Human Computer Systems

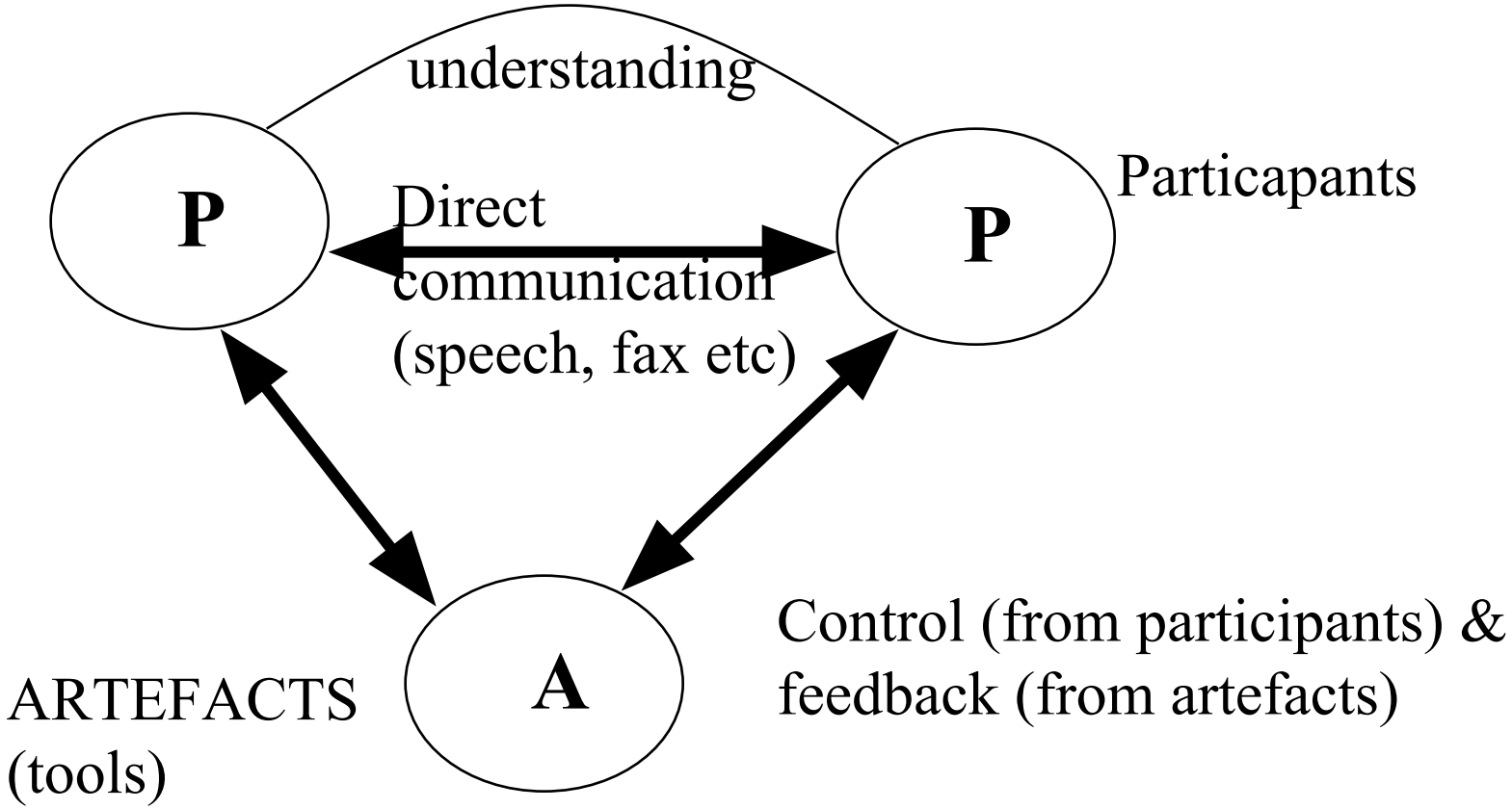
CSCW and Social Aspects

Computer Supported Cooperative Work (CSCW)

- About groups of users, not individuals
- how to design systems to support their work as a group
- how to understand the effect of technology on their work patterns
- HCI → psychology - computing
- CSCW → sociology - computing

Groupware

- Computer systems to support groups



Groupware

- Can classify groupware by function:
  - Computer-mediated communication
  - Meeting & Decision support
  - Shared applications & artefacts

Computer-mediated communication

- Email & bulletin boards
- structured message systems
- video conferencing & communication
- virtual collaborative environments

Computer-mediated communication

- Email & bulletin boards
  - stages in sending email
    - Preparation, dispatch, delivery, notification, Read
  - distribution list - controlled by admin or user
  - bulletin board systems, electronic conferencing systems - address message to a conference or newsgroup
  - speed - can take a few seconds (LAN) to several hours (overseas)
  - some systems allow a form of synchronous text-based communication, where several participants can instantly see each other's contributions

Structured Message Systems

- Common problem with email is **overload** for recipient (particularly if lots of distribution list messages)
- structured message systems developed to deal with this overload
  - e.g. Information Lens - filters to sort items into different categories (importance/subject)
  - as well as normal e-mail fields, has more domain specific fields
  - user chooses message type (eg conference - time, place, speaker, title) template
  - more like database record than normal e-mail
  - problem is extra burden on sender - recipient gains

Structured Message Systems

- More complex systems based on models of **conversation** e.g. sent message requesting information - must reply using “informative reply” or “don’t know” type of message
- debate about how much should be imposed on the user and how flexible systems should be
- more modern systems are “user-structured” developed from the bulletin board concept (more like shared hypertext) - links & cross references to sub-conferences and digressions, to annotate each other’s messages and post follow-on messages eg **Amsterdam Conversation Environment**

video conferencing & communication

- Video phones available for > 15 years
- Video has now become affordable
- Recent video compression techniques allow reasonable quality video

Virtual collaborative environments

- Virtual reality is being used to allow participants to meet within a virtual world
- each participant has a view of the virtual world using desktop/immersive VR
- other participants may appear as cube-based figures with images fixed on them (embodiment)
- Still research systems primarily, but can visit some ‘virtual places’ on the web - MUDs (multi user domains) - your image becomes your embodiment & other visitors likewise - can bump into people, have text conversations and even audio conversations
- See 2nd Life

Meeting & Decision Support Systems

- 1. Augmentation tools
  - methods of recording decisions & arguments leading to decisions
  - normally hypertext-like structures
  - often can be used by several designers simultaneously (needs concurrency control)

- Issue-based information systems (IBIS) eg gIBIS has node types including ‘issues’, ‘positions’, and ‘arguments’ linked together by relationships such as ‘argument support position’

Meeting & Decision Support Systems

- 2. Meeting Rooms
  - specially constructed rooms, with computer equipment designed to support face-to-face meetings eg ZEROX PARC's lab
- 3. Shared Work Surfaces
  - eg electronic whiteboard - shared between users

Shared Applications & Artefacts

- Sharing in participant's work domain itself eg computers, applications, documents
- **Shared PCs** and shared window systems
  - shared window systems to allow ordinary applications to focus on cooperative work
  - 2 or more PCs which function as if they were one - anything typed on one PC appears on the others
  - 2 main uses - focus on shared documents, technical help
- **Shared Editors**
  - editor which is collaboration aware - ie it knows it is being shared
- **Co-authoring Systems**
  - may include periods of shared editing but this is only one of its activities - shared plans, drafts, collaborative writing etc eg quilt - users are assigned roles, - author, commentator, reader etc
- **Shared Diaries**
  - each person uses a shared diary, similar to pocket organiser

Social aspects of HCI

Reference: Chapter 4 : Interaction Design – beyond HCI, Preece, Rogers and Sharp

Social Aspects

- Conversation with others
- Awareness of others
- How to support people to be able to:
  - talk and socialise
  - work together
  - play and learn together

Conversation with others

- Various mechanisms and ‘rules’ we follow to hold a conversation
  - 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

- turn-taking 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?
  - Phone?
  - Email?
  - Instant messaging
  - SMS texting?

Design implications

- How to support conversations when people are ‘at a distance’ from each other
- Many applications have been developed
  - Email, videoconferencing, videophones, computer conferencing, instant messaging, chatrooms, collaborative virtual environments, media spaces
- How effective are they?
- Do they mimic or extend existing ways of conversing?

Synchronous computer-mediated communication

- Conversations are supported in real-time through voice and/or typing
- Examples include video conferencing and chatrooms
- Benefits
  - Can keep more informed of what is going on
  - Video conferencing allows everyone to see each other providing some support for non-verbal communication
  - Chatrooms can provide a forum for shy people to talk more
- Problems:
  - Video lacks bandwidth so judders and lots of shadows
  - Difficult to establish eye contact with images of others
  - People can behave badly when behind the mask of an avatar

Will video be a success using mobile phones?

- Will the judder, sudden jerks and shadows disappear?
- Will it be possible to establish eye contact and read lips on such a small image?
- Will people find it socially acceptable to talk to an image of someone in the palm of their hands?

The VP-210" VisualPhone: a mobile video phone developed by the japanese company Kyocera Corporation
Source: http://www.kyocera.co.jp/news/1999/9905/0003-e.asp

Asynchronous communication

- Communication takes place remotely at different times
- Email, newsgroups, computer conferencing
- Benefits include:
  - Read any place any time
  - Flexible as to how to deal with it
  - Powerful, can send to many people
  - Can make saying things easier
- Problems include:
  - FLAMING!!!
  - Spamming
  - Message overload
  - False expectations as to when people will reply

New communication technologies

- Move beyond trying to support face-to-face communication
- Provide novel ways of interacting and talking

- Examples include:
  - SMS texting via mobile phones
  - Online chatting in chatrooms
  - Collaborative virtual environments
  - Media spaces

Collaborative virtual environments

The rooftop garden in BowieWorld, a Collaborative Virtual environment (CVE), supported by Worlds.com. Users take part by "dressing up" as an avatar. There are 100s of avatars to choose from, including penguins and real persons. Once an avatar has entered a world they can explore it and chat to other avatars.

Source: www.worlds.com/bowie

VideoWindow system (Bellcore, 1989)

- a 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)

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

Hypermirror (Morikawa and Maesako, 1998)

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

People in different places are superimposed on the same screen to make them appear as if in same space

(woman in white sweater is in a different room to the other three)

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 them

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

Everyone happy

Awareness of others

- 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 greater awareness

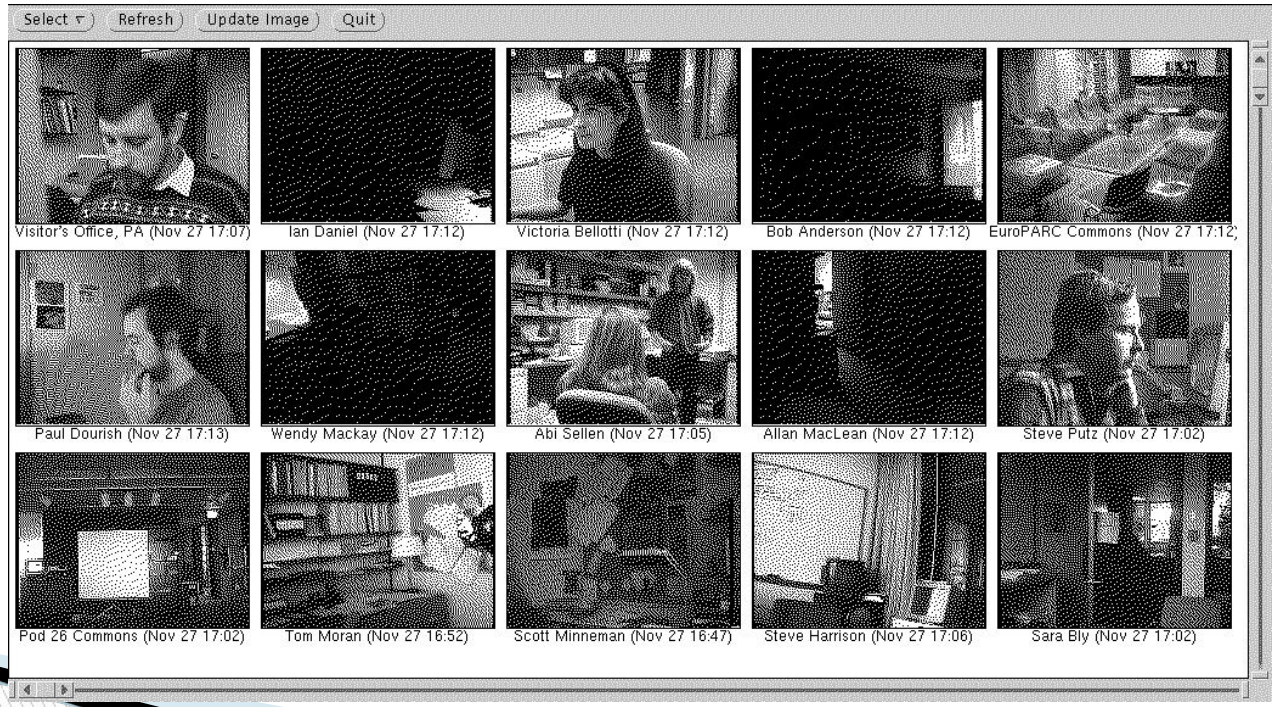
- Provide awareness of others who are in different locations
- Media spaces - “extend the world of desks, chairs, walls and ceilings” (Harrison et al, 1997)
  - Examples: Clearboard, Portholes and Cruiser

Clearboard (Ishii et al, 1993)

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

Portholes (Xerox PARC)

Regularly updated digitized images of people in their offices appeared on everyone's desktop machines throughout day and night



Notification systems

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

Tickertape (Segall and Arnold, 1997)

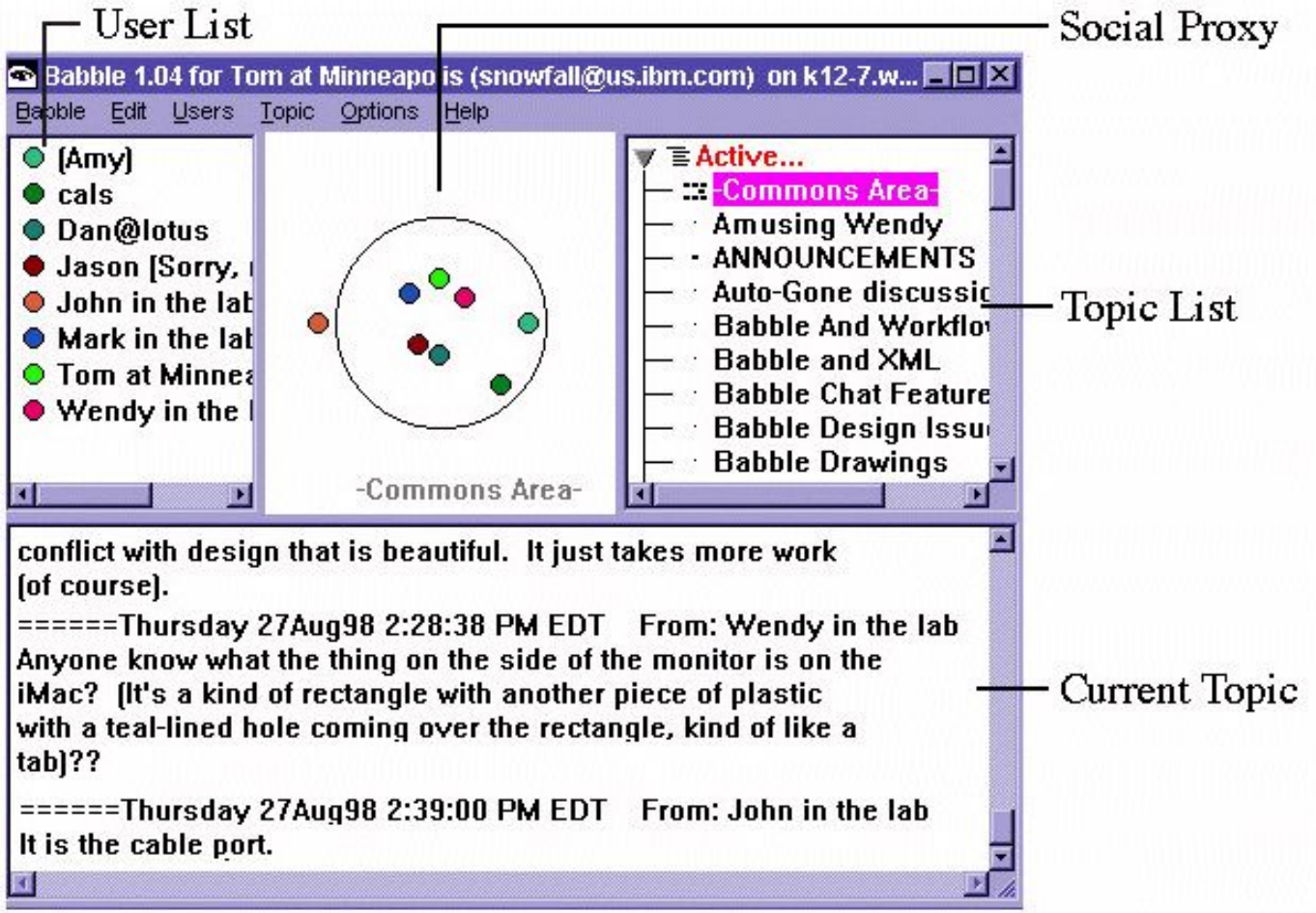
- Tickertape is a scrolling one-line window, going from left to right
- Group name, sender's name and text message

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 (groupware or CSCW) systems have been built to support collaboration, especially communication and awareness