Collaboration And Designing Interfaces

Groupware and CSCW
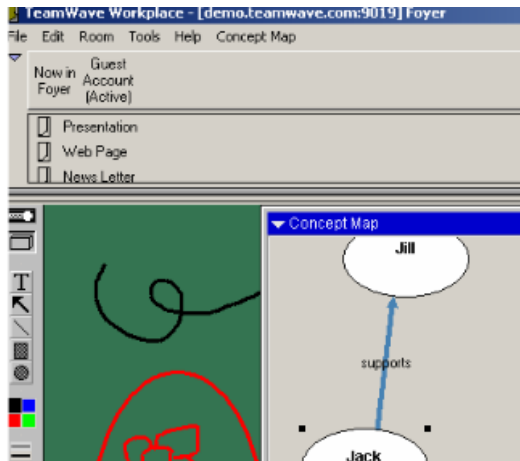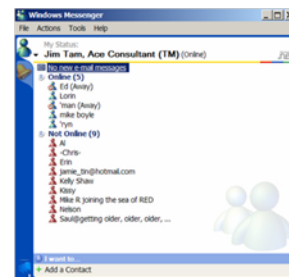
Categories of interaction

Groupware heuristics

Groupware

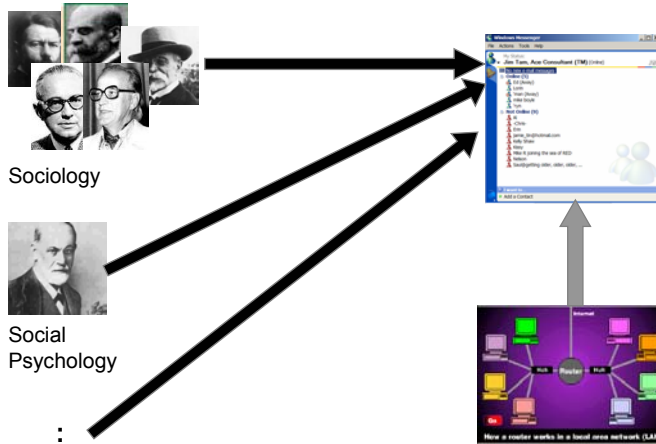•**Software that supports group processes**

The TeamWave Workplace © Sonexis Inc.

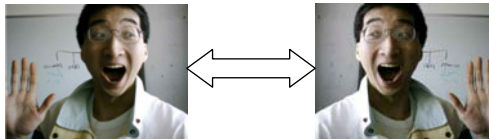Instant messenger © Microsoft

Computer-Supported Cooperative Work

- The theoretical principles for designing and evaluating groupware
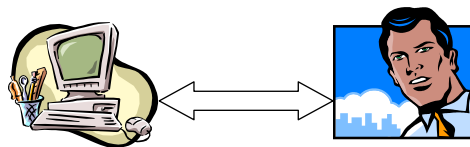- Examine how groups work and how technology can be used to facilitate this work

Sociology

Social
Psychology

:

Focus Of Groupware And CSCW

Facilitating human-human interaction

**…in contrast to HCI which is about
facilitating human-computer interaction**

Categories Of Interactions: Real World

	Same time	Different times
Same place	Traditional classroom setting	Refrigerator magnets, sticky notes
Different place	Telephone	Traditional mail system

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Categories Of Interactions: Computer World[1]

	Same time	Different times
Same place	Single display groupware	Project scheduling, coordination tools
Different place	Instant messaging Online communities Shared editors	Email, Newsgroups

1 Ellis C.A., Gibbs S.J. and Rein G.L. (1990) "Groupware: Some issues and experiences", Communications of the ACM 34(1).

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Same Place, Same Time

Shared display with a single presenter
- e.g., presentation tools: PowerPoint, Lotus Freelance, Adobe Persuasion

Audience response units
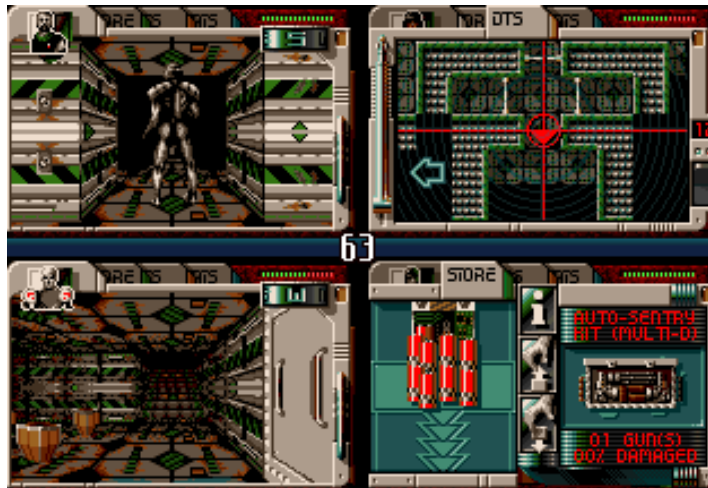- e.g., Votes in government forums, talk shows

Single display groupware

Same Place, Same Time (2)

Single display groupware: separate up the space

Same Place, Same Time (3)

Single display groupware: All collaborators working in the same space may result in new issues.

• e.g., menu selection

Traditional opaque menu

Don't click here
Don't click here
Don't click here
Click here

Translucent menu

Don't click here
Don't click here
Don't click here
Click here

Different Place, Same Time

Some the challenges involve awareness of the environment and other people

• Who is around?
• What are they doing?
• Where are they?

Different Place, Different Time

Some issues:
- The accumulation of information over time may result in the need for some sort of structure i.e., simply accumulating information about everything is typically not a solution.
- The sparseness of the medium used by the current tools e.g., email

Why Evaluating Groupware Systems Is Difficult

Existing techniques used to evaluate single user systems are difficult to apply to groupware
- Lab observation and studies
- Field studies
- Inspection techniques (e.g., usability heuristics)

No agreed upon measures for success
- e.g., Email: success or failure?

Heuristics For Groupware

1. **Provide the means for intentional and appropriate verbal communication**
2. **Provide the means for intentional and appropriate gestural communication**
3. **Provide consequential communication of an individual's embodiment**
4. **Provide artifact feedthrough**
5. **Provide protection**
6. **Manage the transitions between tightly and loosely-coupled collaboration**
7. **Allow people to coordinate their actions**
8. **Facilitate finding coordinators and establishing contact**

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1. Provide The Means For Intentional And Appropriate Verbal Communication

•**Verbal communication is the most prevalent form of communication in face-to-face settings.**

•**In the past it has often been assumed that any necessary conversation is provided outside of the groupware**

•**Typical groupware support:**
  - Text chat
  - Audio channels
  - Video channels

2. Provide The Means For Intentional And Appropriate Gestural Communication

- **May play an important role in collaborative work and can take on many forms:**
    1. Illustrations – verbal speech supplemented with gestures.
    2. Emblems – substituting gestures for verbal communications
    3. Deictic references – referring to objects through a combination of words and gestures
- **Support for gestures can be simple (e.g., clearly distinguishable pointers) but should not be done in isolation from the other heuristics.**
- **Typical groupware support involves some of form embodiment for each collaborator**
    - Telepointers
    - Avatars
    - Video

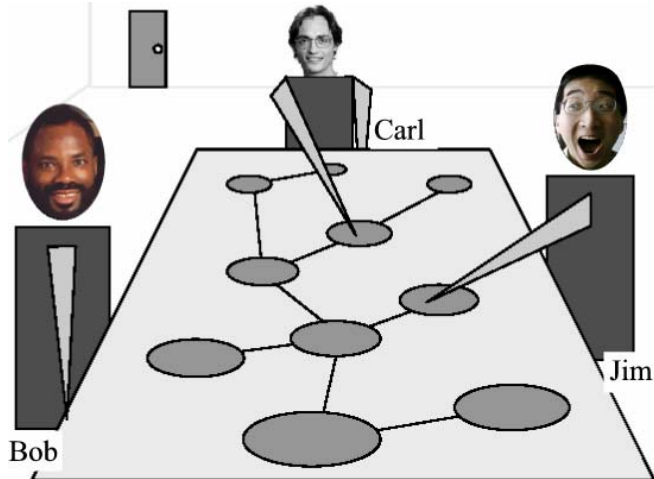# Techniques For Embodiment: Telepointers

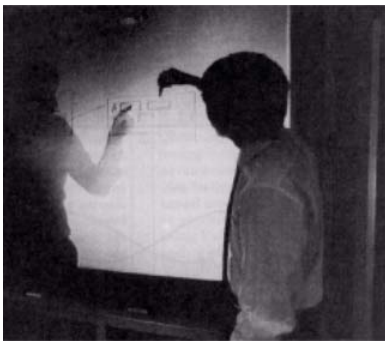**Color**

Abstract

Larry   Moe   Curly

Portrait

Techniques For Embodiment: Avatars

•**Originate in virtual reality software and games**
•**The form of embodiment looks like a physical body**

Techniques For Embodiment: Video

VideoWhiteboard (Tang and Minneman 1991)   Ishii's Clearboard (Ishii et al 1992)

3. Provide Consequential Communication Of An Individual's Embodiment

- **Physical actions and positions that a person automatically (unintentional) gives off that may be picked up by others.**
  - Who
  - What
  - Where
- **Categories:**
  - Actions coupled with the workspace e.g., gaze, motion of the person's embodiment
  - Actions coupled with the conversation e.g., body language
- **Typical groupware support**
  - Capturing and transmitting explicit and subtle gestural information e.g., avatars but this is more difficult than with intentional gestures.

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4. Provide Artifact Feedthrough

•**Objects in the physical work naturally provide visual and acoustic cues.**

•**These cues allow others to see and hear what are others are doing to it.**

4. __Provide Artifact Feedthrough (2)__

- **In the virtual computer work, small quick actions may be easily missed.**
- **Typical groupware support:**
  - Provide information about intermediate states rather than just the end result.
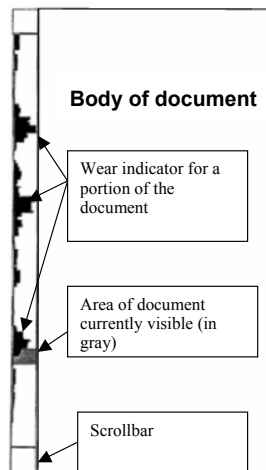 - Exaggerate the representation of physical events e.g., supernova[2]

| Frame 1 | Frame 2 | Frame 3 | Frame 4 |
| Frame 5 | Frame 6 | Frame 7 | Frame 8 |
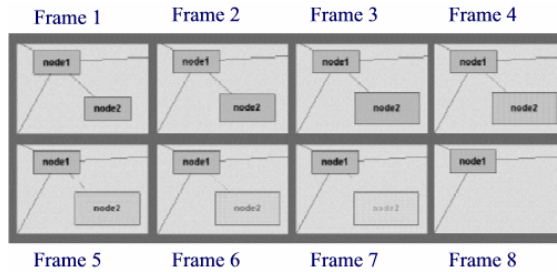
2 Gutwin C (1997) "Workspace awareness in real-time distributed groupware"

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4. __Provide Artifact Feedthrough (3)__

- Visually represent the usage history of objects e.g., readware/editware[3]

Body of document

Wear indicator for a portion of the document

Area of document currently visible (in gray)

Scrollbar

Hill W., Holan J., Wroblewski D. and McCandless T (1991) Edit Wear and Read Wear.

5. Provide Protection

•**When collaborators have a good sense of what is going on in the workspace people will typically employ social protocols for mediating their interactions e.g., turn taking**

5. Provide Protection (2)

Typical groupware support:
  • Many systems allow all collaborators full access to all objects and awareness cues (e.g., what others are doing) are provided by the system – people must rely on social protocols
  • In situations where this not sufficient electronic measures may be used
    - Access control
    - Version control
    - Turn taking
    - :   :

6. Management Of Tightly And Loosely-Coupled Collaboration

•**In the physical world people continually shift back and forth between loosely and tightly coupled collaborations.**

Tight coupling

Loosely coupled

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6. Management Of Tightly And Loosely-Coupled Collaboration (2)

•**Typical groupware support:**
- •Helping others out with their work is an integral part of collaborations.
- •Assistance may result from formal requests for help
- •Assistance may also be opportunistic and informal
- •Groupware support of coupling involves the providing of awareness cues.

6. Management Of Tightly And Loosely-Coupled Collaboration: WYSIWIS Approach

GroupDraw[4]
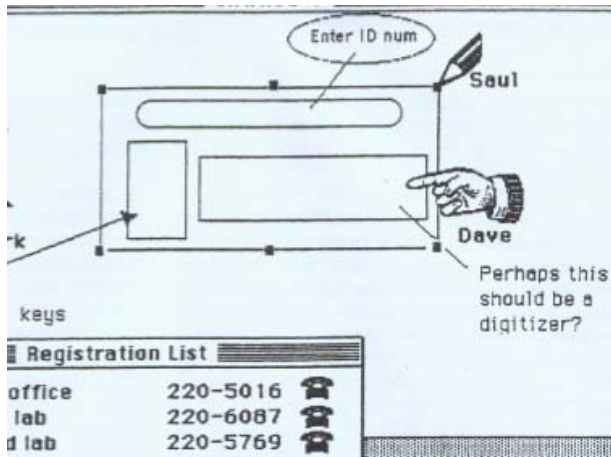
Greenberg S., Bohnet R., Roseman M., and Webster D. (1992). GroupSketch.

6. Management Of Tightly And Loosely-Coupled Collaboration: TeamWave (Fisheye-Text)

• Groupware support of coupling involves the providing of awareness cues.

6. Management Of Tightly And Loosely-Coupled Collaboration: Radar View
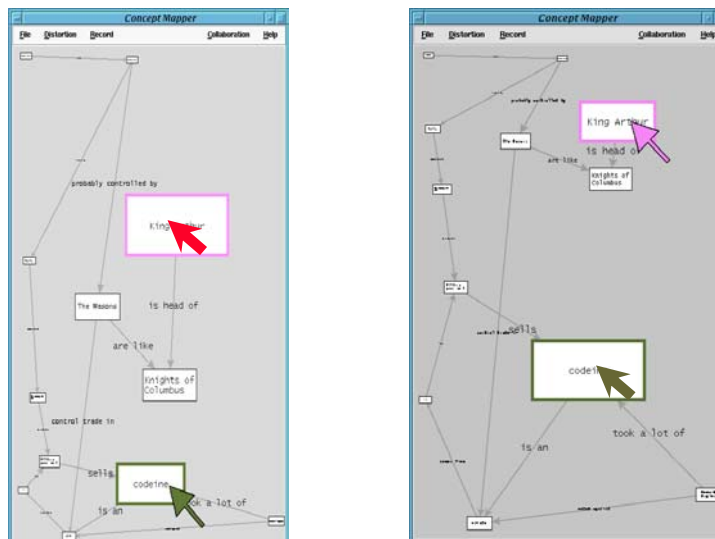
• Groupware support of coupling involves the providing of awareness cues.
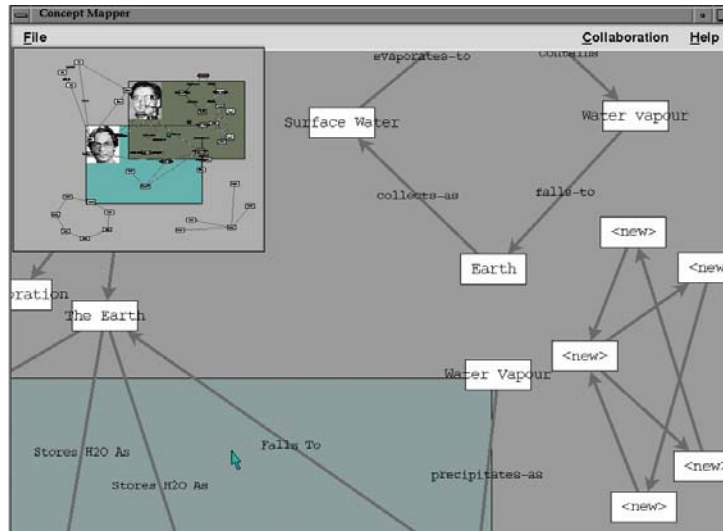
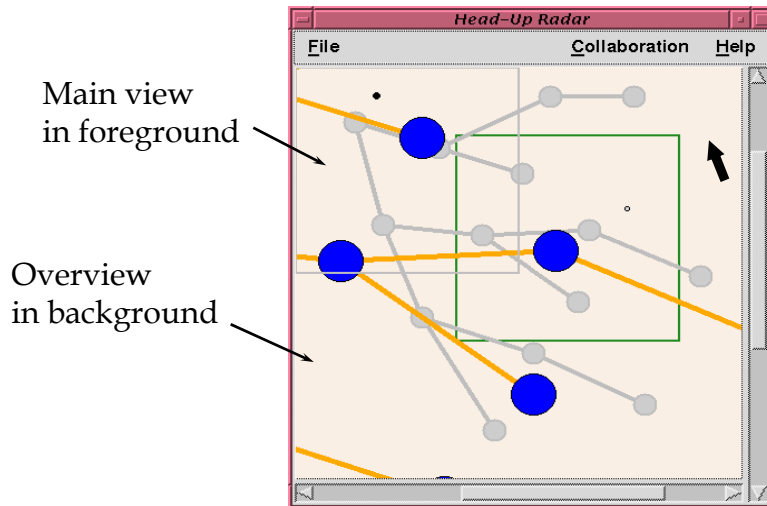# 6. Management Of Tightly And Loosely-Coupled Collaboration: Hyperbolic View

• Groupware support of coupling involves the providing of awareness cues.

6. Management Of Tightly And Loosely-Coupled Collaboration: Heads-Up Radar

• Groupware support of coupling involves the providing of awareness cues.

Head–Up Radar

Main view in foreground

Overview in background

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7. Allow People To Coordinate Their Actions

• **An important part of face-to-face collaboration is being able to mediate interactions by turn taking and negotiating the sharing the workspace.**

• **Typical groupware support:**
  • People are generally skilled at coordinating their interactions with other collaborators
  • Tools that support collaboration tend to focus on providing awareness of others and the workspace rather than trying to dictate how people should interact.
  • It includes the visual techniques described in heuristic #2 - #5 combined with the ability to communicate verbally (heuristic #1).

8. Facilitate Finding Collaborators And Establishing Contact

•**Getting together for meetings can be a formal process (e.g., sending out letters) or it can be informal and impromptu (e.g., you happen to run into someone).**

•**Many successful teams rely on informal and unplanned contact.**

•**In electronic communities collaborators are often distributed and setting up meetings is awkward**
  • e.g., need to determine who to contact, how to contact these people, specialized equipment must be set up etc.

8. Facilitate Finding Collaborators And Establishing Contact (2)

•**Typical groupware support:**
  • Provide awareness cues of who is around and their availability
  • Allow for the establishing of contact in a light-weight fashion.

Instant Messenger © Microsoft

8. Facilitate Finding Collaborators And Establishing Contact: TeamRooms

Room occupants

Shared whiteboard Applets

List of rooms

List of users

chat tool

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8. Facilitate Finding Collaborators And Establishing Contact: TeamRooms (2)

TeamRooms groupware support:
- Being available
- Knowing who is around and available for interaction
- Establishing contact
- Working together

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You Now Know

- **What is groupware and CSCW and how they are related.**
- **What are the different categories of interaction and some of the issues associated with each category.**
- **The set of heuristics for groupware**
  1. Provide the means for intentional and appropriate verbal communication
  2. Provide the means for intentional and appropriate gestural communication
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