Groupware and Computer-Supported Cooperative Work (cscw)

• Aim at allowing greater geographical and temporal flexibility in conducting a wide range of intellectual work

• Groupware is software designed to run over a network in support of the activities of a group or organization

• Activities can occupy any of several combinations of same/different place and same/different time

• Groupware that supports several of these combinations are emerging
• **Roots**

  Formal field of study CSCW and ECSCW conferences since 1986

  Vannevar Bush (1945) “As we may think”—MEMEX ≈WWW

  Doug Engelbart’s famous demonstration at IFIP 1968—NLS (Video)

  Group decision support and support for meeting rooms mid 1980’s
Adopting Groupware in Context

Grudin (1994) Groupware and social dynamics: Eight challenges for developers

- Disparity in work and benefit
- Critical mass and Prisoner’s dilemma problems
- Disruption of social processes
- Exception handling
- Unobtrusive accessibility
- Difficulty of evaluation
- Failure of intuition
- The adoption process

Still significant challenges in supporting group work, especially at a distance
Technical Infrastructure

Network heterogeneity remains a challenge

Internet slow and security facilities limited

Increasingly group tools are written for the web (browsers with plug-ins)

Personal computing also a great enabler for collaborative applications

Flexibility provided by middleware—between network and applications

E.g. GRID technologies for combining scattered computational resources
Communication Tools

• E-mail

Changes the social network of who talks to whom

Empowering people who formerly had little voice in decisions

The tone of what is said and how it is interpreted (Sproull & Kiesler 1991)

E-mail used also for reminding them of things to do/ keeping track of workflow/ archive & documentation—but often such tasks are poorly supported

Spam!

Kraut et al. (1998)—greater Internet use mainly e-mail led to declines in social interactions with family and to increase in depression and loneliness—latest reports (in press “Journal of Social Issues”) these initial effects may not persist
• **Conferencing Tools—Voice and Video**

Real time meetings are among the more difficult situations to support at a distance

Video conferencing, camera/projection systems/high bandwidth connections at all points—still expensive and time consuming; but...

Point-to-point conferencing units and connection time are inexpensive

Still great problems with usability/satisfaction—high quality and immediate audio is essential...(make a second telephone call to connect the audio for high-quality channels)
• Chat, Instant Messaging, and MUDs

Good chat systems can feel like a conversation, even among a number of participants—review conversation threads can be challenging

Instant messaging like ICQ (“I seek you”), MS Messing System: Makes visible who of my “buddies” are on the system or not (or states like “be right back”)

Instant messaging: growing very rapidly; anonymity and logging?

Research lagging behind—effect on the isolating tendencies of internet use/ e-mail reported by Kraut et al. (1998)

MUD—comes from the initial incarnations in the game world: Multi-user Dungeons and Dragons
Coordination Support

• Meeting Support

Group decision support systems, facilitators and specialized rooms—mixed results: high quality decisions but meetings taking longer time and participants less satisfied compared to traditional meetings

Less structured support like the video showed with group whiteboards, Tivoli etc. - Moran et al. from Xerox Parc

Inexpensive mobile computing, projection equipment, digital cameras & video, GRID technology etc. may open many new possibilities to experimented

—adoption of effective tools has so far been slow
• Workflow

Technology support to coordinated asynchronous (usually sequential) steps of activities among team members work on a specific task.

Workflow systems have often been the result of work re-engineering efforts aiming at productivity gains through partly automation.

Often such systems get a dubious reputation, employment are reduced, the remaining employees are more closely monitored, some times by rigid division of the work processes.
• **Group Calendars**

  View people’s schedules to arrange meetings

  Person not present—when to be expected?

  Quite widespread use—after initial difficulties...

  Grudin’s warns against “disparity in work and benefit”
• **Awareness**

  Are people in or out? What are they doing? Are they open for contact?

  A walk up and down the hall...

  Instant messaging—peripheral awareness...(e.g. the video with Ishii’s design)

  Trust and privacy issues

  Shared documents—coworking, editing, publishing...(Stock information, Karnovs Lawbook)
Information Repositories

• Repositories of Shared “Knowledge”

Lotus Notes—Orlikowski & Pricewaterhouse
Web possibilities
Lotus Notes for the web: Domino
Document management tools: Groupware (Danish) & BSCW (GMD.de)

• Capture and Replay

Tools that support collaborative activity can create traces of that activity that later can be replayed and reflected on—for training etc...
Sociality

• Social Filtering
  We often find the information we want by contacting others
  Social networks embody rich repositories of useful information
  Recommender systems like that on web sites like Amazon.com
  Distrust? Key may be to provide access to explanations for why items were recommended

• Trust of People Via the Technology
  Email & fax < telephone < face-to-face
  Build trust through team-building exercises
  If not some meetings face-to-face...mixed results
  E.g. text exchange translated into voice has no effect
  Avatars with human like faces can make the results even worse
  Todays video over the Internet is delayed and choppy
  —producing cues often associated with lying!
Integrated Systems

• Media Spaces

Open, continuous audio and video connections between remote locations, e.g. two labs at Xerox: Palo Alto, California, and Portland, Oregon (1991)

Mixed results—but today's new tools may give improved usability
• **Collaborative Virtual Environments**

  Three-dimensional embodiments of MUD

  The space in which people interact is an analog of physical space...

  People are represented as avatars—simplified digital representations of people

  In real life, we have developed interesting schemes that trigger behavior

  —these subtle behaviors must be incorporated before the virtual environments can have a chance of becoming realistic simulations
• Collaboratories

A collaboratory is a laboratory without walls

Virtual collocation—support geographically dispersed teams as they carry out product design, software development, financial reporting, surgery etc.
Conclusions

• Groupware functionality is steadily becoming more routine

• Groupware functions are being written into operating systems (distributed systems)

• Many of the functions described will probably be ordinary elements of the infrastructure in future networked and distributed computing systems

• Much research and many innovations are needed...