Groupware: Introduction

What is Groupware?

Groupware is technology designed to facilitate the work of groups. This technology may be used to communicate, cooperate, coordinate, solve problems, compete, or negotiate. While traditional technologies like the telephone qualify as groupware, the term is ordinarily used to refer to a specific class of technologies relying on modern computer networks, such as email, newsgroups, videophones, or chat.

Groupware technologies are typically categorized along two primary dimensions:

1. whether users of the groupware are working together at the same time ("realtime" or "synchronous" groupware) or different times ("asynchronous" groupware), and
2. whether users are working together in the same place ("colocated" or "face-to-face") or in different places ("non-colocated" or "distance").

	Same time "synchronous"	Different time "asynchronous"
Same Place "colocated"	voting, presentation support	shared computers
Different Place "distance"	videophones, chat	email, workflow

Several typical groupware applications are described in more detail on our Groupware Applications page.

What is CSCW?

CSCW (Computer-Supported Cooperative Work) refers to the field of study which examines the design, adoption, and use of groupware. Despite the name, this field of study is not restricted to issues of "cooperation" or "work" but also examines competition, socialization, and play. The field typically attracts those interested in software design and social and organizational behavior, including business people, computer scientists, organizational psychologists, communications researchers, and anthropologists, among other specialties.

How is Groupware Design Different from Traditional User Interface Design?

Groupware design involves understanding groups and how people behave in groups. It also involves having a good understanding of networking technology and how aspects of that technology (for instance, delays in synchronizing views) affect a user's experience. All the issues related to traditional user interface design remain relevant, since the technology still involves people.

However, many aspects of groups require special consideration. For instance, not only do million-person groups behave differently from 5-person groups, but the performance parameters of the technologies to support different groups vary. Ease-of-use must be better for groupware than for single-user systems because the pace of use of an application is often driven by the pace of a conversation. System responsiveness and reliability become more significant issues. Designers must have an understanding of the degree of homogeneity of users, of the possible roles people play in cooperative work and of who key decision-makers are and what influences them.

We discuss design issues in significantly more detail on our Groupware Design Issues page.

Why Bother?

Why is groupware design worth paying attention to in the first place?

Groupware offers significant advantages over single-user systems. These are some of the most common reasons people want to use groupware:

- to facilitate communication: make it faster, clearer, more persuasive
- to enable communication where it wouldn't otherwise be possible
- to enable telecommuting
- to cut down on travel costs
- to bring together multiple perspectives and expertise
- to form groups with common interests where it wouldn't be possible to gather a sufficient number of people face-to-face
- to save time and cost in coordinating group work
- to facilitate group problem-solving
- to enable new modes of communication, such as anonymous interchanges or structured interactions

In addition to the benefits of groupware, another good reason to study usability and design issues in groupware is to avoid a failed design. Groupware is significantly more difficult to get right than traditional software. Typically, a groupware system can't succeed unless most or all of the target group is willing to adopt the system. In contrast, a single-user system can be successful even if only a fraction of the target market adopts it.

Groupware: Applications

This page describes several types of groupware applications and their associated design options. Comparing those design options across applications yields interesting new perspectives on well-known applications. Also, in many cases, these systems can be used together, and in fact, are intended to be used in conjunction. For example, group calendars are used to schedule videoconferencing meetings, multi-player games use live video and chat to communicate, and newsgroup discussions spawn more highly-involved interactions in any of the other systems.

Consider how these systems can be integrated in other ways. We are still quite far from developing the grand groupware system that encompasses every type of communication, and we will probably never get there since the possibilities are constantly evolving with changes in both our patterns of social interaction and the technology we have available.

Asynchronous Groupware

Email is by far the most common groupware application (besides of course, the traditional telephone). While the basic technology is designed to pass simple messages between 2 people, even relatively basic email systems today typically include interesting features for forwarding messages, filing messages, creating mailing groups, and attaching files with a message. Other features that have been explored include: automatic sorting and processing of messages, automatic routing, and structured communication (messages requiring certain information).

Newsgroups and mailing lists are similar in spirit to email systems except that they are intended for messages among large groups of people instead of 1-to-1 communication. In practice the main difference between newsgroups and mailing lists is that newsgroups only show messages to a user

when they are explicitly requested (an "on-demand" service), while mailing lists deliver messages as they become available (an "interrupt-driven" interface).

Workflow systems allow documents to be routed through organizations through a relatively-fixed process. A simple example of a workflow application is an expense report in an organization: an employee enters an expense report and submits it, a copy is archived then routed to the employee's manager for approval, the manager receives the document, electronically approves it and sends it on and the expense is registered to the group's account and forwarded to the accounting department for payment. Workflow systems may provide features such as routing, development of forms, and support for differing roles and privileges.

Hypertext is a system for linking text documents to each other, with the Web being an obvious example. Whenever multiple people author and link documents, the system becomes group work, constantly evolving and responding to others' work. Some hypertext systems include capabilities for seeing who else has visited a certain page or link, or at least seeing how often a link has been followed, thus giving users a basic awareness of what other people are doing in the system -- page counters on the Web are a crude approximation of this function. Another common multi-user feature in hypertext (that is not found on the Web) is allowing any user to create links from any page, so that others can be informed when there are relevant links that the original author was unaware of.

Group calendars allow scheduling, project management, and coordination among many people, and may provide support for scheduling equipment as well. Typical features detect when schedules conflict or find meeting times that will work for everyone. Group calendars also help to locate people. Typical concerns are privacy (users may feel that certain activities are not public matters), completeness and accuracy (users may feel that the time it takes to enter schedule information is not justified by the benefits of the calendar).

Collaborative writing systems may provide both realtime support and non-realtime support. Word processors may provide asynchronous support by showing authorship and by allowing users to track changes and make annotations to documents. Authors collaborating on a document may also be given tools to help plan and coordinate the authoring process, such as methods for locking parts of the document or linking separately-authored documents. Synchronous support allows authors to see each other's changes as they make them, and usually needs to provide an additional communication channel to the authors as they work (via videophones or chat).

Synchronous or Realtime Groupware

Shared whiteboards allow two or more people to view and draw on a shared drawing surface even from different locations. This can be used, for instance, during a phone call, where each person can jot down notes (e.g. a name, phone number, or map) or to work collaboratively on a visual problem. Most shared whiteboards are designed for informal conversation, but they may also serve structured communications or more sophisticated drawing tasks, such as collaborative graphic design, publishing, or engineering applications. Shared whiteboards can indicate where each person is drawing or pointing by showing telepointers, which are color-coded or labeled to identify each person.

Video communications systems allow two-way or multi-way calling with live video, essentially a telephone system with an additional visual component. Cost and compatibility issues limited early use of video systems to scheduled videoconference meeting rooms. Video is advantageous when visual information is being discussed, but may not provide substantial benefit in most cases where conventional audio telephones are adequate. In addition to supporting conversations, video may also be used in less direct collaborative situations, such as by providing a view of activities at a

remote location.

The Usability First site maintains a bibliography of papers on the user interface design of video communications systems.

Chat systems permit many people to write messages in realtime in a public space. As each person submits a message, it appears at the bottom of a scrolling screen. Chat groups are usually formed by having listing chat rooms by name, location, number of people, topic of discussion, etc.

Many systems allow for rooms with controlled access or with moderators to lead the discussions, but most of the topics of interest to researchers involve issues related to unmoderated realtime communication including: anonymity, following the stream of conversation, scalability with number of users, and abusive users.

While chat-like systems are possible using non-text media, the text version of chat has the rather interesting aspect of having a direct transcript of the conversation, which not only has long-term value, but allows for backward reference during conversation making it easier for people to drop into a conversation and still pick up on the ongoing discussion.

Decision support systems are designed to facilitate groups in decision-making. They provide tools for brainstorming, critiquing ideas, putting weights and probabilities on events and alternatives, and voting. Such systems enable presumably more rational and even-handed decisions. Primarily designed to facilitate meetings, they encourage equal participation by, for instance, providing anonymity or enforcing turn-taking.

Multi-player games have always been reasonably common in arcades, but are becoming quite common on the internet. Many of the earliest electronic arcade games were multi-user, for example, Pong, Space Wars, and car racing games. Games are the prototypical example of multi-user situations "non-cooperative", though even competitive games require players to cooperate in following the rules of the game. Games can be enhanced by other communication media, such as chat or video systems.

Groupware: Links

This page is intended to be as comprehensive an index as possible for Groupware resources.

CSCW or "Computer-Supported Cooperative Work" is the study of how people work together using computer technology. Typical applications include email, awareness and notification systems, videoconferencing, chat systems, multi-player games, and realtime shared applications (such as collaborative writing or drawing).

Updates and additions

Use the feedback form to let us know about any useful CSCW references that can be added to these lists.

Groupware Links Sections

NEW!= This link is new in a recent update of this site.
!= This is a recommended page for really useful information.

Introductions and Overviews

- The Domain and Goals of CSCW (pfeiffer, UCalgary), part of Electronic Meetings - CSCW & GDSS
- Group Think - A look at how groupware allows small-company employees to work simultaneously, saving both time and money (Anne Field, Inc. Magazine)
- !Groupware - The Changing Environment - an online book introducing groupware (David Coleman, Collaborative Strategies)
- Seminararbeit (Dominik Stein, U.Essen) - definition and classification of the terms CSCW, Groupware, Workgroup Computing and Workflow (in German only)
- !Usability First Groupware Section: introduction to groupware, typical applications, design issues (Tom Brinck, Diamond Bullet Design)

Conferences and Workshops

upcoming conferences (by date):

- !CHI 2002 Conference on Human Factors in Computing Systems, 20-25 Apr 2002, Minneapolis, Minnesota, USA NEW!
- CRIWG 2002 8th International Workshop on Groupware, 1-4 Sep 2002, La Serena, Chile NEW!
- CSCW 2002 Conference on Computer Supported Cooperative Work 16-20 Nov, 2002, New Orleans, Louisiana, USA NEW!

prior conferences

- CHI - Conference on Human Factors in Computing Systems
  - CHI 97 22-27 Mar 1997, Atlanta, GA, USA
  - CHI 98 18-23 Apr 1998, Los Angeles, CA, USA
  - CHI 99 15-20 May 1999, Pittsburgh, PN, USA
  - !CHI 2000 1-6 Apr 2000, The Hague, The Netherlands
  - !CHI 2001 31 Mar - 5 Apr 2000, Seattle, WA, USA
- CSCW - Conference on Computer Supported Cooperative Work
  - Abstracts from CSCW'88, CSCW'90, and CSCW'92 - nothing fancy, but useful

    - CSCW'93 June 1993, London, UK
    - CSCW'96 16-20 Nov 1996, Cambridge, MA, USA
    - CSCW'98 14-18 Nov 1998, Seattle, WA, USA
    - CSCW 2000 2-6 Dec 2000, Philadelphia, PA, USA - International Workshop on Awareness and the WWW
- ECSCW - European Conference on Computer Supported Cooperative Work
    - ECSCW'97 7-11 Sep 1997, Lancaster, UK
    - ECSCW 2001 Seventh European Conference on Computer Supported Cooperative Work, 16-20 Sep 2001, Bonn, Germany
- COOP'96 Second International Conference on the Design of Cooperative Systems, 12-14 Jun 1996, Juan-les-Pins, France, Coop'98, Third International Conference on the Design of Cooperative Systems, 26-29 May 1998, Cannes, France
- CRIWG 2001 7th International Workshop on Groupware, 6-8 Sep 2001, Darmstadt, Germany
- CSCL'99 Computer Supported Collaborative Learning, 12-15 Dec 1999, Stanford, CA, USA, CSCL 2002 Foundations for a CSCL Community, 7 - 11 Jan 2002, outside of Boulder, Colorado, USA
- DCSCW'96 30 Sep - 2 Oct 1996, Stuttgart-Hohenheim, Germany (in German), DCSCW'98, Deutsche CSCW Tagung, 28-30 Sep 1998, Dortmund, Germany
- Desktop Collaboration Technology & Interoperability Conference 18 April 1996 (will be held again 16-17 April 1997)
- ERCIM workshop on CSCW and the Web Sankt Augustin, Germany, February 7-9, 1996
- GROUP'99 International Conference on Supporting Group Work, 14-17 Nov 1999, Phoenix, AZ, USA, GROUP 2001, 30 Sep - 3 Oct 2001, Boulder, CO, USA
- ozGROUP-98, Australian Workshop on Computer Support for Collaboration, 20-21 Sep 1998, Brisbane, Australia
- WACC'99 International Joint Conference on Work Activities, Coordination, and Collaboration, 22-25 Jan 1999, San Francisco, CA, USA
- WET ICE - IEEE International Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises, WET ICE '96, 19-21 Jun 1996, Stanford University, CA, USA, WET ICE '97, 18-20 June 1997, Cambridge, MA, USA, WET ICE'98, 17-19 Jun 1998, Stanford University, CA, USA
- WWW Conference '94: Computer Supported Cooperative Work section, including the Workshop on Wide-Area Collaboration and Cooperative Computing

Papers and Abstracts

bibliographies and collections

- CSCW Bibliography - ftp site, maintained by Saul Greenberg
- CSCW Bibliography (searchable)
- Video Communications Bibliography (Tom Brinck)

individuals and labs

- Brinck, T. and L. Gomez: CSCW'92 Abstract - The Conversation Board: A Collaborative Medium for the Support of Conversational Props.
- Grudin, Jonathon
- Woo, Tak K. and Michael J. Rees A Synchronous Collaboration Tool for World-Wide Web
- The wOrlds project: Publications

Books

- Computer-Supported Cooperative Work : A Book of Readings - Irene Greif (editor)
- Computer Supported Cooperative Work : Issues and Implications for Workers, Organizations, and Human Resource Management (Advanced Topics in organization) Michael D. Coovert, Lori Foster Thompson
- Computer Supported Co-Operative Work (Trends in Software, 7) - Michel Beaudouin-Lafon
- Cybermeeting : How to Link People and Technology in Your Organization - James L. Creighton (non-technical guide to meetings and tools)
- Designing Groupware for Real-Time Drawing - S. Greenberg, S. Hayne, R. Rada (shared drawing tools)
- Groupware : Software for Computer-Supported Cooperative Work - David Marca, Geoffrey Bock
- Groupware, Workflow and Intranets : Reengineering the Enterprise with Collaborative Software - Dave Chaffey
- Groupware and Authoring - Roy Rada (shared writing tools)
- Linguistic Concepts and Methods in CSCW (Computer Supported Cooperative Work) - J. H. Connolly, L. Pemberton (editors)
- Practical Internet Groupware (Nutshell Series) - Jon Udell
- Proceedings of the Third European Conference on Computer-Supported Cooperative Work, 13-17 September 1993, Milano, Italy : ECSCW '93 - G. De Michelis, C. Simone, K. Schmidt (editors)
- Readings in Groupware and Computer-Supported Cooperative Work: Assisting Human-Human Collaboration - Edited by Ronald M. Baecker (an excellent compilation)
- Remote Cooperation : CSCW Issues for Mobile and Teleworkers (Computer Supported Cooperative Work) - A. Dix, R. Beale (editors)
- Towards a CSCW Framework for Scientific Cooperation in Europe (Lecture Notes in Computer Science, Vol 889) - Hannes P. Lubich
- The Usability First Bibliography contains a list of highly-recommended books related to user interface design.

Journals

- Journal of Computer-Mediated-Communication
- Computer Supported Cooperative Work (CSCW) - An International Journal
- Group and Organization Management
- Group Decision and Negotiation
- Group Dynamics: Theory, Research, and Practice (APA)
- Journal of Organizational Computing

Types of Groupware and Groupware Issues

- **awareness:** Awareness in Collaborative Systems, The aware-cscw mailing list
- **collaborative drawing and writing:** The Conversation Board, DistEdit and DistEmacs, Multi-User Editor Index (Project Names) Distance Education Clearinghouse (UWisconsin), POLIS - Project for On-Line Instructional Support (UArizona)
- **email:** Yahoo - Email, Galaxy - Email
- **groupware toolkits:** GroupKit, Habanero (NCSA, Java groupware support), Tango Java-based collaboratory system (Syracuse U.), The Clock Language, COAST (Cooperative Application Systems Tech, GMD-IPSI), DreamTeam
- **MUDs:** Yahoo - MUD programming
- **newsgroups:** GroupLens (filters Usenet postings based on predictions of interest), See Below

- **scientific collaboration:** NCSA Collage (a collaborative data analysis tool)
- **shared virtual spaces:** TeamRooms (2D chat, whiteboard, etc., UCalgary), The Contact Consortium (a consortium for virtual worlds)
- **shared windows and shared applications:** JAMM (Java Applets Made Multiuser)
- **video communications:** Video Communications Bibliography, Yahoo - Videoconf and Videoconf. companies.
- **virtual reality:** Collaborative Work in Virtual Environments
- **web-based conferencing:** Conferencing on the Web - Discussion Forums (David R. Woolley), The Well, The Utne Café, COW (Conferencing on the Web, SFSU), ForumOne search engine for forums
- **workflow:** Workflow Management Coalition, Workflow and Reengineering International Association, Workflow-Management and Groupware (Fraunhofer-ISST)

Products/Companies

- Companies with Multi-User Editors (TUM, part of the unOfficial yellow pages)
- CSCW & groupware products (TeamIT)
- Action Technologies - modeling methodology and design tools for BPR
- Ashmount - Virtual Access - an email and news reader integrated with Compuserve
- Avail Technologies - WorkNet - Java-based workflow using standard email for messaging
- Avalon Business Systems - Lotus Notes groupware development
- Axista.com - Maker of Xcolla, web-based collaborative project management software NEW!
- bizOA - messaging and groupware solution
- Blackboard - support for collaborative classrooms
- CommunityZero - web-based community development and hosting services
- Cap Gemini Innovation - CapWeb-Flow workflow management
- Collaborative Strategies - a consulting firm
- Corporacion UNISOL - Top-Report - internet-based executive report for organizations, esp. construction (in Spanish)
- Cybozu - web-based office groupware running on a LAN, a variety of applications
- DCASoft - makes BrightSuite KM and collaboration software that allows a corporation to deploy its entire knowledge base
- Deep Woods - consulting firm specializing in organizational technology and culture
- !Diamond Bullet Design - usability consulting with ample experience in groupware and website design, offering both user interface design and usability evaluation
- eBeam - turns whiteboards into digital collaborative workspaces using infra-red and ultrasonic technology
- Enterprise Solutions: MeetingWorks
- Enviros Software Solutions - Business Collaborator - collaborative knowledge management system
- eShare - chat, discussion forums, etc.
- Exoplex
- Facilitate.com - virtual internet meeting area supporting discussions with various tools such as brainstorming, organizing, voting, surveying, or chat.
- Farallon - Timbuktu (for screen-sharing) and other groupware products
- Ferris Research - publications on messaging
- GFI Communications - email based workflow software
- GMD FIT-CSCW Research Group - BSCW (Basic Support for Cooperative Work) - a web-based shared workspace, The Social Web
- Groove Networks - makes a product called Groove that uses peer-to-peer technology to let groups work together in real-time
- Group Performance Systems (GPS) - includes some definitions and links to other sites
- Groupware Development Inc.

- HelpMeeting.com - data conferencing service
- iCohere - provides a collaborative web environment that integrates knowledge management and collaboration tools with principles of group dynamics and learning NEW!
- ILINC - LearnLinc, a collaborative learning system
- Inovie Software - TeamCenter, a real-time collaborative project management system
- Instinctive Technology - eRoom - web-based collaboration tool which supports group discussions, file sharing, polling, etc.
- INTERnetOFFICE - web-based GroupWare solutions for today's small to mid size companies
- JDH Technologies - Web-4M - comprehensive distance learning and collaboration environment
- Level 8 Systems, Inc. - messaging tools and component-based enterprise integration frameworks
- Lotus - Notes, etc.
- mArratech AB - mStar - a comprehensive tool suite for scalable distributed teamwork and network-based learning
- Microsoft - Exchange, NetMeeting
- MOTION - collaborative EU R&D project aimed at development of Teamwork support tools and platform to support Virtual Communities
- NeoJapan International - iOffice2000 - groupware application suite
- NetIQ - software for management of network server applications
- Net Perceptions - GroupLens Toolkit
- Netscape - Communicator
- Olivetti - Active Badge
- Onlive! Technologies - realtime voice and text communication
- PeerView - Java-based collaboration tool - a framework for artifact rendering and group review
- phpGroupWare - multi-user web-based groupware suite written in PHP which also provides an API for developing additional applications
- PHProjekt - open source groupware suite for the Internet and Intranet
- PicturePhone: videoconferencing
- PictureTalk Inc - cross-platform visual conferencing
- PictureTel - videoconferencing
- projectplace.com - Web service for project collaboration that includes shared document archives, discussion forums, task lists, shared calendars etc.
- SoftArc Inc - FirstClass, a multiplatform electronic mail and group collaboration product
- Spoke.net - build websites where people interact and contribute
- StageDirector - a method and workflow engine; includes a white paper on the method
- Sixth Floor Media - CommonSpace - a cross-platform collaborative writing tool
- TeamNow - online business service enabling collaboration
- Teamsoft - TeamAgenda - a cross platform group scheduler
- Teamware - solutions for building web communities, as well as groupware and content management for web environments
- TeamWave Software Ltd - TeamWave Workplace
- Technography.com - advocates electronically-supported meetings
- TopTeam - Web-based Group Decision Support Software (GDSS) to support meetings
- TUTOS - multilingual, web-based team organization software
- TrustedWeb - provides role-based access to Intranet contents
- Ultimus: Ultimus Workflow Suite - automation of essential business processes using the Web
- Ventana GroupSystems - meeting-support software
- VSOffice - software solution that allows organizations to set up an intranet, or add functionalities to an existing intranet NEW!
- WebCal - group web calendar

- Working by Wire - an online course for building online virtual teams. It teaches people to use groupware and CSCW products for business benefit.

Empirical Studies of Groups and Groupware Use

- Evaluation Methods in the CSCW Literature and Studies
- Evaluation of cooperative systems project (Magnus Ramage)
- Research Tasks Page (ISWorld Net) - tasks that have been used in group research, amazingly-useful, incredibly-detailed
- Social Cognition Paper Archive

Research Centers and Educational Programs

- CSCW Research Centers and Projects (KUL) - a useful set of abstracts on a variety of centers
- DSTC, Australia: The WORLDS Project - the Orbit collaboration environment and the Locales Framework
- Fraunhofer-ISST (in English and German)
- Fujitsu: Regatta Project
- GMD-IPSI, Darmstadt (Integrated Publication and Information Systems)
- GeorgiaTech: Computer-Supported Cooperative Work (part of the Graphics, Visualization and Usability Center)
- Katholieke Universiteit Leuven: CSCW: Computer Supported Cooperative Work
- Lancaster U.: PublicSpace
- Lotus Research
- Luleå U. of Technology: CDT (Center for Distance-spanning Technology) - mStar (an integrated environment with a variety of tools for desktop multimedia conferencing over the Internet)
- MIT: Center for Coordination Science (CCS)
- The MIT Media Lab: The Sociable Web Project
- North Carolina State U: CBL (Collaborative Benchmarking Laboratory)
- Northwestern: CoVis: Learning Thru Collaborative Visualization
- The Ontario Telepresence Project
- Queen Mary and Westfield College, University of London: Project Mushroom
- RPI: Design Conference Room
- Stanford: SHARE Projects - Collaborative software development
- Syracuse University: NPAC - Northeast Parallel Architectures Center
- UArizona: Communication Collaboratory
- UBonn: ProSEC - Research Group Softwareergonomics and CSCW
- UCalgary: GroupLab
- UCIrvine: CORPS - Computing ORganizations Policy and Society
- UCSC: CCRG - Computer Communications Research Group
- UColorado: CTRG - Collaboration Technology Research Group
- UIUC: Advanced Collaborative Systems Lab
- UIUC: Team Engineering Collaboratory (TEC)
- UJyvaskyla, Finland: Group Technologies Program, Jyvasklya Telematics Studio
- UKyoto: Ishida Laboratory (FreeWalk - a shared virtual world)
- ULille: Laboratoire Trigone (in French)
- ULimerick: CSCW Research Centre
- UMichigan: Collaborative Systems Research Group
- UMichigan: CREW - Collaboratory for Research on Electronic Work
- Virginia Tech: Human-Computer Interaction Lab
- West Virginia U: Concurrent Engineering Research Center (CERC)

Special Interest Groups, User Groups, and Working Groups

- ACM SIGGROUP - Special Interest Group on Supporting Group Work
- CCTWG - Collaborative Computing Tools Working Group (Intelink Engineering Board)
- PictureTel User Group

Newsgroups and Mailing Lists

- The **AWARE-CSCW** mailing list is for discussion of awareness mechanisms in collaborative systems.
  Read their FAQ to subscribe.
- comp.groupware is a newsgroup that discusses CSCW and groupware issues.
  Read their FAQs for more info.
- comp.groupware.lotus-notes.misc
- The **CSCW-SIG** mailing-list is for discussion about CSCW & CSCW SIG notices (e.g. of meetings):
  To subscribe, send a message to mailbase@mailbase.ac.uk
  Include one line in the body of the message that says:
  JOIN cscw-sig firstname(s) lastname
  (Don't forget to substitute your first & last names.)
- The **GSS-L** (Group Support Systems List) Listserv is for discussion among group support systems researchers, covering issues such as research, products, facilitation, and conferences.
  To subscribe, send a message to listserv@uga.cc.uga.edu
  Include one line in the body of the message that says:
  subscribe GSS-L your-first-name your-last-name
- **LNOTES-L** (The Lotus Notes users mailing list)
  To subscribe, send a message to lnotes-l-request@wums.wustl.edu
  In the body of the message, enter SUBSCRIBE LNOTES-L.

Indexes

human-computer interaction

- Usability First

special topic indexes related to CSCW/groupware

- Internet Group Communication Tools
- Knowledge Management & Organizational Learning - good bibliography (@BRINT)
- WWW Collaboration Projects (Daniel LaLiberte, NCSA)

general CSCW/groupware indexes

- Collaboration, Knowledge Representation and Automatability - index of web-based collaboration work (W3C Collaboration Working Groups)
- Collaborative Software Resource (Jintae Lee, U.Hawaii)
- Computer-Mediated Communication Index (Galaxy)
- CSCW Directory (JRA Consulting)
- CSCW related pages (TU-Muenchen)

- Internet Resources on Computer-Supported Cooperative Work (Lee Honeycutt, RPI)
- Groupware, Workflow, E-Mail, etc (COMPINFO)
- Project ACOST Pointers to CSCW and Groupware
- The unOfficial Yellow Pages of CSCW - list of groupware products and projects (TUM)

Quick web searches for "cscw and groupware"

Alta Vista | Lycos | Go | newsgroup search | Google | Yahoo |Excite