Chapter 4: Designing for collaboration and communication

Overview

- Conversational mechanisms
- Coordination mechanisms
- Awareness mechanisms
- Examples of technologies designed to extend how people
  - talk and socialise
  - work together
  - play and learn together

Conversational mechanisms

- Various mechanisms and ‘rules’ are followed when holding a conversation, e.g. mutual greetings
  
  A: Hi there  
  B: Hi!  
  C: Hi  
  A: All right?  
  C: Good, how’s it going?  
  A: Fine, how are you?  
  C: OK  
  B: So-so. How’s life treating you?

Conversational rules

- Sacks et al. (1978) work on conversation analysis describe three basic rules:
  - Rule 1: the current speaker chooses the next speaker by asking an opinion, question, or request
  - Rule 2: another person decides to start speaking
  - Rule 3: the current speaker continues talking

Conversational rules

- Turn-taking used to coordinate conversation
  - A: Shall we meet at 8?  
  - B: Um, can we meet a bit later?
  - A: Shall we meet at 8?  
  - B: Wow, look at him?
  - A: Yes what a funny hairdo!  
  - B: Um, can we meet a bit later?
- Back channeling to signal to continue and following
  - Uh-uh, umm, ahh

More conversational rules

- farewell rituals
  - Bye then, see you, yer bye, see you later....
- implicit and explicit cues
  - e.g., looking at watch, fidgeting with coat and bags
  - explicitly saying “Oh dear, must go, look at the time, I’m late...”
Breakdowns in conversation

- When someone says something that is misunderstood:
  - Speaker will repeat with emphasis:
    A: "this one?"
    B: "no, I meant that one!"
  - Also use tokens:
    Eh? Quoi? Huh? What?

What happens in technology-mediated conversations?

- Do same conversational rules apply?
- Are there more breakdowns?
- How do people repair them for:
  - Phone?
  - Email?
  - IM?
  - Texting?

Activity: how do the conversations differ for the same game of ZORKI?

Designing technologies to support conversations

- Much research focus has been on how to support conversations when people are 'at a distance' from each other
- Many applications have been developed
  - e.g., email, videoconferencing, videophones, computer conferencing, instant messaging, chatrooms
- Do they mimic or move beyond existing ways of conversing?

VideoWindow system (Bellcore, 1989)

- Shared space that allowed people 50 miles apart to carry on a conversation as if in same room drinking coffee together
- 3 x 8 ft 'picture-window' between two sites with video and audio
- People did interact via the window but strange things happened (Kraut, 1990)

Sketch of VideoWindow
Findings of how VideoWindow System was used

- Talked constantly about the system
- Spoke more to other people in the same room rather than in other room
- When tried to get closer to someone in other place had opposite effect - went out of range of camera and microphone
- No way of monitoring this

3D virtual worlds

- The rooftop garden in BowieWorld
  - Users take part by "dressing up" as an avatar, including penguins and real people
  - Once an avatar has entered a world they can explore it and chat to other avatars

Massive 3D virtual worlds

  - Over 2 million users
- Habbo Hotel (2000)
  - Over 7 million players
  - Massively multiplayer online game
- What kinds of conversation take place in these environments?

Hypermirror (Morikawa and Maesako, 1998)

- allows people to feel as if they are in the same virtual place even though in physically different spaces

Creating personal space in Hypermirror

2) Two in this room are invading the 'virtual' personal space of the other person by appearing to be physically on top of woman in white sweater

3) Two in the room move apart to allow person in other space more 'virtual' personal space

Everyone happy
Synchronous computer-mediated communication

• Conversations are supported in real-time through voice and/or typing
• Examples include video conferencing, VOIP, MUDs and chat
• Benefits include:
  - Not having to physically face people may increase shy people’s confidence
  - Allows people to keep abreast of the goings-on in an organization without having to move from their office
• Problems:
  - Difficult to establish eye contact with images of others
  - People can behave badly when behind the mask of an avatar

Asynchronous computer-mediated communication

• Communication takes place remotely at different times
• Examples include email, newsgroups, texting
• Benefits include:
  - Read any place any time
  - Flexible as to how to deal with it
  - Can make saying things easier
• Problems include:
  - FLAMING!!!
  - Message overload
  - False expectations as to when people will reply

Coordination mechanisms

• When a group of people act or interact together they need to coordinate themselves
  - e.g., playing football, navigating a ship
• They use:
  - verbal and non-verbal communication
  - schedules, rules, and conventions
  - shared external representations

Verbal and non-verbal communication

• Talk is central
• Non-verbal also used to emphasize and as substitute
  - e.g., nods, shakes, winks, glances, gestures and hand-raising
• Formal meetings
  - explicit structures such as agendas, memos, and minutes are employed to coordinate the activity

Schedules, rules and conventions

• Schedules used to organize regular activities in large organizations
• Formal rules, like the writing of monthly reports enable organizations to maintain order and keep track
• Conventions, like keeping quiet in a library, are a form of courtesy to others

Shared external representations

• Common method used to coordinate collaborative activities,
  - e.g., checklists, tables, to-do lists
• They can provide external information on:
  - who is working on what
  - When it is being worked on
  - where it is being worked on
  - when a piece of work is supposed to be finished
  - whom it goes to next
Collaborative technologies to support coordination

• There are a variety of software tools designed to support scheduling, planning and coordinating
  – e.g., group calendars, electronic schedulers, project management tools, and workflow tools
• Need to get balance between human and system control
  – too much system control and the users will rebel
  – too little control and the system breaks down

Awareness mechanisms

• Involves knowing who is around, what is happening, and who is talking with whom
• Peripheral awareness
  – keeping an eye on things happening in the periphery of vision
  – Overhearing and overseeing - allows tracking of what others are doing without explicit cues

Designing technologies to support awareness

• Provide awareness of others who are in different locations
  Early example was media spaces
  "extend the world of desks, chairs, walls and ceilings" (Harrison et al, 1997)
• Examples: Clearboard and Portholes

A shared external coordination representation

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Lo tech awareness mechanism

Portholes (Xerox PARC)

Regularly updated digitized images of people in their offices appeared on everyone’s desktop machines throughout day and night.
Clearboard (Ishii et al, 1993)

- Transparent board that shows other person's facial expression on your board as you draw

Notification systems

- Users notify others as opposed to being constantly monitored
- Provide information about shared objects and progress of collaborative tasks
  
  - examples: Tickertape, Babble

Elvin

- Elvin is a distributed awareness system that provides a range of client services (Segall and Arnold, 1997)
- It includes Tickertape, one of the first lightweight messaging systems

Babble (IBM, Erickson et al, 1999)

Circle with marbles represents people taking part in conversation in a chatroom

Those in the middle are doing the most chatting
Those towards the outside are less active in the conversation

Key points

- Social mechanisms, like turn-taking, conventions, etc., enable us to collaborate and coordinate our activities
- Keeping aware of what others are doing and letting others know what you are doing are important aspects of collaborative working and socialising
- Many collaborative technologies systems have been built to support collaboration