Social Software and MMOs

**MMO** = massively multi-person, online... games, crowds,

John Canny
CS160 Fall 2012
Social Software

- Same place (co-located)
  - Same time (synchronous)
    - Face-to-face interactions
  - Different time (asynchronous)
    - Continuous Task

- Different place (remote)
  - Same time (synchronous)
    - Remote interactions
  - Different time (asynchronous)
    - Communication + Coordination

The diagram illustrates a Time/Space Groupware Matrix, categorizing interactions into synchronous and asynchronous tasks based on whether they occur at the same place or different place.

**Synchronous (same time, same place)**
- **Face to face interactions**: decision rooms, single display groupware, shared table, wall displays, roomware, ...
  - **Remote interactions**: video conferencing, instance messaging, chats/MUDs/virtual worlds, shared screens, multi-user editors, ...

**Asynchronous (different time, different place)**
- **Continuous task**: team rooms, large public display, shift work groupware, project management, ...
  - **Communication + coordination**: email, bulletin boards, blogs, asynchronous conferencing, group calendars, workflow, version control, wikis, ...

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.”
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”
Same Time, Different Place
(synchronous, remote)
ClearBoard

by Hiroshi Ishii & Minoru Kobayashi

Special Thanks to Naomi Miyake and Jonathan Grudin
Face-to-face interactions

1. Voice (what is said)
2. Facial expressions
3. Gestures
4. Posture
5. Locus of attention
Being There (sort of)
AT&T Picturephone 1969

iPhone video
Video conferencing systems usually are inferior to Face-to-Face

It is hard for participants to keep track of:
1. Gaze
2. Deixis (pointing)
3. Body language often missing

However, these are design problems that can be fixed
MultiView: Gaze affects Trust

Quasi-3D display, gaze-faithful solution for group conferencing
Online distance learning
“Face-to-Face” is the wrong model for many social tasks!
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 <=> 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

Number who Picked up  12  11  5

Significant differences between head-only framing and face-to-face (p < 0.003) and upper-body framing (p < 0.01).
Different Time, Different Place
(Asynchronous, Remote)
Examples:

1. Email
2. Wikis
3. Blogs
4. Facebook
5. BBS (Discussion boards)
Lorem ipsum...
Visual Diff
Social Media Participation
“Work” systems support hierarchies
Participation in Live Groups

Relative participation

Rank of user
Elementary Graph Theory

# of edges in a fully connected graph:
\[ n^2 \quad \sim \quad n^2 \]

# 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.
Managing Many/many communication

- Search tools – find what you want from clues
- Recommenders – find what you probably want from your history
- Social software – find what your friends liked
I'M BENDIN' UR SPOON WITH MY MIND

(User contributed image descriptions)
More useful than LOLcats.
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, Bakeries
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 are looking for a cheap hearty FREAKIN DELICIOUS Mexican food, then El Farolito's
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

Explore similar items

Suggested Tags from Similar Products (What's this?)
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)
- data visualization (1)
- software development (1)
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)
Social Dynamics of MMOs
Social Dynamics of MMORPGs

• Reward structure in WoW: careful progression of playing time with levels:

Figure 2 - Average time required to reach a level

Figure 3 - Average accumulated play time by level

• i.e. WoW is extremely strong as a single-player game.
Social Dynamics of MMORPGs

• World of Warcraft, the most successful MMORPG in history.
• Encouraged social play via group quests and guilds.
Groups in WoW

- WoW encourages group play in two ways:
  - Characters have complementary abilities
  - Groups are required to perform harder quests

Figure 4 - Average time spent in a group, by class
Groups in WoW

• WoW encourages group play in two ways:
  – Characters have complementary abilities
  – Groups are required to perform harder quests

![Chart showing mean group ratio by class]

*Figure 4 - Average time spent in a group, by class*
Groups in WoW

- Group play as a function of level:

![Graph showing the percentage of time spent in groups by level.]

**Figure 5 - Fraction of time spent in groups, by level**
Groups in WoW

- Leveling time as a function of time spent in groups

Figure 6 - Impact of grouping on leveling time
Guilds

• Guilds are long-lived groups of players created by the players themselves.
• Guilds are groups of players who know each others’ skills and can work together regularly to meet challenges.
• They should be at the same level so they are motivated by the same quests.
• Guild membership is about 66% overall, and 90% at level 43 and above.
Guilds and playing time

- Guild members have some dependence on each other, and create pressure for players to play more.

*Figure 7 - Guild membership and playing time, by level*
Guild size

• Guilds tend to be small:
  – Average size 14.5

• Guild size tends to stay constant over time

• BUT:
  – Player churn is significant, and old players regularly leave and are replaced by new ones.
  – Guilds themselves churn regularly, 25% of them disappear each month.
Guild Networks

- The social networks in guilds usually have a committed core, and several peripheral players:

*Figure 8 – Co-location network in a medium-sized guild*
Guild Networks

- The social networks in guilds usually have a committed core, and several peripheral players:

Figure 8 – Co-location network in a medium-sized guild
Guild Networks

• The social networks in guilds usually have a committed core, and several peripheral players:

Figure 8 – Co-location network in a medium-sized guild
WoW discussion

• Game design (playability) is still a big factor in success of the game.
• WoW was designed to be accessible to many players, and the leveling structure is very clean.
• Group play increased with level, but group play was less efficient for rapid leveling.
• Guild are small, churn regularly, and players turn over to keep the guild at its working size.
• They often have a committed core and periphery.
• Groups and guilds are formed from need, but players still play “alone together”.

11/14/2012
Alone together

Why do players enjoy individual play in a public arena? The answer seems to be:

• Audience
• Social presence
• Spectacle
Design Implications?
Design Implications?

Are game collaborators more like friends or weak ties?

Share personal information or just game-related stuff?

Keep a detailed archive of your collaborations over time?

Would you hire someone you quested with?
Wikipedia

Is it a “wisdom of crowds” phenomenon, or a volunteer elite?

In 2004, the top 2.5% of users contributed half the edits.

There were about 1000 “Admins” in Wikipedia in 2006.
Figure 1. Percentage of total edits made by admins.
Wikipedia

Edits by groups of users

Figure 4. Percentage of total edits made by users with differing editing levels.
Wikipedia

Growth of population groups

Figure 8. Percentage of users in each user group over time.
Wikipedia

The small contributor community has grown much faster than the elite group.

By far the largest group of contributors do less than 100 total edits, and this group was also the fastest growing.

However, contributions follow a power law with exponent around -2. Most of the contributions still come from active users (who are not admins).
Power Law graph of user participation in Wikipedia
Power Law graph of user participation in Wikipedia

Slope ~ -2

Slope = -1
Why do users contribute (Bruckman et al.)?:

- Authors are like scientists: they like to learn about the world, and write about it.
- Authors are also strongly motivated by perceived status.
- Although there are no author citations, active users are aware of the primary authors of many documents. They take pride in their best articles and are aware of the best articles of others.
Design Implications?
Design Implications?

Make a more explicit credit system, but maybe only visible to contributors.

Keep a viewable archive or resume for each contributor.

Include citation indices, similar to Google Scholar (i.e. keep track of how many other articles cite each article).
Social Media and Social Change

Social media filled a multitude of roles in “Arab Spring” protests:
Alternative news: 75% of tweets from Egypt and Libya were read from outside the arab world.
Social Media for News

Social media proved to be unique conduits for real-time news. Traditional news requires confirmation from independent sources. Social media provide many independent accounts, often with video, in a fraction of the time.
Social Media

Blogs by individuals became a major source of influence. Beginning in Tunisia, news spread across borders. Social media with remote servers, multiple providers etc., were particularly resilient to being shut down.

Lena Ben Mhenni of Tunisia
Social Media and Mobilization

Social media activity spiked before major gatherings, indicating they were an important technology for organizing and coordinating.

Movements were able to grow without formal organization. i.e. there was no central “resistance” with an organizational hierarchy.
Social Media and Access

How much does internet access matter (2009 numbers)?
Design Implications?
Design Implications?

Facilitate rapid forwarding across media, to many recipients.

Support a variety of publish/subscribe models, especially distributed (a la Bittorrent).

Better privacy/obfuscation tools?
Social Media and Freedom

Countries with closed (National) networks:

- Iran
- North Korea
- Myanmar
- Cuba

These closed networks have extensive censorship and monitoring in place. But, there are some “back-doors” for information:

- About 30% of Iranians watch Satellite TV.
- Large numbers of bloggers in Iran and Myanmar, and many blogging from outside those countries.
Social Media and Freedom

But are social media instruments of freedom or tools for oppression? Are the large blogger communities in some countries deliberately tolerated for surveillance purposes?
Social Media Mining
Social Media Mining

Localizing natural disasters from messaging rate and density. Can be used to estimate intensity and epicenter of earthquakes.

See also Cal’s warning service: http://warnme.berkeley.edu/
Epidemiology:
Subjects mobility and social contacts are heavily affected by illness, e.g. flu, malaria etc. Tracking mobility, proximity and messaging activity can generate maps of disease progression.
Social Media Mining

Social media generate huge volumes of public or semi-public information. E.g. about half of all tweets are public. Twitter manages about 10 million public tweets/hour, 10’s of terabytes per year.

Such data support all kinds of analysis. Two in particular have been very active:

- Mood analysis: how do people feel generally?
- Sentiment analysis: what do people think about X?
Social Media Mining

Sentiment keywords. The ANEW corpus (Affective Norms for English Words). Each word is tagged with a numerical score, and then scores are added up to generate a document score. Value is “valence”, large equates to “happy”, small values to “sad”

Lyrics for Michael Jackson’s Billie Jean

“She was more like a beauty queen from a movie scene.
And mother always told me, be careful who you love.
And be careful of what you do ’cause the lie becomes the truth.
Billie Jean is not my lover, She’s just a girl who claims that I am the one.

<table>
<thead>
<tr>
<th>ANEW words</th>
<th>$v_k$</th>
<th>$f_k$</th>
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<tbody>
<tr>
<td>1. love</td>
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<td>2. mother</td>
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<td>1</td>
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<td>3. baby</td>
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<td>4. beauty</td>
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<td>5. truth</td>
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<td>6. people</td>
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<td>8. young</td>
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<td>9. girl</td>
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<td>11. perfume</td>
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<tr>
<td>14. lie</td>
<td>2.79</td>
<td>1</td>
</tr>
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</table>

$$v_{text} = \frac{\sum_{k} v_k f_k}{\sum_{k} f_k}$$

$\textbf{Billie Jean} = 7.1$

$\textbf{Thriller} = 6.3$

$\textbf{Michael Jackson} = 6.4$
Social Media Mining

![Graphs showing normalized frequency](image-url)
Gross National Happiness

A new school year begins
Sentiment Analysis

Key Dimensions:

Subjectivity
– subjective (genius), objective/factual (hypertext markup language)

Polarity
– positive (love), neutral (fish), mixed (love-hate), balanced

Strength
– weak (nice), strong (extremely nice)

Affect
– key universal categories (anger, disgust, fear, joy, sadness, surprise, ...)

Sentiment Analysis

- Inauguration
- Recovery Act
- Budget Revealed
- WH Correspondents Dinner
- CIA Torture Memos Released
### Sentiment Analysis

<table>
<thead>
<tr>
<th>Term</th>
<th>Lab</th>
<th>Con</th>
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<tr>
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**Relevance**

- **Lib**: 73
- **Lab**: 113
- **Con**: 74

**Freq.**

- **Lib**: 129
- **Lab**: 34
- **Con**: 34
## Latent Sentiment Analysis

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<tr>
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<th>Following term</th>
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<th>Backward count</th>
<th>( \chi^2 ) statistic</th>
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</table>
Latent Sentiment Analysis

Many postings show only indirect relationships between the “Obama” and “Muslim”:

Based upon past actions such as a certain American president who was recently seen bowing in submission to one of the world’s largest sponsors of nutjobs like Hassan the King of Saudi Arabia is not called pointless that is called speculation based upon empirical data.

It says rather a lot about Obama who on the day this cowardly attack by this Muslim terrorist happened comes out to allegedly address the nation about the attack and instead comes out and then takes that opportunity to talk about his own political agenda for over two minutes.

It only seems fair to call this terrorist an Islamist terrorist eight months into office and Prezident Obama has the military and the CIA afraid to report behavior inconsistent with a military officer Obama bears ultimate responsibility for military personal afraid to speak out against radical Muslim within their own ranks.

Obama’s Homeland Security Department told us to worry about right-wing extremists so they forgot to keep tabs on Muslim extremists and that’s why 13 soldiers are dead at Fort Hood. Obama should now be impeached.
Latent Sentiment Analysis

Persuasive/Behavior Change interventions clearly need to be tailored to the individual. But what source do we use to figure out what actually influences people?

This is hard because self-report is very biased: user’s always ascribe their own actions to their own choices rather than peer pressure. Data on peer influence show otherwise.

By analyzing statistical relations between posts and actions by users (see next slide), we want to uncover actual (conscious and unconscious) influences.
Social Media and Behavior Change

What we can do:

• Study very large groups of users and filter to find those who have successfully changed.

• Look at posting histories for those users for systematic influences through self-report.

• Look for peer influence between users who regularly @tweet to each other.

• Study **real-time influences** from mass media. i.e. there are about 200k tweets/minute, and substantial coherence with real-time events like network news, major sports events, popular TV shows.
Summary

Social media have become “almost everything we do”.

Social gaming is more of an individual sport.

“Wisdom of crowds” often still dominated by an elite, but which may be an informal one.

Social media can facilitate social change in important ways – but may also be used to stifle it.

Social media mining can provide many insights into: real-time events, trends in attitudes, and behavior change.