\mu=6$), the number of messages sent ranging from 0 to 240 ($\mu=30$), and the duration ranging from less than 1 min to over 71 hours ($\mu= 8$ hours 50 min). The activity level across users also varied widely with some users initiating many conversations (max=9) while 35 others never initiated a single conversation. A high variance was observed for the number of conversations people joined and the number of messages sent, with some users participating in many conversations (max=76) or sending many messages (max=175) while others participated in very few conversations or sent very few messages.

In Phase 2, 25 GroupBanter conversations were initiated during the third and fourth weeks of the study (12 and 13 respectively). The number of users per conversation ranged from 2 to 10 ($\mu=7$), the number of messages sent ranged from 2 to 75 ($\mu=17$), and the duration ranged from 20 min to almost four days ($\mu=12:29$). Although 11 participants participated in the study there were 7 main users who contributed 97% of the messages. Each of these 7 participated in 16-24 conversations. The remaining 4 predominantly observed conversations without sending messages.

Although the number of messages sent and duration of the conversations varied, the overall structure of the conversations was fairly consistent. In most conversations there was an initial burst of highly interactive conversation (~4-20min) followed by a long tail of inactivity, occasionally with a few messages sent later on. For example, in one conversation from Phase 2 (Figure 2), the initial burst of activity was 11 minutes, followed by a day of inactivity (although 4 people dropped in to view the conversation) followed by a second burst of activity which elicited some additional dropping-in to check on the conversation.

Having people drop in and 'lurk' on conversations was common in Phase 1, and occurred in all Phase 2 conversations. Lurkers are people who actively join a conversation (and presumably read the messages) but do not send any messages themselves. In Phase 2, every conversation had at least 1 lurker and several conversations had 6 or 7 lurkers. As the Phase 2 participants were a development team, lurking can be considered a good way to get awareness about what other team members are working on or concerned about. All participants agreed that GroupBanter made them more aware of what other people on their team were discussing - resulting in better overall group awareness.

Figure 3 shows a partial transcript from a representative conversation from Phase 2. It involved 10 participants, with 5 (Jim, Ed, Mitch, Will, Leo) making contributions, and another 5 (Kim, Dave, Mike, Paul and Peter) lurking (all names are pseudonyms).

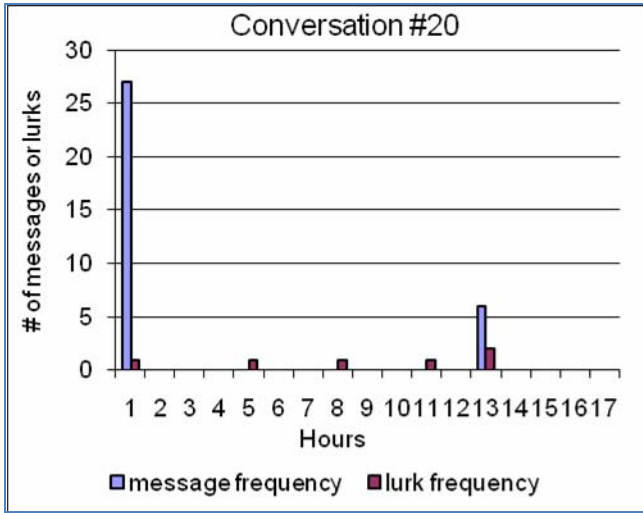


Fig. 2. Activity plot for conversation #20 which shows two spikes of activity (in the first hour and 13 hours later), followed by inactive time with people dropping in to check on the conversation and then leaving.

It involved 37 messages which were an average of 20 words long. The conversation has various interesting properties:

Opportunistic interactions where the respondent is not the person who was addressed. Jim initiated the conversation with a comment to Mike at line 4 which prompted a response from Ed who has done relevant work for Jim. Mitch also contributed an unprompted joke at line 34.

Intermittent fast paced interactive exchanges (lines 4-10, 19-31) interspersed with long periods (excised due to space constraints) when people said little, often ‘dropping in’ to the conversation without contributing content (lines 12-13).

Informality. Many of the conversations featured highly informal interaction, For example, lines 30-34 discuss cultural differences within the group and a subsequent joke about possible repercussions to a prior comment (lines 33-34).

Lurking. Half the participants were lurkers, who never said anything (although all contributed to other conversations). Lurkers dip into the conversation occasionally to track its progress (e.g., Kim at 12, 18 and 35). Other people alternated between lurking and more active participation.

Active co-ordination. We see GroupBanter being used to resolve co-ordination problems. For example, when a notifying email hadn’t arrived (lines 15-17) and when both Mitch and Will accidentally found themselves reviewing the same code (37-42).

1	04/10 09:54	new	Jim	code review tracking
2	04/10 09:54	open	Ed	
3	04/10 09:54	open	Peter	
4	04/10 09:55	msg	Jim	Mike - I have finished reviewing code review #15 - I didn't raise any issues
5	04/10 09:55	msg	Ed	Hey Jim
6	04/10 09:55	msg	Ed	I've yours
7	04/10 09:55	msg	Jim	Kim - I am looking at review #18 now
8	04/10 09:55	msg	Jim	Hi Ed
9	04/10 09:55	msg	Ed	I've done yours I should say
10	04/10 09:55	msg	Jim	very good - thanks!
11	...			EXCISED MATERIAL
12	04/10 11:51	open	Kim	
13	04/10 13:58	open	Mike	
14	...			EXCISED MATERIAL
15	04/11 12:15	msg	Mitch	Massive Guid - String replace reviewed
16	04/11 12:15	open	Kim	
17	04/11 12:17	msg	Leo	didn't receive any email
18	04/11 12:20	close	Kim	
19	04/11 14:06	msg	Leo	new code review posted.
20	04/11 14:06	msg	Will	what's the focus?
21	04/11 14:06	msg	Leo	I renamed all colo'u'rs to colors for the sake of fixcop
22	04/11 14:06	msg	Leo	no logic changed
23	04/11 14:07	msg	Will	uh...I added the dictionaries already to take care of that
24	04/11 14:07	msg	Leo	:(
25	04/11 14:07	msg	Will	agg you still getting FXCop warnings?
26	04/11 14:08	msg	Leo	was not but I decided to do it since it took only 15 mins
27	04/11 14:09	msg	Will	I'd say we should rely on the dictionaries...there are lots of "misspellings" that are actually just unrecognised words. Since we need the dictionaries anyway for those, I say we "fix" all the false positives through the dictionary
28	04/11 14:10	msg	Leo	alright then. i'll revert this one
29	04/11 14:11	msg	Will	(there was one real misspelling, though...and it's in code I'm working on, so I'll fix it with the next checkin)
30	04/11 14:13	msg	Will	we're a mixed-culture team...no reason for us to be draconian about which spellings to use!
31	04/11 14:13	msg	Leo	Heh
32	04/11 14:42	msg	Mitch	I'm not a huge fan of colour myself
33	04/11 14:43	msg	Will	careful, your roommate will get after you
34	04/11 14:43	msg	Mitch	I'm going to need one of those cameras for over my shoulder
35	04/11 15:19	open	Kim	
36	04/11 15:19	close	Kim	
37	04/14 11:01	msg	Will	so, Mitch both commented on the same piece of code at the same time (review #29),, did we?
38	04/14 11:01	msg	Mitch	I just did review that one, so it's possible :)
39	04/14 11:01	msg	Mitch	I think Ed will get the msg to make a change there... :)
40	04/14 11:02	msg	Will	
41	04/14 11:03	msg	Mitch	did you get a concurrency error or did it work?
42	04/14 11:04	msg	Will	it worked -- I think I was in a little earlier than you
42	...			EXCISED MATERIAL

Fig. 3. Transcript from a GroupBanter conversation. Conversation codes are: “new” – new conversation started; “open” – open conversation window; “close” conversation window; “msg” add message to the conversation.

Overall this example illustrates that GroupBanter conversations had many of the features we intended to support. Conversations were often opportunistic with people contributing un-elicited comments and were informal (as evidenced by the jokes and typos). In addition, GroupBanter conversations allowed different levels of contribution (active messaging versus dipping in), different paces of conversation (interactive to intermittent), and were useful in detecting group co-ordination problems.

The main reasons given for why people started GB conversations included:

Didn't know who would be interested: *"I didn't know who in particular would be interested". "wasn't intended for anyone specific". "whoever is interested will join".*

In order to get a quick reply. *"wanted someone to reply right away". "reach a group of people fast". "I would like a quick response". "immediate and real-time feedback".*

Interested in having a group conversation: *"wasn't aimed at an individual ... I wanted to hear other comedic responses". "I didn't really want to talk to one person". "wanted to see what everyone was thinking". "didn't have to ask people individually. We could all discuss it together"*

Just for fun: *"it was there". "just to say hi". "just wanted to talk to some people". "companionship"*

6.1 New Opportunities and Exchanges

Fifty-eight participants in Phase 1 and eight participants in Phase 2 completed the post-study questionnaire. Many respondents saw themselves as active contributors to conversations (Phase 1: 62%; Phase 2: 63%) and initiated conversations that they would not have otherwise engaged in (Phase 1: 41%, Phase 2: 63%). Additionally, 45% of Phase 1 participants indicated they would be more likely to use GroupBanter than the group email list. In Phase 1 (where not all of the participants knew each other), GroupBanter provided opportunities for interaction with new users - 72% of participants indicating they had unexpected conversations and 66% indicating they met new people using GroupBanter.

We also asked whether GroupBanter changed the nature of their communication. Many reported that GroupBanter conversations were more useful than those in other communication channels. When asked *how* communication would have been different without GroupBanter, several participants commented on inclusiveness ("anyone outside the immediate conversation would be blind as to the larger picture involving the code review") and response time ("[it would have taken] a lot longer to get to resolution").

6.2 Attitudes towards GroupBanter

Most participants indicated they would utilize a system like GroupBanter to create conversations that others could see and join (Phase 1: 83%; Phase 2: 100%) and would join GroupBanter conversations others were having (Phase 1: 93%). One participant commented: "My siblings and I use IM a lot to chat since we're spread

over the country. I'd like to see and join other conversations that are going on instead of each talking 1-1. This is in addition to just being able to have a multiway chat.”

Although GroupBanter was utilized throughout Phase 1, many participants in this group were less interested in GroupBanter for the existing population (Intern group) and instead wanted to use GroupBanter with their close friends. Overall, 49 participants in Phase 1 (84%) reported they would use GroupBanter if it was integrated into their IM application, however, several participants mentioned they would want to know that more people were using it and have more control over whom conversations would be broadcast to. For example, “if I could use it to just communicate within a set of people I know or who are closely related to someone I know.”

Users also commented on the benefit of being aware of ongoing conversations and the ability to join conversations they were interested in, as well as the ability to socialize, meet new people, and have a sense of community. One participant in Phase 2 commented that: “1) it cut down on the amount of e-mail our team used; 2) I could choose to casually join or leave conversations; 3) there was no immediate pressure to reply to conversations (most of the time); 4) it allowed greater sharing of information - conversations that otherwise would have been hidden were available to “listen to”.

6.3 Ephemeral versus Persistent Conversations

GroupBanter was designed to support ephemeral group conversations that can be broadcast to encourage serendipitous group exchanges. We hypothesized that there would be interest in having short-lived, spontaneous conversations similar to hallway conversations. To our surprise, participants tended to keep conversations open for extended periods of time to allow others to see the discussion and provide input if desired. As a result, the duration of conversations was much longer than we anticipated.

We probed the issues of ephemeral versus persistent conversations in the Phase 2 mid-study interviews and the post-study questionnaire. Although GroupBanter conversations persist until everyone closes the conversation window, two people in Phase 2 had specific IM behaviors that conflicted with this approach and contributed to the extended conversation durations. First, one participant never closed any of his IM windows, he just minimized them so that he could maintain an ongoing transcript with each person he IMed with. A second participant wanted to keep the conversations open in case he needed to access the information later. The remaining participants all commented that they would have preferred that conversations end when they became inactive and be removed from the list. Although the participants were interested in having throw-away conversations (i.e., ones that are not archived) they recognized that some conversations contained valuable information and wanted the option of tagging specific conversations for archiving.

7 Design Suggestions and Challenges

Although user reactions tended to be positive, the results from both studies highlighted several design suggestions, suggesting areas for further investigation.

A key concern raised in Phase 1 was who information should be broadcast to. The population we studied in Phase 1 was a group of loosely connected people; however,

this type of group interaction was of less interest to our participants. They instead wanted to use GroupBanter with close friends and have control over whom conversations were broadcast to. Tools such as GroupBanter may therefore be better suited to closely connected individuals or those with common interests. This was validated in Phase 2 where GroupBanter was valued more by a group of close work colleagues.

Another important design suggestion relates to the degree to which persistence is supported. If tools like GroupBanter are used in the workplace we need to provide an option to archive some conversations. However, our results indicate that users do not want *all* conversations to persist. Instead, users argued for a semi-persistent, asynchronous tool that enables them to share information with their colleagues for a period of time, and archive the information if desired. This would help reduce 'clutter' resulting from having all conversations persist, while ensuring key information is not lost.

The necessity of good (but still lightweight) awareness and notification features was also evident in Phase 2. Several participants commented that they wanted better awareness of updated conversations, the ability to tag conversations, and an unobtrusive invitation mechanism.

8 Concluding Remarks

Our participants actively used group conversations in GroupBanter and wanted to continue using it after the study was over. The field studies demonstrated the utility of GroupBanter in supporting certain types of conversations that aren't well supported with other tools. GroupBanter has advantages of rapidity, interactivity, and informality over email. We also saw benefits over face to face interaction; GroupBanter allows access to what has happened previously in conversations that can be available longer. These advantages suggest that GroupBanter might usefully augment other media and cut down on email.

Our results also demonstrate the value of GroupBanter compared with other IM systems. GroupBanter offers benefits of lurking, awareness of ongoing conversations, and serendipitous exchanges. Although multi-way IM conversations are reported to occur very infrequently, many of our users' expressed interest in seeing conversation information for people on their buddy list. Participants also reported that GroupBanter provided new opportunities for conversations that wouldn't have otherwise have taken place and that in some instances they would be more likely to utilize GroupBanter than an email list for group conversations.

The usage data revealed that users utilized the system to broadcast conversations, as well as to maintain an awareness of, and join conversations. Not surprising, the activity levels varied greatly across users, with some users initiating and actively participating in conversations, while others sat back and preferred to only interact occasionally. In the work context, participants saw direct team benefits - being more aware of conversations, without feeling the need to interact directly.

Our results show the value of ephemeral group conversation awareness provided by GroupBanter. We also gained insights into the types of conversations that GroupBanter supports, which include: not knowing who to direct a question to; not

knowing who is interested in participating in a conversation; needing quick feedback; wanting to have a group conversation; just for fun, and group awareness.

On the issue of persistent versus ephemeral conversations, usage data suggests that users want to allow conversations to persist even after the initial burst of dialog - in case others have anything to add. However, participant feedback also suggests that not all conversations should persist. This argues for a hybrid approach, where ephemeral conversations last long enough for others to provide input, but they eventually disappear, unless someone actively chooses to archive that conversation. Participants also noted that conversations were different with GroupBanter than other media and many participants felt that using GroupBanter made the conversations more useful. Finally, GroupBanter helped increase group awareness, particularly in Phase 2.

We are currently revising our integrated prototype, to incorporate the design suggestions that emerged from this study. We intend to conduct longer term evaluations of GroupBanter and investigate how usage changes over time. In conclusion, despite evaluating an early prototype, we feel that our results provide strong validation for the GroupBanter concept.

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