Issues in 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 articles on CSCW

What is CSCW?

- **CSCW**: Computer Supported Cooperative Work
- 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
Illustrating the situation

- HCI is one of the precursors to CSCW and was concerned about supporting the work of individuals using interactive systems.

HCI (Human Computer Interaction)

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Relationship between HCI, CSCW and CSCL and other fields

- computer science
- cognitive science
- distributed systems
- HCI
- distributed cognition
- AI
- office info. systems
- communications
- CSCW
- sociology
- cooperative design
- pedagogical design
- Ped/tech scaffolding

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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) systems
- Defined by Ellis et al. in following way: “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
Aspects of groupware

- Common task / goal
- Interface to a shared environment
- In addition, because there are more than two users, additional implications are
  - Communication support
  - Division of labor, explicit role assignment
  - Support for joint design of common artifact
  - Awareness of the other users who are interacting within the shared environment (since they are often not F2F)
Shared environments

• Referred to as “common information spaces” (Bannon & Bødker, 1997)

• 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 the above approaches?

• Do you know of groupware or other systems that have been developed according to other approaches?

• What other approaches to design do you know of, which are not falling into the three categories just described?
Early examples of groupware

• Ellis et al identifies the following type of groupware (1991)
  – Message systems (e.g. email)
  – Multi-user editors
  – Group decision support systems (e.g. discussion forums)
  – Video conferencing systems
  – Intelligent information sharing systems (Malone et al.)
  – Workflow coordination systems (Winograd et al.)
Contemporary groupware

• What are examples of groupware introduced after 1991:
  – Ex:
  – Ex:
  – Ex:
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 (Grudin, 1994)
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
    • Collaboration
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 extend 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 groupware (e.g. Jim Hollan)
Time/place matrix

From Ellis et al, 1991
Extended matrix for CSCL

- One of the approaches to CSCL we address in this course is to use groupware for educational purposes.
- 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, work & learning)?
Extended matrix for CSCW

From Grudin, 1994
Supporting coordination and collaboration

- What are the unique features of groupware that supports
  1) coordination?
  2) collaboration?