Collaboration and Social Software

John Canny
CS160 Fall 2010
Personal Computing

Xerox Star, 1981
Engelbart’s Vision

Mother of all demos, 1968
• How can we understand and support collaboration between multiple users?
# A spectrum of collaboration

(not exhaustive)

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<thead>
<tr>
<th>Number of Users</th>
<th>1 10 100 1k 10k 100k 1M 10M</th>
</tr>
</thead>
<tbody>
<tr>
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<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>
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CSCW = Computer Supported Cooperative Work
# A spectrum of collaboration

(Not exhaustive)

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Computer-Supported Cooperative Work
“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.”
Time/Space Matrix

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same time
synchronous

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, ...

different time
asynchronous

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, ...

Time/Space
Groupware Matrix

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!
**Table 1. Eight challenges for groupware developers**

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

2. **Critical mass and Prisoner’s dilemma problems.** Groupware may not enlist the “critical mass” of users required to be useful, or can fail because it is never to any one individual’s advantage to use it.

3. **Disruption of social processes.** Groupware can lead to activity that violates social taboos, threatens existing political structures, or otherwise demotivates users crucial to its success.

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

5. **Unobtrusive accessibility.** Features that support group processes are used relatively infrequently, requiring unobtrusive accessibility and integration with more heavily used features.

6. **Difficulty of evaluation.** The almost insurmountable obstacles to meaningful, generalizable analysis and evaluation of groupware prevent us from learning from experience.

7. **Failure of intuition.** Intuitions in product development environments are especially poor for multiuser applications, resulting in bad management decisions and an error-prone design process.

8. **The adoption process.** Groupware requires more careful implementation (introduction) in the workplace than product developers have confronted.
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, subordinates have the burden)
Make this calendar public Learn more
This calendar will appear in public Google search results.

Share only my free/busy information (Hide details)
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.”
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“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
Same Time, Different Place
(synchronous, remote)
An early synchronous, remote interface

Alexander G. Bell
1876, Wikipedia
Face-to-face interactions

1. Voice
2.
3.
4.
5.
Face-to-face interactions

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

- Written Letter
- Telephone
- Videoconferencing
- Holodeck

Versimilitude

Face to Face
Being There (sort of)
AT&T Picturephone 1969
ClearBoard

by Hiroshi Ishii & Minoru Kobayashi

Special Thanks to Naomi Miyake and Jonathan Grudin
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
Online distance learning
“Face-to-Face” is the wrong model for video conferencing!
Non-verbal cues

Facial expression
Eye contact
Posture
Gesture
Proxemetics
Touch

Facial codes
Conscious media

Body codes
Unconscious media

Chronemics, speech prosody, dress, ...
An Experiment

Face to face

Upper-body video

Face-only video
Measuring Empathy: Help!!

Empathy $\iff$ willingness to help.
Pen-drop experiment

Subjects meet 1-1 in expt. condition, talk about philanthropy.

They go to separate rooms, fill out the questionnaire.

Then one subject is coached on pen-dropping.

Dropper enters the room where the other subject (the “helper”) is, carrying books and pen.

Dropper “accidentally” drops pen, helper may or may not try to pick it up.
Results: Pen drop

Significant differences between head-only framing and face-to-face (p < 0.003) and upper-body framing (p < 0.01).
Results: Pickup rate

Significant differences between head-only framing and face-to-face (p < 0.01) and upper-body framing (p < 0.04).
Media Richness Theory (Daft)
Rich (video) vs. poor (text) media

The best medium for an interaction is the most appropriate, not the richest. Poor media are preferred by users for some tasks.

**Rich Media:**
- Pointing
- Speed
- Bidirectinoality
- Real-time

**Poor Media:**
- Convenience (asynchronous)
- Detachment
- Review – edit
- Archival – searchability –scannability
- Quick
- Lack of pressure
Rich (video) vs. poor (text) media

The best medium for an interaction is the **most appropriate**, not the richest. Poor media are **preferred** by users for some tasks.

**Rich Media:**
- Hi stakes communication: sales, making deals, interviewing
- Communication between strangers/people you like
- Reaching shared understanding quickly
- Motivating members

**Poor Media:**
- Convenience (time-shifting for write and read)
- Archival
- Lack of ambiguity
- Routine communication
- Communication with known associates
- “Slack” – multitasking, kicking back, reducing stress
Many successes do not approach “being there”
Many successes do not approach “being there”

For me the worst part is the lack of communication from requesters. When I get a rejection and can’t figure out why, it sucks. Worse, if a requester who previously approved more than 99% of my work suddenly bans me, and I don’t know why, nor is the MTurk customer service willing to inquire on my behalf, that sucks major. As workers we hardly have any rights, but requesters have a lot of power. At times this feels really bad.

The worst part of it is all the scams. It is very difficult to find work that won’t send me tons of spam! The pay is also very bad for most of the tasks.

The biggest challenge is there is not enough credible work loaded into the system on a regular basis. I find the tasks that require me to sign-up for any form of service to be quite annoying. I wish there was more work for higher pay and that there was also more data entry tasks. The only problem I have is the lack of communication between the requester and the worker.

I agree. While there is an unofficial program out there where Turk users can rate the quality of requesters, even that is hit and miss (for example--what if the requester is new?). Still, it’s better than nothing.

Another thing that happens is people will create hits that have broken links or elements that don’t work. You’ll go offsite and do what they asked, then click “submit hit,” and you’re not able to. Scams galore, and no quality control.

It is difficult to find tasks that pay enough to be worth the effort.

Agreed. It makes one feel expendable. Oftentimes requestors don’t even respond to your requests or inquiries, and it makes you feel like they just want cheap labor. Anybody’s labor. I’m not complaining, so I know going in. It’s just that sometimes there is real, quality work available, and it’s disheartening to know that no one would ask for you specifically. Basically whoever gets the job first kind of thing. Again, I know this going in, it’s just I see much work going by that would be great long-term—but if you feel the employer thinks you are expendable, it’s almost little to no incentive to keep checking back for them. I always do my best work, regardless, but sometimes I just want to stop looking for work on Turk altogether.

What irritates me the most is getting work rejected for no good reason. I shouldn’t complain as, overall, I have a high acceptance rate.
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

Lorem ipsum...
Track Changes for Movies

Pixar
From: B. Buxton
Sketching User Experiences
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.
What CSCW overlooked (initially)

- Early CSCW research focused on collaboration in hierarchical professional organizations.

- Why?
  And what areas does such an orientation miss?
Social Media Participation
“Work” systems support hierarchies
# of edges in a fully connected graph: 
\( \frac{n(n-1)}{2} \sim n^2 \)  

# 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.)
I'M BENDIN' UR SPOON WITH MY MIND

(User contributed image descriptions)
More useful than LOLcats.
Yet more useful.
Welcome to Wikipedia,
the free encyclopedia that anyone can edit.
3,262,285 articles in English

Overview · Editing · Questions · Help
Contents · Categories · Featured content · A–Z index

Today's featured article

The "Morotai Mutiny" was an incident in April 1945 involving members of the Australian First Tactical Air Force based on the island of Morotai, in the Dutch East Indies. Eight senior pilots, including Australia's leading flying ace, Group Captain Clive Caldwell, tendered their resignations to protest what they perceived as the relegation of Royal Australian Air Force (RAAF) fighter squadrons to strategically unimportant ground attack missions. A government investigation vindicated the "mutineers", and three high-ranking officers at

In the news

- Venezuelan boxer Edwin Valero is found dead from an apparent suicide at the age of 28.
- A state funeral is held for Polish President Lech Kaczyński and First Lady Maria Kaczyńska in Kraków, a week after their fatal plane crash.
- A series of bomb attacks kills more than 48 people in Kohat District, Pakistan.
- Volcanic ash from the eruption of
1. El Farolito
Category: Mexican
Neighborhood: Mission
Meals Served: Dinner
Price: $

Their claim to fame is the "super burrito" (and especially the chile relleno super burrito) which is huge, moist, and flavorful. A cheap and filling dinner in the Mission district, and a cheap

2. La Oaxaqueña Bakery and Restaurant
Categories: Mexican, Bakers
Neighborhood: Mission
Meals Served: Dinner
Price: $

Jeff had another work assignment at 16th and Mission and texted me to see if I was free to meet him during his lunch break, which is dinner for most folks. I don't see my guy as much as I'd like, so

3. Valencia Pizza & Pasta
Categories: Pizza, Italian, Breakfast & Brunch
Neighborhood: Mission
Meals Served: Dinner
Price: $

A redeeming feature was the wine that we could pick by the bottle and it was about $15 per bottle. Sure it was a cheap dinner, my boyfriend and I walked away paying about $45 but I'd rather pay a bit more

4. El Farolito
Category: Mexican
Neighborhood: Mission
Meals Served: Dinner
Price: $

I was craving some good ol' cheap Mexican food, and I stumbled upon this gem on Yelp. Thanks to Yelp again! If you're looking for a cheap hearty FREAKIN DELICIOUS Mexican food, then El Farolito's
passed by my desk and picked up the book had the exact same reaction.

2) The processing language is touted as a means for people unfamiliar with programming to get up to speed with visualization. However, I would be very surprised if anyone with little programming experience would get much out of this book.

3) Don't expect to use this book as a reference for the processing language. It is basically just a collection of half explained examples. Consider for example the function smooth(). This function appears in almost every example but forget about trying to find an explanation of what the function does in the book.

The book is probably worth buying to get up to speed quickly but plan on spending a significant amount of time sifting through the processing.org website and other online resources before being able to get anything non-trivial done. And if you don't already know Java then don't expect to accomplish anything even modestly complex without a lot of outside help.

34 of 39 people found the following review helpful:

⭐⭐⭐⭐⭐ Little more than a Processing Environment tutorial, February 20, 2008

By Samuel Crank (Canton, GA USA) - See all my reviews

Amazon Verified Purchase (What's this?)

This review is from: Visualizing Data: Exploring and Explaining Data with the Processing Environment (Paperback)

Based on the title and publisher's writeup I was expecting the book to provide in-depth coverage of various visual metaphors for...
What Do Customers Ultimately Buy After Viewing This Item?

79% buy the item featured on this page:
Visualizing Data  ★★★★★ (15)
$17.59

10% buy
Programming Collective Intelligence  ★★★★★ (56)
$17.59

8% buy
Visual Thinking: for Design  ★★★★★ (3)
$31.96

4% buy
Getting Started with Arduino  ★★★★★ (34)
$7.99

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Be the first one to add a relevant tag (keyword that's strongly related to this product).

Check a corresponding box or enter your own tags in the field below.

- processing (2)
- beginners
- software development (1)
- visualization (1)
The words above come from scanned books. By typing them, you help to digitize old texts.

```
Scanned type

This aged portion of society were distinguished from
```

```
OCR reads as

“niis aged pntkm at society were distinguished frow.”
```
How does social participation work in practice? Are there patterns/laws?
Power Law Distributions

Figure 5-1: The distribution of photographers contributing photos of the 2005 Coney Island Mermaid Parade.

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

From C. Shirky, Here Comes Everybody
Power Law Distribution

Long tail graph of user participation in Wikipedia

Source: Ed Chi, PARC
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)
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

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