Introduction to CSCW and Groupware

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Outline

• Two articles on CSCW
• What is CSCW and groupware and their relation to CSCL
• Historical development
• Basic problems addressed
• Research areas and concepts
• Components of groupware
Two seminal articles on CSCW


What is CSCW?

- CSCW: Computer Supported Cooperative Work is a term introduced by Irene Greif and Paul Cashman in 1984, meaning:
  - “A set of concerns about supporting multiple individuals working together with computer systems”
- Can be divided into two main areas, associated with 1) CS and 2) CW, respectively
- The series of CSCW conferences started in 1986, it has since alternated between USA (even years) and Europe (odd years)
- By many thought of as a “spin off” from HCI
The move from HCI to CSCW

- Whereas HCI is concerned about supporting individuals, CSCW is concerned about facilitating co-located and distributed groups.

**HCI (human-computer interaction)**
From problem solving to cooperation

- The “spin off” of CSCW from HCI was phrased by Ellis et al, something like this:
- Whereas HCI was concerned about using the computer to solve problems, CSCW is concerned about using the computer to mediate human interaction.
Relationship of CSCL to HCI and CSCW
(can probably be improved)
What is groupware?

- Associated with the CS part of CSCW
- The term groupware was first used in 1982 in a paper by Johnson-Lentz in context of computer-mediated communicating (CMC)
- Defined by Ellis et al. as: “computer-based systems that support groups of people engaged in a common task (or goal) and that provide an interface to a shared environment”
- This creates a need for concepts to describe the various aspects of groupware, e.g. common task/goal, interface to a shared environment, etc.
Components of groupware

- Common task / goal
- Interface to a shared environment
- In addition, because there are more than two users, we also need to be concerned about
  - Communication support
  - Division of labor, role assignment
  - Support for joint design of a common artifact
  - Awareness of the other users who are interacting within the shared environment (in distributed settings)
Shared environment

- Also referred to as “common information space” (Bannon & Bødker, 1997), or “shared space” in KP-Lab project (IME takes part)
- Multiple ways to design them
  - Extending a single user environment to a multi user environment (technology-driven approach)
  - Identifying a collaborative situation that is currently unsupported by technology (empirical-based approach)
  - Basing the design on theories, models or design principles originating in fields outside of software design (e.g., communication, social sciences) (theory-based approach)
Questions for discussion

- Do you know of groupware or other systems that have been developed according to one or more of the above approaches?
- What other approaches to design do you now of, or could you think of that are not falling into any of the three approaches just described?
Early examples of groupware

• Ellis et al identifies the following type of groupware (1991)
  – Message systems (e.g. email)
  – Multi-user editors (e.g. Grove for collaborative text editing)
  – Group decision support systems (e.g. discussion forums)
  – Video conferencing systems (e.g. Marratech)
  – Intelligent information sharing systems (Information Lens)
  – Workflow coordination systems (The Coordinator)
  – Others ...
3 type of sessions with Grove

• Face-to-face (F2)
  – Two or more people sitting in front of same workstation of with individual workstations in same room

• Distributed
  – Working together at a distance

• Mixed-mode
  – Combining F2F and distributed modes of interaction
Contemporary groupware

What are examples of groupware in use today, not mentioned by Ellis et al., and making use of one or more of the types of sessions (interaction modes)

- 1:
- 2:
- 3:
What is group work?

- Related to the **CW** part of CSCW
- Jonathan Grudin suggests the following:
  - Small group usually consisting of 2-3 people who works together to reach a common goal
  - There are also larger groups, but they are less efficient when supported by technology
- Why do you think groupware works best in small groups?
- Any counter examples you know of?
Historical development of ICT and organization according to research
Basic concepts in CSCW

• Ellis et al. suggest the following three concepts are basic for CSCW research and groupware design:
  – Communication
  – Coordination
  – Collaboration (sometimes divided into:)
    • Cooperation (default in CSCW)
    • Collaboration (default in CSCL)
Supporting communication

- Groupware can be divided into two types depending on the kind of interaction it supports:
  - Synchronous communication (real time)
  - Asynchronous communication (indirect)
Synchronous communication

• Advantages
  – Good support for awareness of others (modeling F2F)
  – Appropriate for many kinds of situations resembling F2F

• Disadvantages
  – Complexity of developing from scratch technology to support this form of communication can outweigh its advantages
  – Work that require high amount of individual concentration (i.e. time consuming individual work) is not well supported (e.g. collaborative writing a paper)
Asynchronous communication

- **Advantages**
  - Allows time for individual reflection before making a next move while interacting (over time) with others
  - Good for tasks that naturally lend themselves to clear division of labor

- **Disadvantages**
  - Social interaction is minimal (in its F2F form)
  - Motivation to work together over an extended period of time may be lower and requiring incentives to work
Modeling F2F vs. going “beyond being there”

• In recent years some researches have questioned the prevailing F2F metaphor of CSCW
• They instead ask how can we extend “beyond being there”
• They suggest we need new metaphors for communication and cooperation that builds on and extends the strengths of of groupware (e.g. paper by Jim Hollan et al.)
Time/place matrix

From Ellis et al, 1991

<table>
<thead>
<tr>
<th></th>
<th>Same Time</th>
<th>Different Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same Place</td>
<td>face-to-face interaction</td>
<td>asynchronous interaction</td>
</tr>
<tr>
<td>Different Places</td>
<td>synchronous distributed interaction</td>
<td>asynchronous distributed interaction</td>
</tr>
</tbody>
</table>
Time/place matrix with examples

- **Face to face interactions**
  - decision rooms, single display
  - groupware, shared table, wall displays, roomware, ...

- **Continuous task**
  - team rooms, large public display,
  - shift work groupware, project management, ...

- **Remote interactions**
  - video conferencing, instance messaging, chats/MUDs/virtual worlds, shared screens, multi-user editors, ...

- **Communication + coordination**
  - email, bulletin boards, blogs,
  - asynchronous conferencing, group calendars, workflow, version control, wikis, ...

URL: http://en.wikipedia.org/wiki/CSCW
Extended T/P matrix for CSCL

- It is common in CSCL to use groupware as the “CS” component.
- What additional dimensions would be necessary or recommended to add to the time/place matrix in order to be able to better account for the factors that emerge in educational contexts (e.g. classrooms, learning when working)?
- Think first about what features of the groupware would have to be added to say this is educational technology and not merely a groupware for human communication.