Social Translucence: Designing Social Infrastructures that Make Collective Activity Visible

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INTRODUCTION

We are concerned with designing systems that allow groups to collaborate over computer networks. We are particularly interested in the question of how to design such systems so that they support interactions that are coherent, that enable groups with a shared aim to make progress towards a common goal. It is our experience that such coherent interaction is difficult to achieve in online environments, and thus our work begins with a question: How it is that, in the physical world, we are able to manage our group interactions so gracefully? Our answer is that humans are remarkably skilled at using subtle cues about the presence and activities of others to govern their interactions.

We use a story to illustrate our answer. In the building where our group works there is a door that opens from the stairwell into the hallway. This door has a design flaw: opened quickly, it's likely to slam into anyone entering from the other side. In an attempt at a remedy, a sign was posted: "Open Door Slowly." As you might guess, the sign is not very effective. We like to contrast the 'sign' approach with a solution of a different sort: putting a glass window in the door. The 'glass window' approach is effective for three reasons: First, as humans, we are *perceptually attuned* to movement and human faces and notice them more readily than we notice a sign. Second, once we become *aware* that a person is present, our social rules come into play: I don't open the door quickly because I know that you're on the other side, and I've been raised in a culture that frowns upon slamming things into other people. There is a third reason for the efficacy of the glass window. Even if I haven't been properly acculturated and don't care about harming you, nevertheless, I may still refrain from slamming into you because I know that you know that I know you're there, and therefore I will be held *accountable* for my actions.

This example is unremarkable. Every day we make countless decisions based on being able to see traces of others' activities. We wrap up a talk when the audience starts to fidget; we forego the grocery shopping when we see that the parking lot is jammed; we follow the crowd at the reception, assuming that everyone is headed towards the food. We are also sensitive to the expectations that others develop about our own behavior. Sometimes we may pretend not to notice cues to which we'd prefer not to respond; thus, we have a colleague's strategy for driving in Italy: 'Don't make eye contact.' (Readers interested thorough accounts of the ways in which social cues shape behavior should see the work of sociologists such as Goffman (e.g. [4]), and work in the ethnomethodological tradition such as that by Heath and Luff [5]).

SOCIAL TRANSLUCENCE: A DESIGN APPROACH

We call interactive systems that provide perceptually based social cues which afford awareness and accountability *Socially Translucent Systems* [1, 2]. In such systems we believe it will be easier for users to carry on coherent discussions; to observe and imitate others' actions; to engage in peer pressure; to create, notice, and conform to social conventions. We see social translucence as a fundamental requirement for supporting communication and collaboration.

While socially translucent systems are ubiquitous in the physical world, this is not the case in the digital world. The basic premise of our work is that it is desirable to build digitally based, socially translucent systems, and that such systems can provide traction for our ordinary socially-based processes to operate. In our view, the key properties of such systems are that they provide socially-salient cues which can be interpreted by participants, and that these cues are visible (and known to be visible) to everyone. In this article we describe a socially translucent system which we have designed, and over the last four years, deployed to about two dozen groups. Then we describe a number of prototypes for other socially translucent systems to give an idea of the power and flexibility of the approach.

The Babble System: A Working Example

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. Among the assumptions embodied in Babble were that the groups would be relatively small (less than thirty or forty people), that most participants

would know one another or at least know *of* one another, and that, because participants were identified and situated in an organizational context, there would be considerable pressure to behave responsibly.

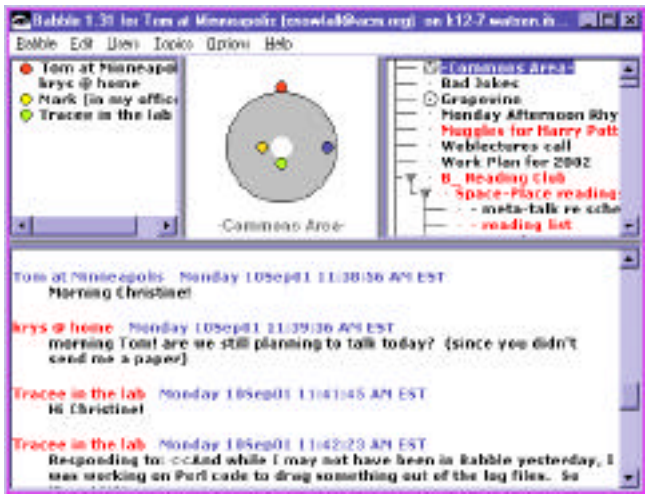

Figure 1. The Babble user interface.

Figure 1 shows a screenshot of the Babble user interface. For our purposes, what is important is the visualization in the upper middle pane of the window. We call this a social proxy, and it is intended to provide cues about the presence and activity of those in the current conversation. The way it works is that people in the conversation are shown within the circle; people logged on but in other conversations (shown in 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 of the course of about 20 minutes. Although simple, the social proxy conveys a lot of information: one can see how many are present; how many appear to be paying attention; whether a crowd is gathering or dispersing; whether someone who has been silent is about to 'speak' (as their dot moves to the center when they begin composing their reply); and so on. Our users report that the Babble social proxy is engaging, and that it creates a sense that others are in the same room.

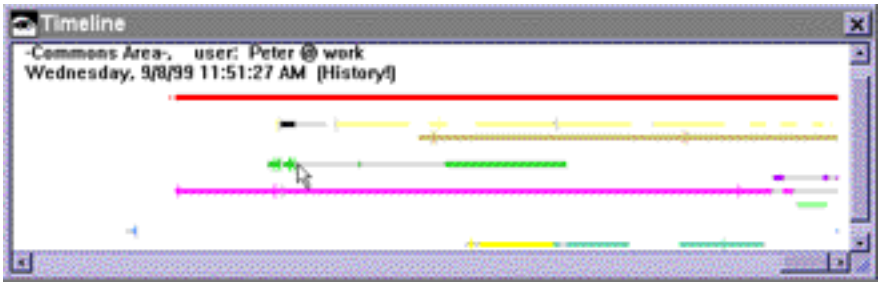

Figure2. The Babble Timeline shows activity over the last week.

Although Babble resembles a synchronous, multi-channel chat system, it is important to note that its conversations persist across sessions. So while users carry on synchronous chat-like conversation, they also carry on conversations whose turns are separated by hours, days or weeks. To support asynchronous conversations like these, we designed a different sort of social proxy called the Timeline (figure 2) [3]. In the Timeline each user 'owns' a row: they leave a trace if they are logged on, and a blip when they speak; if they are in the conversation being viewed, the line or blip is in color, otherwise it's gray. Users report being able to 'read' the timeline to see who was around when, learn where people tend to hang out, and to understand the patterns of the community (e.g. when people tend to show up and depart).

Social Proxies: Visualizing Collective Interaction

We have developed prototypes of social proxies for other online activities. Although these have not been implemented, they give a sense for some of the other roles social proxies might play in supporting collective behavior on the Internet.

Lectures

Imagine an on-line lecture, perhaps delivered via some textual conversation system, but more likely delivered via audio, over, say a conference call and accessed by people using screen phones. The Lecture proxy shown in figure 3 assumes that we have some way of identifying who has spoken. Given that, the positions of the dots reflect a running average of the number or length of comments during the last five minutes. The 'lecturer' starts out on the left, and the members of the audience on the right, and the proxy is dynamically updated. As long as the lecture follows its canonical interaction period, with the lecturer speaking, and the audience being silent, it retains its initial form. However, if a person interrupts with a question or a comment, their dot will move a bit to the left, and if the interruptions continue, that person becomes, quite literally, out of line (as shown in figure 3). The proxy is seen by everyone, and so everyone knows (and knows that everyone knows) what is happening. How the group makes use of this information is up to it; in some cases, perhaps the social proxy will enforce norms about how to behave during a lecture; in other cases, it might be taken as a signal that now is the time to shift to more informal discussion (particularly if others begin to interject their questions).


Figure 3: A lecture proxy

Auctions

It is important to note that social proxies aren't just about conversation — they have the potential for supporting any sort of collective interaction. To illustrate this, let's turn our attention to auctions, an increasingly popular genre of online interaction. In the physical world of face to face interaction, auctions are social events. People gather, inspect the items being offered, and participate in a public bidding process. Participants not only look at what is being auctioned — they also observe who is interested in what, and who bids for what; and they are conscious that their own actions and gazes are watched by others. That is, people not only bid *for* items, they also bid *against* other participants. All this contributes to making auctions intensely social and dramatic experiences, as well as enabling them to function as social mechanisms for computing the value of items, asserting the social or professional status of the bidders, and, of course, actually carrying out transactions. However, when we look at online auctions, the social cues that make their face-to-face counterparts such rich and engaging experiences have vanished. The social proxy shown in figure 4 is an attempt to restore some of these cues. As before, each participant is represented by a colored dot. If they have accessed the auction page within the last 3 minutes, their dot is shown in color; after that, it turns gray. People who only look at what's for sale are shown around the outside of the circle; when people place bids, the move into the circle, and are positioned in a way that shows the relative magnitude of their bids. Thus, the auction proxy reveals how many have shown interest, how many have bid, what the spread of bidding is, and how many people are 'present' and thus, perhaps, candidates for entering the bidding at the last minute.

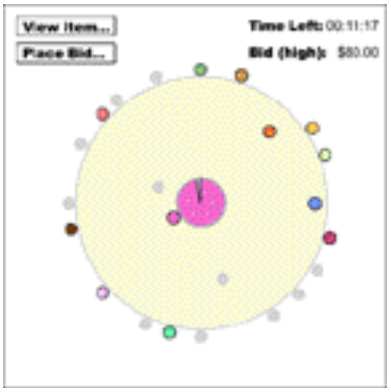

Figure 4. An auction proxy

Lines

Auctions are a special case of commerce-oriented interaction. For a different example of supporting non-conversational interaction, let's turn to perhaps the most ubiquitous hallmark of commerce-oriented interaction: the line. As experienced users of lines we understand a lot about them. We understand the implications of their length; we make estimates of their speed; we mutter when someone with a problem slows the line; we become irritated when others 'cut' in front of us; we feel elation if extra personnel show up to handle a lengthy line. We may decide to postpone a transaction if a line we are in appears to be moving slowly... only to change our minds, perhaps, if we notice that the growth of the line behind us has accelerated. However, when we move into the digital medium, the lines have vanished. But, as anyone who has listened to the 'your call is important to us please remain on the line and your call will be answered in the order in which it was received' message knows, "vanished" doesn't mean that they're gone. They have simply lost all the cues that transform a really annoying experience into a mildly annoying, or very occasionally, a mildly interesting experience. Figure 5 shows another social proxy, which was designed to support online situations where customers are, for example, waiting to chat with a technical support person or a customer representative.

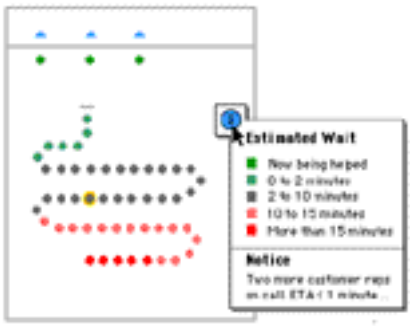

Figure 5. Online lines

CLOSING REMARKS

Both the Babble system, and design prototypes we've described, illustrate our approach of making cues about the presence and activity of others visible. By making these cues visible, and allowing visible traces to accumulate over time, we create a resource that allows people — especially those familiar with the interactive context — to draw inferences about what is happening which can, in turn, shape their own activity. This emphasis on making things visible raises the issue of privacy, and brings us to the issue of translucence. Why socially "translucent" systems? Because we aren't in favor of making all activity visible. Neither privacy nor visibility are inherently good or bad: each supports and inhibits certain types of behavior. For example, the perceived validity of elections depends crucially on keeping certain aspects very private, and others very visible: it is both important that a voter be alone in the voting booth, and that it be visible that the voter is alone (hence the knee length curtain). Privacy and visibility stand in tension with one another, and understanding how to strike an appropriate balance is one of the critical issues in designing to support social interaction.

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