

Example by Vardhan A:

BeReal (remember that?) pushes you to only friend strong ties

Attendance:





Group Collaboration

CS 278 | Stanford University | Michael Bernstein



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.



Announcements

Assignment 3 starts Tuesday and will happen in multiple stages

No late days for the internal deadlines (e.g., remixing, voting)

Project milestone will be due the Wednesday of Week 7

Zone 1: either the front-end or the back-end is functional

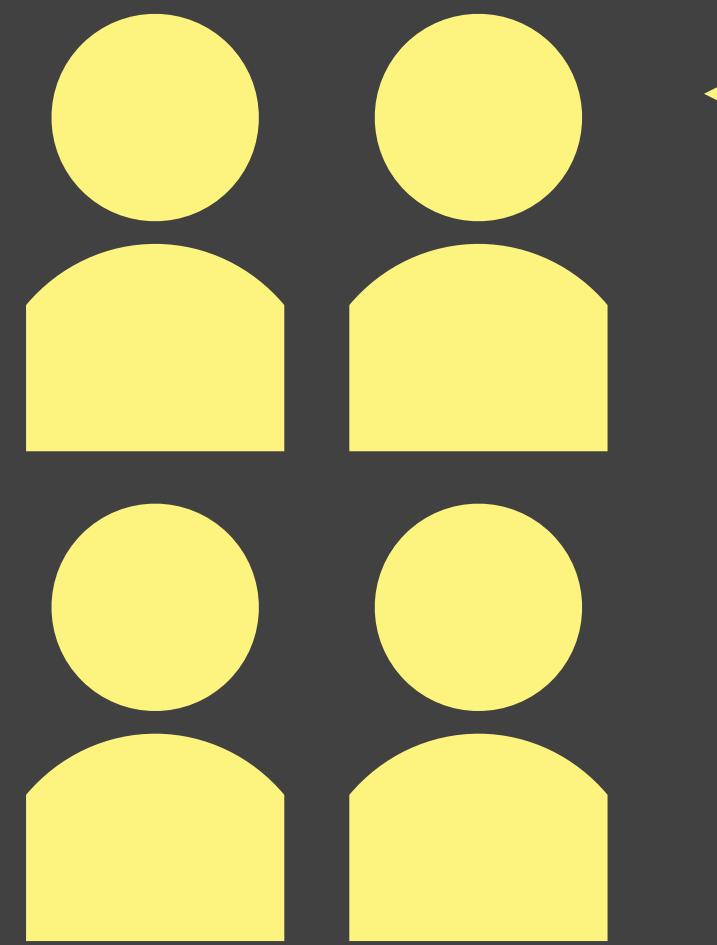
Zone 2: no-code components of the project should be complete; code components may still be in progress

Zone 3: launch! no-code components are complete, so take the system live and start recruiting

We Work

Unit 4

Which team is more effective?

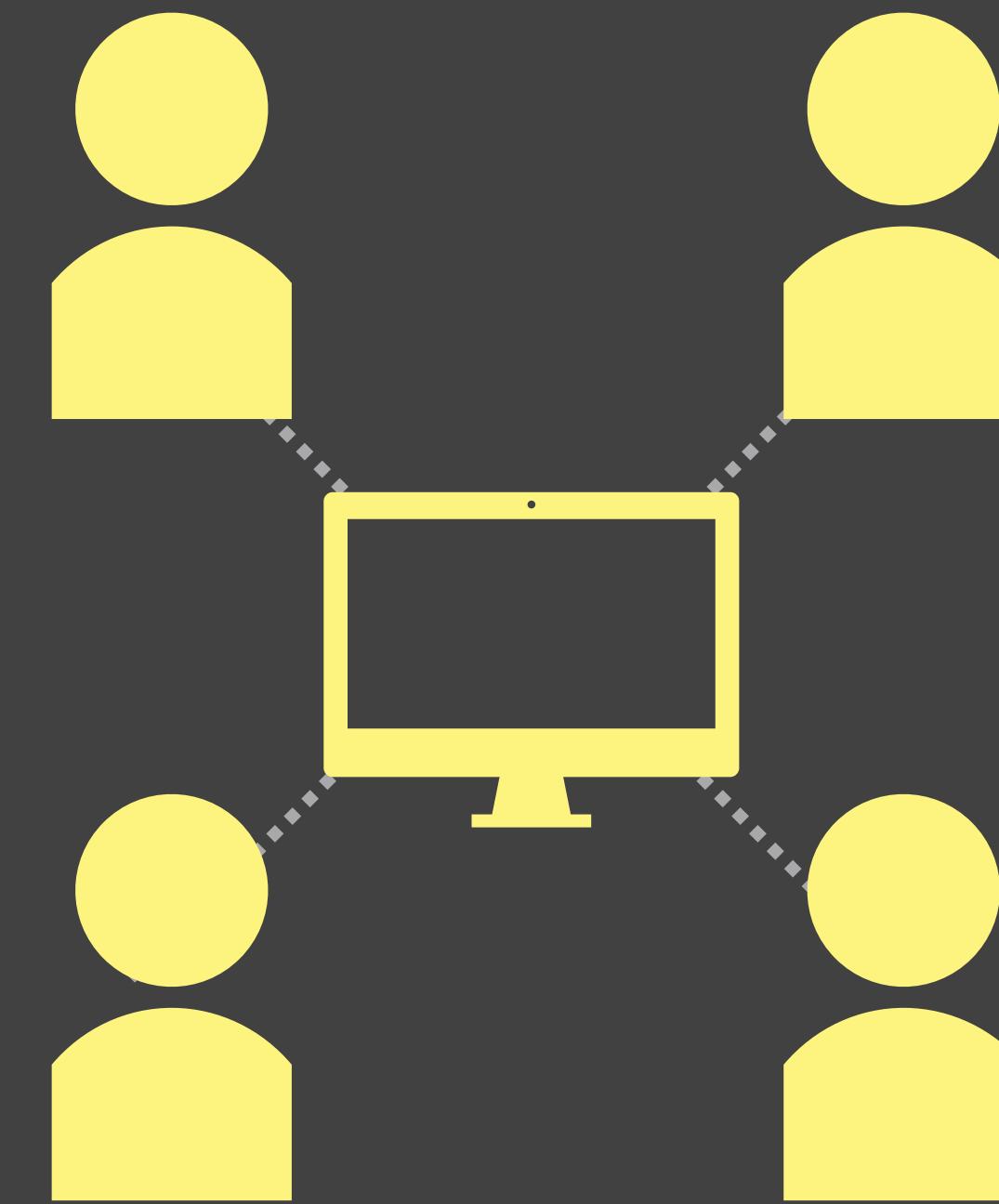


Colocated team
has: a room



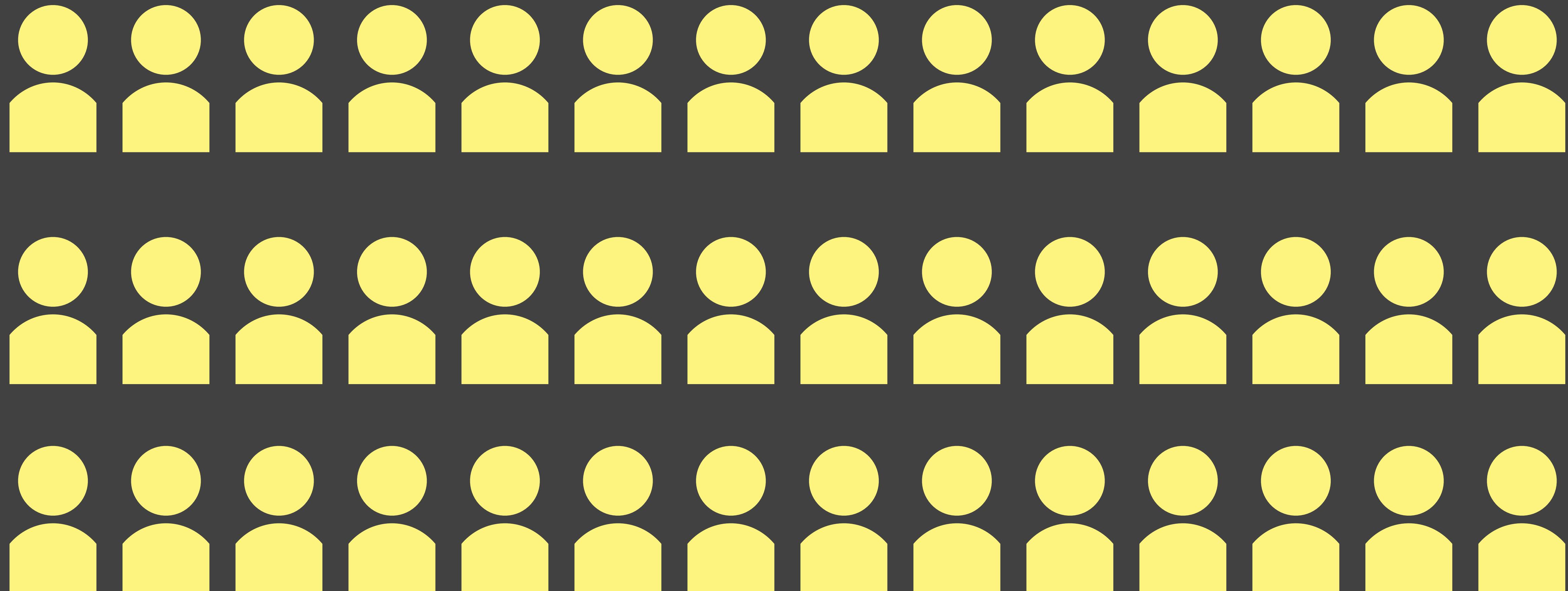
2:l more effective
[Olson and Olson
2000; Espinosa
2011; Björn 2014;
Hu et al. 2022]

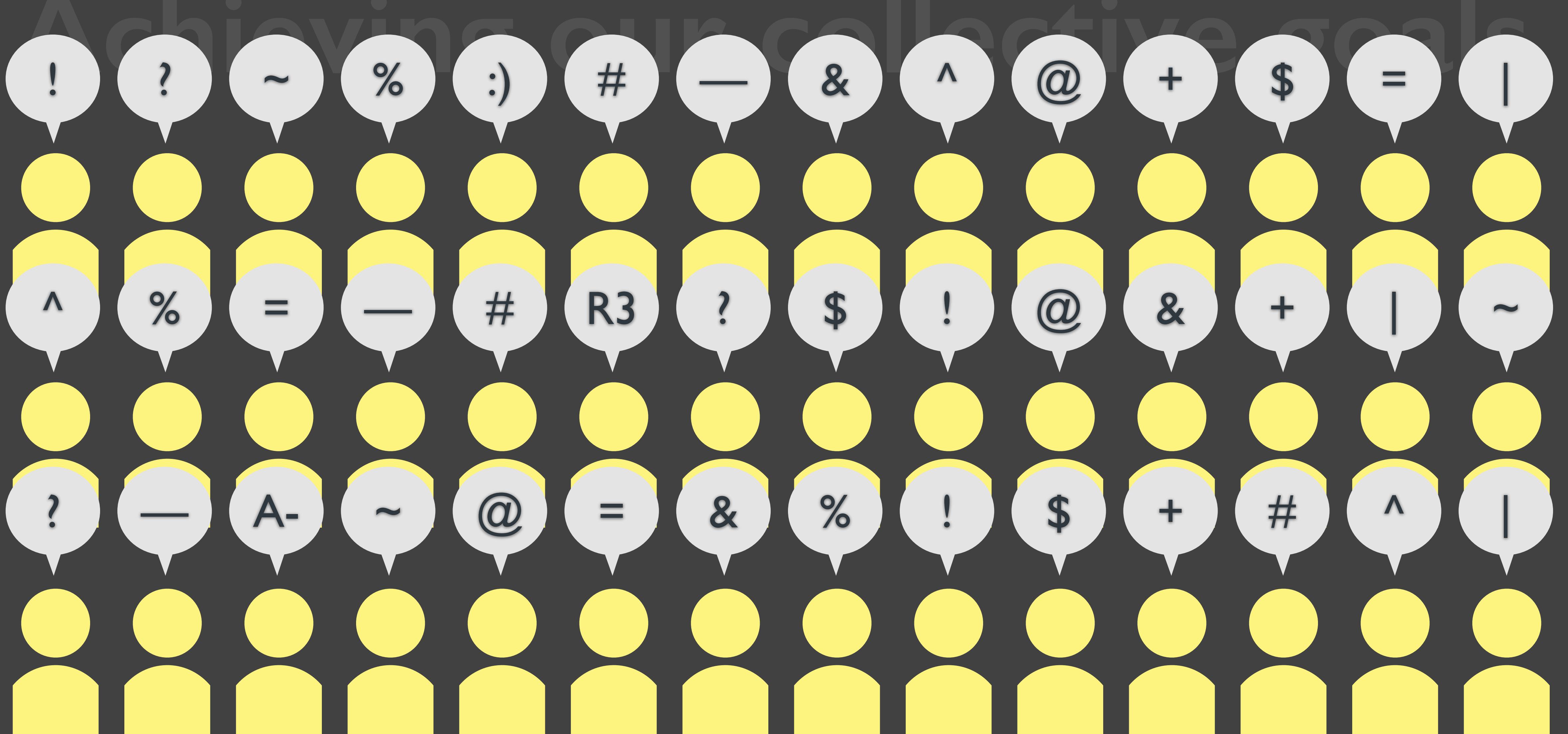
Why? And what
can we do about it?



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

Achieving our collective goals





Out of Sight, Out of Sync: Understanding Conflict in Distributed Teams

COORDINATION NEGLECT: HOW LAY THEORIES OF ORGANIZING COMPLICATE COORDINATION IN ORGANIZATIONS

The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration

The team scaling fallacy: Underestimating the declining efficiency of larger teams

Who's in Charge Here? How Team Authority Structure Shapes Team Leadership

Team Familiarity, Role Experience, and Performance: Evidence from Indian Software Services

= The Influence of Shared Mental Models on Team Process and Performance

Structure and Learning in Self-Managed Teams: Why “Bureaucratic” Teams Can Be Better Learners

Some unintended consequences of job design

COORDINATION NEGLECT: HOW LAY
THEORIES OF ORGANIZING
COMPLICATE COORDINATION IN
ORGANIZATIONS

The Mutual Knowledge Problem and Its
Consequences for Dispersed Collaboration

**Failures to achieve our collective
goals are less and less due to
insufficient skills and increasingly
due to fraught collaborations.**

The team scaling fallacy: Underestimating the declining efficiency of larger teams

Who's in Charge Here? How Team Authority Structure Shapes Team Leadership

Team Familiarity, Role
Experience, and

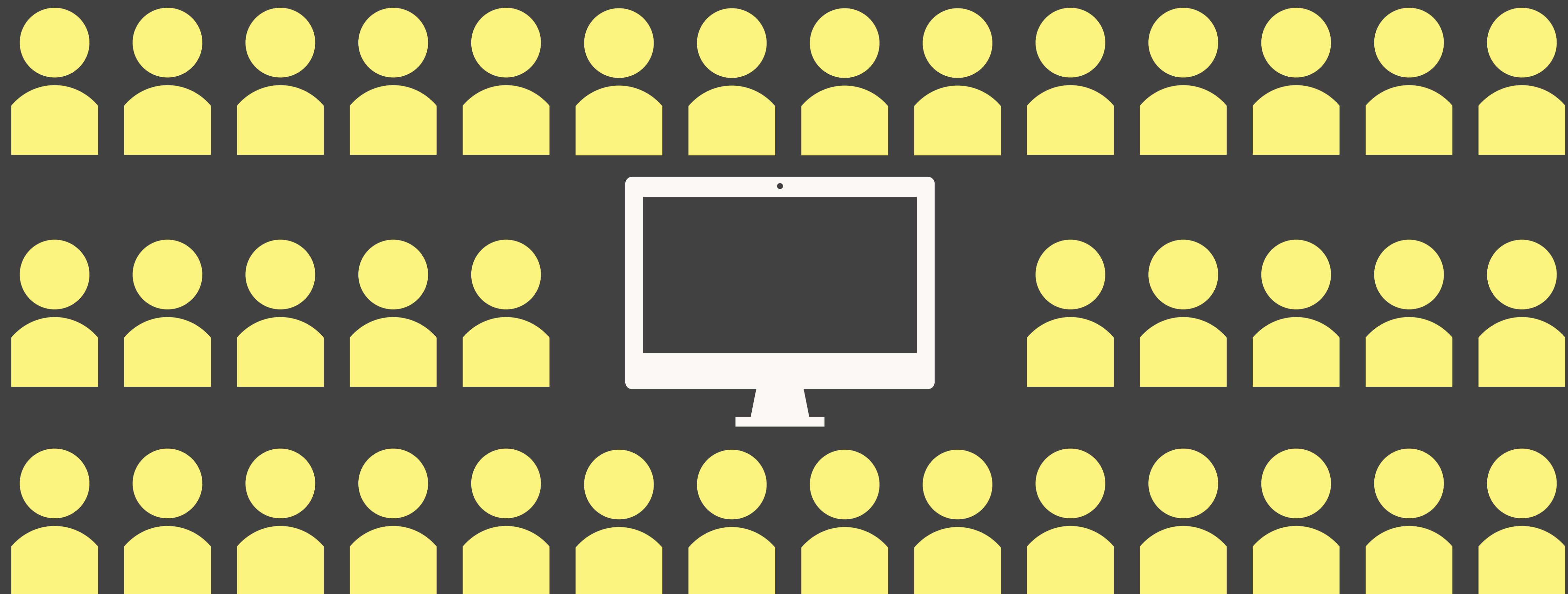
The Influence of Shared Mental Models on Team Process and Performance

Indian Software Services

Some unintended consequences of
job design

Structure and Learning in Self-Managed Teams:
Why “Bureaucratic” Teams Can Be Better Learners

How might computing augment us in achieving our collective goals?



What tools do we use?



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

Remote work

Beyond being there



Goal: 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 Zoom 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

Collaborate online as easily as you do in person

How to Have a Zoom Meeting That Is (Almost) as Good as Being There



Ian Gwin on March 14, 2020

Just like you're there: Swedish augmented reality business establishes presence in Portsmouth, U.S.

WORD ON THE STREET

'Virtual': A Way To Be Present Without Being There

Centuries before digital technology and its use for social distancing, the term was used to mean an

Beyond being there

[Hollan and Stornetta | 1992]

“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 | 1992]

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?

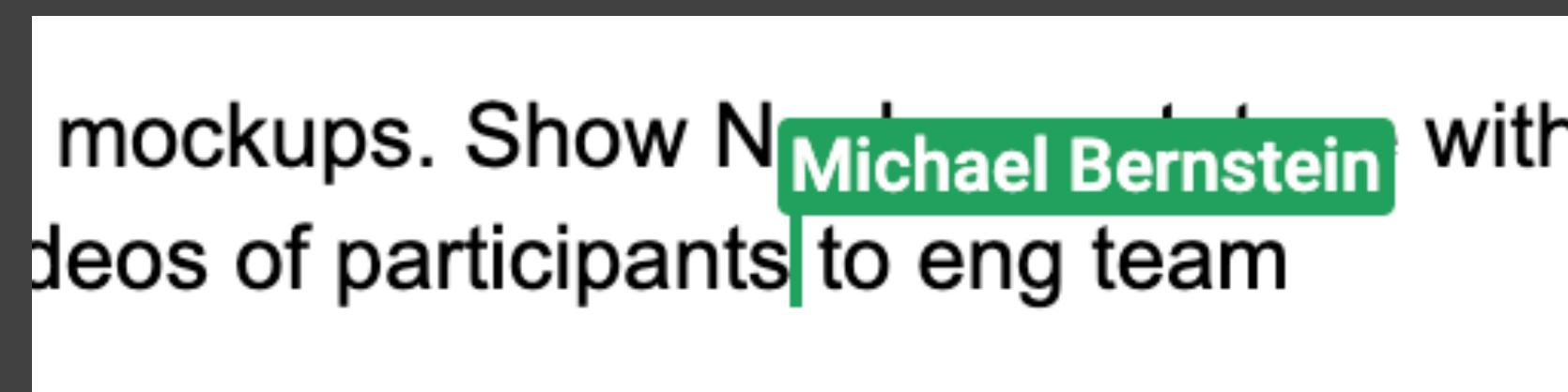
Social translucence

Awareness

[Dourish and Bellotti 1992]

Design must allow people to understand each others' state and coordinate accordingly, to coordinate interdependencies.

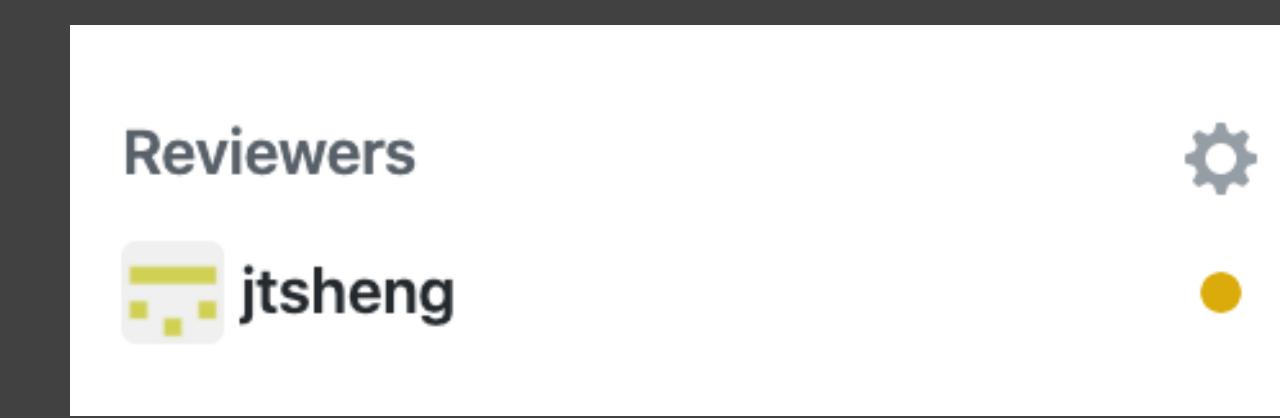
This goal is typically achieved through the design pattern of awareness: visualization of others' activities.



Google Docs



Messaging apps



GitHub



Slack



Significant Otter
[Liu et al. 2021]

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

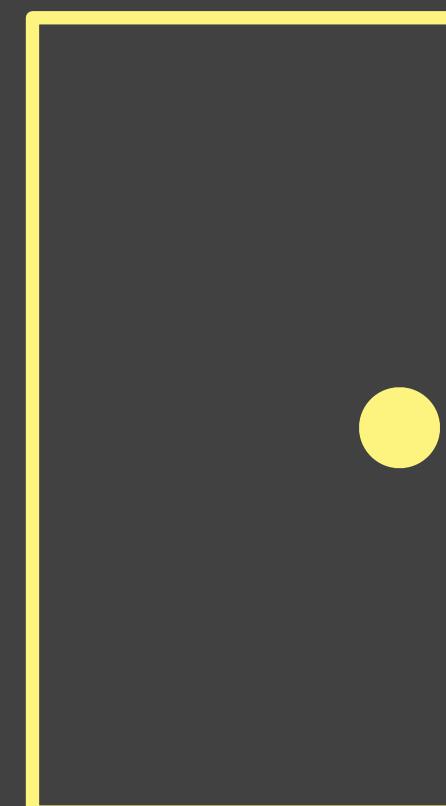
So how do we walk this line?

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

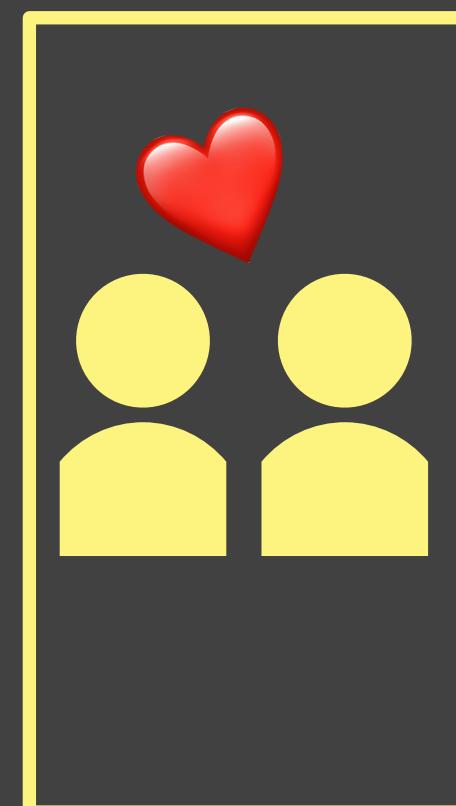


Solid door
to a trafficked
stairwell

Door-in-the-
face situation

More
transparency
↔
Less
transparency

Transparent systems:
total information



Glass door
to a trafficked
stairwell

Everybody feels
awkward

Social translucence

[Erickson and Kellogg 2000]

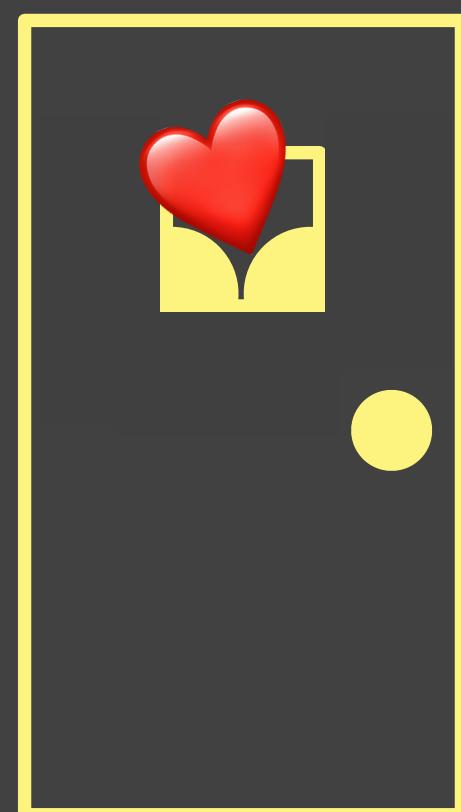
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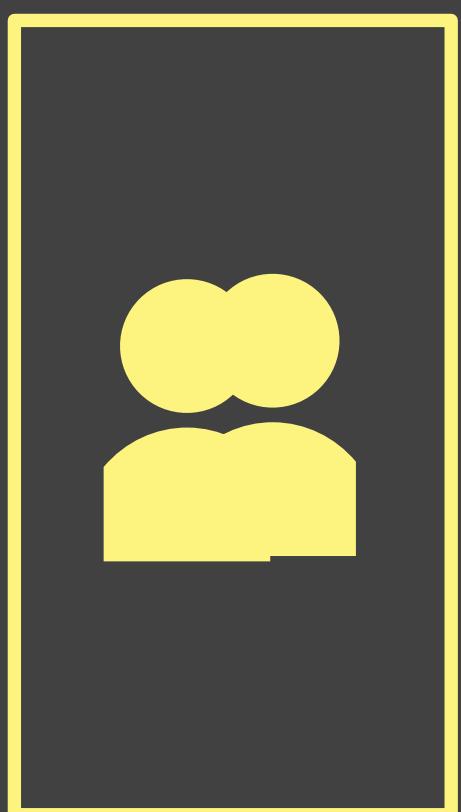
Translucent
systems



Windowed
door

Social cues
prevail

Transparent systems:
total information



Glass door
to a trafficked
stairwell

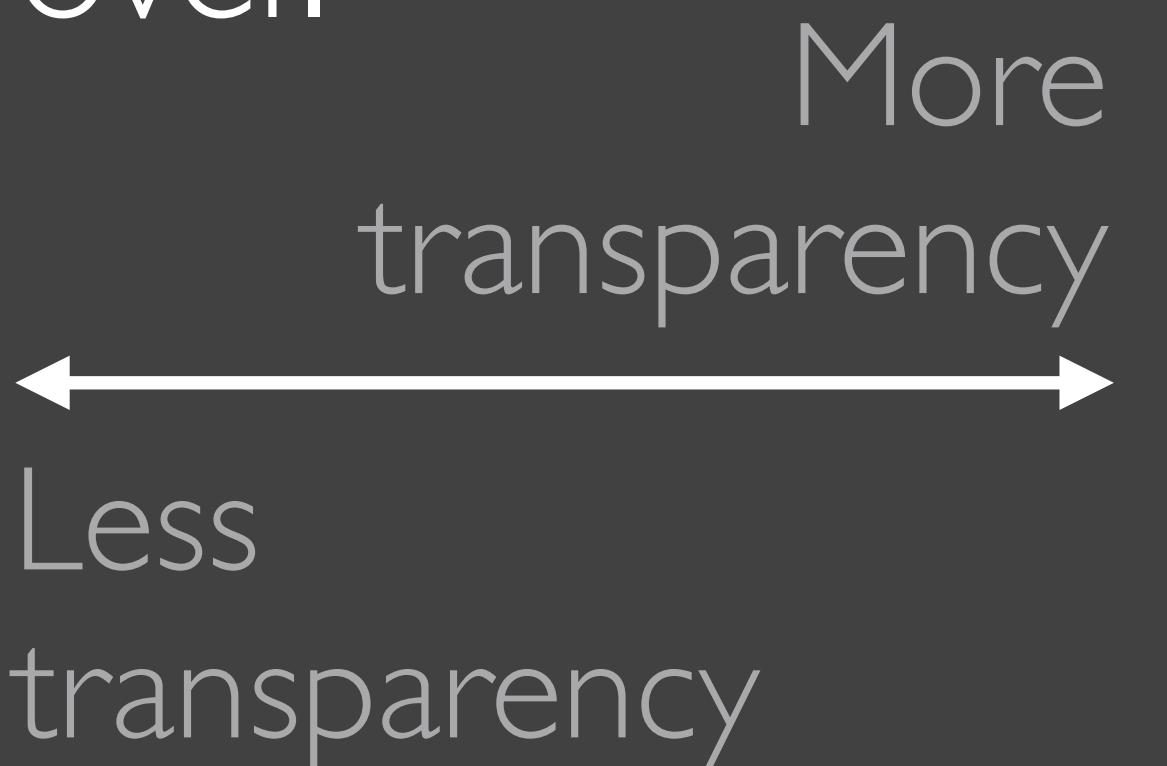
Everybody feels
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Social translucence: example

[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 am stupid` over and
over into his code editor.

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...

Translucent
systems
Michael is working
on `importantfile.py`

Transparent systems:
total information
Michael Bernstein is editing
`importantfile.py`. He's typing
`I am stupid` over and
over into his code editor.

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 a text instead.”

...even though these systems may even provide social translucence and go beyond being there.

Grudin's paradox [Grudin 1994]

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. [Halverson and Ackerman 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 1994]

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. 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?



Meta
Horizon
Workrooms:
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.

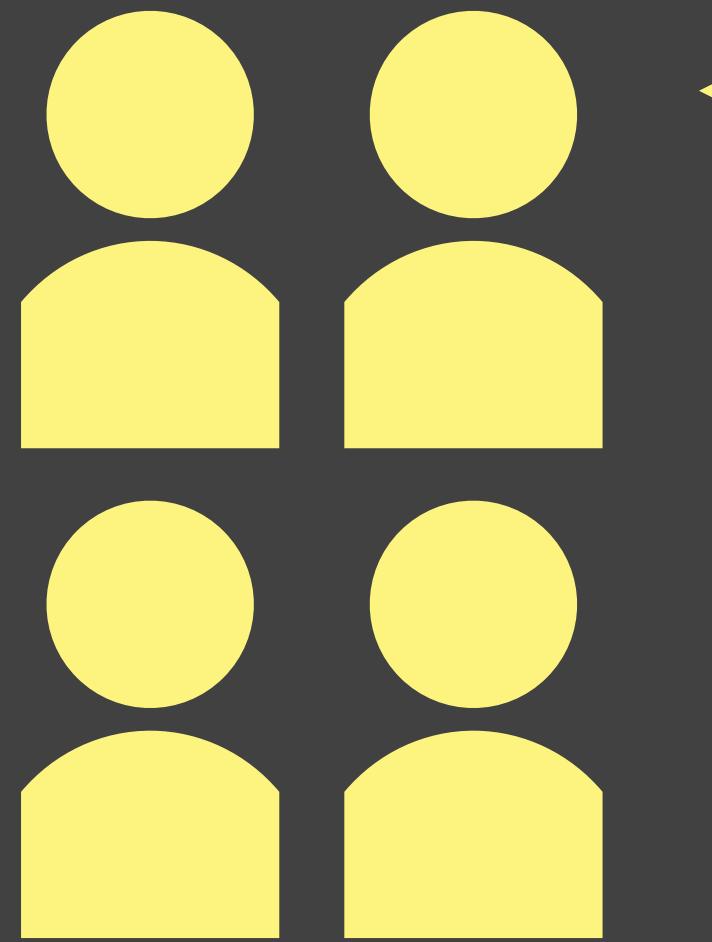
Who can be working with who? And how?

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

Can we recover if we get into conflict and fracture?

Remote work

Back to the remote team...

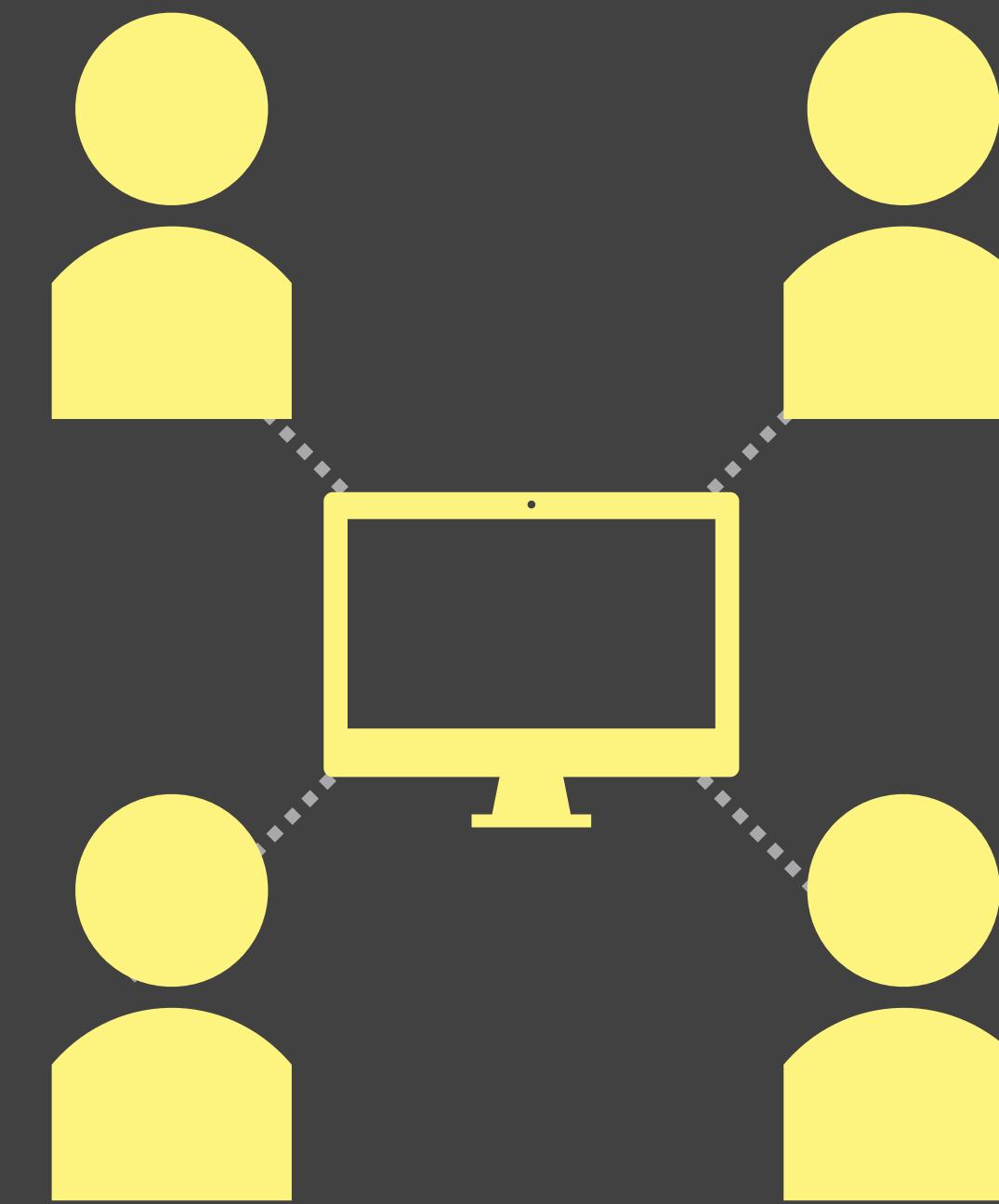


Colocated team
has: a room



2:l more effective
[Olson and Olson
2000; Espinosa
2011; Björn 2014;
Hu et al. 2022]

Why? Under what
conditions?



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

Remote & hybrid work

Remote work does not have a negative effect on individual execution outcomes

Productivity outcomes go up [Bloom et al. 2015], possibly due to 40% of saved commute time being redirected to work [Aksoy et al. 2023]

Remote work has a negative effect on creative and social outcomes

Firm-wide remote work makes collaboration networks more static and siloed [Yang et al. 2021], and reduces the creativity of ideas generated [Brucks and Levav 2022]

Yes, even today.

Even as improved remote work tools have made collaboration smoother within teams, they paradoxically make coordination worse across teams [Hu et al. 2022]

Example: what if Stanford forced everyone to use the same Slack/GroupMe/iMessage platform for your projects?

A “Distance Matters” Paradox: Facilitating Intra-Team Collaboration Can Harm Inter-Team Collaboration

XINLAN EMILY HU, The Wharton School, University of Pennsylvania, U.S.A.
REBECCA HINDS, Stanford University, U.S.A.
MELISSA A. VALENTINE, Stanford University, U.S.A.
MICHAEL S. BERNSTEIN, Stanford University, U.S.A.

By identifying the socio-technical conditions required for teams to work effectively remotely, the Distance Matters framework has been influential in CSCW since its introduction in 2000. Advances in collaboration technology and practices have since brought teams increasingly closer to achieving these conditions. This paper presents a ten-month ethnography in a remote organization, where we observed that despite exhibiting excellent remote collaboration, teams paradoxically struggled to collaborate across team boundaries. We extend the Distance Matters framework to account for inter-team collaboration, arguing that challenges analogous to those in the original intra-team framework – common ground, collaboration readiness, collaboration technology readiness, and coupling of work – persist but are actualized differently at the inter-team scale. Finally, we identify a fundamental tension between the intra- and inter-team layers: the collaboration technology and practices that help individual teams thrive (e.g., adopting customized collaboration software) can also prompt collaboration challenges in the inter-team layer, and conversely the technology and practices that facilitate inter-team collaboration (e.g., strong centralized IT organizations) can harm practices at the intra-team layer. The addition of the inter-team layer to the Distance Matters framework opens new opportunities for CSCW, where balancing the tension between team and organizational collaboration needs will be critical technological, operational, and organizational challenge for remote work in the coming decades.

CCS Concepts: • Human-centered computing → Computer supported cooperative work.

Additional Key Words and Phrases: distance, teams, workplace, distributed work, remote work, future of work, ethnography, collaboration technology

ACM Reference Format:

Xinlan Emily Hu, Rebecca Hinds, Melissa A. Valentine, and Michael S. Bernstein. 2022. A “Distance Matters” Paradox: Facilitating Intra-Team Collaboration Can Harm Inter-Team Collaboration. Proc. ACM Hum.-Computer Interaction 48 (April 2022), 36 pages. <https://doi.org/10.1145/3512895>

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.

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Social Computing

CS 278 | Stanford University | Michael Bernstein

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