Group Collaboration

CS 278 | Stanford University | Michael Bernstein

Reply in Zoom chat while waiting:
What’s your favorite collaboration tool?
Last time

How to design for different kinds of social groups

Strong ties: a few tight friends and family — design for honest signals

Weak ties: a wide variety of acquaintances — design for connectedness and to manage non-uniform contributions

Identity-based groups (no ties): brought together by a shared identity rather than pre-existing ties.

Today, a different kind of group: one brought together by shared purpose and goal.
Which team is more effective?

Colocated team
has: a room

Distributed team
has: Zoom, Slack, Trello, Dropbox, GitHub, Asana, Google Docs, Jira

2:1 more effective
[Olson and Olson 2000; Cummings 2011]

Why? And what can we do about it?
Achieving our collective goals
Achieving our collective goals
COORDINATION NEGLECT: HOW LAY THEORIES OF ORGANIZING COMPLICATE COORDINATION IN ORGANIZATIONS

Failures to achieve our collective goals are rarely due to insufficient skills and increasingly due to fraught collaborations.
How might computing augment us in achieving our collective goals?
What tools do we use?

Dropbox  
Google Docs  
Slack  

Jira Software  
Gmail  
GitHub  

Zoom  
SharePoint  
Google Calendar

Others?

What design patterns make them successful? [2min]
Today

How do we design tools for effective remote collaboration?

Topics

Beyond being there
Social translucence
Grudin’s paradox
Beyond being there
Our main goal is to increase fidelity: to try and make the channel have increased richness, allowing for more and more social cues. [Daft and Lengel 1986]

Let's make Skype and FaceTime have lower delays, higher resolution, and 3D VR or AR scenes.

Let's make coding collaboration tools as effective as if we were pair programming.
Beyond being there

[Hollan and Stornetta 1993]

“Being there” is the wrong goal.

We will never fully recreate the face-to-face experience. There are too many subtle cues for us to fully model or recreate them, even with hypothetical future technology.

Network lag, immersion and comfort issues in VR, lack of shared physical context, …

So, stop trying.
Beyond being there
[Hollan and Stornetta 1993]

Instead of tilting at windmills to design experiences that are as good as being there, design for beyond being there: experiences that could never have been created face-to-face.

How could remote video bring you closer in ways that face-to-face collaboration never could?

How could online coordination tools help us be more effective planners than we ever could with whiteboards and gantt charts?
Examples

Skype translating between languages in real-time and producing foreign language speech in your own voice

Tools that help teams quickly identify if they should be flat or hierarchical, encouraging or critical, and enforcing equal turn-taking [Zhou, Valentine and Bernstein 2018]

Finding just the right person to answer the hard question you are facing, immediately [McDonald and Ackerman 2000]

What are some collaborative superpowers you have or could have? [3min]
The Hyperpersonal Model

[Walther 1996]

One way that social computing technologies allow us to go beyond being there is by giving us the ability to carefully curate our self-presentation. I can carefully choose my words, apply filters, pick the best profile pic, etc.

This makes the result “hyperpersonal”, Walther claims, exceeding face-to-face (But at what cost?)

Recall that we do this from the Norms lecture:

**We are different people when we are in different spaces**

[Goffman 1959]

We do not have a static set of behaviors that we perform in every environment. Like actors, we change our behavior to guide the impressions that people form of us. So, our behaviors change as we enter different social environments.
Social translucence
Interdependence

What makes teamwork hard (and important) compared to social interaction is that the group interactions are interdependent.

We can't just work in isolation: we need to engage in behaviors that are discretionary, pro-social, and non-programmed.

Sometimes those behaviors assume risk: asking questions, revealing ignorance, ceding power, putting in extra effort, monitoring each other, and holding each other accountable.

[h.t. Melissa Valentine]

What do we design to support interdependent collaboration?
Awareness [Dourish and Bellotti 1992]

If interdependence is a key requirement, then design must allow people to understand each others’ state and coordinate accordingly. This goal is typically achieved through the design pattern of awareness: visualization of others’ activities.
But awareness can go too far

You don’t want collaborators to know everything…

Whether you’re working at every moment

Draft emails you wrote when you were angry but didn’t send

Dumb bugs that you introduced into your code but fixed quickly before you made a git commit

So how do we walk this line?
Social translucence

[Erickson and Kellogg 2000]

Aim for **socially translucent systems**: give enough information to let natural social cues take over.

Opaque systems: no information
- Solid door to a trafficked stairwell
- Door-in-the-face situation

Transparent systems: total information
- Glass door to a trafficked stairwell
- Everybody feels awkward

More transparency
Less transparency
Social translucence

[Erickson and Kellogg 2000]

Aim for **socially translucent systems**: give enough information to let natural social cues take over.

**Opaque systems**: no information

- Solid door to a trafficked stairwell
- Door-in-the-face situation

**Translucent systems**

- Windowed door
- Social cues prevail

**Transparent systems**: total information

- Glass door to a trafficked stairwell
- Everybody feels awkward
Social translucence: example

[Erickson and Kellogg 2000]

Aim for **socially translucent systems**: give enough information to let natural social cues take over.

Opaque systems: no information
- Code isn’t pushed yet...

Transparent systems: total information
- Michael Bernstein is editing `importantfile.py`. He’s typing `i don’t know how this works` over and over into his code editor.
Social translucence: example

Aim for **socially translucent systems**: give enough information to let natural social cues take over.

Opaque systems: no information
Code isn’t pushed yet…

Translucent systems
Michael is working on `importantfile.py`

Transparent systems: total information
Michael Bernstein is editing `importantfile.py`. He’s typing `i don’t know how this works` over and over into his code editor

[Erickson and Kellogg 2000]
Social translucence

[Erickson and Kellogg 2000]

Two requirements for social translucence:

1) **Awareness**: others’ activity can be seen — to an extent

2) **Accountability**: others know that their activity can be seen

If done correctly, social translucence supports interdependent work while maintaining plausible deniability when necessary.

If there’s no plausible deniability in the system, people will abandon it.
Grudin’s paradox
Why do so many collaborative software systems get abandoned?

Dead wikis and documentation at work
Calendars not reflecting actual person or room availability
“Oh, I don’t use that. Just send me an email instead.”
…even though these systems may even provide social translucence and go beyond being there.
Grudin’s paradox [Grudin 1998]

The socio-technical system may be benefiting everyone...except the people who are expected to use it.

What is in the product manager’s interests may not be in the ordinary users’ interests. [Ackerman and Halverson 2003]

Examples:

The manager wants everybody’s calendars to be up-to-date...but the programmers don’t care, and just want to work on the project.

We want an API to be documented and kept up-to-date, but the people who write and actively use the software don’t need the documentation.

Being on Slack is distracting for the people who need to be reached
Grudin’s paradox [Grudin 1998]

When a system falls prey to Grudin’s paradox, it gets abandoned or circumvented.

How to avoid this? The system needs to provide benefit to all users, not asymmetric benefits.

….And not just perfunctory benefit — enough benefit to justify the work and distraction that using the system might entail.
Hate ‘em, then love ‘em

Irene Greif, who founded the field — and was the first woman to earn a PhD in CS from MIT — spent much of her career in industry research labs working on collaboration tools.

She notes that with each new generation of collaboration technology, companies are extremely wary: all they can see are the risks and the lawsuits.

Initially, even with something as simple as voicemail!

Collaboration benefits are much harder to quantify and put into dollar amounts, to balance against the risk. Only later do companies see the value and buy in.
So where are we going?

Facebook Spaces: VR remote conversations

Using today’s concepts: will this succeed? [2min]
So where are we going?

Beam: robot telepresence robot

Using today’s concepts: will this succeed? [2min]
Michael’s take

All the tools that we talked about today take the organizational structures as given: the team, the teams, the hierarchy, and so on.

  e.g., Skype already assumes the members of the team are set

My opinion: the important technologies from here on out will help aid the authoring and evolution of these structures more directly.

  Who can be working with who? And how?

  What’s the best way for this team to be working together?

  Can we recover if we get into conflict and fracture?
Best memes

Assignment 1: Going Viral

As voted by the class.
when stanford said no finals but ur class has a “cumulative midterm” week 9 😎

Yanichka Ariunbold

Title: “Trying to get work done this quarter” with the image of a man presenting his food to judges, saying “Started making it, had a break down.... Bon appetite!”
Text: ‘me: raise hand in Zoom lecture.
Professor: ’, followed by Bernie Sanders looking determined with the caption ‘I am once again asking you to unmute’
The Two Buttons Meme. There are two frames stacked vertically. The first shows two side-by-side buttons labeled the contradicting choices of “The coronavirus was created and spread by the Chinese government” and “The coronavirus is God’s wrath on sinners”. The bottom frame shows a character sweating and holding a towel to his head due to the stress of choosing between these two choices. The character is labelled “MY MOTHER.”
3 vertical pairs of images are shown. The left photo of the first pair says “CS major spring quarter”, the one on the right shows several TAPS 3 unit classes. The left photo of the second pair says “spring quarter will be taught online” and the right one shows a “Leave of Absence” button being selected. The left photo of the third pair says “all courses will be taught Satisfactory /No-Credit” and the right shows CS221, CS229, CS110
A sign held up at Pride with the words “Looking for a Christian man... so I can date his sister”
Title: “Trying to get work done this quarter” with the image of a man presenting his food to judges, saying “Started making it, had a break down.... Bon appetite!”
A picture of a pleased Marge from “The Simpsons” looking at Homer’s front with overlaid text “there will be no final exams this quarter.” Followed by another picture with the back view of Homer, with overlaid text “mandatory lecture attendance”, “weekly problem sets”, “2 quizzes/week”, “5 take home exams” on Homer’s backside.
Top image: two vintage cartoon businessmen and shaking hands, with the left man having the text “Enrolling for 20+ units because of S/NC policy” written over him, and the right “Stanford Students”. Bottom image: same background image of businessmen shaking hands, but now left has “Having 6 psets due at the end of week 1 and realizing you need to do all the word for an A to get an S” and the right man is now sawing his right hand off with a saw labeled “Are You Sure You Want To Drop?”.
When you get called on in a Zoom class

"sorry my internet disconnected"

An image of a hand about to slap a blue button superimposed with Zoom’s “leave meeting” button with the caption “When you get called on in a Zoom class”
A young woman, labeled “me, post-quarantine”, holds a gas pump nozzle labeled “never ending love + support” in her right hand and a red Solo cup labeled “the homies” in her left hand. Gasoline and heart emojis pour from the gas nozzle into the overflowing cup.
Final project is now live

First deliverable is due Wednesday May 6 (Week 5)

Scaled back for COVID-19
Summary

Group and team collaboration requires interdependence, which leads to a distinct set of design constraints and affordances.

Aiming just to replicate the experience of being there is quixotic; better to aim for beyond being there by looking for affordances unique to the digital realm.

Social translucence is a general principle for designing these systems with awareness and accountability.

If incentives are misaligned, these systems will get abandoned.
Social Computing

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