Due on Wednesday

1. Pilot Usability Study
   (on wiki)
2. Individual Team Assessment
   (email to cs160@imail)

Submit hardcopies for both!
Mini-Assignment

Send final project title and one-line description to cs160@imail by this Wednesday, 6pm.

1 point, fame & fortune

Engelbart's Vision

Mother of all demos, 1968

How can we **understand** and **support** collaboration between multiple users?

Personal Computing

Xerox Star, 1981

Engelbart’s Vision

How can we understand and support collaboration between multiple users?
A spectrum of collaboration
(not exhaustive)

<table>
<thead>
<tr>
<th>Number of Users</th>
<th>1 10 100 1k 10k 100k 1M 10M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity of Users</td>
<td>Small group Organization Strangers</td>
</tr>
<tr>
<td>Purpose</td>
<td>Work Hobby Family Entertainment</td>
</tr>
<tr>
<td>Time scale</td>
<td>Minutes Hours Days Years Open-Ended</td>
</tr>
</tbody>
</table>

CSCW = Computer Supported Cooperative Work

Social Media Participation / Social Computing

“CSCW [is] a generic term, which combines the understanding of the way people work in groups with the enabling technologies of computer networking, and associated hardware, software, services and techniques.”
Understanding Groups

Principles that govern group behavior are often subtle and non-obvious.

Social/organizational dynamics are at play.

It's easy to get it wrong!
Challenge: Disparity of Work and Benefit

Groupware applications often require additional work from individuals who do not perceive a direct benefit from the use of the application.

Example: Shared Calendars

Early shared calendars at Sun were a failure. Disparity: who did the work vs. who gained the benefit of maintaining an electronic calendar (managers benefit, reports have the burden).
Challenge: Exception Handling

Groupware may not accommodate the wide range of exception handling and improvisation that characterizes much group activity.

Example: On-Line Medical Records

Dental office installed new automated billing system

Assistants unhappy with new system

Old forms had hand-written notes
  e.g., patient A's insurance takes longer than most, etc.

Same Time, Same Place
  (synchronous, co-located)
Personal Response Systems (Clickers)

Source: UCLA Instructional Development, einstruction.com

Single Display Groupware

“Computer programs which enable co-present users to collaborate via a shared computer with a single shared display and simultaneous use of multiple input devices.”

“Roomware”

“Roomware” – Nice Room Video
Same Time, Different Place (synchronous, remote)

An early synchronous, remote interface

Face-to-face interactions

1. Voice
2. Facial expressions
3. Gestures
4. Posture
5. Locus of attention
Early goal of CSCW research: approximate “being there”

- Written Letter
- Telephone
- Videoconferencing
- Holodeck
- Face to Face

Versimilitude

Video conferencing gets tricky past n=2

- It is hard for participants to keep track of:
  1. Gaze
  2. Deixis (pointing)
MultiView
Quasi-3D display, gaze-faithful solution for group conferencing

Many successes do not approach “being there”

Online distance learning

Many successes do not approach “being there”
Beyond Being There

Virtual presence could be “Beyond Being There”
Some distinguishing features of CSCW:

- asynchronous communication
- anonymous communication
- automatic archive of communication

Principle (from Bob Kraut)

The goal should be to support the functions of collocation and not the form.

Are real-time tools more productive?

“A wealth of information creates a paucity of attention.”
- Herbert Simon

Different Time, Different Place
(Asynchronous, remote)
Examples:

1. Email
2. Wikis
3. Blogs
4. Facebook
5. BBS (Discussion boards)

Track Changes

Track Changes for Movies

Visual Diff
3 Principles for CSCW
It’s not good enough to replicate offline experiences online; we have to go ‘beyond being there.’ (Hollan)

CSCW systems where the cost to participants is high, and the system’s benefit is mostly to someone else, will fail. (Grudin)

In the (near) future, almost everything will be a CSCW application, so it pays to get this right.

Social Media Participation

What CSCW overlooked (initially)
Early CSCW research focused on collaboration in hierarchical professional organizations.

Why?
And what areas does such an orientation miss?

“Work” systems support hierarchies
Elementary Graph Theory

- # of edges in a fully connected graph: \( n(n-1)/2 \sim n^2 \)
- # of edges in a tree: \( n-1 \)

The Benefits of Hierarchical Organization

**Ronald Coase** (Nobel laureate), The Nature of the Firm (1937):
Hierarchical organizations (institutions) can be more efficient than open labor markets, because they limit transaction costs.

The Coasean Floor (due to Clay Shirky)

Institutions have managerial overhead. This limits what activities they engage in.

**Coasean Floor**: The point below which the transaction costs of a particular type of activity are too high for a standard institutional form to pursue.

Finding Value Below the Floor

New social tools lower the cost of coordinating group action.

When coordination becomes nearly free, new group actions become possible that will never be served by institutions.

(Companies provide platforms for groups to self-organize.)
More useful than LOLcats.

Yet more useful.

Welcome to Wikipedia, the free encyclopedia. 3,902,280 articles in English.

The *Monsanto Mutiny* was an incident in April 1949 involving members of the Australian Post Tactical Air Force based on the island of Christmas, in the Dutch East Indies. Eight junior pilots, including Australia's leading flying ace, Group Captain Oliver Castellani, tendered their resignations to protest what they perceived as the retrenchment of Royal Australian Air Force (RAAF) fighter squadrons to strategically unimportant ground attack missions.

A government investigation vindicated the 'rebels' and three high-ranking officers at an informal court of inquiry.
How does social participation work in practice? Are there patterns/laws?

Power Law Distributions

$P(x) \propto x^{-\alpha}$

Heuristics for Social Participation

Three Ingredients:
1. Promise
   What’s the value of contributing?
2. Tool
   The user interface for contributing/consuming
3. Bargain
   Community rules a user agrees to
Challenges to social software

**Success crisis:**
whether your software scales will only become apparent once you are successful, and then it’s often too late to change the architecture (cf. Friendster)

**There goes the neighborhood:**
Early adopters are often a self-selected, homogenous group; therefore utility in early stages is not indicative of the “steady state” once successful.

Wisdom of Crowds (Surowiecki)

Crowds can be effective at:
• Predictions (prediction markets)
• Solving tough problems (InnoCentive)
• Causing / creating change
• Collecting / filtering info (Digg, Delicious)
• Democratizing production (crowdsourcing)

Time/Space Matrix

<table>
<thead>
<tr>
<th>Same place (co-located)</th>
<th>Different place (remote)</th>
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<tbody>
<tr>
<td><strong>Same time (synchronous)</strong></td>
<td><strong>Different time (asynchronous)</strong></td>
</tr>
<tr>
<td>Face-to-face interactions</td>
<td>Communication + Coordination</td>
</tr>
<tr>
<td>Continuous Task</td>
<td>Remote interactions</td>
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Next Time

Current Directions in HCI
Readings: Will be posted by Tomorrow morning