

# Supporting Appropriation Work with Social Translucence, Collective Sensemaking, and Social Scaffolding

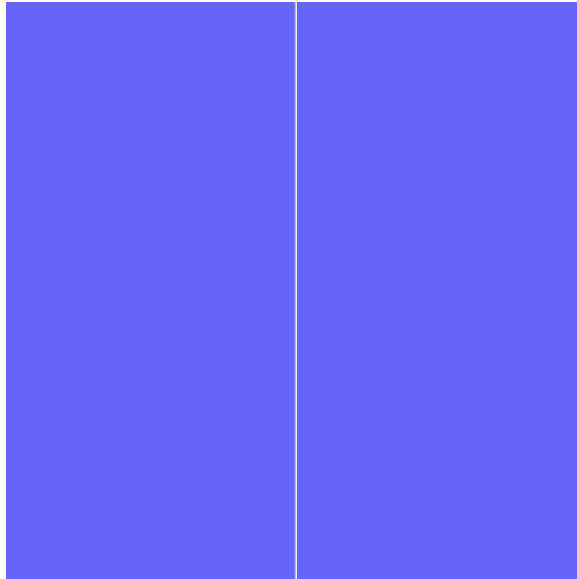
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**Abstract.** How do users come to understand the capabilities of online environments in order to adapt them to their own purposes? We have argued elsewhere that creating socially translucent systems – those that support mutual awareness and accountability by providing perceptual cues about participants’ presence and activities – is a key enabler for the emergence of social behavior and norms. In this paper we analyze three cases in which 1) users engage in collective sensemaking to understand an unfamiliar interface feature (the Babble social proxy), 2) the Babble designers and leader of a community of interest collaborate to provide social scaffolding to help establish healthy norms and practices in an online environment, which in turn allows new practices to emerge; and 3) designers of a broadcast messaging tool make a small interface change that enhances the ability of a population of users to self-regulate and thereby successfully appropriate a new technology. We argue that designing systems to be socially translucent facilitates social interactions like sensemaking and scaffolding that are critical to appropriation work.

## 1 Introduction

For the past several years, the Social Computing Group at IBM’s T.J. Watson Research Center has been designing socially translucent online environments by making cues about presence and activity visible to users. We believe that such systems — by supporting mutual awareness and accountability<sup>1</sup> — will make it easier for people to carry on coherent discussions; to observe and imitate others’ actions; to engage in peer pressure; to create, notice, and conform to social conventions; and to engage in other forms of collective interaction, including sensemaking and scaffolding. We use the phrase “social translucence” as a rubric

<sup>1</sup> Eriksen (2002) provides an interesting discussion of three views of accountability (following Garfinkel’s “everyday” accountability, Suchman’s “located accountability,” and Dourish’s “system accountability”). Accountability with respect to socially translucent systems is closest to Garfinkel’s concept in the sense that making presence and activity visible in the course of everyday (online) activities both enables and demands accountability to others for one’s actions.



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for our approach to designing such systems. “Social,” of course, signals our interest in providing cues that are socially salient. “Translucence” has a more nuanced role: Most evidently, in an implicit contrast to “transparence,” it indicates that our aim is *not* to make all socially salient information visible. Translucence stands in for the notion that, in the physical world, cues are differentially propagated through space — something which, as social creatures, we understand and make use of in governing our interactions. Thus, we know that those across the room may see *that* we are talking, but will be unable to hear *what* we say; and we adjust our interactions to take advantage of this. If we might call this the ‘social characteristics of (physical) space;’ it suggests a design goal of creating similar regularities in the propagation of social cues in online environments (Erickson et al., 2002).

Sensemaking and scaffolding are central activities in which collectivities of people — teams, groups, communities of interest, or societies — engage. Individuals engage in sensemaking to regulate their behavior in the context of groups in which they participate. Groups regulate their behavior in part by establishing interactive norms and conventions. In this paper, we argue that for users to appropriate technology they must both understand its capabilities and have scaffolding mechanisms for collectively discovering, structuring, iterating, and promulgating practices that enable the technology to become what Ackerman et al. have termed a ‘resource’ (Ackerman et al., in preparation). To examine these propositions more concretely, we look at sensemaking and scaffolding in three examples of socially translucent technologies designed to aid people interacting online.

## 2 Group Sensemaking in Babble: The Social Proxy

Babble was designed to serve the communication needs of small to medium-sized corporate groups. It was intended to provide a semi-private online conversation area where members of groups such as teams, work groups, committees, and special purpose task forces could have text-

based synchronous or asynchronous conversations. Figure 1 shows a screenshot of the Babble user interface. In the upper middle pane of the window is a visualization called the social proxy. Its purpose is to provide cues about the presence and activity of those in the current conversation. People in the conversation are shown within the circle; people logged on but in other ‘rooms’ (the list to the right) are positioned outside the circle; and, most importantly, when people are “active” in the conversation, meaning that they either ‘talk’ (type) or ‘listen’ (click and scroll), their dots move to the inner periphery of the circle, and then gradually drift back out to the edge over the course of about 20 minutes.

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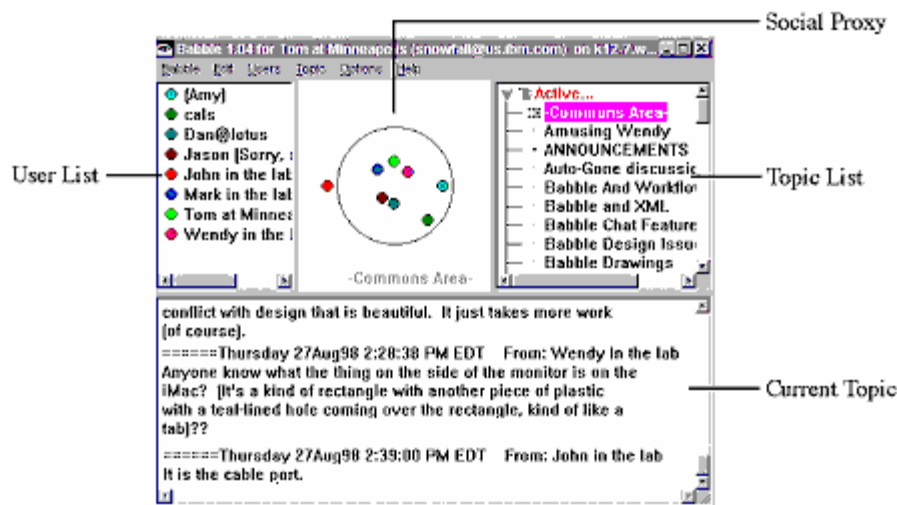


Figure 1. The Babble user interface (cf. Erickson et al., 1999).

Over the course of the last seven years, we have deployed Babbles to a few dozen groups, and conducted a variety of studies of its adoption and use.<sup>1</sup> The social proxy is an unfamiliar element to new users of Babble, but readily attracts attention as people try to figure out what it is and how it works. Often there is one or more experienced Babblers around to answer questions. But in the excerpt shown in Figure 2, all of the users were new to Babble and none knew what the social proxy was for; this evoked the following example of group sensemaking.

Jessica@San Jose Monday 23Jul01 1:13:45 PM EST

what do the circles with different numbers of dots in them mean? (e.g., next to some peoples' names in the personal places?)

dan@chicago Monday 23Jul01 1:13:49 PM EST

i like the round table

Randy@boston Monday 23Jul01 1:14:06 PM EST

We look like dancing M&Ms

dan@chicago Monday 23Jul01 1:14:22 PM EST

if it can show people's icon or picture, ...

Chen@China Monday 23Jul01 1:15:14 PM EST

Are the people outside of the gray circle not in the chat room? For e.g. Ram are u not in the chat room?

<sup>1</sup> For a list of recent publications, see [www.research.ibm.com/SocialComputing/SCGpapers.htm](http://www.research.ibm.com/SocialComputing/SCGpapers.htm).

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Lori@Italy Monday 23Jul01 1:15:33 PM EST

!

Ram@Mountain View Monday 23Jul01 1:15:35 PM EST

Hello, World!

Billy@Atlanta Monday 23Jul01 1:15:46 PM EST

Chen, it looks like they are in a different Babble area

Becki Raven@Armonk Monday 23Jul01 1:15:59 PM EST

The circles move when an individual moves...

Chen@China Monday 23Jul01 1:17:03 PM EST

Becki, you just moved out of the gray circle...what does it mean? Hv you gone to a differnt Babble area?

Mitchell@Toronto Monday 23Jul01 1:17:56 PM EST

When you enter a room/area, your marble will move to the center and you can tell who else is in the area.

William@Mountain View Monday 23Jul01 1:18:12 PM EST

Interesting, is there any significance to the differences in proximity to the center for some dots vs. others? Why are some closer to the middle and some more towards middle/outer radius?

Mitchell@Toronto Monday 23Jul01 1:18:29 PM EST

Hmmm... need more testing to find out!

Susanne@Germany Monday 23Jul01 1:18:46 PM EST

Hi

Billy@Atlanta Monday 23Jul01 1:18:53 PM EST

William, it looks like an activity statement... the longer your idle the further from the center you are.

Caitlin@SanFrancisco Monday 23Jul01 1:19:10 PM EST

perhaps the people who came in recently are further away from the core of the commons area?

William@Mountain View Monday 23Jul01 1:19:20 PM EST

Thanks for the info Bill, I'm going to see if I move in closer as a result of typing this message...

Rhonda@UK Monday 23Jul01 1:19:53 PM EST

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as soon as u send a message u get closer to the center

Figure 2. An excerpt from a Babble as new, untrained users engage in sensemaking to figure out the Babble social proxy or “cookie.” (Note: Names have been changed).

This excerpt is interesting in a number of ways. First, it is remarkable for how distributed and rapid the sensemaking is: 13 people from all over the world make 18 utterances over the course of 6 minutes. The people have never met and have never been in a Babble space. Yet they rapidly converge on the correct interpretation of the social proxy. The persistence of the chat facilitates participants building on each other’s questions and observations. The excerpt also underscores the importance of common ground in allowing sensemaking to take place; everyone sees the same changes in the environment as they and others take action, and they see themselves as others see them — i.e., from a “third person” point of view. When everyone sees the same thing, it creates a coherent basis for conversation. When users get feedback on their own actions by seeing themselves as others will see them, they can more readily understand the relationship between their actions and changes in the visualization, and therefore the meaning of changes in the visualization for other people.

Erickson (2003) outlined six claims for designing visualizations of social activity, based partially on the design and experience of Babble, as follows:

- (1) Everyone sees the same thing; no customization.
- (2) Portray actions, not interpretations.
- (3) Social visualizations should allow deception.
- (4) Support micro/macro readings.
- (5) Ambiguity is useful: suggest rather than inform.
- (6) Use a third-person point of view.

While not all of these claims may be vital to facilitating sensemaking, some of them clearly are, including 1 and 6, as discussed above, and perhaps others. In the next example, we draw on the experiences of a long-running Babble community to look at how seeding the environment with suggested actions created a fertile ground for the emergence of new norms and practices among the users.

### 3 Appropriation Work in Babble: Seeding and Evolving Work Practices through “Social Scaffolding”

Netweavers is a community of interest at IBM consisting of globally distributed participants with an interest in communities, both “real-world” and online. The community has been active for several years as of this writing, and has a dedicated leader. In November, 2000, the leader approached the Social

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Computing Group with a request to start a Babble as one of the ways Netweavers members could interact. The Babble has been active on and off ever since.

By the time the Netweavers Babble was started, we had already deployed and observed other Babbles and had developed a set of recommendations to help groups get started. We called these the “Six Habits of Effective Babblers,” (see Figure 3) and gave them to the leaders of new Babbles (or posted them ourselves in the case of some Babbles in which we were also participants) along with some guidelines for how to get a successful installation off the ground. In the case of Netweavers, the leader was highly motivated and organized, and in addition our posting the “Six Habits,” he posted three other topics: “Things To Do Right Away,” (Figure 4) “Etiquette and Norms,” (Figure 5) and “How to Make a Personal Place” (not shown). In addition, one of the developer/participants created a post called “Creating a Digital Culture,” that shared some of the patterns that other Babble groups had discovered (Figure 6).

### **The “Six Habits of Effective Babblers” Post**

1. TALK! Especially at the beginning, people aren't sure what to say. Be brave! Remember that something doesn't have to be of interest to the entire group to be posted in Babble. After a while you will find that there is benefit in listening in on other group member's conversation, even when they don't concern you directly.
2. BE RESPONSIVE. If someone writes something you like, say so. In Babble it's perfectly OK to write "I agree" or "Thanks" and nothing else.
3. BE SOCIABLE. Although Babble is intended as an environment for work groups, don't hesitate to be sociable. Say "good morning." Chat about the weather, or the headlines. Our experience is that talk breeds talk, and what begins as small talk often turns into work talk.
4. CREATE NEW TOPICS. Don't hesitate to create new topics.
5. BE EXPLICIT. If you'd like people to respond in a particular way, make that explicit: end with a question, or a request.
6. RESPECT THE GROUP'S PRIVACY. Treat Babble as a trusted space, where the group can talk freely and frankly with one another without fear of 'outsiders' overhearing. Thus, do not quote conversations that occur in Babble, either by pasting segments into email, or by verbally passing them on.

Figure 3. The Six Habits of Effective Babblers. Posted by one of the developer/participants in a new Babble community.

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### **The “Things To Do Right Away” Post**

1. Change your marble color step 1 - options menu

step 2 - select marble color  
2. Go to the Commons Area and say hello

Step 1 - Click on Commons Area  
Step 2 - click on the area where you can read the text  
Step 3 - Start typing  
Step 4 - <shift+enter> to send your message

3. Comment on something that has already been written.  
Step 1 - highlight text on which you would like to comment  
Step 2 - start typing  
Step 3 - <shift+enter> to send the message

2. Create your Personal Place  
Step 1- click on Personal Places

Step 2 -Topic menu/ New Topic  
Step 3 - enter your name  
Step 4 - Please tell us a bit about yourself.

Figure 4. Things To Do Right Away. Posted by the community leader, this message asked members who visited Babble for the first time to take some initial steps to become acquainted with the environment.

### The “Etiquette and Norms” Post

! 1. When you arrive, please say hello & check in with the group. This just makes the place nicer for everyone else. This doesn't mean you have to stay and chat. But it's just nice to be real with the people around you. :-)

- ! 2. Please make sure that you read "Thing to do right away."
- ! 3. Please make sure that you have a name that everyone else knows or can link back to

you. It's not okay to be anonymous here. Please...

! 4. Just jump into the conversation. Feel free. What are you working on? What is capturing your attention today? What would you like to see in the future? What's new? If someone could help you, how could they? What's the weather like outside? Are you going to be around today?

! 5. Again, please make a point of at least saying one or two things each time you visit. This could be as simple as "hello" or something about the weather.

! 6. Preferably, comment on something substantial that was mentioned earlier. Of course if nothing substantial was mentioned earlier, your comment could always be the first. ;-)

! 7. Please do not send the Babble application to people. Please do not tell people the port number for the Netweavers Babble.

! 8. Anyone who does work related to community is invited to join Netweavers. People get this information when they join.

! 9. Otherwise, if you enable someone to join Netweavers without them actually going through the registration process, this creates a lot of work tracking the person down and getting them registered. Having a process in place through which people join Netweavers and tell others about themselves is critical to keep some important characteristics of our social capital in place.

Figure 5. Etiquette and Norms. Created and posted by the community leader soon after the Babble had been deployed, except for items 7-9, which were added almost 9 months later.

## The “Developing a Digital Culture” Post

As you use Babble over a longer period of time, you'll find that your group develops a set of customary ways of using Babble. Each group is different, but you may find it useful to try out some of the patterns that work for others.

### THE COMMONS

This is the only usage pattern that is built into Babble. The Commons is intended to be a place where people hang out, and where a lot of casual talk occurs. To keep the amount of text in the Commons manageable, it is archived on a weekly basis.

### GURU'S CORNER

In some Babble installations a topic of this ilk is inhabited by one or more members of the Babble design team, as a way of offering intelligent (hopefully!) online help.

### OFFICES

Babble participants often create topics which serve as their online offices. People set the rules for their own offices, but typically an office is a place where others may leave messages (if the office owner is not online), and where an office owner may post drafts of work for comments, rough notes, their schedule, or do just about anything they wish!

### BAD JOKES

Everyone seems to get a small trickle of jokes over the internet, and this is where they end up in our Babble.

### ANNOUNCEMENTS, etc.

One or more topics devoted to upcoming events, announcements, interesting URLs, or other reference information can be quite useful. The Babble timeline window allows you to see whether people are actually making use of this information...

### PROJECT X

Naturally, there are many topics which are oriented around a project...

Figure 6. Patterns of use in Babble, shared by one of the developer/participants in the Netweavers Babble.

The posts above were all created within couple of months of the Netweavers Babble deployment. What is striking, perhaps, is the amount of effort that the community leader and one of the Babble developer/participants exerted to seed an active, viable community. Our experience as the developers of Babble was that this kind of guidance, as well as leadership and commitment by a core group of users, was essential to establishing a successful Babble deployment. Another thing to note is the social nature of the scaffolding – in one case, the community leader making an explicit request of members new to Babble, and in the other, an experienced Babble user vouching for successful practices and encouraging others to explore and adapt them. The fact that these bits of encouragement or instruction surface in a conversational way reinforces that they are social requests, to be honored voluntarily.

The difficulty of establishing norms in online environments has been well noted in the literature. Danis & Lee (2005) provide a review in the course of reporting on their observations of the emergence of norms in an online chat environment used by summer interns. Notable points include that creating norms is difficult (Mark, 2002); that groups typically will only do the work of

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developing norms with respect to things that really matter to them (Feldman, 1984), and that conflicting views of what appropriate behavior is can impair the social functioning of the group and its ability to establish norms. Jasperson et al. (1999) propose three ‘social appropriation



moves' (conformance, imitation, and mutual discovery) to account for social influence on individual decisions about IT use. In a similar vein, Mark (2002) attributes the failure of a distributed work group she studied to develop norms to several social factors mediated by awareness, such as being able to observe others' behavior, ability to monitor adherence to norms, and ability to apply peer pressure. We note that these are the kinds of awareness and accountability that socially translucent systems are meant to provide and support, respectively.

In the case of Netweavers, whether due to its skilled and organized leadership, to experienced participants leading the way, to a happy accident of a lively set of users, or some of all of the above, the social scaffolding was effective. This group, over time, evolved new Babble practices (albeit often with the participation of the community leader or an experienced participant), including an interview genre, a "best of Babble" topic that collected significant posts in one place, a question board for asking questions of the whole community, and a regularly-scheduled online chat for a leadership affinity group. Figure 7 shows some of the Babble dialogue that discussed the interview genre in a topic called "About Interviews." The discussion here shows that the interview concept is not yet well understood by the group, and normative practices (such as where the text will reside after the "live" interview is over) have not yet stabilized. Figure 8 shows the genesis of an idea for a question board initiated by one of the core participants (emphasis added).

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### The "About Interviews" Posts

Mark the Community Leader Monday 27Nov00 4:04:16 PM EST Interviews are an experiment in ways that we can get to know one another.

Todd Friday 22Dec00 10:40:10 AM EST  
As far as that goes, a couple of thoughts...FWIW.

*I just read your interview (I think it's the only one done so far) with Tom, and I now understand what this process is meant to do. I signed up without really considering what it was I was signing up for - guess I thought it would have more to do with interviewing Babble users to get a sense of what they found useful/interesting, and unuseful/uninteresting about Babble - more researchy type of interview. (I believe this type of interview would still be worth conducting across our membership, from a research perspective).*

*In any case, as I read the interview with Tom I was reminded of my days as a reporter/journalist for the school newspapers (I did this in high school and college and loved it). As I thought about what those interview stories required to get them published, it occurred to me that you may need to have Babble "reporters" identified who do this sort of work as more of a routine assignment, rather than on a hit and miss basis. Don't know whether I'm making sense or not, but that's just a thought.*

Mark the Community Leader Tuesday 26Dec00 9:00:19 AM EST

*Excellent idea, Todd. It would be great if we reached a point where there was someone who was willing to take the lead around doing these interviews on a more regular and long-term basis. (I'd do it myself if I wasn't already doing so many other things here).*

*So, you understand that this has nothing to do with being a Babble user? It's mostly about learning more about each other. This is about the people inside of the company who do community-related work.*

The idea started when Tom and I had a discussion here (see archives) about where we can start to address some of the issues. He felt that we don't yet know each other enough and that it would help to have some activity where we could introduce ourselves a bit more.

Mark the Community Leader Tuesday 14Aug01 7:03:58 AM EST

*I wonder about interviews... here we are, finishing up Carlos' interview and we can still develop the questions as if we are the interviewers... I wonder about the possibility of the interview being integrated into a person's personal place? Would it make sense to relocate an interview there and continue the dialog with the interviewees?*

Mark the Community Leader Tuesday 14Aug01 7:04:12 AM EST

*I'm noting the similarity between interviews and personal places.*

Carlos Tuesday 14Aug01 8:26:59 AM EST

*Responding to: <<the similarity between interviews and personal places>>*

*And I agree with it, actually, more than anything else because it is OUR OWN interview and as such it should be in OUR OWN place... By the way, when is the next interview taking place?*

Figure 7. A community clarifying what is and what is not an interview in a collective experiment to get to know each other better by conducting "live" interviews (online) in front of a "live" (online) audience.

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## **The Genesis of the "Question Board" Idea**

Lloyd @ London Thursday 1Feb01 6:22:03 AM EST

*Hey people - had an idea. Could we use this place to ask questions to anyone in the community..*

*Here's one to start:*

We have a customer coming who requires consultation advice about how to set up knowledge communities in their organisation. Would any of you be prepared to fly over here to meet this customer? (obviously we'll cover costs + provide more info if you are interested) ???

Mark the Community Leader Thursday 1Feb01 9:53:31 AM EST

*Great idea, Lloyd. I was wondering if there might be a place where we could start engaging in some of the work around "building" community. Thinking that a construction zone, or something like that would be a good metaphor. There, we could share methods, info re: tools access, strategy, etc.*

Scott Thursday 1Feb01 10:16:27 AM EST

*Hi Lloyd - yes, it will be interesting to see what shows up here.*

Figure 8. A core participant suggests the need for a new topic, and demonstrates what he has in mind with a particular request of the community. The community leader reinforces and extends the idea, and another participant seconds the idea.

## 4 Large-Scale Sensemaking: IBM Community Tools' Pollcast

The last example is taken from a suite of “broadcast messaging” applications that run within IBM, called IBM Community Tools (ICT). ICT has about 50,000 subscribers globally across the company, from many different organizations and parts of the business. One application, called “Pollcast,” allows subscribers to compose a multiple-choice question and send it out to one of the communities defined within ICT. The poll is received by any members of the target community who are online, and within a minute or two, responses come back and are displayed in the sender’s pollcast window. An example of this is shown in Figure 9.

Two types of sensemaking with respect to Pollcast are interesting from the perspective of the ability of large communities of people to self-regulate. In the initial deployment of Pollcast, a particular pattern of abuse emerged. For example, someone might send out a poll asking “Which do you like best: Pepsi or Coke?” A minute later, someone else would follow this with a poll asking “Do you think

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Figure 9. A poll sent to the “everyone” community.

it’s appropriate to use Pollcast to ask about soft drink preferences?” and so on, leading to a kind of trivia flame fest that in practice could ruin the broadcast capability for everyone. The developers responded to this pattern by disrupting it: they made it mandatory for “This poll is inappropriate” to be added as a response to every poll that was generated (see the last response option in Figure 9).

This was a relatively small interface change, but it had the intended effect of reducing the number of inappropriate polls. It is interesting to speculate why. First, the change made inappropriateness more visible, public and at the same time less disruptive to the community. A poll sender (as well as anyone who responded to the poll) could see in the poll results how many people were annoyed or thought it inappropriate *without* the disruption occasioned by “follow up” polls. Second, making it easier to ‘see’ the degree of inappropriateness clearly opened up the possibility of either policy-based regulation (e.g., “people having more than X inappropriate responses will lose their privileges”), or worse, termination of a useful service if there was too much abuse. The latter possibilities were only ambiguously and subtly represented by the interface change, but were definitely not lost on this population of corporate users.

Experiments in real-time broadcast messaging are new in enterprise environments, and they raise many concerns about whether the benefit gained is worth the potential disruption to a large number of coworkers. This brings us to the second type of sensemaking in Pollcast, which has to do with choosing an appropriate community to which to send your message. Most ICT users send their messages to the “everyone” community, because it is the largest community, and the possible alternative choices are hard to understand, consisting of a list of

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hundreds of communities without any information beyond their (sometimes cryptic) names. Unfortunately, using “everyone” when a more targeted community would do exacerbates the “tragedy of the commons” problem that pits an individual’s interest in getting an answer against the community’s interest in not being excessively pinged. During the summer of 2004, we studied this issue (in part by examining log files to ascertain the level of activity and types of questions in each community and in part by interviewing ICT users and developers) and designed a prototype to give users more information about the activity level, participants, and typical questions of various ICT communities. By making such social information visible, we hoped to better address the tradeoff between getting a swift answer and imposing unnecessarily on the larger community. At least one aspect of the prototype has been implemented as of this writing: ICT communities now show the number of subscribers currently logged on to ICT, giving questioners some idea of the size of the audience to which they are broadcasting (and thus some way to estimate the likelihood of a response).

## 5 Social Translucence and Appropriation

From the dawn of modern computing with “end users” getting their (situated) hands on technology and applications, technology has been “appropriated” and assimilated into activities and work practices. Designers and developers of technology can’t prevent appropriation, nor should they seek to, but they can attempt to make it easier and the possibilities richer – both by creating intentionally malleable software, and, as discussed here, by designing socially translucent software. By creating support online for basic, everyday human activities – sensing who is around and with whom you are interacting, being able to observe others’ behavior, knowing what others can observe about your own behavior, and being able to converse with others under well-understood circumstances – technologists create optimal conditions for appropriation work. Collective sensemaking and social scaffolding are central to the essential

appropriation work of understanding the capabilities of a technology, and negotiating with others as it is adapted for use in particular circumstances. We believe that social translucence – providing perceptible social cues that lead to mutual awareness and accountability – can support these key activities in appropriation work.

## 6 Acknowledgments

Thanks to the members of the Social Computing Group for their inspiration and collaboration.

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