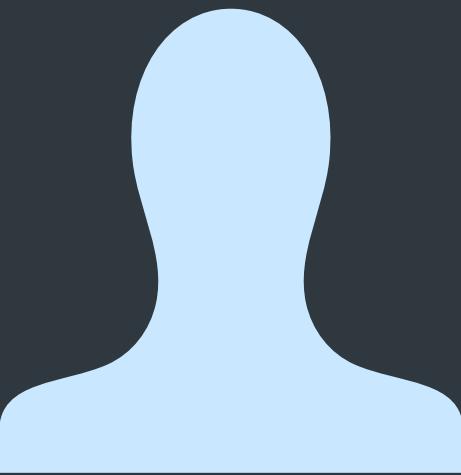


CROWDSOURCING A MEETING OF MINDS DESIGNING THE FUTURE OF WORK

Michael Bernstein
Stanford Computer Science
msb@cs.stanford.edu + [@msbernst](https://twitter.com/msbernst)



20% of US jobs [Blinder 2006]

45,000,000 workers [Horton 2013]





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

Some unintended consequences of job design

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





How might computing connect large groups
to tackle bigger, harder problems
than they could complete in isolation?

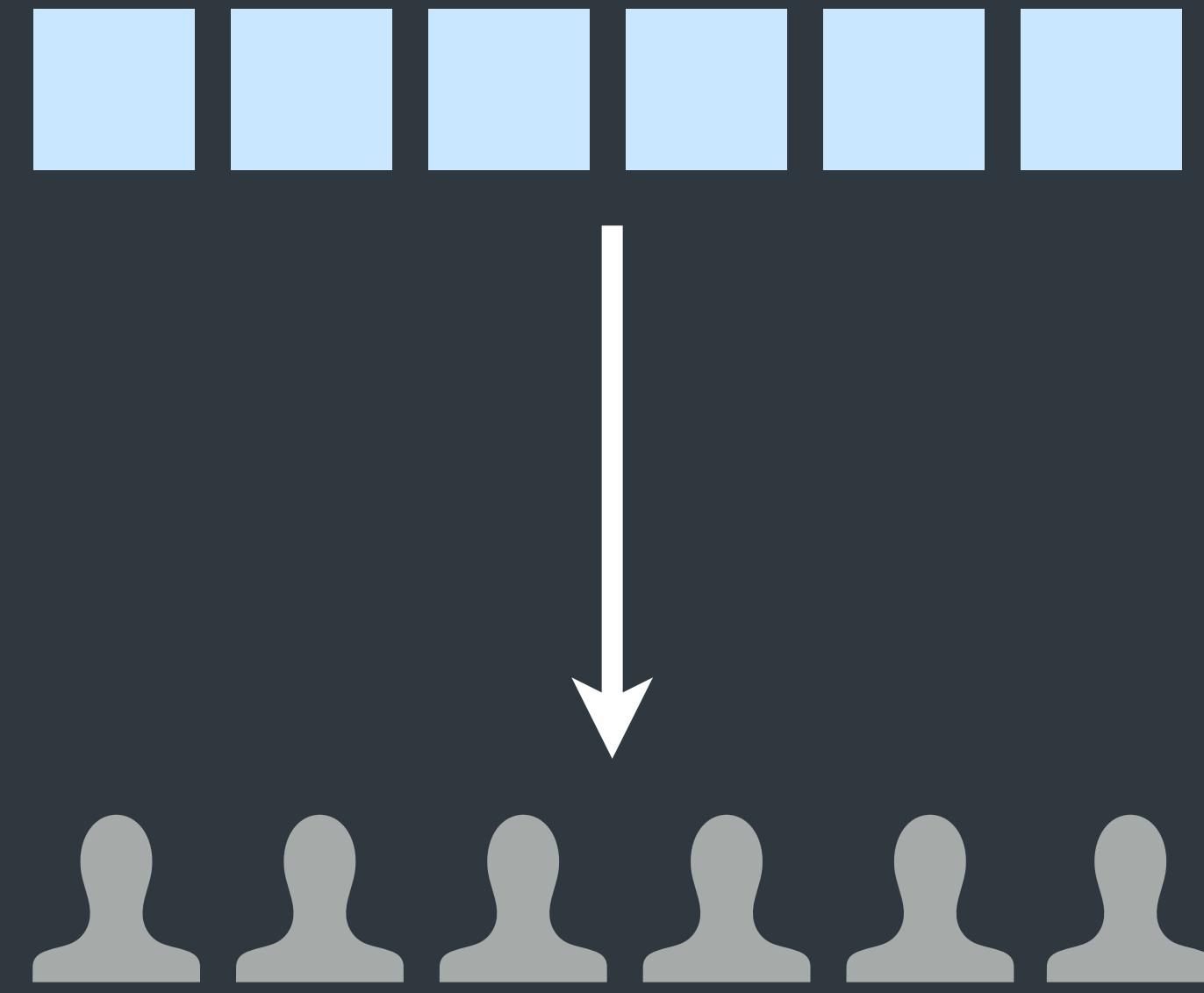
CROWDSOURCING: SMALL TASKS, MANY PEOPLE

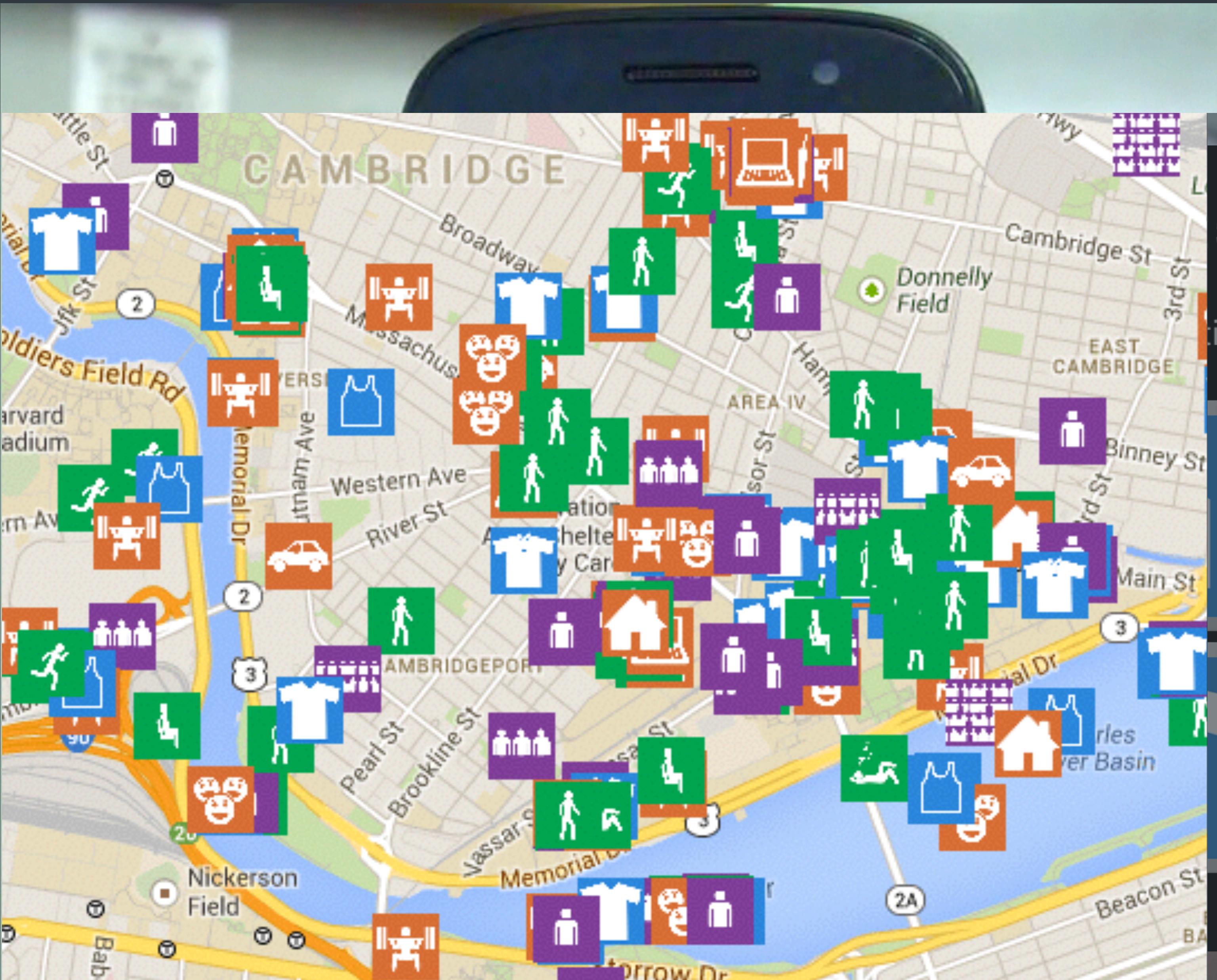
Computationally
recombine many paid
non-expert opinions

e.g., text shortening
[Bernstein et al. 2010]

e.g., image labeling
[von Ahn and Dabbish 2005]

e.g., data collection
[Deng et al. 2009]





[Vaish et al. CHI 2014]

Public deployment:
over 100,000
unlocks

no slower than
slide-to-unlock

no more cognitive
load than
slide-to-unlock

HYBRID CROWD-ML CLASSIFIERS



Paired examples generate human features
Machine learning learns to weigh the evidence

Hybrids 300% relative improvement over human reasoning

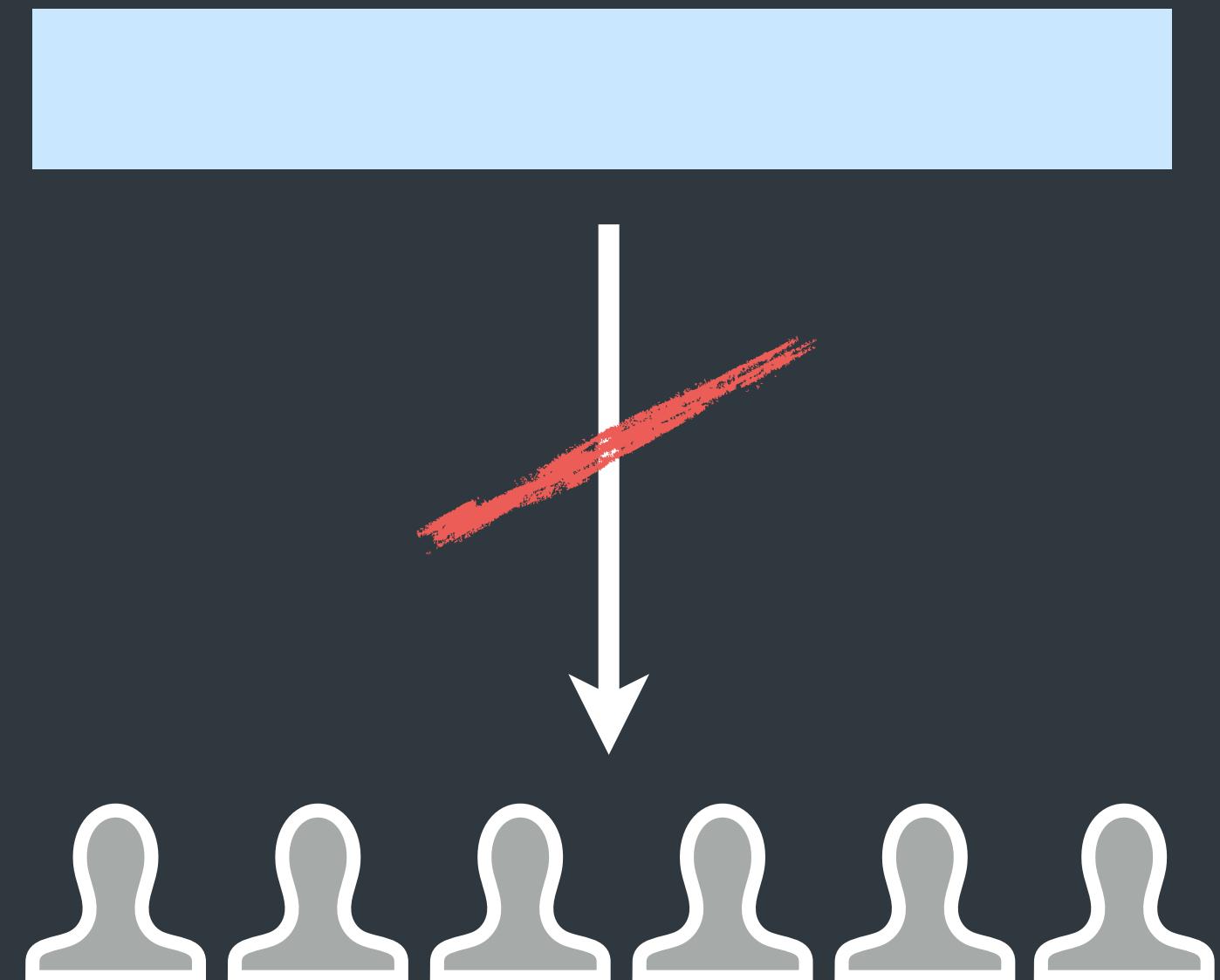
[Cheng and Bernstein CSCW 2015]

Short sentences
Few details

MICROTASK CROWDS STRUGGLE WITH COMPLEX TASKS

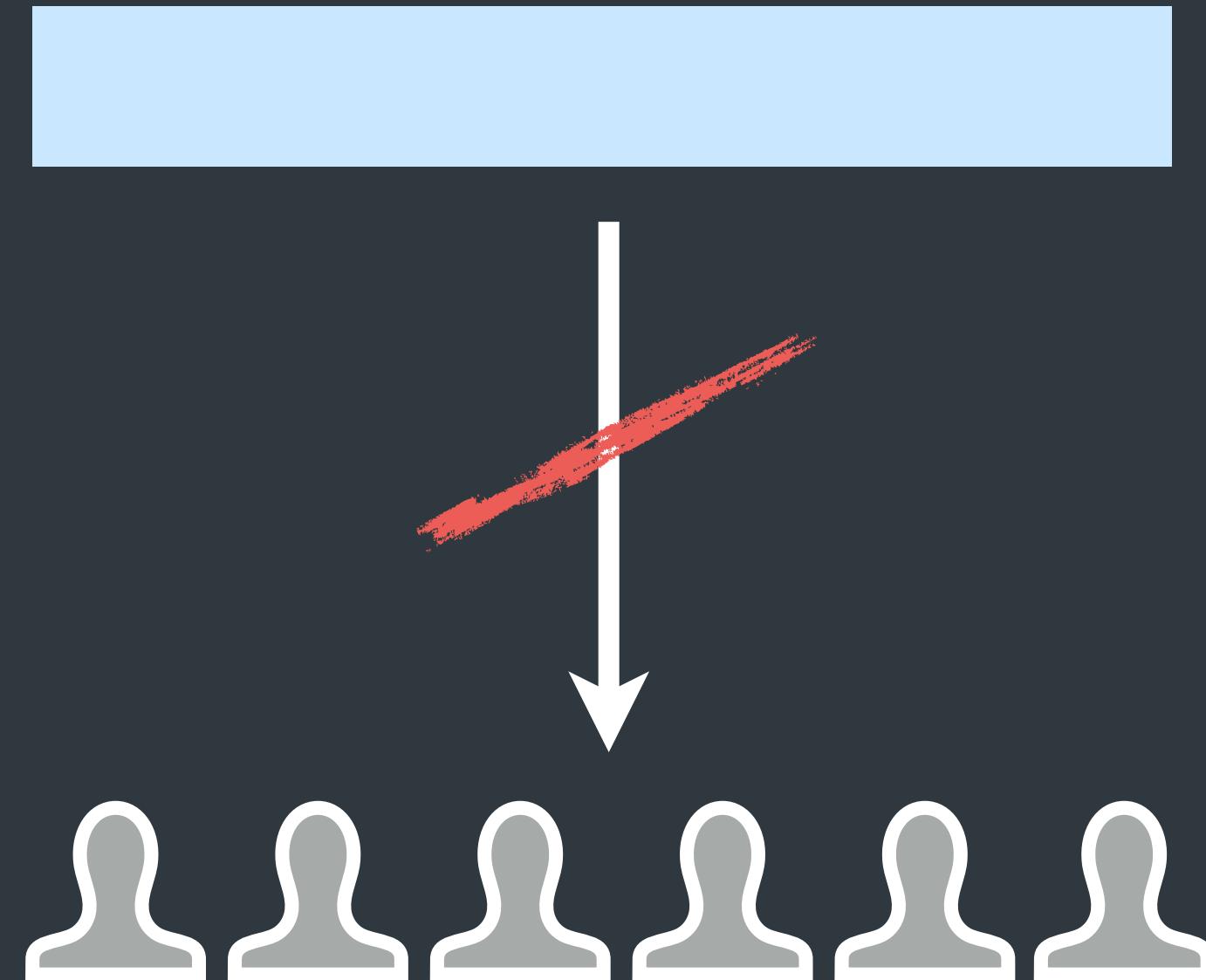
Design, engineering,
writing, video production,
music composition

[Kittur et al. 2013, Kulkarni et al. 2012]



MICROTASK CROWDS STRUGGLE WITH COMPLEX TASKS

Today: Three efforts to computationally scale up the complexity, interdependence, and sociotechnical infrastructure for crowd work.



EXPERT CROWDSOURCING WITH FLASH TEAMS

Daniela Retelny, Sébastien Robaskiewicz, Alexandra To, Walter Lasecki,
Jay Patel, Negar Rahmati, Tulsee Doshi, Melissa Valentine,
Michael Bernstein. UIST 2014. Best paper award.

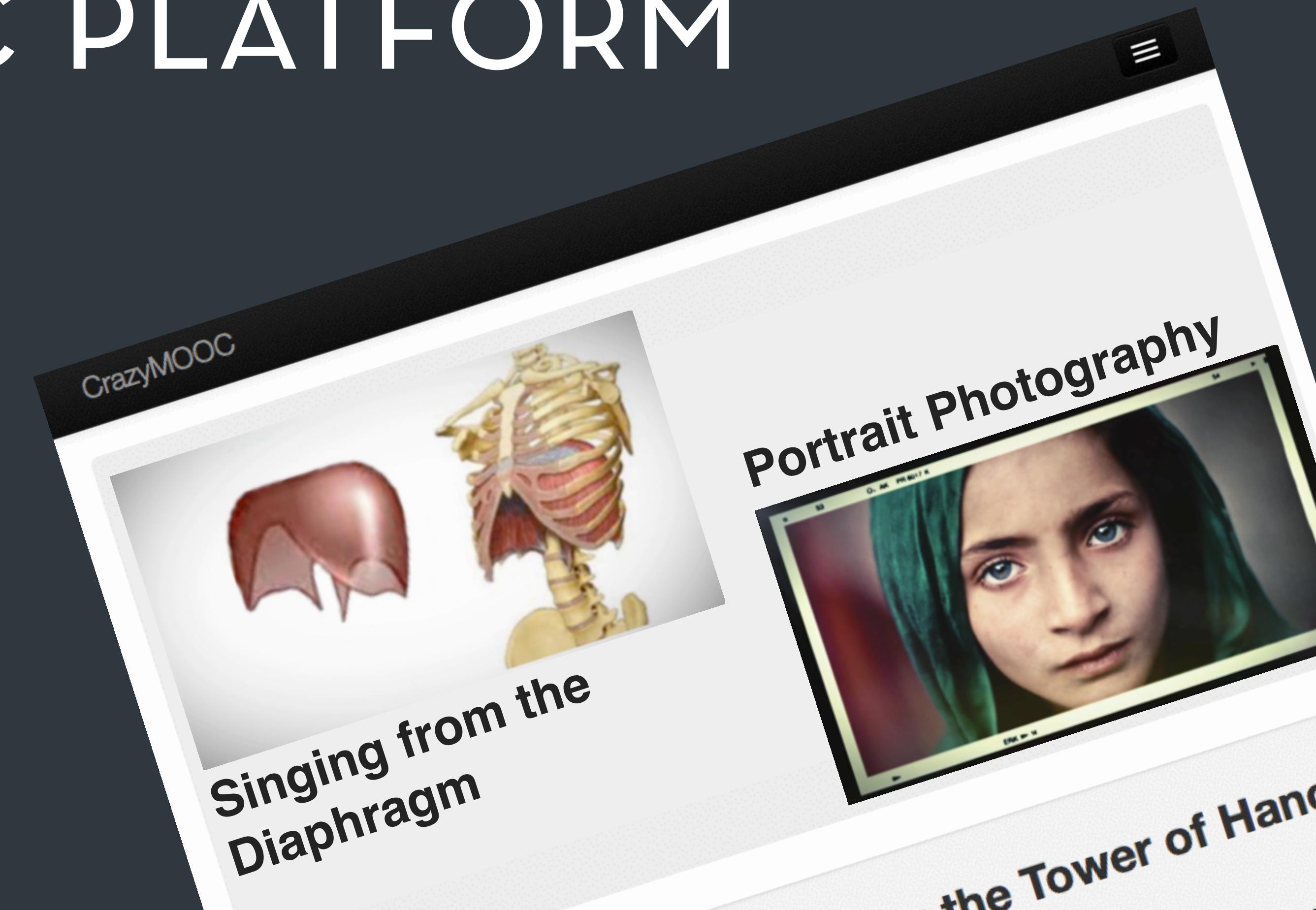
COULD WE CROWDSOURCE...
THE DESIGN PROCESS,
STARTING FROM A NAPKIN
SKETCH, IN ONE DAY?



COULD WE CROWDSOURCE...
AN ANIMATED VIDEO
IN 48 HOURS?



COULD WE CROWDSOURCE... AN ENTIRE MOOC PLATFORM IN 24 HOURS?



CROWDS OF EXPERTS

Mechanical Turk



microtask worker
microtask worker
microtask worker
microtask worker
microtask worker



Upwork



programmer
designer
video editor
musician
statistician

CROWDS OF EXPERTS FACE COORDINATION CHALLENGES



Microtask techniques
do not leverage diverse
skills and expertise.



Expert crowd work is
independent and
uncoordinated.

ORGANIZATIONAL BEHAVIOR



Self-managed teams are inefficient,
riddled with frustrated members,
and poorly coordinated.
[Bunderson and Boumgarden 2010]

ORGANIZATIONAL BE

MSB: 10: take these team scaffolds —> transform the ideas behind team scaffolds so that they could...

Arvind: The earlier slides, you flash up graphics while you talk through them, might want to stagger more e.g., slide 10 you into a lot, then ask the question, might want to stagger the display



Lightweight team scaffolds significantly outperform pipelined and self-managed efforts.
[Valentine and Edmonson 2012]

computational ORGANIZATIONAL BEHAVIOR



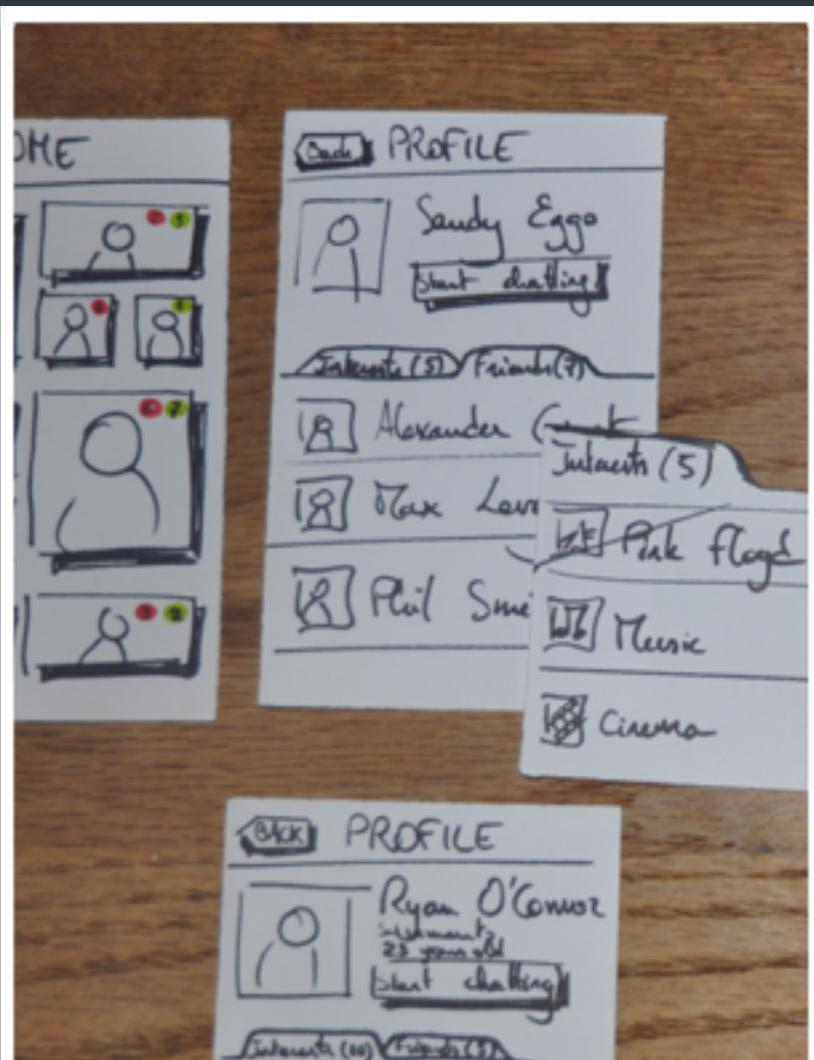
FLASH TEAMS

Crowdsourcing infrastructure for creating and
guiding on-demand teams of diverse experts

FLASH TEAMS

Computationally-guided teams of crowd experts supported by lightweight, reproducible and scalable team structures.

Input

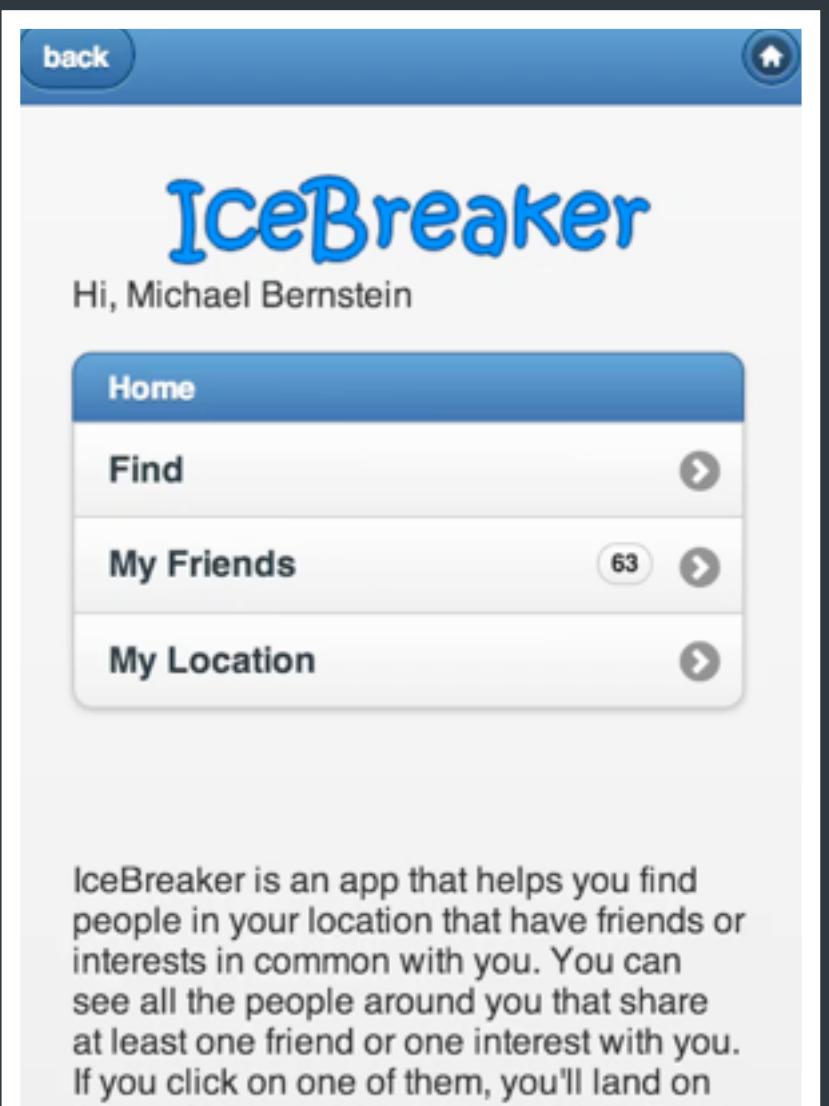


Flash Team

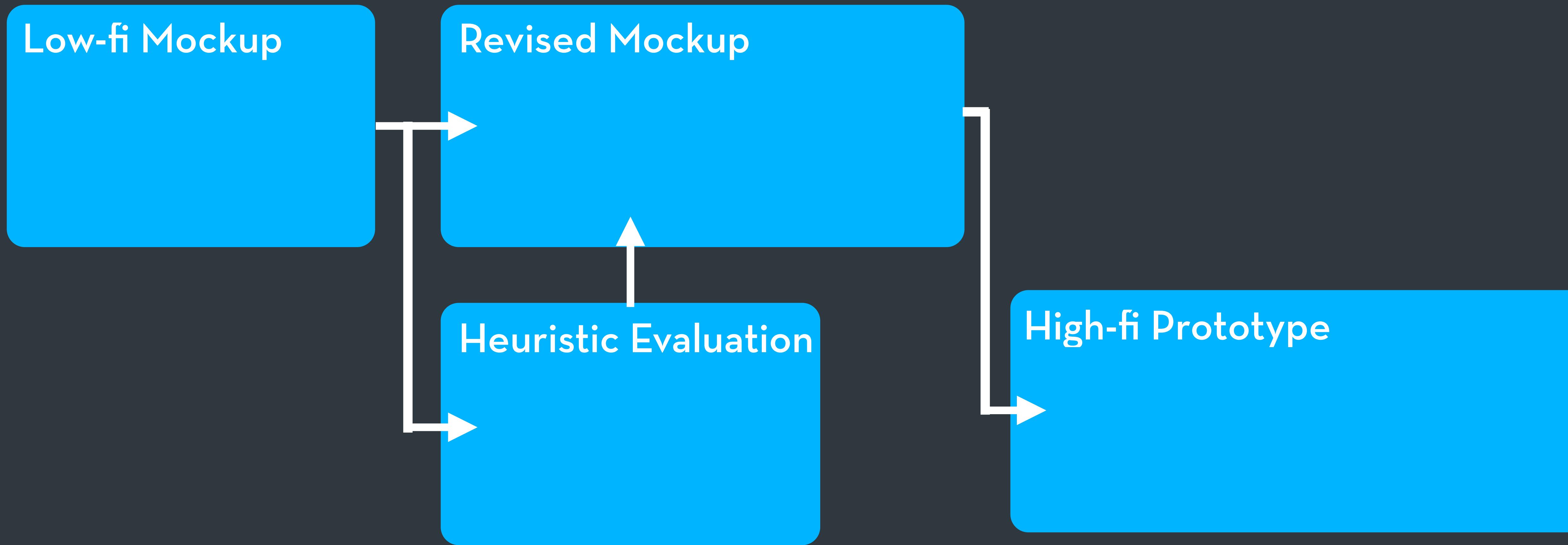


DESIGN

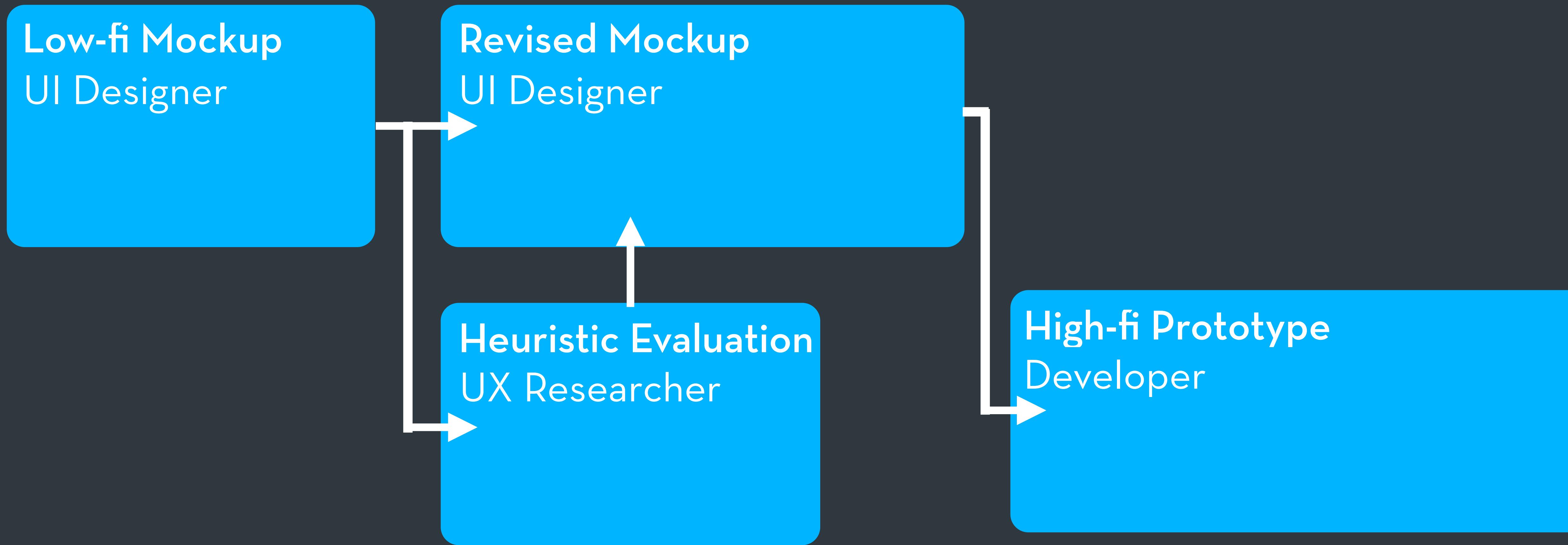
Output



SEQUENCE OF LINKED TASKS



SEQUENCE OF LINKED TASKS



ATOMIC UNIT: BLOCK

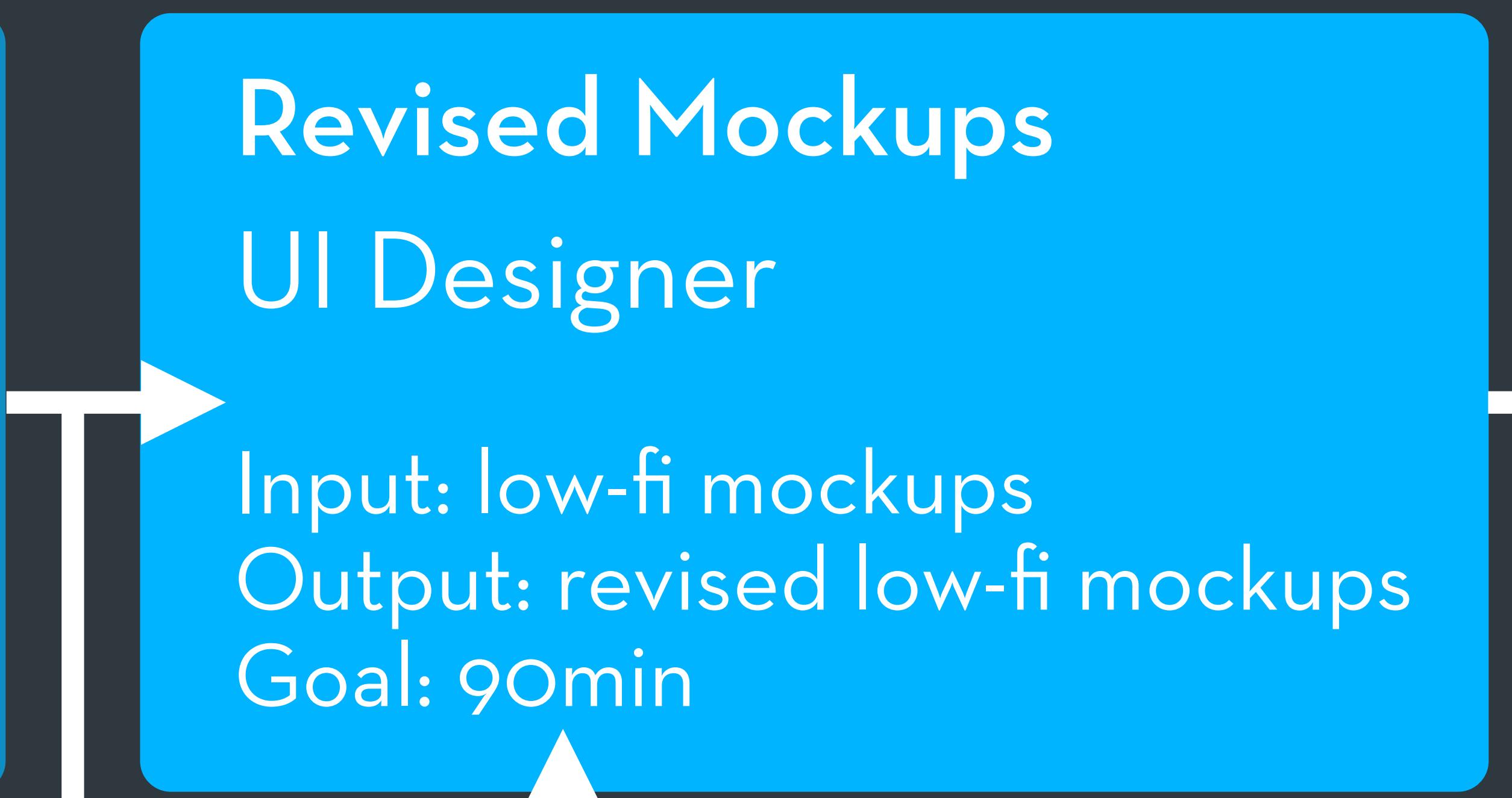
Revised Mockups

UI Designer

Input: low-fi mockups

Output: revised low-fi mockups

Goal: 90min



Low-fi Mockup

UI Designer

Input: napkin sketch
Output: low-fi mockups
Goal: 1hr

Revised Mockup

UI Designer

Input: low-fi mockups
Output: revised low-fi mockups
Goal: 2hrs

Heuristic Evaluation

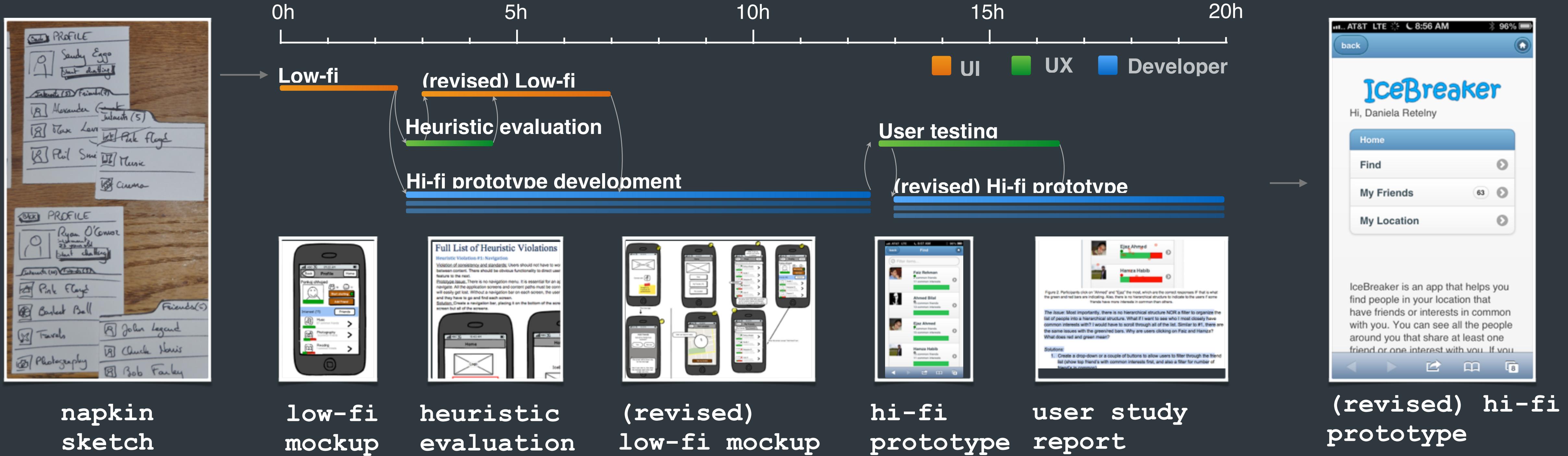
UX Researcher

Input: low-fi mockups
Output: heuristic evaluation
Goal: 1hr

High-fi Prototype

Developer

Input: low-fi mockups, HE
Output: high-fi prototype
Goal: 4hrs



RUNNING A FLASH TEAM

1. Introspect on the team composition & convene experts from the crowd
2. Convey the team through the workflow, shepherding files between tasks and sharing schedule updates

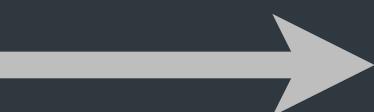
Upwork



programmer
designer
video editor
musician
statistician

COMPUTATIONAL AFFORDANCES OF FLASH TEAMS

Modularity



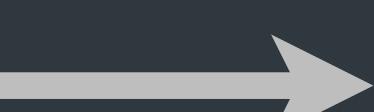
Scale

Elasticity



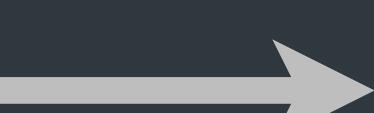
Grow + shrink

Pipelining



Optimize

Planner



Create on-demand

MODULARITY

REPLICATE TEAM STRUCTURES AT SCALE



DESIGN



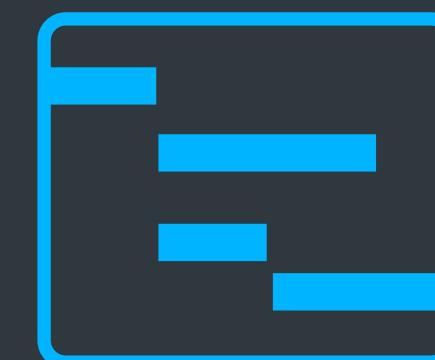
DESIGN



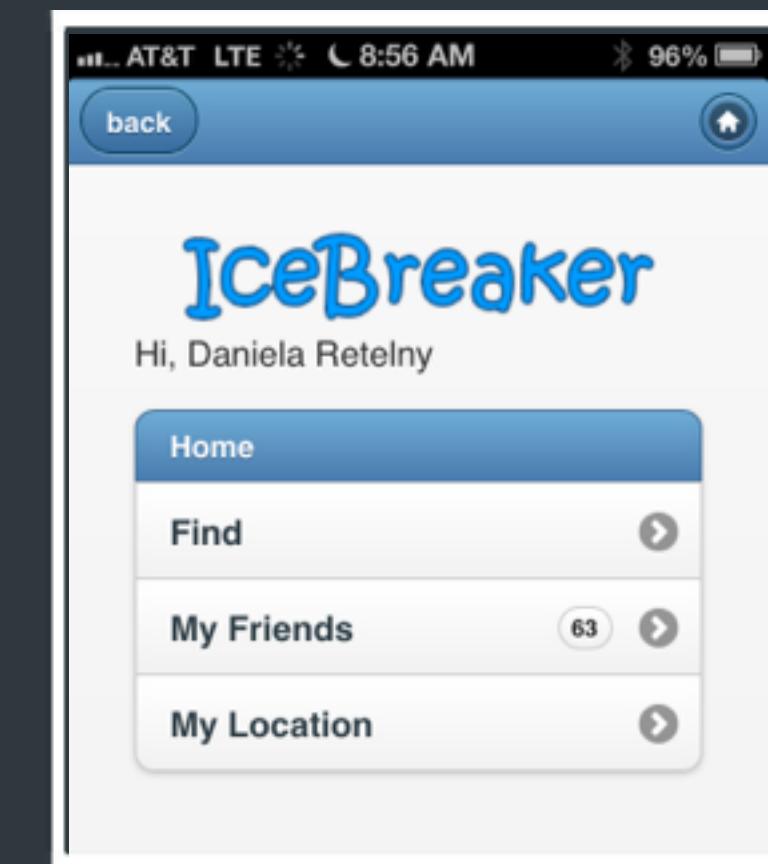
DESIGN

MODULARITY

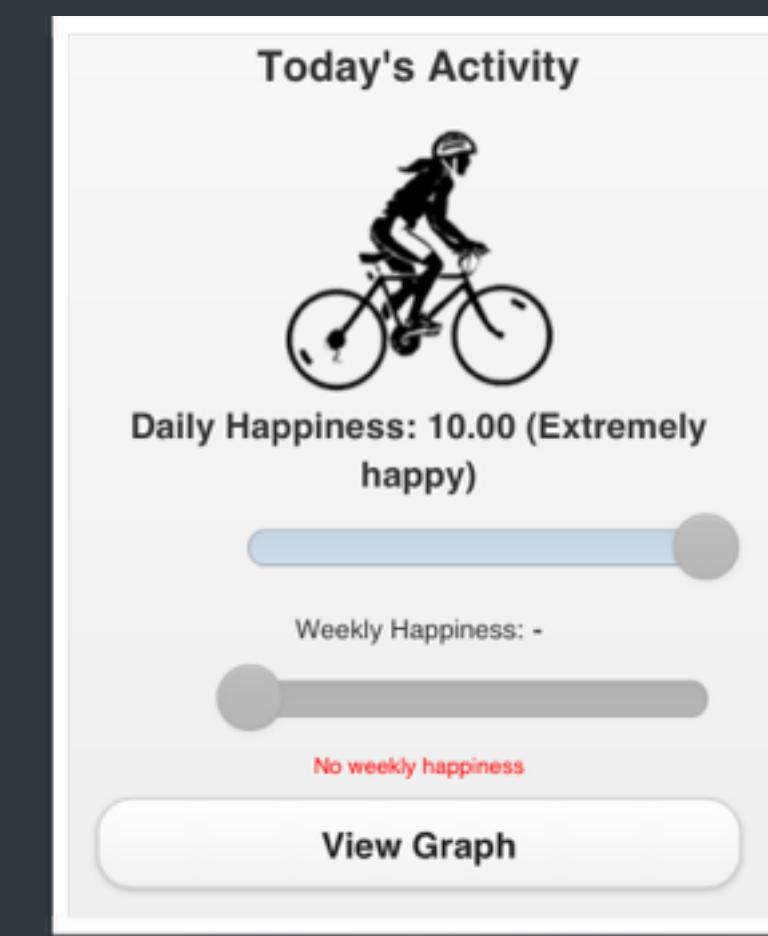
REPLICATE TEAM STRUCTURES AT SCALE



DESIGN



DESIGN



MODULARITY

COMBINE TEAMS TO FORM ORGANIZATIONS

DESIGN



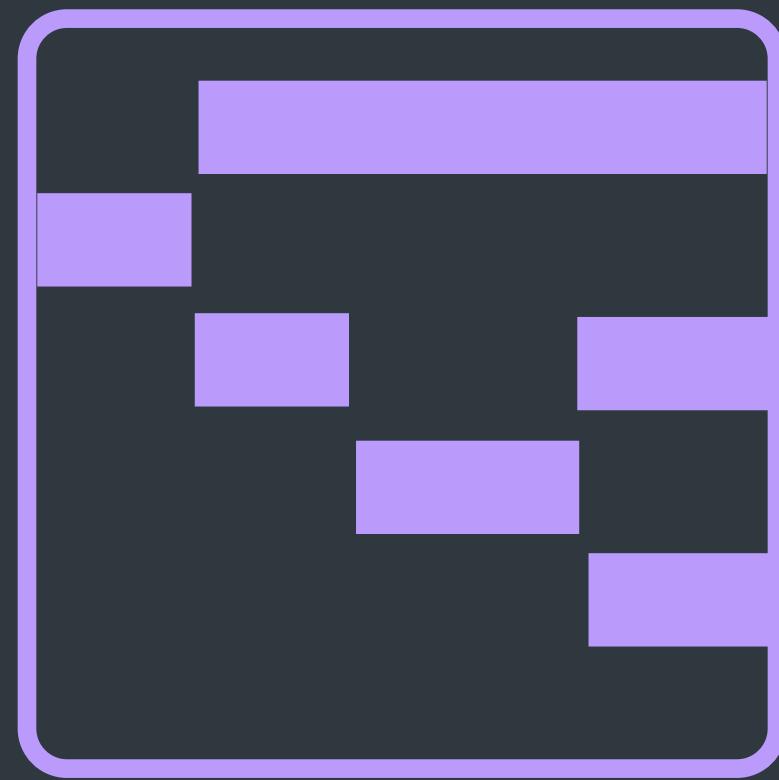
DESIGN



DESIGN



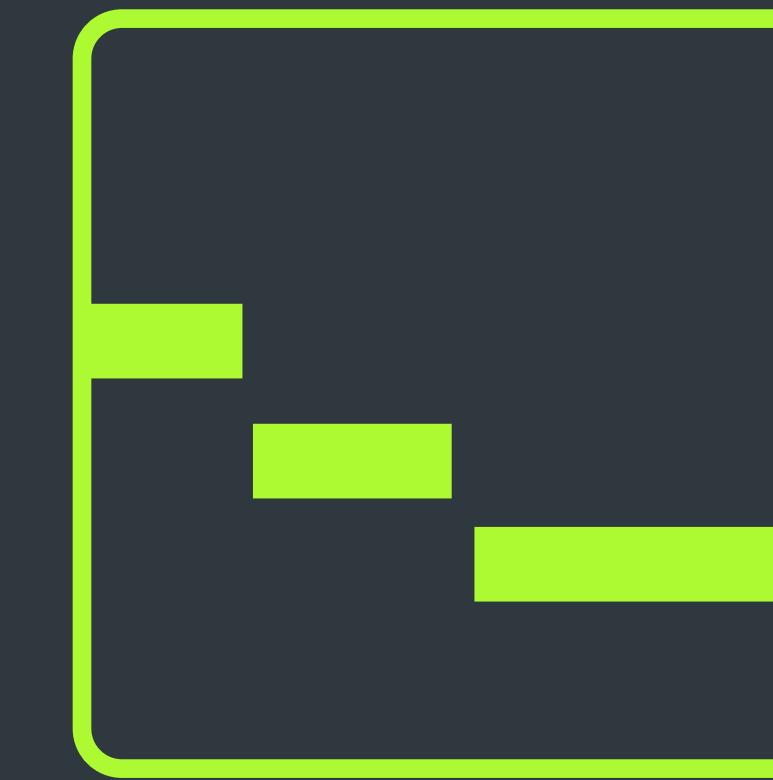
EBOOK



ANIMATION

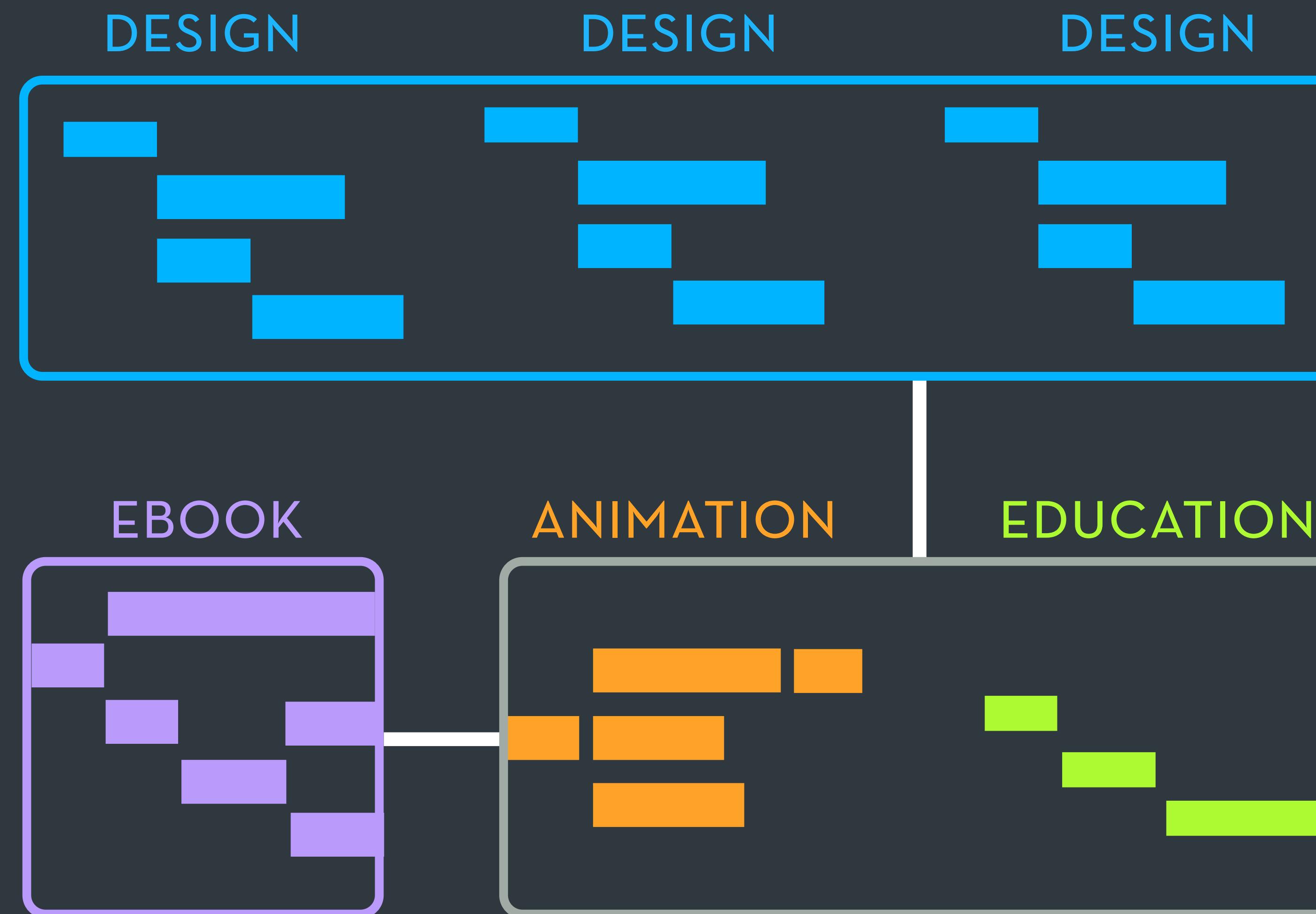


EDUCATION



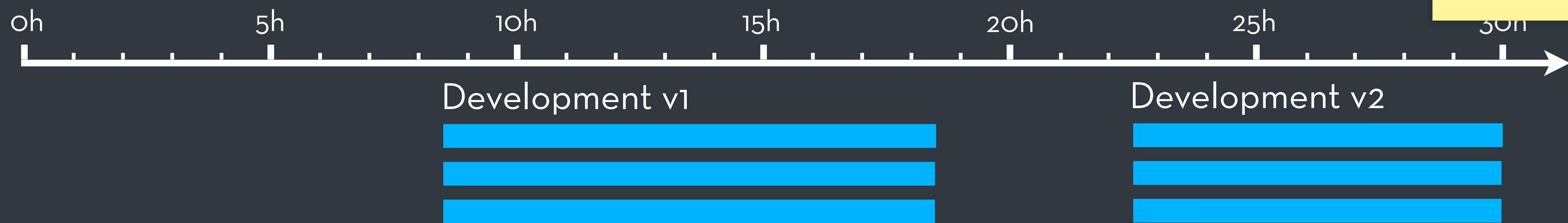
MODULARITY

COMBINE TEAMS TO FORM ORGANIZATIONS



ELASTICITY

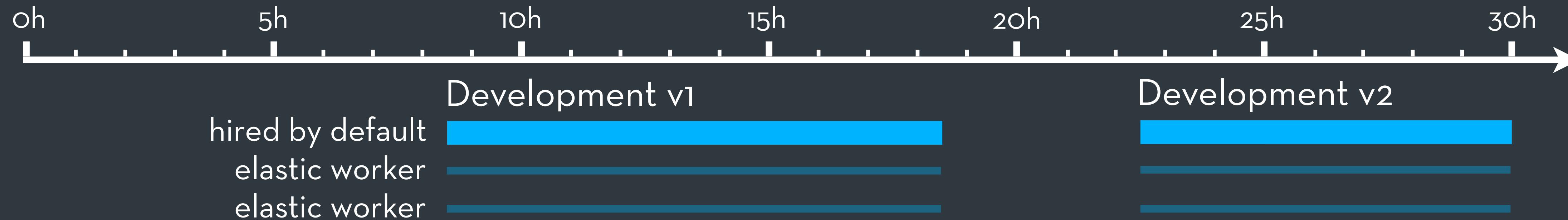
GROWTH ON-DEMAND



Is it ok to leave DRI on this slide and next slide even though I don't mention it when I speak?

ELASTICITY

GROWTH ON-DEMAND

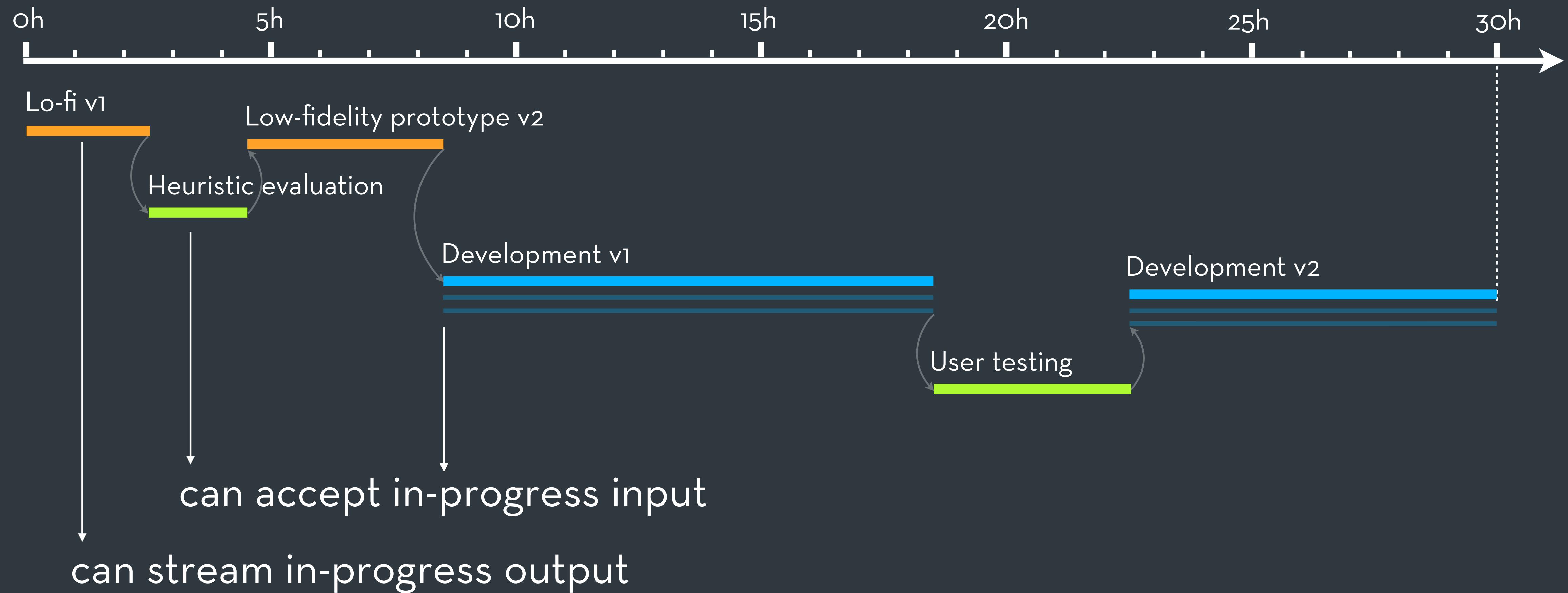


Elasticity enables growth by dynamically adding:

- Extra workers to complete job on time
- Workers with specialized skills

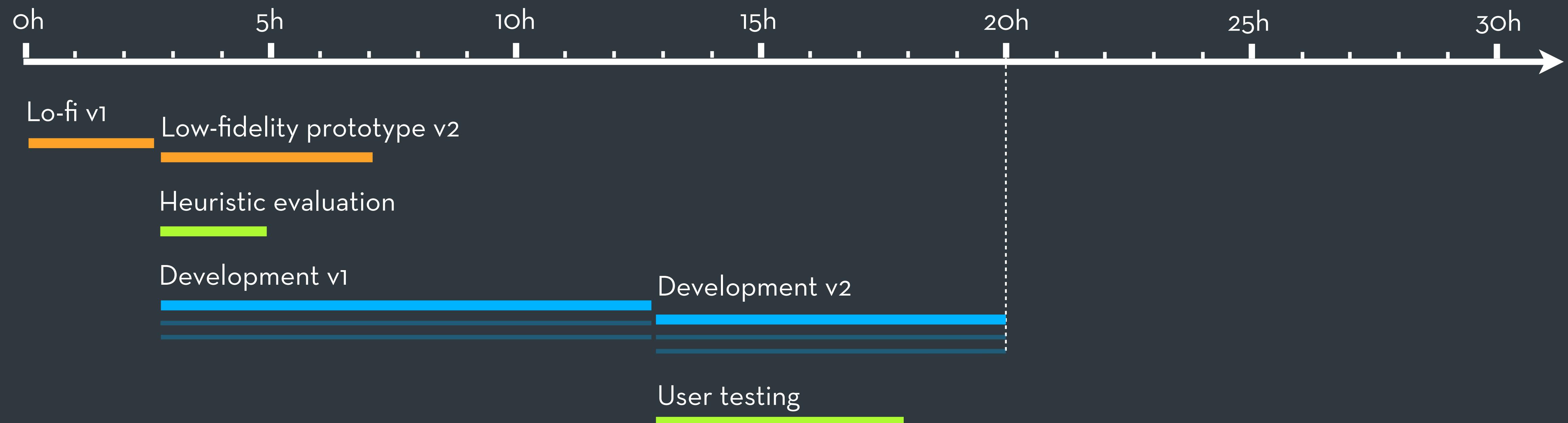
PIPELINING

PASS ALONG INCOMPLETE RESULTS



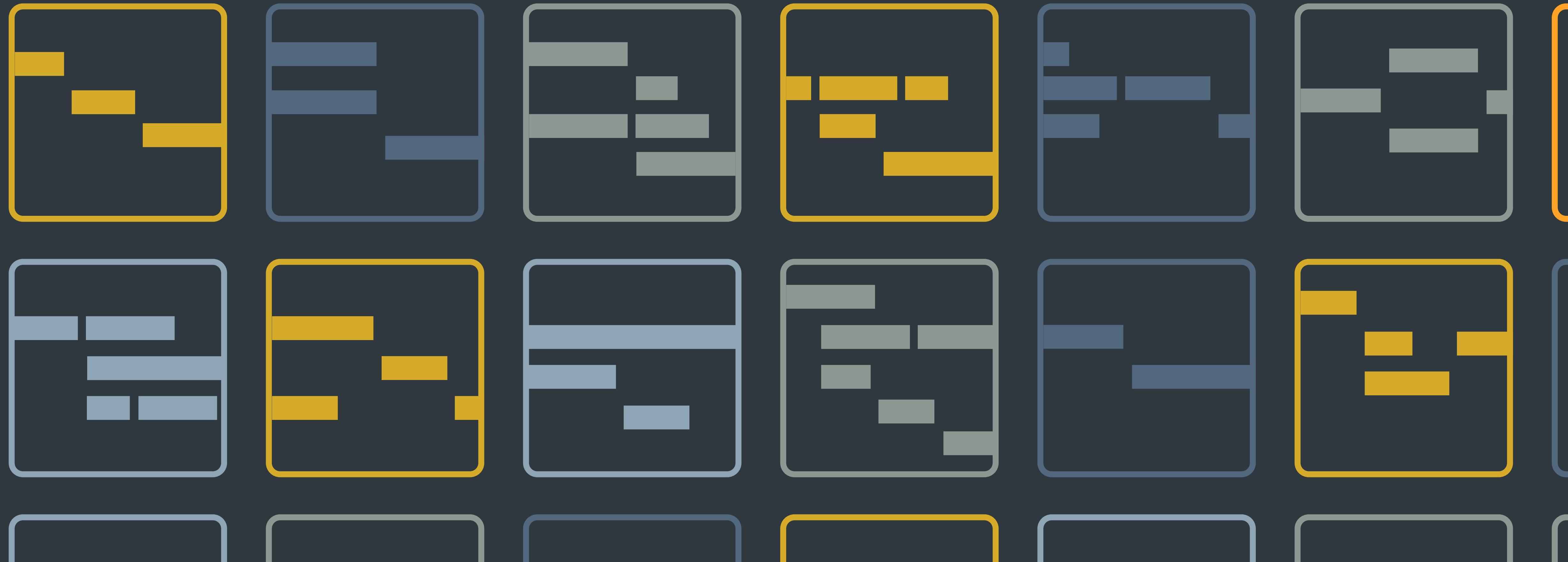
PIPELINING

PASS ALONG INCOMPLETE RESULTS



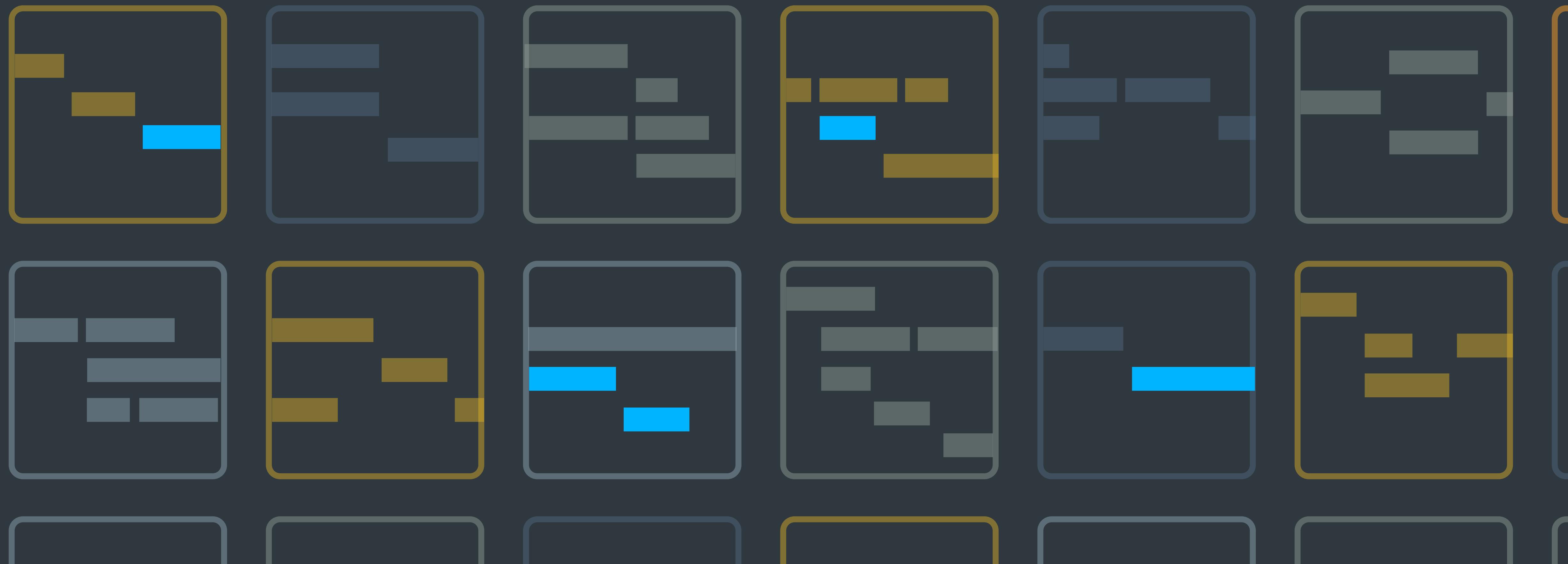
CREATION BY REQUEST

“I have a napkin sketch of a design, and I’d like an animation describing the idea.”



CREATION BY REQUEST

Synthetic team created from compatible
blocks from previous teams.



CREATION BY REQUEST

Translate blocks into a STRIPS action planning problem, which utilizes efficient boolean satisfiability solvers.



CREATION BY REQUEST

Translate blocks into a STRIPS action planning problem, which utilizes efficient boolean satisfiability solvers.

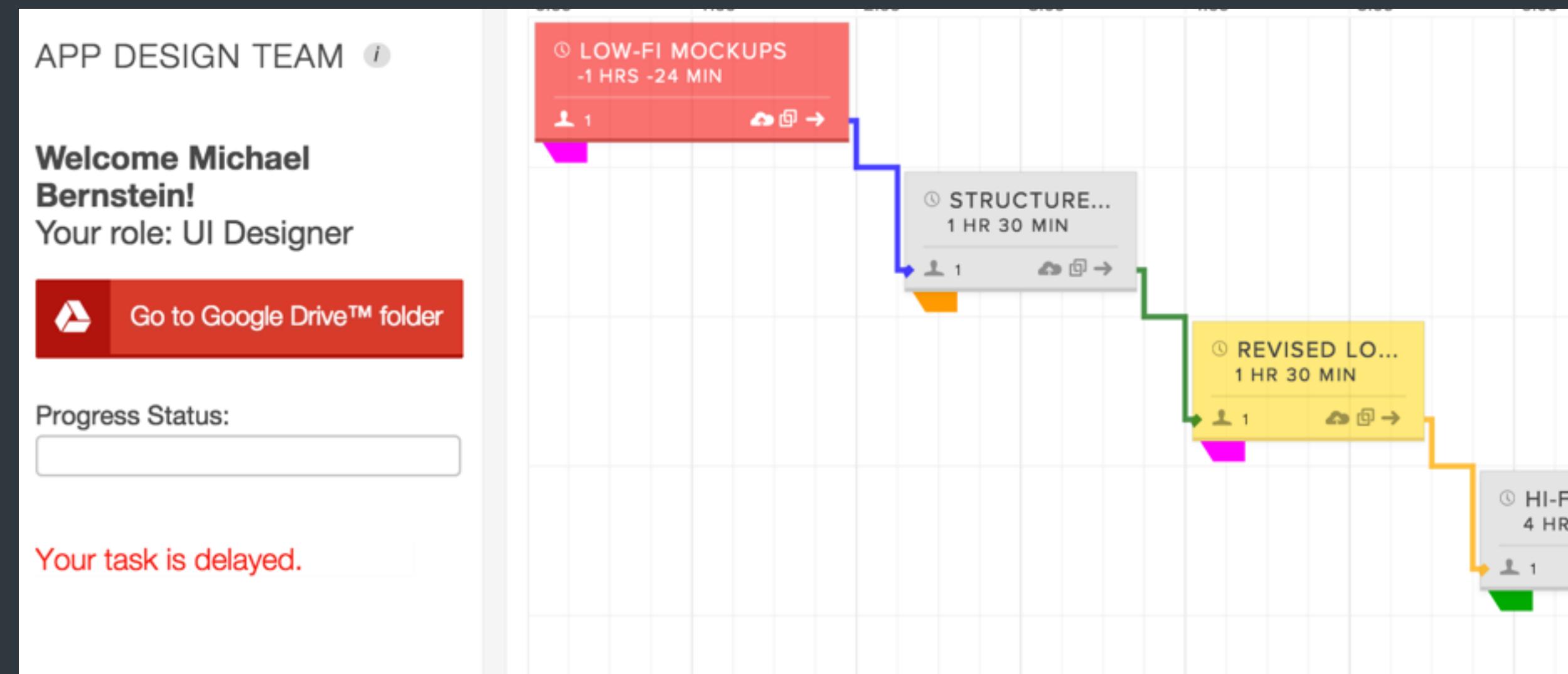
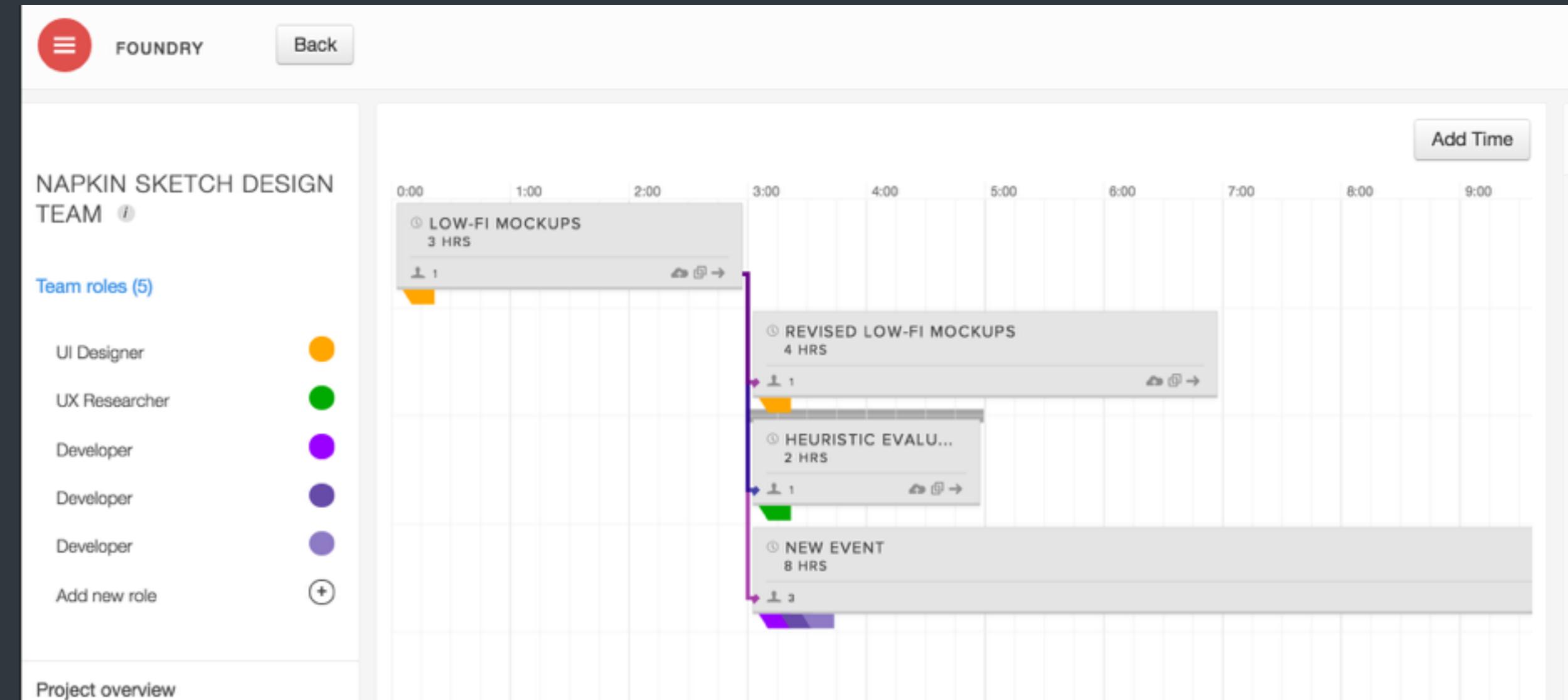


FOUNDRY

Web platform that allows:

Requesters to author
flash teams

Team members to
track the progress
of tasks



AUTHORING IN FOUNDRY

FOUNDRY Back Start Foundry Tour Start Team

APP DESIGN TEAM i

Team roles (4)

- UI Designer
- UX Researcher
- Developer
- Graphic Designer

Add new role

Project overview

Event library

Search...

0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00

Add Time

Chat SEE WHO'S ONLINE (1)

Type your message here...

Send

Detailed description: The screenshot shows a team management interface for 'APP DESIGN TEAM'. On the left, there's a sidebar with 'Team roles' (UI Designer, UX Researcher, Developer, Graphic Designer) each represented by a colored circle (pink, orange, green, blue respectively). Below that are 'Project overview' and 'Event library' sections. The main area features a Gantt chart with five tasks: 'LOW-FI MOCKUPS' (2 HRS), 'STRUCTURE...' (1 HR 30 MIN), 'REVISED LO...' (1 HR 30 MIN), 'HI-FI PROTOTYPE' (4 HRS), and 'LOGO DESIGN' (1 HR 30 MIN). Each task has a duration, a person icon, and a cloud icon. Colored arrows connect the tasks: a pink arrow from LOW-FI to STRUCTURE..., an orange arrow from STRUCTURE... to REVISED LO..., a green arrow from REVISED LO... to HI-FI PROTOTYPE, and a blue arrow from HI-FI PROTOTYPE to LOGO DESIGN. The chart is set against a grid from 0:00 to 9:00. On the right, there's a 'Chat' section with a 'SEE WHO'S ONLINE (1)' button and a text input field 'Type your message here...' with a 'Send' button.

AUTHORING IN FOUNDRY

The screenshot shows the Foundry application interface. At the top left is a red circular icon with three horizontal lines, labeled "FOUNDRY". To its right is a "Back" button. Below this, the main area displays a timeline from 0:00 to 7:00. A grey box at 0:00 is labeled "LOW-FI MOCKUPS" and "2 HRS". A grey box at 3:00 is labeled "MEETING..." and "30 MIN". A grey box at 4:00 is labeled "REVISED LO..." and "1 HR 30 MIN". A grey box at 7:00 is labeled "HI-FI PROTOTYPE" and "4 HRS". On the left, under "APP DESIGN TEAM", there is a list of "Team roles (4)": UI Designer (pink dot), UX Researcher (orange dot), Developer (green dot), Graphic Designer (blue dot), and "Add new role" (plus sign). A modal window is open for the "Developer" role, showing "website-prototyping" and "html5" as member types, "Worker" as the member type, and a green square as the member color. It also has "Save", "Delete", and "Replace" buttons.

APP DESIGN TEAM *i*

Team roles (4)

- UI Designer
- UX Researcher
- Developer
- Graphic Designer
- Add new role

Developer

website-prototyping ~~X~~ html5 ~~X~~

Member Type:

Worker

Member Color:

Save Delete Replace

0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00

LOW-FI MOCKUPS
2 HRS

MEETING...
30 MIN

REVISED LO...
1 HR 30 MIN

HI-FI PROTOTYPE
4 HRS

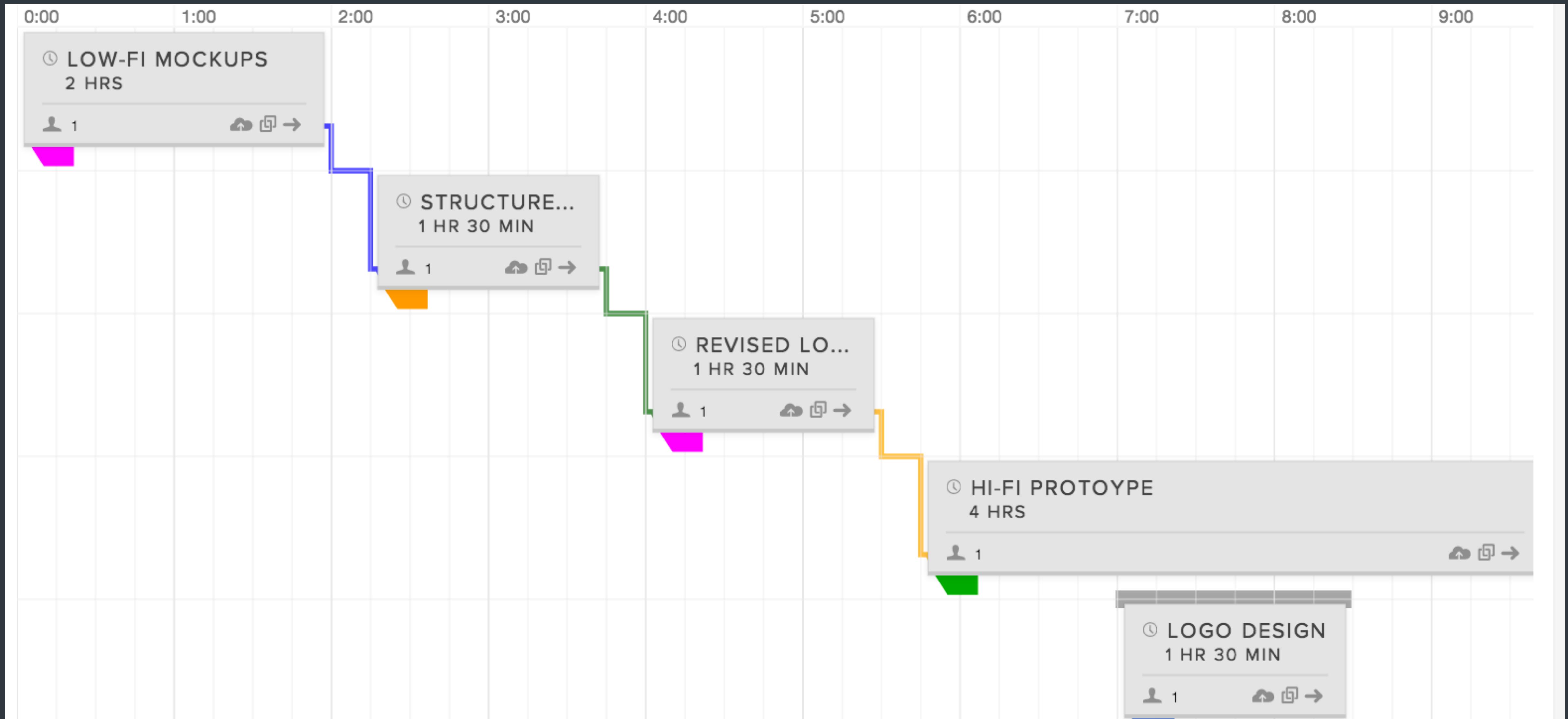
AUTHORING IN FOUNDRY

The screenshot shows the Foundry application interface. A modal window is open, titled "Low-fi Mockups". Inside the modal, there are several configuration fields:

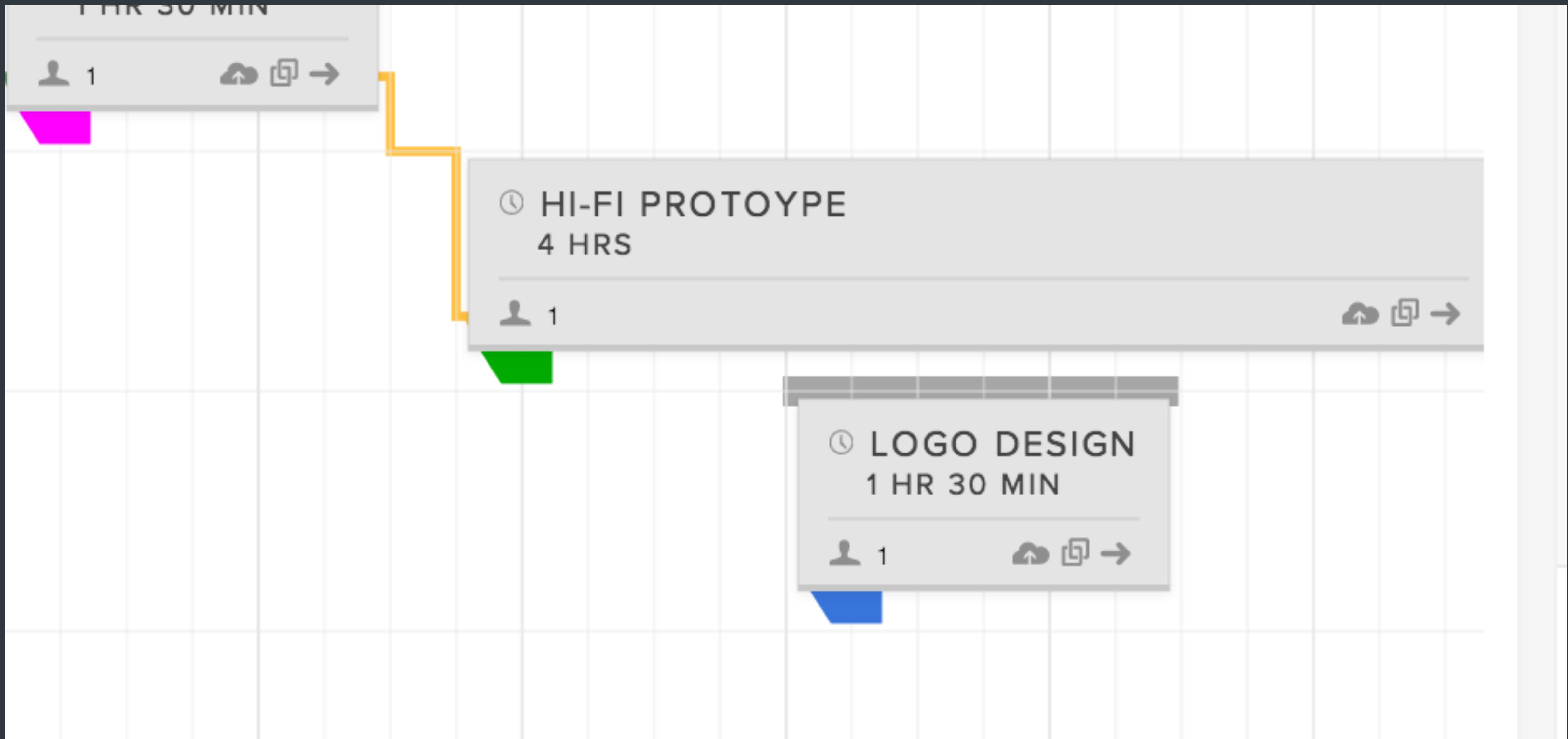
- Event Start:** Set to 0:00 Minutes : 0
- Total Runtime:** Set to 2 Hours : 0 Minutes : 0
- Project Coordinator:** A dropdown menu showing "-- Choose PC --"
- Directly-Responsible Individual:** A dropdown menu showing "UI Designer"
- Members:** A list of team members with checkboxes:
 - UI Designer
 - UX Researcher
 - Developer
 - Graphic Designer
- Description:** A text area containing the placeholder "Create low-fi mockups from a sketch of an idea".
- Inputs:** A list of inputs with an "x" icon and an "Add input" button:
 - sketch
- Deliverables:** A list of deliverables with an "x" icon and an "Add deliverable" button:
 - mockups

At the bottom of the modal, there are two buttons: "Hire" (gray) and "Save" (red). The background of the application shows the "APP DESIGN TEAM" section, which includes a "Team roles (4)" list with icons for UI Designer (purple), UX Researcher (orange), Developer (green), and Graphic Designer (blue). There is also a "Project overview" section and a "Search..." bar.

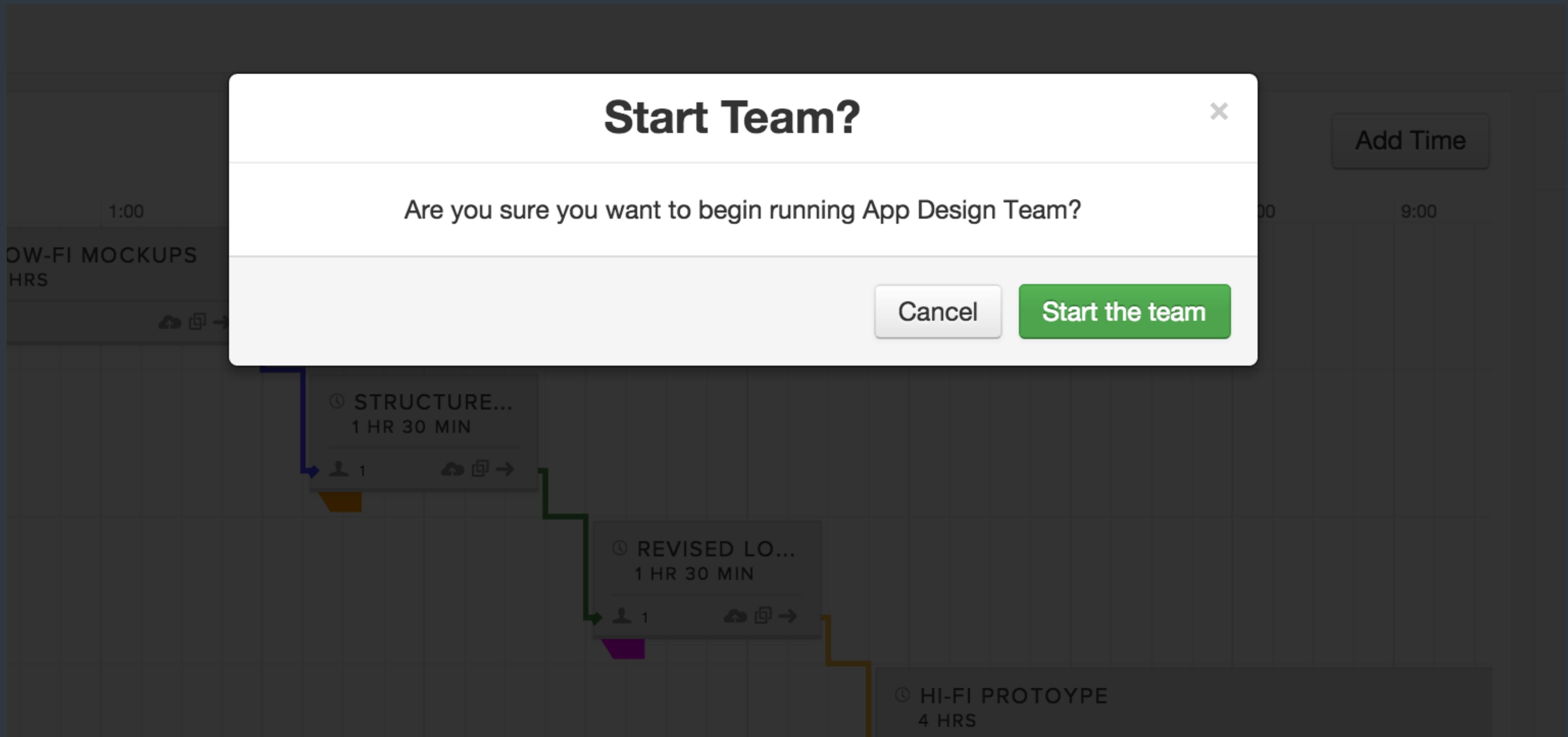
AUTHORING IN FOUNDRY



AUTHORING IN FOUNDRY



FOUNDRY AS MANAGER



FOUNDRY AS MANAGER

FOUNDRY

APP DESIGN TEAM i

Welcome Michael Bernstein!
Your role: UI Designer

Go to Google Drive™ folder

Progress Status:

You can now start Low-fi Mockups task.

Project overview

Start Foundry Tour

Chat SEE WHO'S ONLINE (2)

Hi Team! Let's get started!

Stanford HCI (Author)
1/16/2015, 9:57:57 PM

I'm ready!

Michael Bernstein (UI Designer)
1/16/2015, 11:36:48 PM

Type your message here...

Send

FOUNDRY AS MANAGER

FOUNDRY

APP DESIGN TEAM *i*

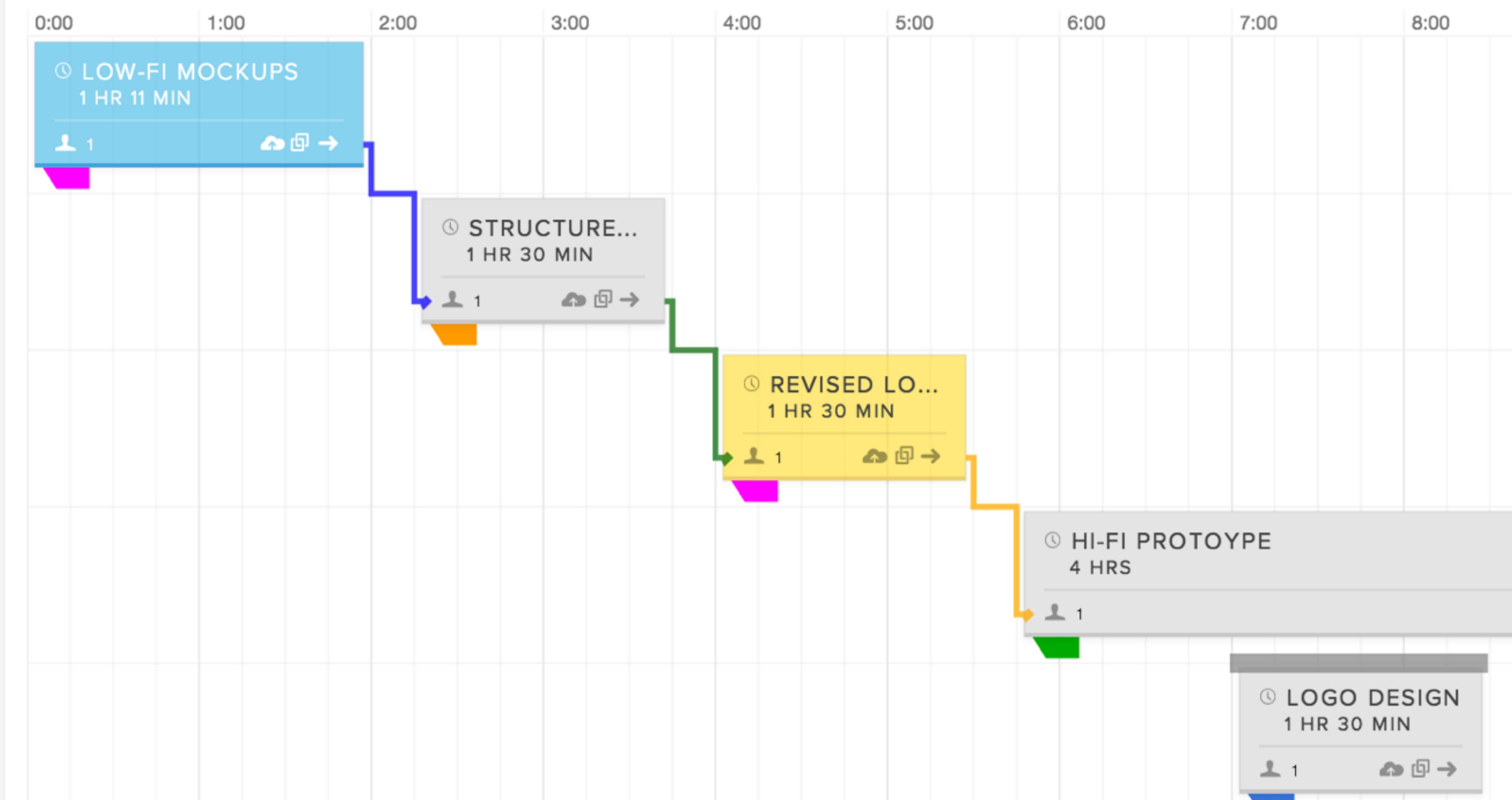
Welcome Michael Bernstein!
Your role: UI Designer

 Go to Google Drive™ folder

Progress Status:

Your task is in progress.

Project overview



Task	Duration	Start Time	End Time
LOW-FI MOCKUPS	1 HR 11 MIN	0:00	1:00
STRUCTURE...	1 HR 30 MIN	2:00	3:30
REVISED LO...	1 HR 30 MIN	4:00	5:30
HI-FI PROTOYPE	4 HRS	6:00	10:00
LOGO DESIGN	1 HR 30 MIN	10:00	11:30

FOUNDRY AS MANAGER

FOUNDRY

APP DESIGN TEAM i

Welcome Michael Bernstein!
Your role: UI Designer

 Go to Google Drive™ folder

Progress Status:

Your task is delayed.

Project overview

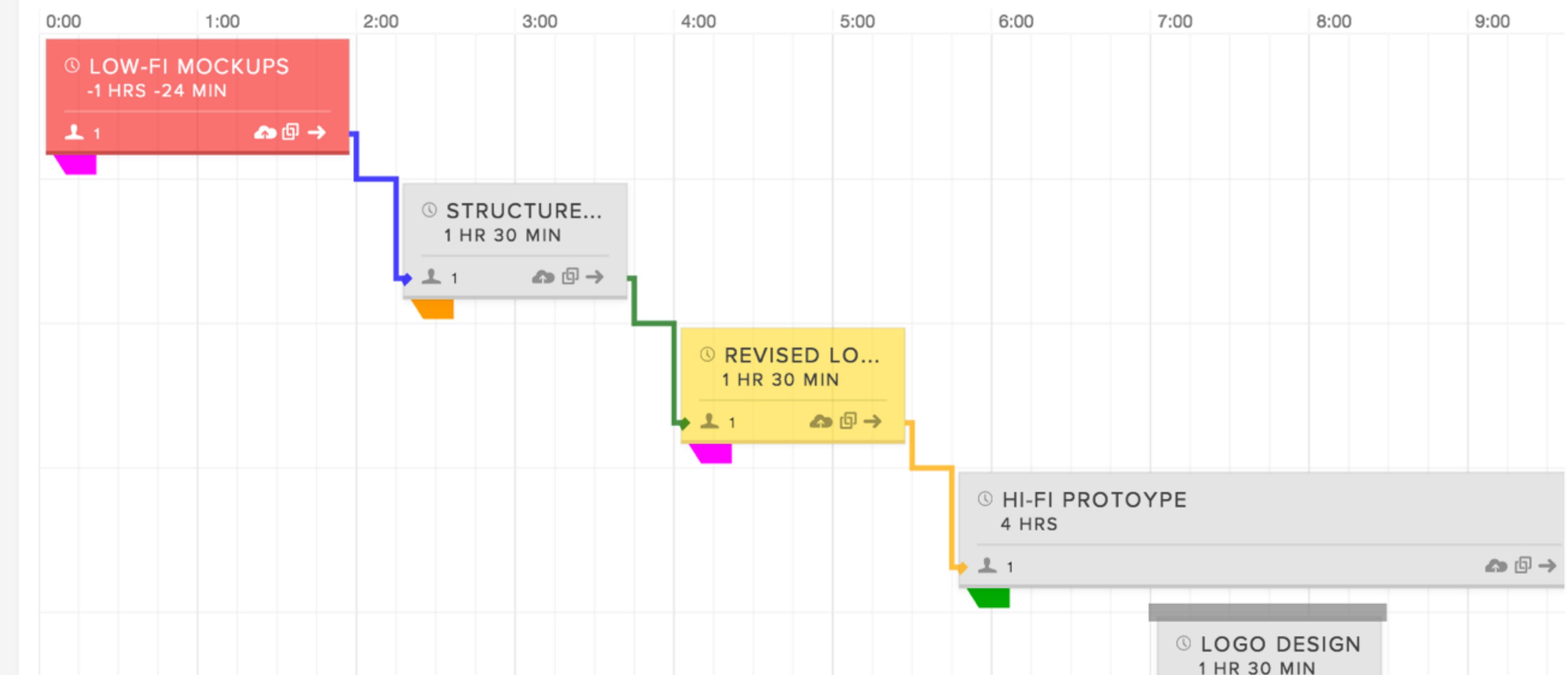
Chat

Hi

Standf

1/16/

Type y



FOUNDRY AS MANAGER

FOUNDRY

APP DESIGN TEAM i

Welcome Michael Bernstein!
Your role: UI Designer

Go to Google Drive™ folder

Progress Status:

You can now start Revised low-fi mockups task.

Project overview

Start Foundry Tour

Chat SEE WHO'S ONLINE (2)

Hi Team! Let's get started!

Stanford HCI (Author)
1/16/2015, 9:57:57 PM

I'm ready!

Michael Bernstein (UI Designer)
1/16/2015, 11:36:48 PM

Type your message here...

Send

0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00

① LOW-FI MOCKUPS -3 HRS -44 MIN
1 person, Cloud, Share, Export

② STRUCTURE... 44 MIN
1 person, Cloud, Share, Export

③ REVISED LO... 1 HR 30 MIN
1 person, Cloud, Share, Export

④ HI-FI PROTOYPE 4 HRS
1 person, Cloud, Share, Export

⑤ LOGO DESIGN 1 HR 30 MIN
1 person, Cloud, Share, Export

FOUNDRY IN SUM

Author structured, modular representations of flash teams

Grow, shrink, pipeline and recombine the flash teams

Recruit from Upwork

Maintain situational awareness as the team works

FLASH TEAM EXAMPLES

Recruited from paid crowd marketplace Upwork

Three team types:

Napkin sketch (design & web programming)

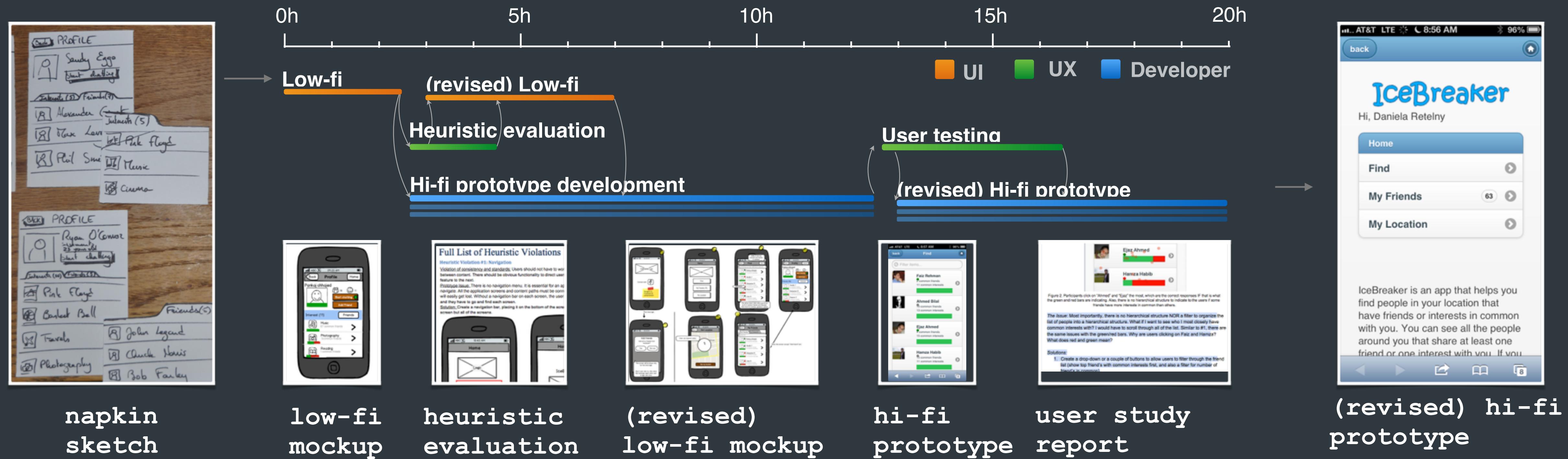
Animation (video making)

MOOC (online education)

NAPKIN SKETCH DESIGN TEAM

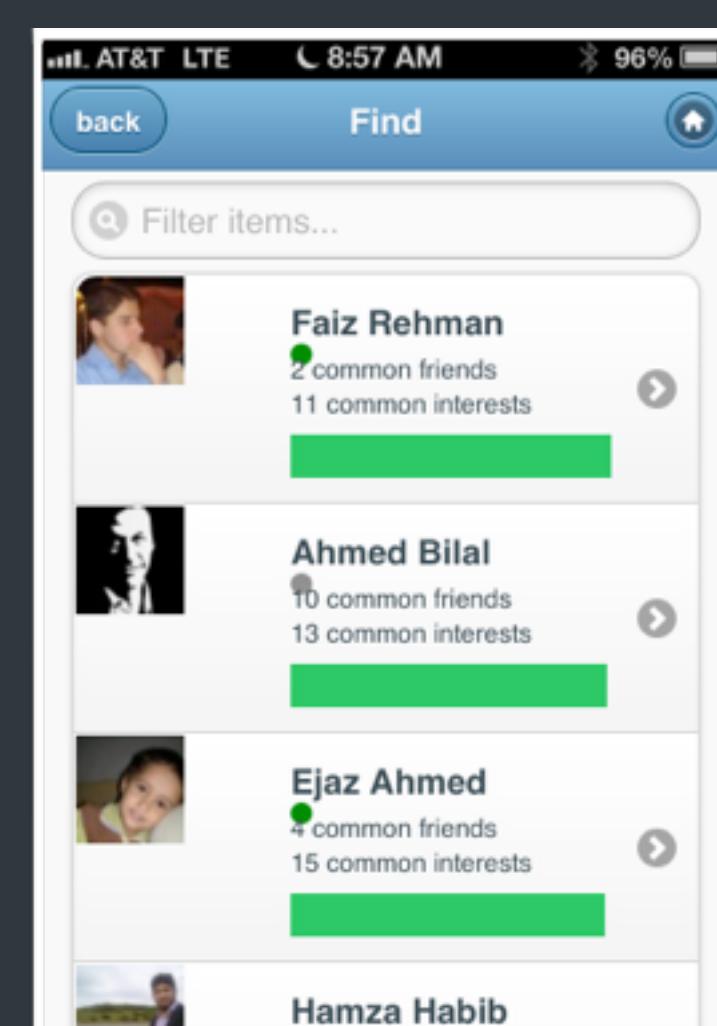
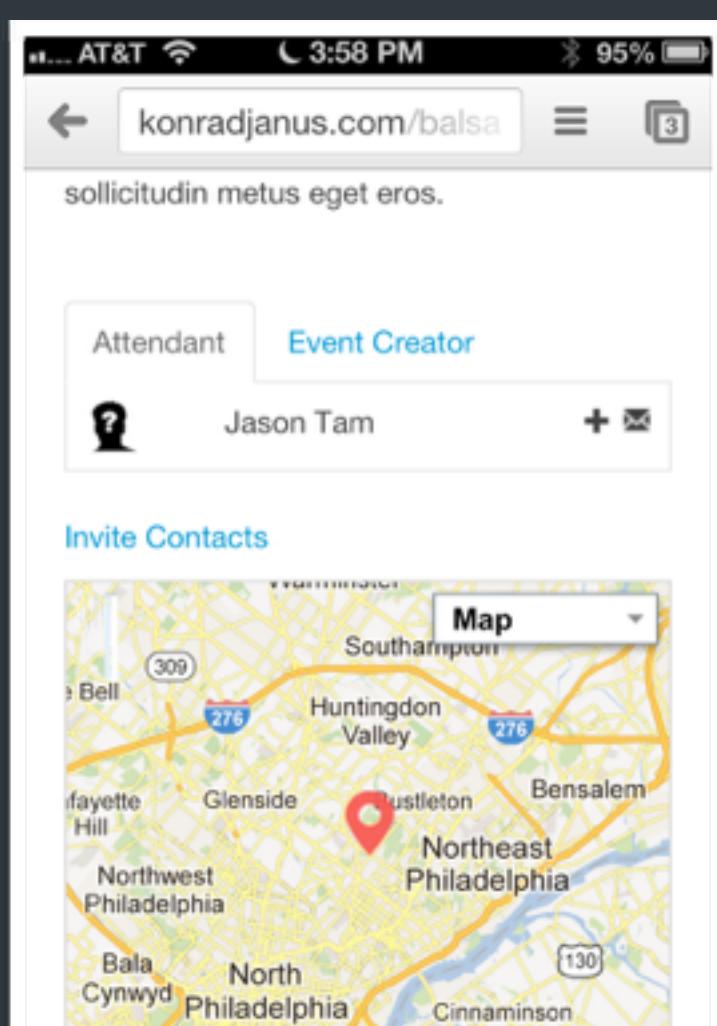
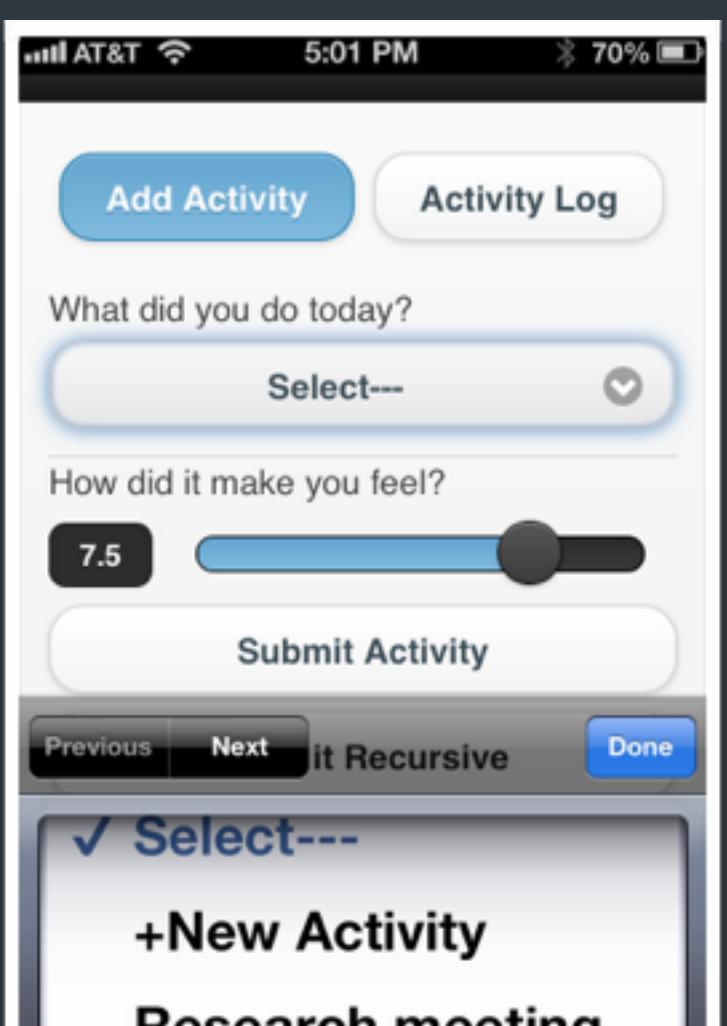
OVERVIEW

Objective: replication of flash teams across different inputs



USER-TESTED HI-FI PROTOTYPES IN ONE DAY

Design Goal	Completion time	Team size	Total cost
Emotion tracking	31:30	3	\$744.48
Event bullet board	18:00	5	\$1270.28
Social meetups	23:10	5	\$1200.97

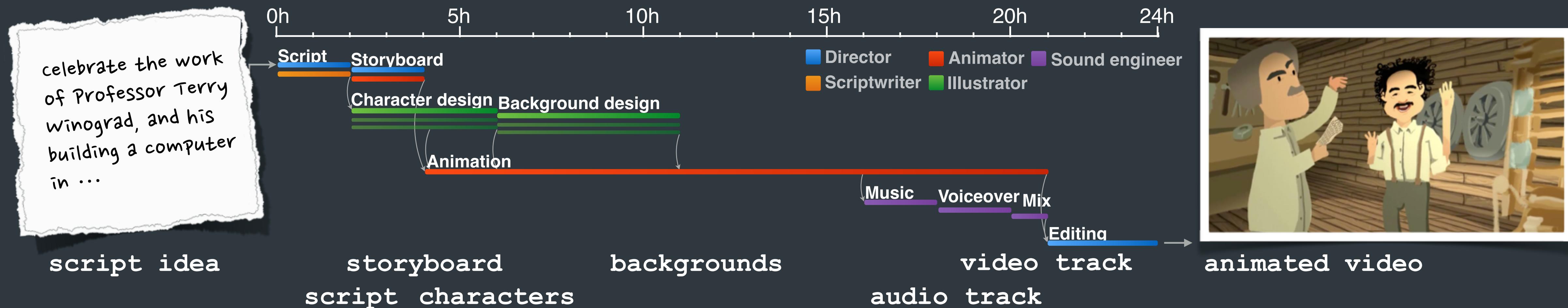


The IceBreaker app interface features a blue header bar with a back button and a home icon. The main screen displays a "Home" section, a "Find" section, a "My Friends" section (with 63 notifications), and a "My Location" section. The "Find" section shows a list of users with their profile pictures, names, and statistics of common friends and interests.

IceBreaker is an app that helps you find people in your location that have friends or interests in common with you. You can see all the people around you that share at least one friend or one interest with you. If you click on one of them, you'll land on the profile page. You can see the detailed list of interests or friends in common, and you can start a chat conversation. If you click on an interest or a friend in common, you'll see a list of all the people in your location that share that particular interest.

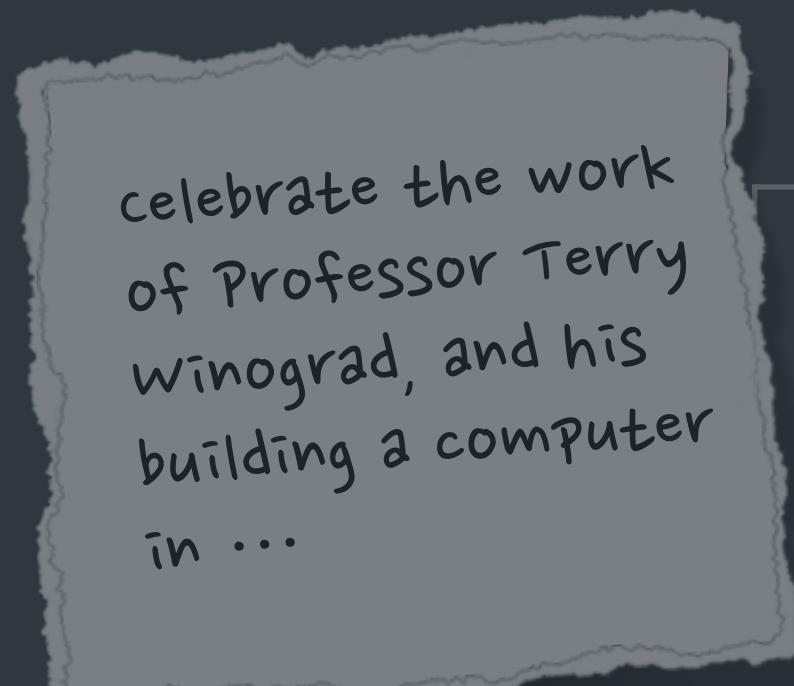
ANIMATION TEAM OVERVIEW

Objective: explore how flash teams can support creative outputs and non-engineering domains



ANIMATION TEAM OVERVIEW

Objective: explore
outputs and no



script idea

storyboard

script characters



support creative

4h
per



animated video

audio track

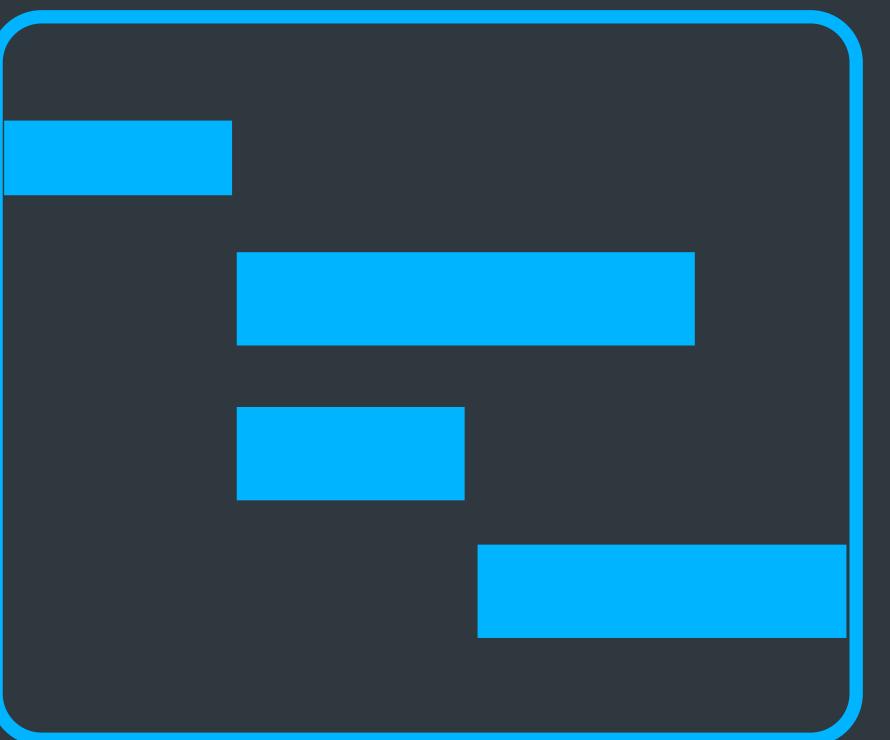
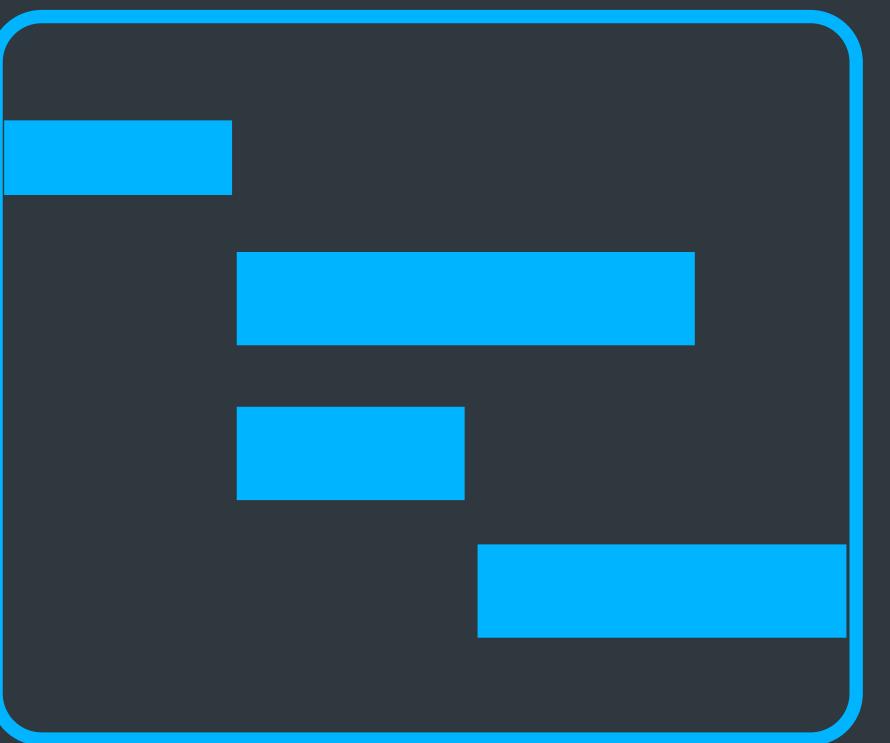
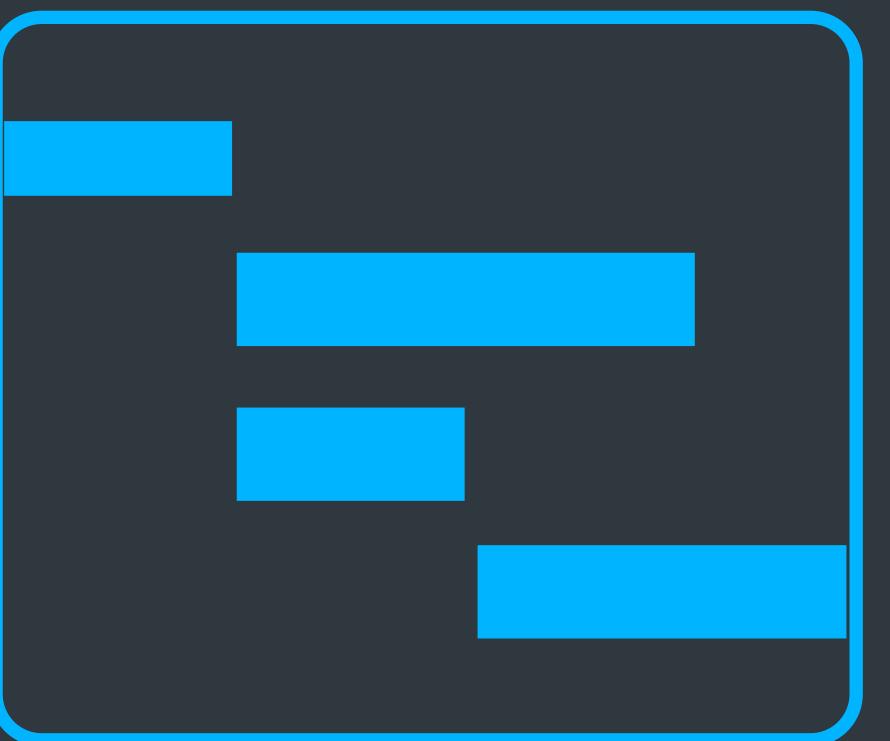


ON-DEMAND MOOC

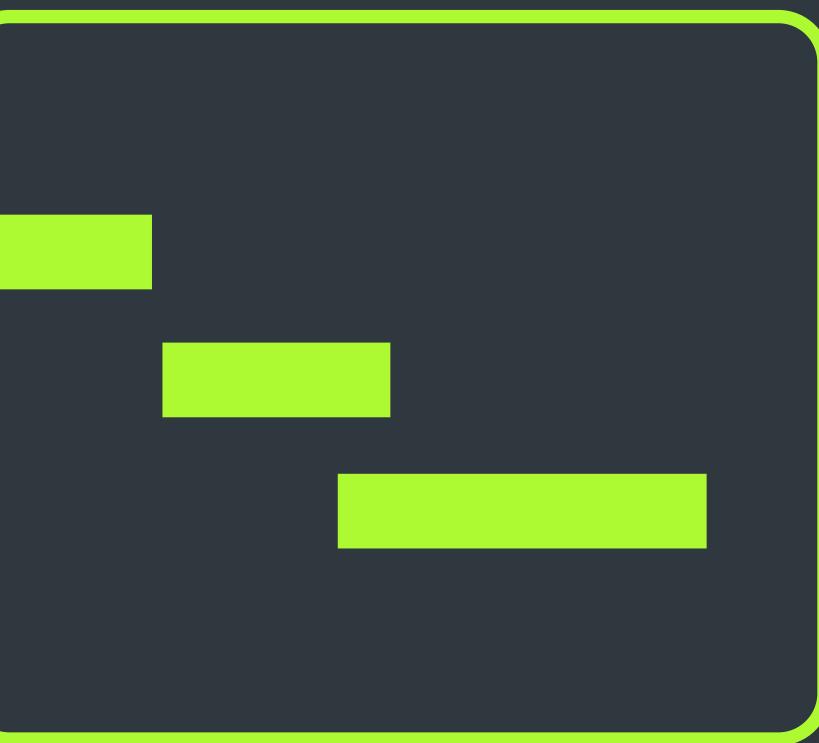
OVERVIEW

Objective: compose multiple modular team structures to complete a large scale project in 1 day

DESIGN (x3)



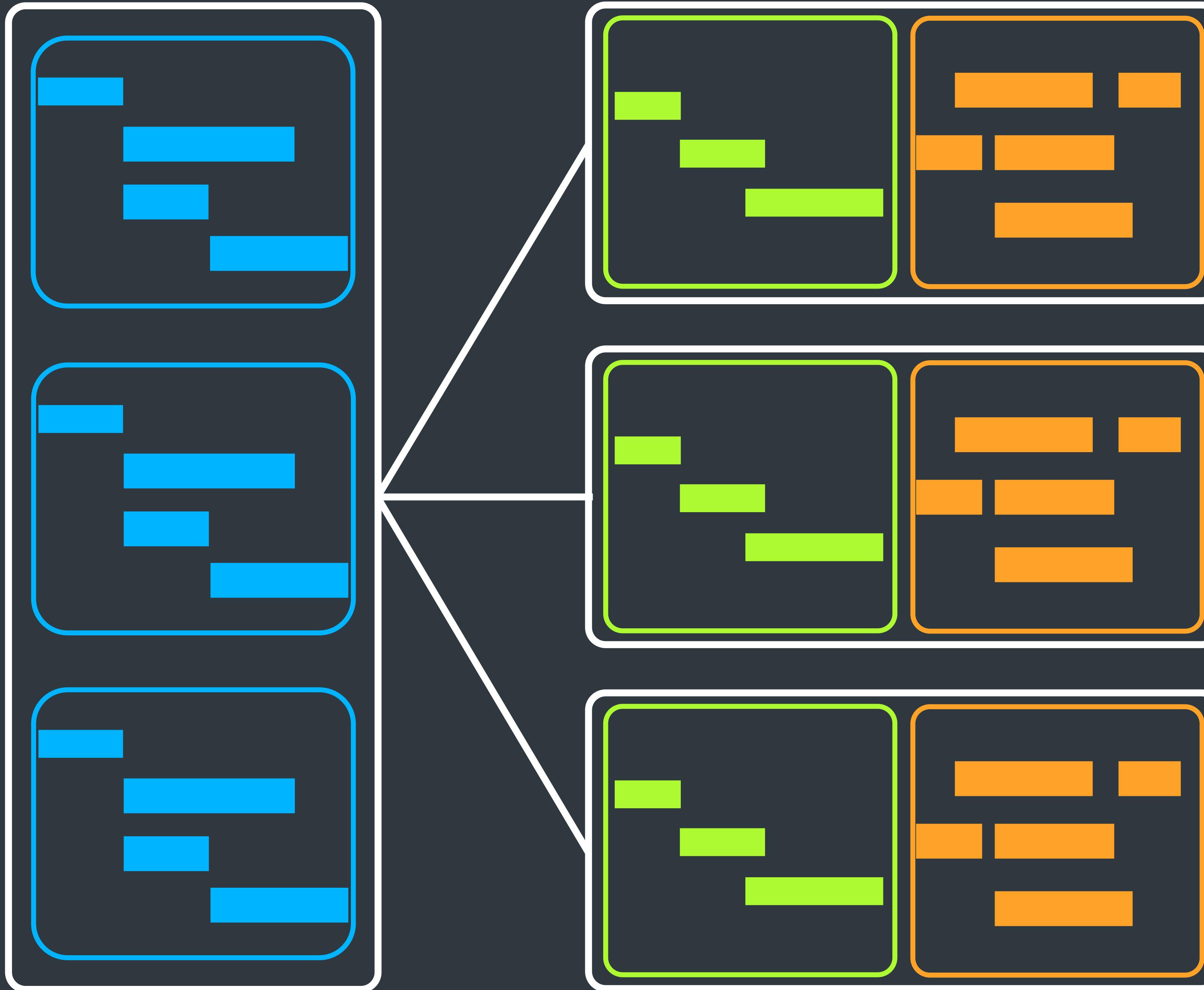
EDUCATION (x3)



ANIMATION (x3)



WEB PLATFORM



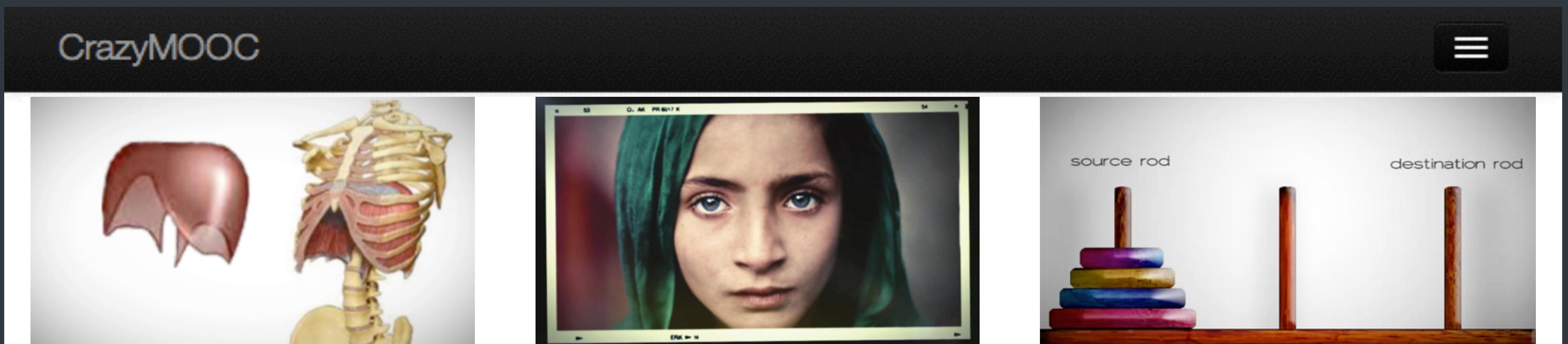
COURSE 1

COURSE 2

COURSE 3

MOOC COMPLETED IN 1 DAY

MOOC component	Completion time	Video length	Total cost
Diaphragm singing	19:20	1 min 49	\$1,597.32
Portrait photography	19:00	1 min 30	\$741.58
Towers of Hanoi	11:30	1 min 24	\$446.49
Web platform	13:00	N/A	\$1015.80

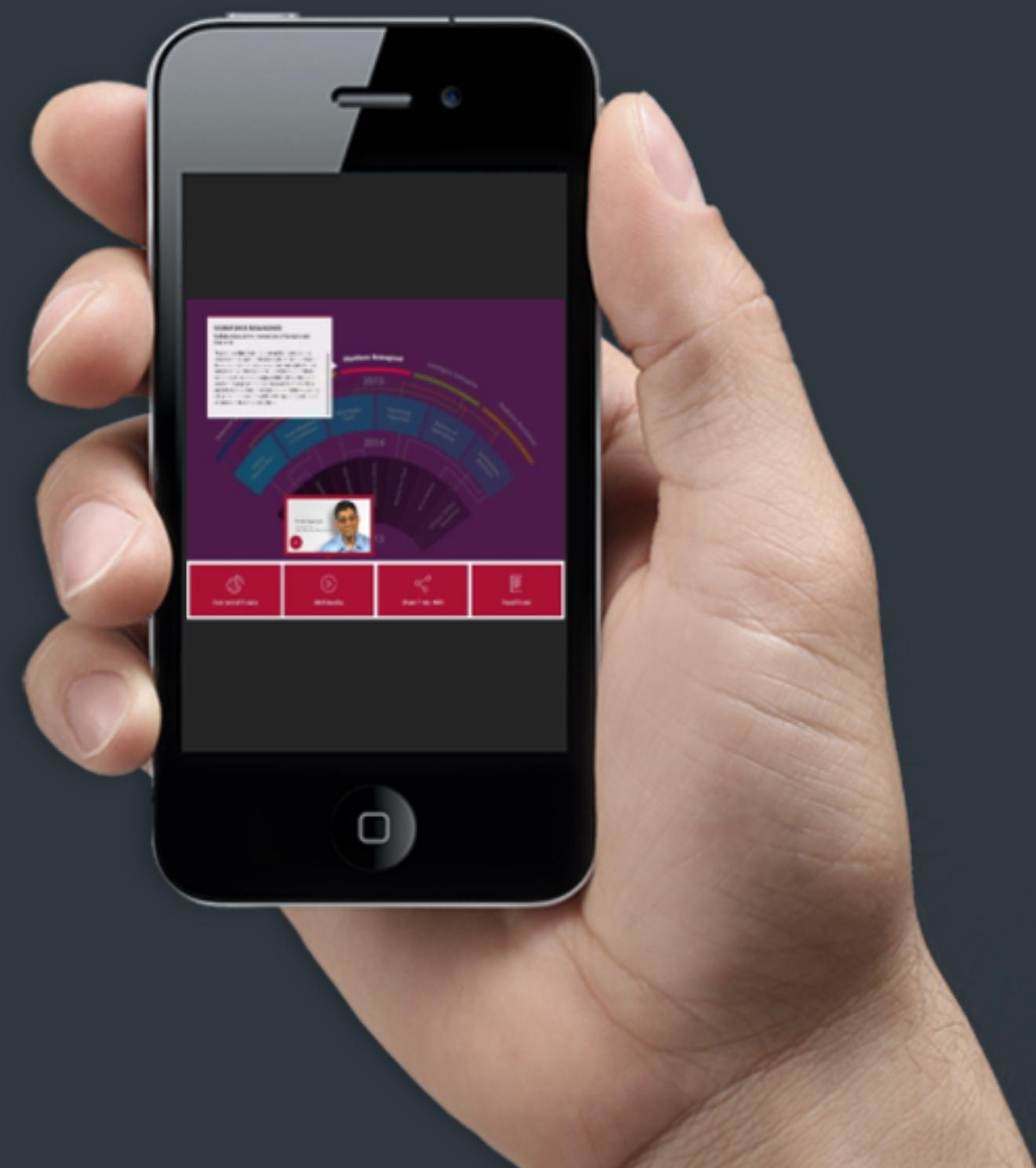


ACCENTURE'S FLASH TEAMS

Project #1:
Marketing video
177 work hours



Project #2:
Mobile application
54 work hours

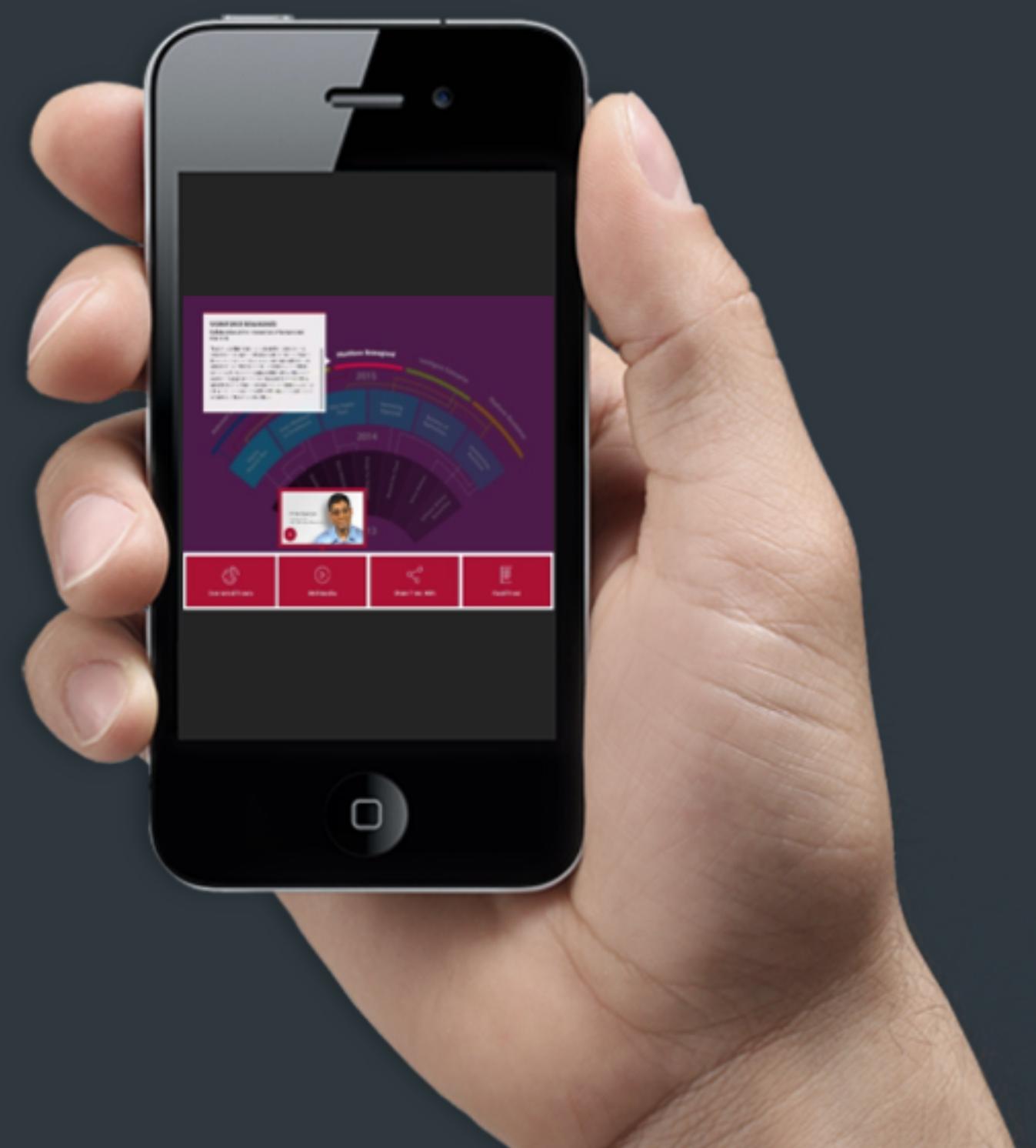


Project #3:
Business dev. video
132 work hours



ACCENTURE'S FLASH TEAMS

Result:
1/8th – 1/6th cost of agency estimate for equivalent quality



ARE FLASH TEAMS EFFECTIVE?

FIELD EXPERIMENT

Do flash teams complete tasks equally effectively but in less time?

Controlled experiment: 22 experts across six napkin sketch teams (UI design, UX research, web dev)

Flash teams vs. self-managed teams

FIELD EXPERIMENT

NAPKIN SKETCH DESIGN TEAM

Task: party planning mobile web application

Input: Napkin sketch

Requested time limit: 13 hours

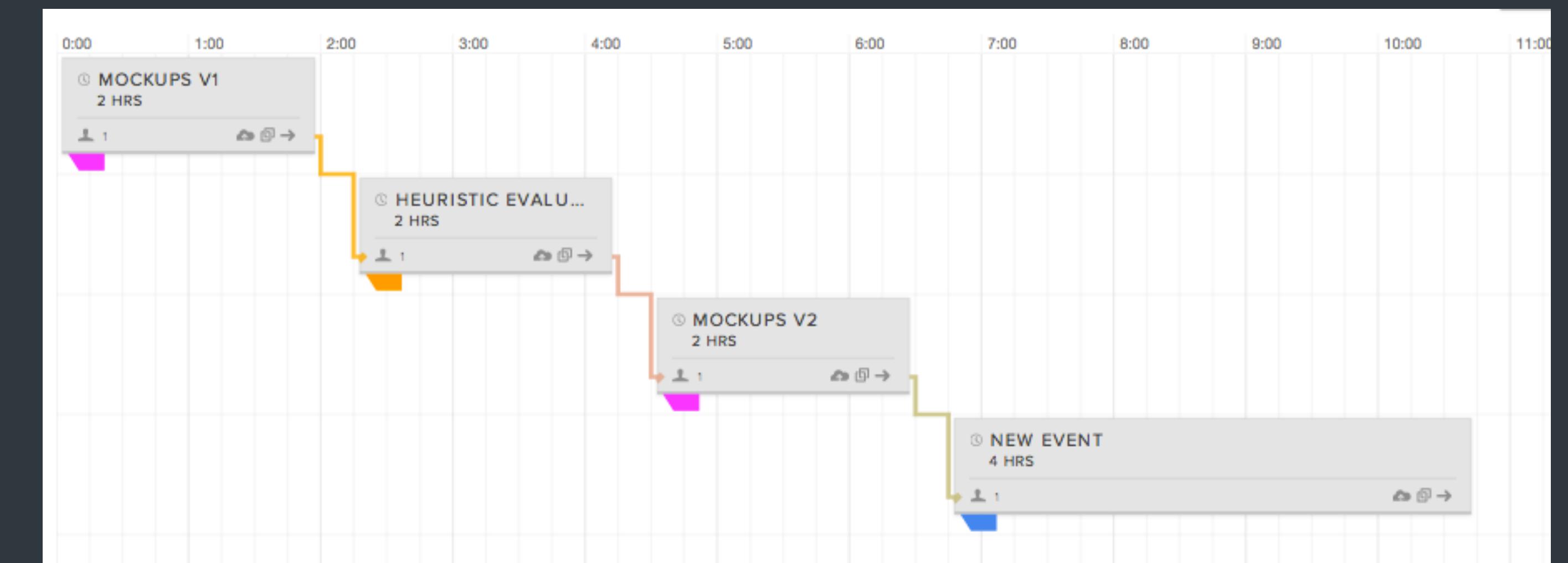
Measured: total number of work hours across team

CONDITIONS

FLASH TEAMS VS. SELF-MANAGED TEAMS

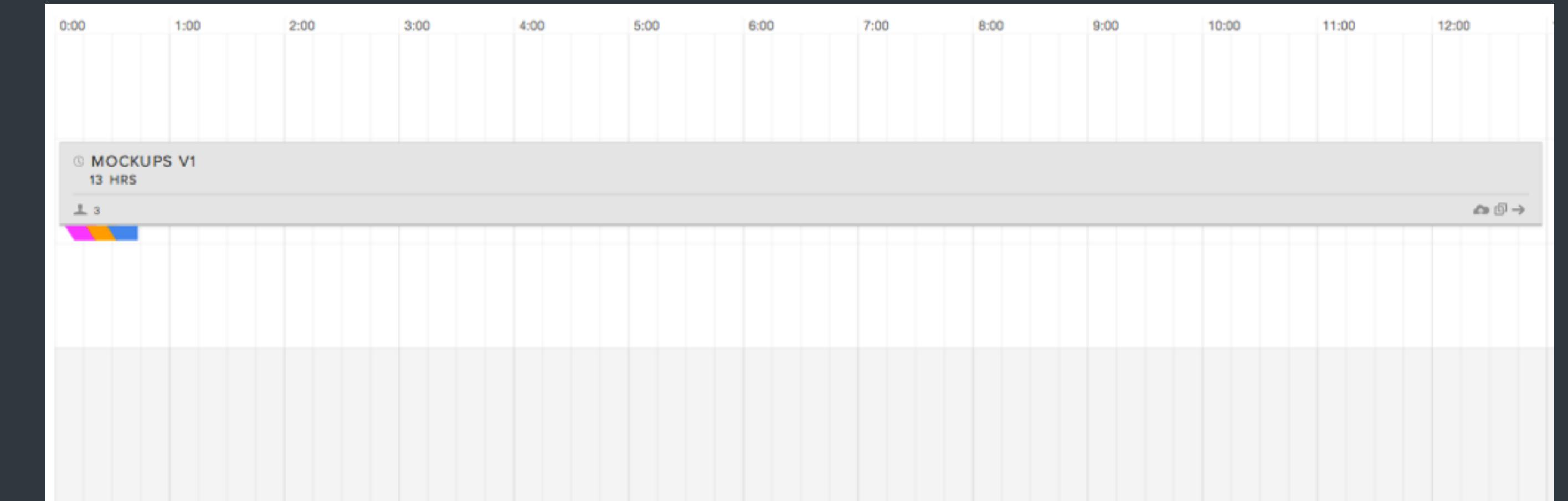
Flash teams:

full Foundry with
flash team workflow



Control teams
(self-managed):

full Foundry with just
one 13hr block



FLASH TEAMS: 50% FEWER WORK HOURS

Flash teams (mean 13hr2min) are significantly faster than self-managed teams (mean 23hr47min), $p=0.05$

The **slowest** flash team finished in fewer hours than the **fastest** team in the control condition

Flash teams introduce computational infrastructure for crowdsourcing diverse, on-demand teams of experts.



WE ARE DYNAMO: COLLECTIVE ACTION WITH CROWD WORKERS

Niloufar Salehi, Lilly Irani, Michael Bernstein, Ali Alkhatib, Eva Ogbe,
Kristy Milliland, Clickhappier. CHI '15. Best paper honorable mention.

CROWD WORK: PROMISE OR PERIL?

Crowdsourcing generated excitement by framing itself as a populist form of information work.

Yet platforms such as Amazon Mechanical Turk place workers inside a reliable, steadily humming infrastructure, making it difficult for workers to make their voice heard.

[Irani and Silberman '13]

“WHAT ABOUT A UNION?”

The metaphor of unionization is largely built around offline organizations, and needs to be redesigned for digital labor.

- new workers join the market daily and stay for only days or weeks
- work contracts last only minutes
- no way for workers to enforce behaviors on other workers

“If by ‘union’ you mean a ‘labor union’, I would not feel comfortable taking part. It runs against my grain because I am an individualist. I do not want to feel forced to go along with the ‘majority thinking’ of the leaders within a labor union. I have never been a member of a union and hope to continue along my merry way. I consider myself self-employed...not working for anyone in particular.”

<http://turkernation.com/archive/index.php/t-18874.html>

CROWD COLLECTIVE ACTION

One year of ethnography with crowd workers, understanding and building relationships. This work led to the creation of:

The screenshot shows the homepage of the DYNAMO website. At the top, there is a navigation bar with links for Home, Vote on new ideas!, How it works, Forum, and a user profile for 'light_dragonfly'. The main title 'Powering change on MTurk' is displayed prominently in large white text on a blue background. Below the title, a subtitle reads 'We are a community of 485 Turkers and growing...!'. On the left side, there is a section titled 'Trending Campaign Ideas' with a button that says '23 more upvotes to launch this campaign'. On the right side, there is a 'Live Campaigns' section featuring a campaign titled 'Dear Jeff Bezos' with a description and a timestamp 'Posted 4 months ago.'

DYNAMO

Home Vote on new ideas! How it works Forum light_dragonfly ▾

Powering change on MTurk

We are a community of 485 Turkers and growing...!

Trending Campaign Ideas

23 more upvotes to launch this campaign

▲ 2

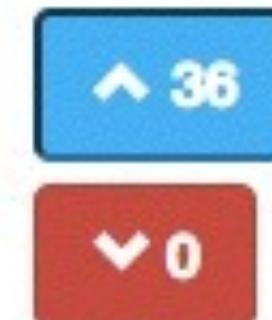
Live Campaigns

Dear Jeff Bezos

We are writing to let you and the rest of the world know all about who we are. The intent is for you to see that Turkers are not only actual human beings, but people who deserve

Posted 4 months ago.

This is the page that will host the letters you send to us and publicize the



[Start an email campaign to Jeff Bezos letting him know who we are off/on mTurk, and what we are looking for on mTurk.](#)

Posted 2 months ago by dark_bird_of_paradise.

1) Idea

2) Vote

3) Discuss

4) Mobilize

Dear Jeff Bezos

Posted 4 months ago.

We are writing to let you and the rest of the world know all about who we are. The intent is for you to see that Turkers are not only actual human beings, but people who deserve respect, fair treatment and open communication.

[Join the discussion and letter writing!](#)

[Wiki page for authoring the description and goals](#)

This is the page that will host the letters you send to us and publicize the movement:

[Letters »](#)

THE SAME FORCES THAT
MAKE IT EASY TO GATHER
ON THE WEB...

ALSO MAKE IT EASY TO
DISPERSE.

FLIRTING WITH FAILURE: STALLING

“So, it seems no one is interested [...] [a Turker] just says we’re doing it wrong, but won’t say how to do it right, and no one else has input.”

FLIRTING WITH FAILURE: FRICTION

“I’m sorry to see the core document get excessively mired in technical detail in what purports to be a high-level document on ethics. I certainly hope this document sees fewer revisions than it will if it ties any of its own legs directly to the five-year-old ‘beta test’ which Amazon calls ‘policy.’”



STALLING
FRICTION

scylla and charibdis...

STRUCTURED HUMAN SCRIPTS

These kinds of publics require special action to preserve their kinetic energy. For example:

debates with deadlines

act and undo

This labor could not have been written into software: it consists of human scripts undertaken by a trusted party.

SUCCESSES SO FAR

532 verified workers signed up (pseudonymously)

7,000 unique visitors

32,000 views

22 ideas for action

2 live campaigns

ETHICAL RESEARCH GUIDELINES

First campaign: curb poor academic research practices

Spawned when an IRB-approved economics researcher ran an experiment to inject false information into Turkopticon

Wiki-written guidelines covering fair pay, rejection, and IRB arbitration for poor requesters

23 PAGES OF EFFORT

Guidelines for Academic Requesters

About the project [edit]

Version 1.0

"Treat your workers with respect and dignity. Workers are not numbers and statistics. Workers are not lab rats. Workers are people and should be treated with respect." - turker 'T', a Turkopticon moderator

This document consists of this main **Guidelines for Academic Requesters** page, and several subpages with important additional details, which are referenced with "Read more" links at relevant points throughout this main page:

- Basics of how to be a good requester
- Fair payment
- Resources for communicating with requesters
- Links to other resources on AMT and online research ethics
- Meta: Maintaining the guidelines

Contents [hide]

1 About the project

- 1.1 Goal: Guidelines that IRB will use to approve responsible AMT research

2 For Turkers: what can you do when these guidelines are violated?

3 Guidelines

- 3.1 Clearly identify yourself to give workers a sense that you are accountable and responsible
- 3.2 Provide reasonable time estimates
- 3.3 Approve work as soon as possible
- 3.4 Maintain worker privacy
- 3.5 Abide by AMT Terms of Service

<http://guidelines.wearedynamo.org> – 216 signatures so far

HUMANIZATION IN THE MEDIA

Dear Jeff Bezos

We are writing to let you and the rest of the world know all about who we are. The intent is for you to see that Turkers are not only actual human beings, but people who deserve respect, fair treatment and open communication.

[Donate](#)

Donations will go towards reaching out to more Turkers via a HIT on MTurk (a 3 minute paid vacation). Raised: \$60

A circular portrait of Jeff Bezos, the founder of Amazon, looking slightly to his right with a faint smile.

[Tweet 23](#)

[Like 40](#)

[Share 40](#)

21 letters

Amazon's Mechanical Turk workers protest: 'I am a human being, not an algorithm'

A Christmas email campaign is asking Amazon's CEO Jeff Bezos to improve terms for workers providing cheap digital labour

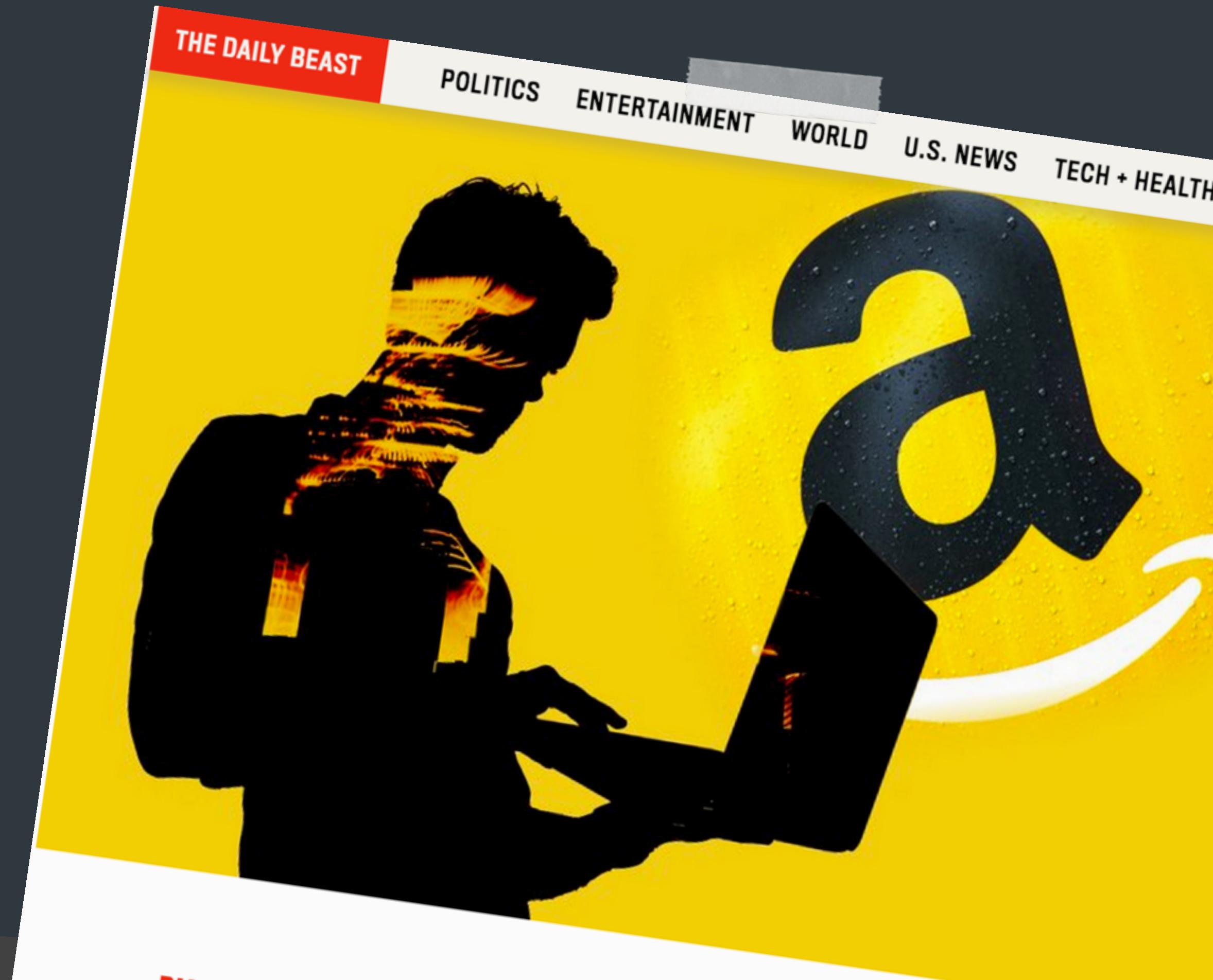


engadget

Amazon's Mechanical Turk workers be treated like humans



by Jon Fingas | @jonfingas | December 3rd 2014 at 1:39 pm



RISE UP 12.03.14

Amazon's Turkers Kick Off the First Crowdsourced Labor Guild



Kevin
Zawacki

Emil Lendof/The Daily Beast

IN SUM...

If flash teams are a new form of work collective,
Dynamo is a new form of counterbalance.

Our goal: design systems for collective action in crowd work

CROWD RESEARCH: UNLOCKING THE GATES TO THE IVORY TOWER

ongoing work with Rajan Vaish, Geza Kovacs, Ranjay Krishna, Sharad Goel,
and James Davis

SETTING OUR SIGHTS HIGHER

Must we restrict ourselves to research problems that are solvable alone or in small groups?

Must we deny access to motivated aspiring researchers?

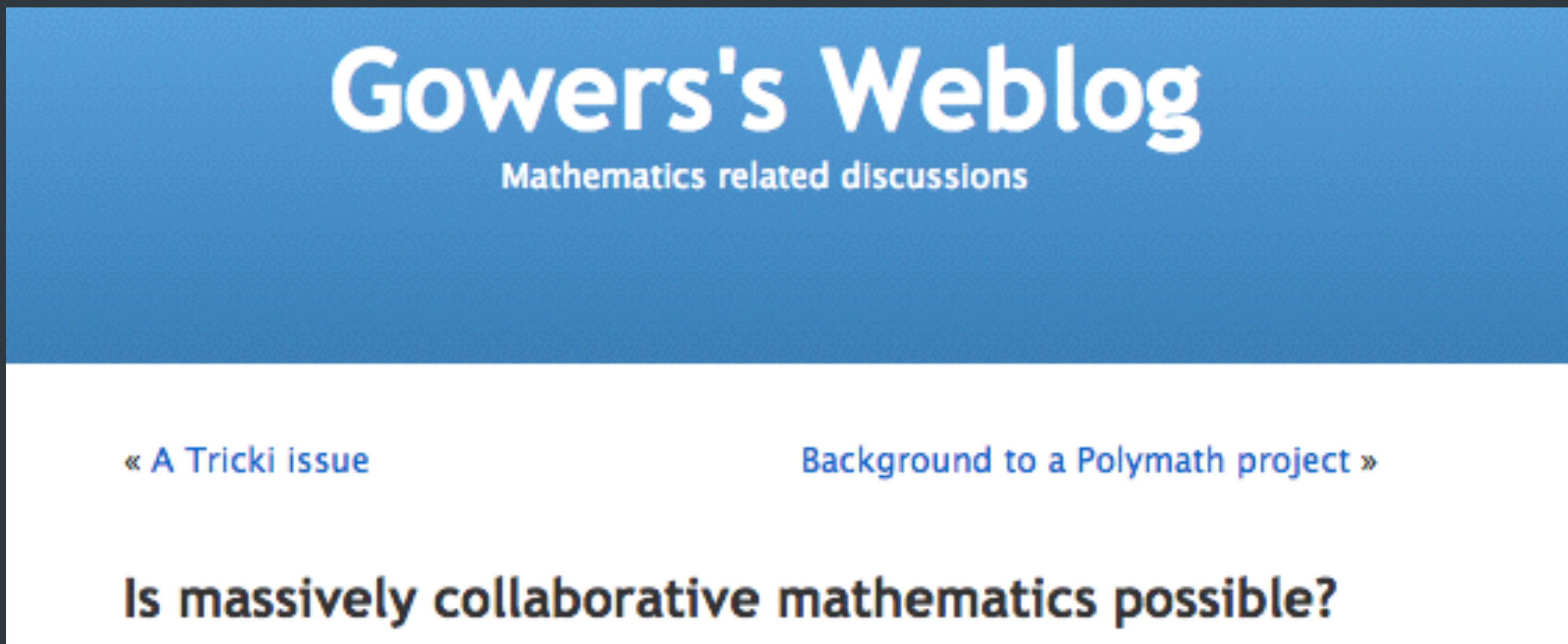
Could people around the world work together to...

Build a new crowdsourcing platform?

Design and run hundreds of parallel experiments?

Develop computer vision algorithms?

WELL-STATED PROBLEMS



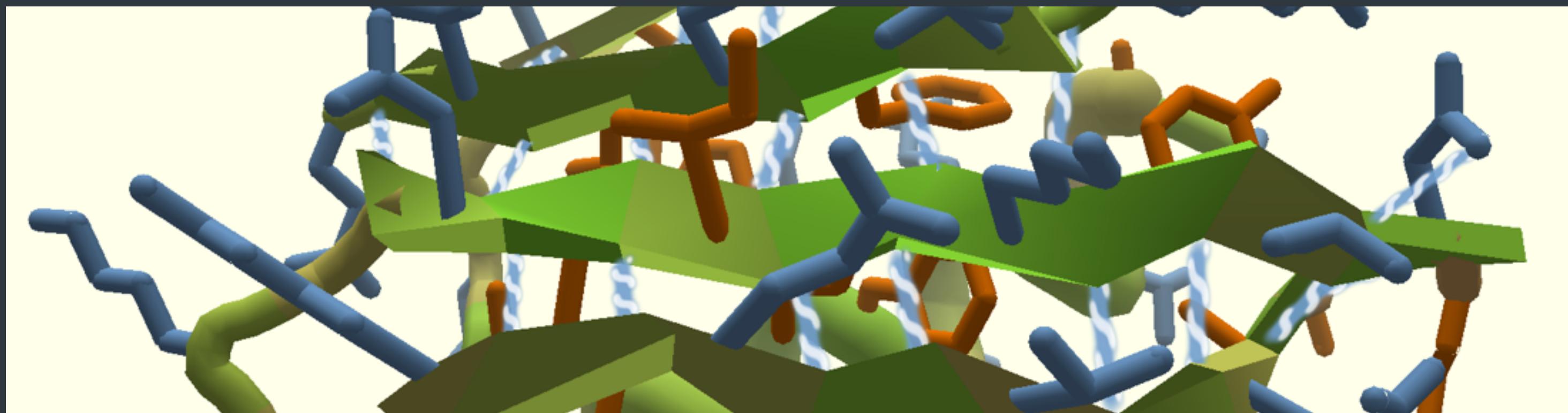
The screenshot shows the homepage of Gowers's Weblog. The header is blue with white text: "Gowers's Weblog" and "Mathematics related discussions". Below the header, there is a large white area containing two blue links: "« A Tricki issue" on the left and "Background to a Polymath project »" on the right. At the bottom of this white area, there is a dark grey footer bar with the text "Is massively collaborative mathematics possible?" in white.

Gowers's Weblog
Mathematics related discussions

« A Tricki issue Background to a Polymath project »

Is massively collaborative mathematics possible?

Polymath project
[Gowers and Tao]
[Cranshaw and Kittur 2011]



FoldIt
[Cooper et al. 2010]

OPEN-ENDED, MESSY RESEARCH

Could we invite anyone from around the world to participate, and crowdsource large-scale, open-ended research problems?

These are problems for which a felicitous approach to finding the solution cannot be known in advance.

EDUCATIONAL MISSION

Provide scaffolding so anyone can learn to do top-tier research

Participant motivations: research experience, stronger resume,
solving interesting problems

Tightly-constrained
RAship



Open-ended
grad school

crowd research

CHALLENGE: COORDINATION

My Stanford group is eight students. And that keeps me pretty busy.
Google managers are asked to have no more than seven reports.
So how could we possibly run a research team of hundreds?

CHALLENGE: CREDIT

Eventually, we need to decide on an author order, and participants will need recommendation letters. How do we measure impact?

Assumption: advisor goes last in the author order, but other authors should be ranked by contribution to the project

Calling aspiring researchers!

Do you love challenges? Do you aspire to be a researcher? - but do not know how to conduct research or whom to contact to? - Well, here's your chance to work on a research project and co-author academic papers with professors from Stanford University and the University of California.

[Learn More »](#)

1097 signups, predominantly from India and United States

27% female, median age 21, average team 3 people

73% undergraduate, 22% masters, 4% PhD, 1% high school

71% engineering-oriented areas of study

THREE PARALLEL PROJECTS

HCI

Michael Bernstein, Stanford

Building a new crowd
marketplace



The image shows the homepage of the DAEMO website. The background features a yellow gradient with multiple hands raised, symbolizing a community or crowd. The DAEMO logo, which consists of a stylized 'D' icon followed by the word 'DAEMO' in a serif font, is positioned in the upper left. Below the logo, the text 'Next generation crowdsourcing' is displayed. A descriptive paragraph follows, stating: 'The platform with a conscience that the gig economy has been waiting for. Build sustainable careers, grow your business and help make decisions about the platform's future.' To the right, there are two dark blue rectangular buttons labeled 'CREATE ACCOUNT' and 'SAMPLE TASKS'. At the bottom center, the text 'WELCOME TO THE FUTURE OF CROWDSOURCING!' is written in a bold, dark blue font. Below this, three icons with corresponding text descriptions are shown: a magnifying glass icon for 'PROTOTYPE TASKS ALLOW TO TEST WORKERS AND REFINE DESCRIPTIONS', a list icon for 'MILESTONE REVIEWS EASE WORKER/REQUESTER EXCHANGES', and a people icon for 'AN OPEN GOVERNANCE STRUCTURE HELPS TO EMPOWER ALL PARTIES'.

How it works Login

DAEMO

Next generation crowdsourcing

The platform with a conscience that the gig economy has been waiting for. Build sustainable careers, grow your business and help make decisions about the platform's future.

CREATE ACCOUNT

SAMPLE TASKS

LEARN MORE

WELCOME TO THE FUTURE OF CROWDSOURCING!

PROTOTYPE TASKS
ALLOW TO TEST WORKERS
AND REFINE DESCRIPTIONS

MILESTONE REVIEWS
EASE WORKER/
REQUESTER EXCHANGES

AN OPEN GOVERNANCE
STRUCTURE HELPS TO
EMPOWER ALL PARTIES

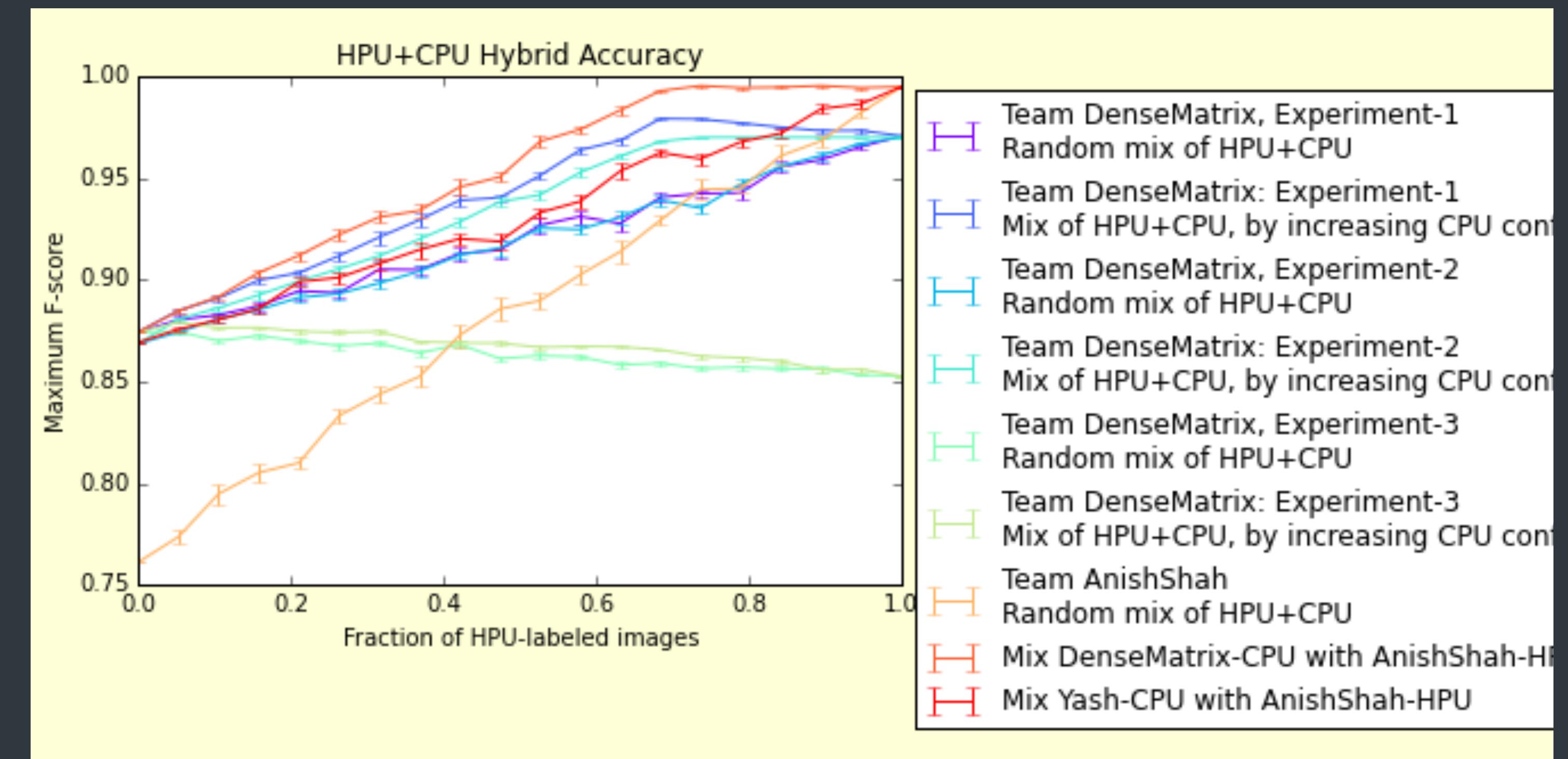
THREE PARALLEL PROJECTS

Computer vision

James Davis, UCSC

Serge Belongie, Cornell

Hybrid crowd-computer vision algorithms



THREE PARALLEL PROJECTS

Data science

Sharad Goel, Stanford

Hundreds of experiments testing the wisdom of the crowd

Predict the direction of penalty shot



Time Remaining

30

Tasks Remaining in the domain: 15 / 20

Options:

- left
- right

RESEARCH IN PROGRESS

Three work-in-progress papers: two at UIST, one at HCOMP

Papers in preparation or under review...

COORDINATION STRATEGY

Exploration during the week, reset to argmax each weekend

Saturdays: team meeting + milestone opens

Thursdays: milestone closes

Fridays: peer feedback and ranking + staff collation

COORDINATION STRATEGY

Divergence

Every interested contributor submits a milestone, then peers upvote high-quality submissions

Tools: Telescope (Reddit clone), Wiki

The screenshot shows the Crowd Research interface. At the top, there's a navigation bar with three horizontal lines and the text "Crowd Research". Below it, there are two entries:

- Milestone 20 Instructions** ([OPEN-GOV](#))
Upvote **TASK-CREATION** **ONBOARDING**
Geza Kovacs 1 point 23 days ago 0 Comments
- Onboarding proposal** ([ONBOARDING](#))
Upvote Dilrukshi Gamage 1 point 12 days ago 0 Comments

Each entry has a small profile picture, a "comments" icon with the number 0, and a "Upvote" button.

Convergence

Empower active community members to create temporary ad-hoc teams

Tools: Google Hangout, Slack, Google Presentations

The screenshot shows a message thread from a Google Hangout:

- karolina** 1:57 PM: doing it now 😊
- @channel:** we will begin shortly!
- here is the link to join
- 1:58 ★ <https://hangouts.google.com/call/atw4bueag6pt2munaykj2fv>

INTUITION: TRANSFORM CREDIT INTO A NETWORK PROBLEM

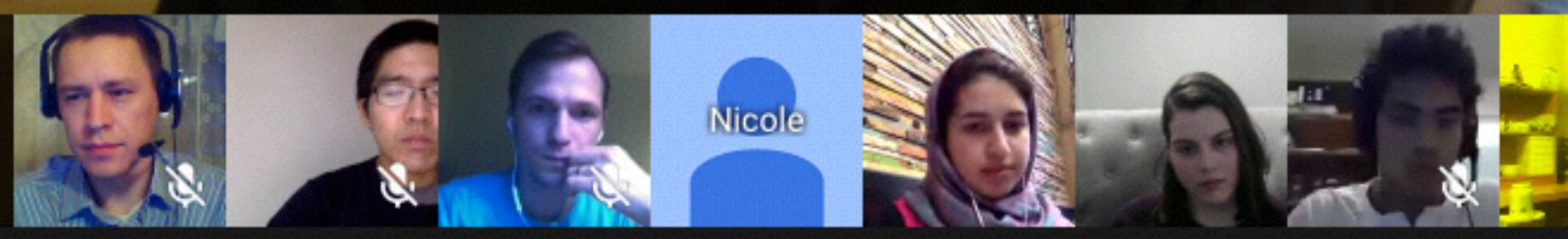
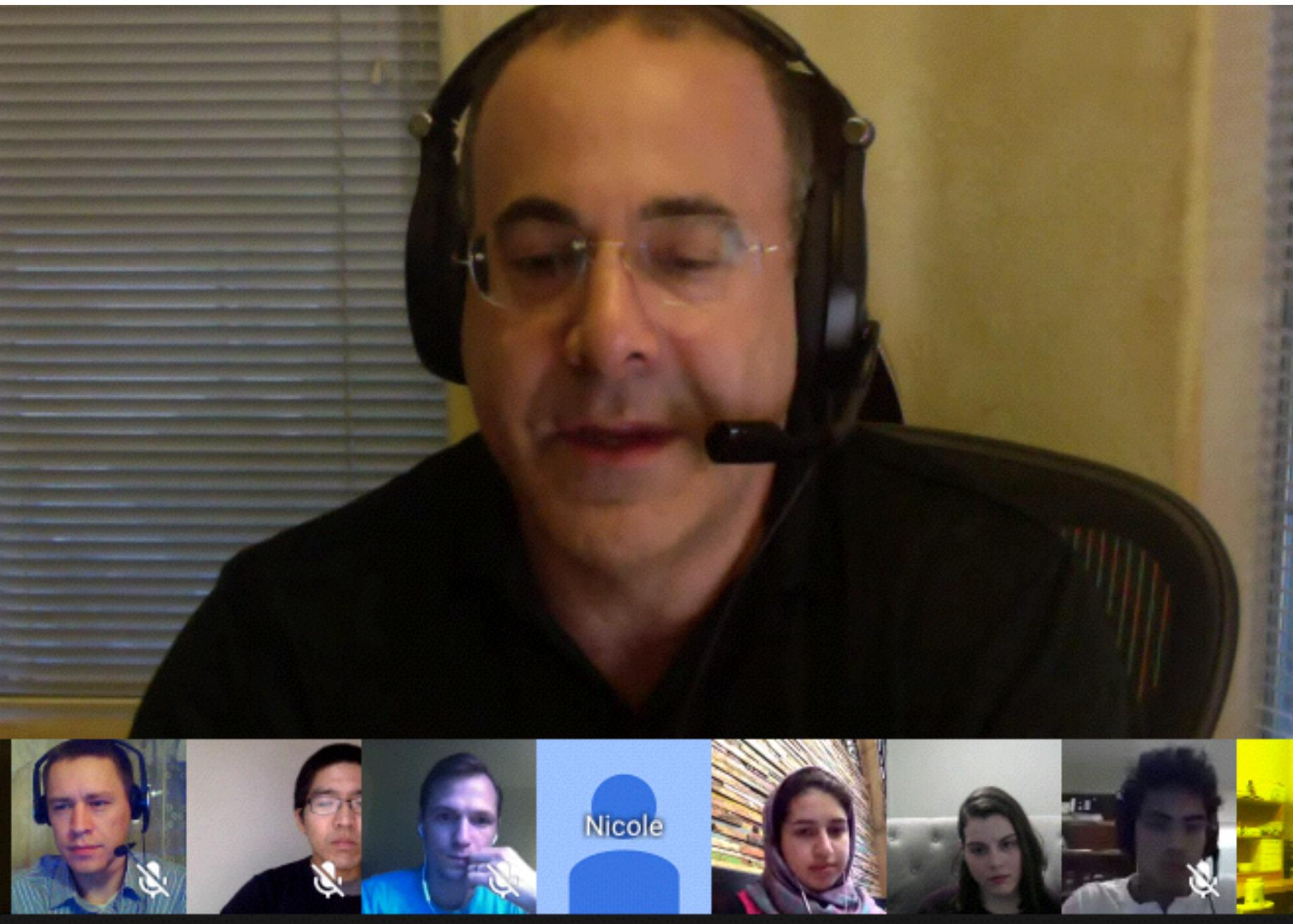
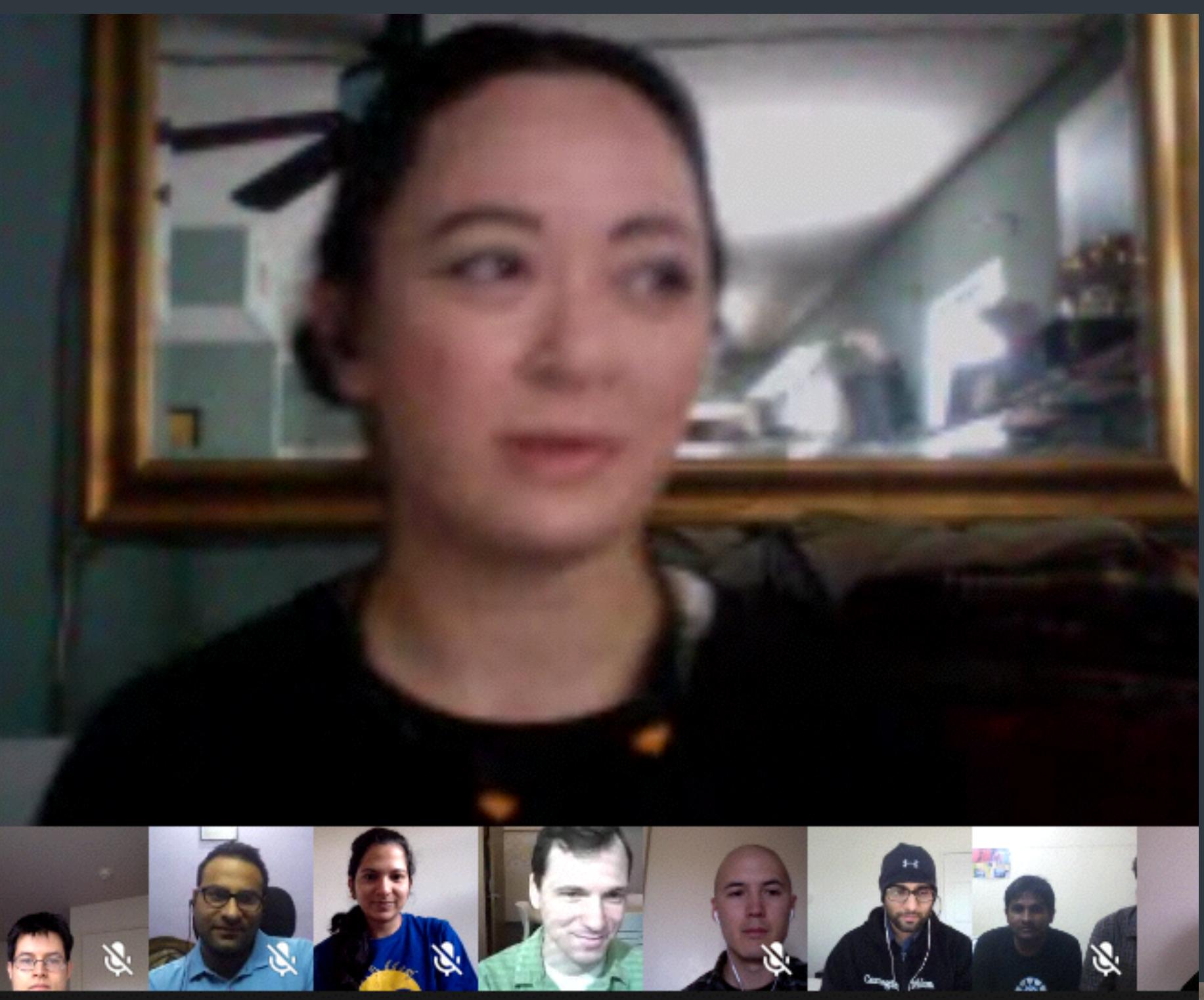
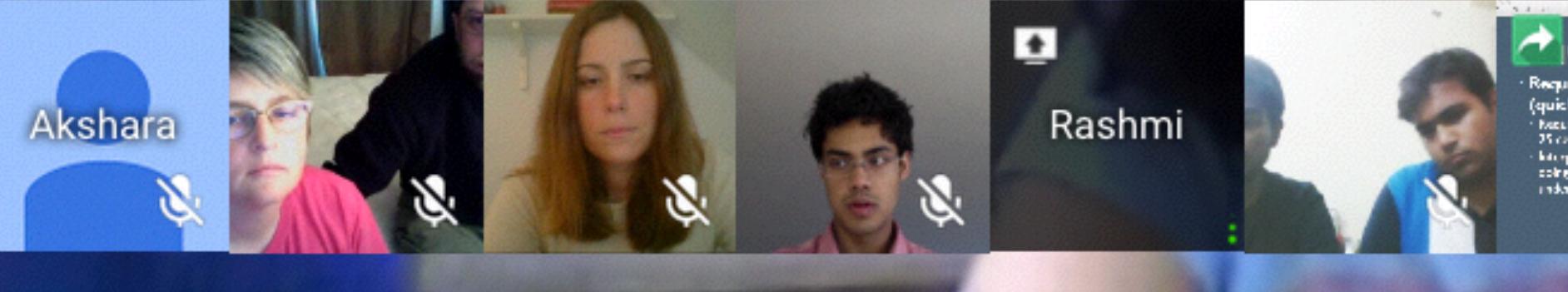
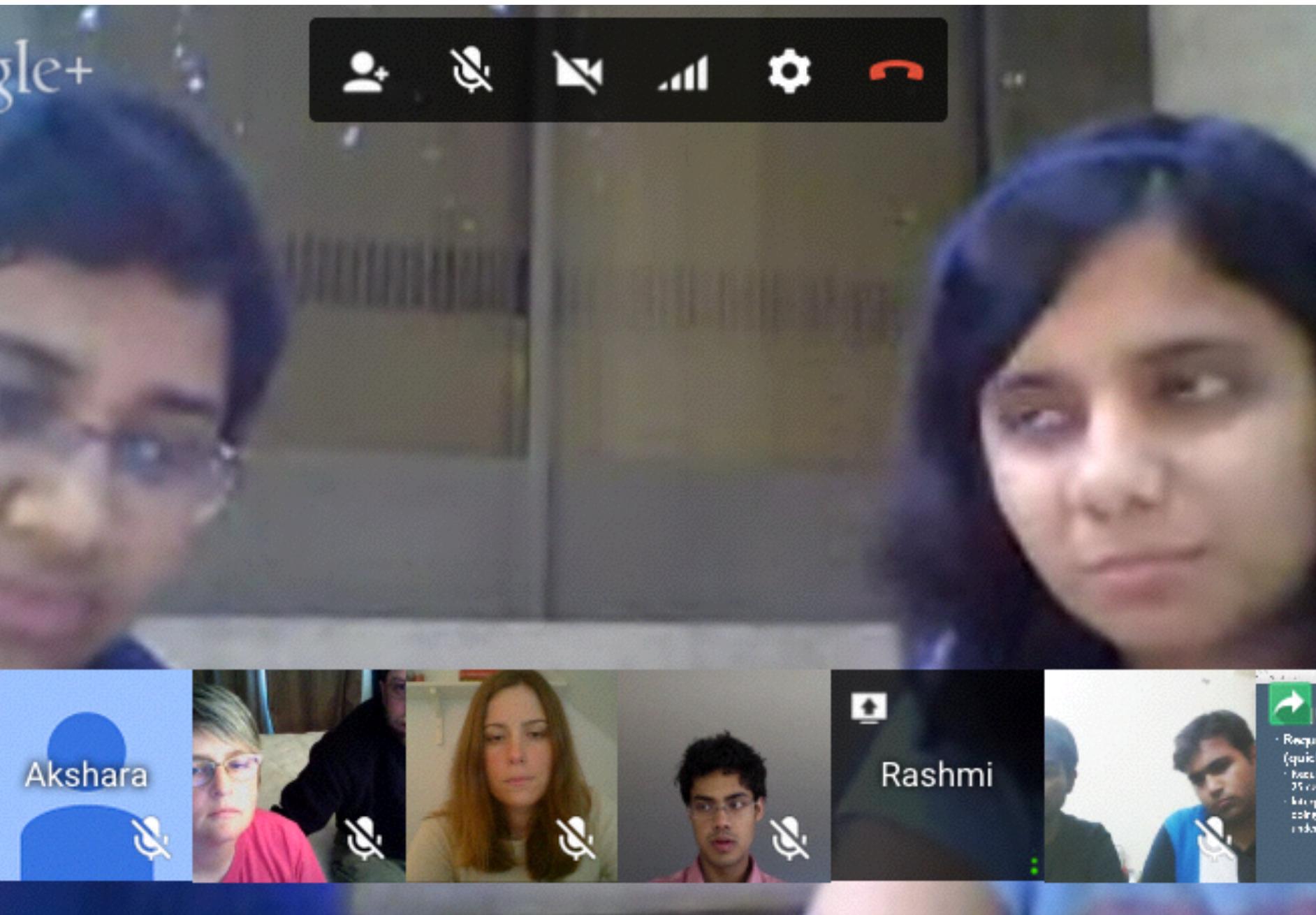
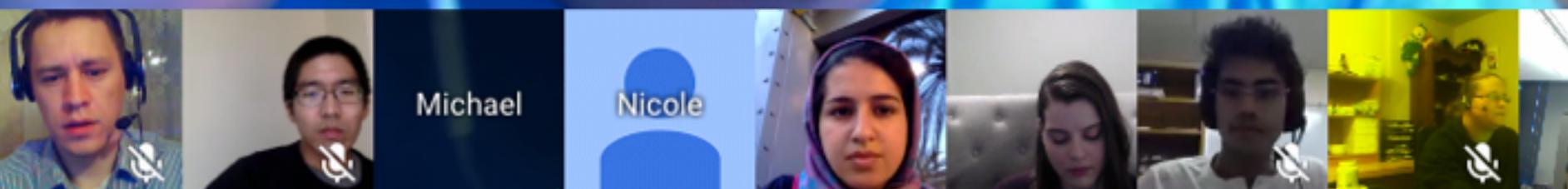
Each participant allocates 100 points across other contributors.

This produces a credit network, but some groups of participants rally a few friends to vote for them and artificially increase their influence.

PAGERANK-BASED CREDIT

Approach: run a modified PageRank algorithm over the network

Informally, PageRank identifies the universally-respected contributors, then weighs their votes more heavily. This process iterates until convergence.



-  **rajanvaish** 9:01 AM
hello everyone!
-  **seasondyb** 9:02 AM
Hi!
Greetings from Seattle!
-  **csarasua** 9:02 AM
Hi!
-  **sbagroy986** 9:02 AM
hey!
-  **sujeathpareddy** 9:02 AM
Hi!
-  **rainydayz8** 9:02 AM
hi ^_-^
-  **meenalmandil** 9:02 AM
Hi
-  **ossolorzano** 9:02 AM
hello

MILESTONE SELF-ASSIGNMENT

STANFORD CROWD RESEARCH
Crowd Research

Getting Started Crowd Research Org Visible

Click first: how does this work? 3

Each week, you (and/or your team) sign up for at least one milestone here on Trello. See more...

Understanding lives of workers 13

Try being a worker on oDesk (now Upwork.com) or other large project platforms.

Hello, world! Getting started with our code 1

Work on one of our open feature requests on GitHub

Related work/papers: read and comment 17

Read the MobileWorks paper

Dashboard - Milvstrin Munakami If you're not Milvstrin Munakami, click here. Your Worker ID: AKUWVSKH9RQK

Total Earnings DISCOUNTED

Earnings To Date	Value	Earnings Available	Value
Approved HITs	\$3.93	Earnings Available For Transfer	\$3.23
Bonus	\$0.00		
Total Earnings	\$3.93		

Transfer Earnings

Your HIT Status DISCOUNTED

Date	Submitted	Approved	Rejected	Pending	Earnings
May 21, 2013	5	5	0	0	\$3.93

HIT Totals DISCOUNTED

HITs You Have Submitted	Value	Rate
Approved	\$3.93	100.0%
Rejected	\$0.00	0.0%
Pending	\$0.00	0.0%

Sign up as a worker for Mechanical Turk at and earn \$1.

Read Flash Teams paper 5

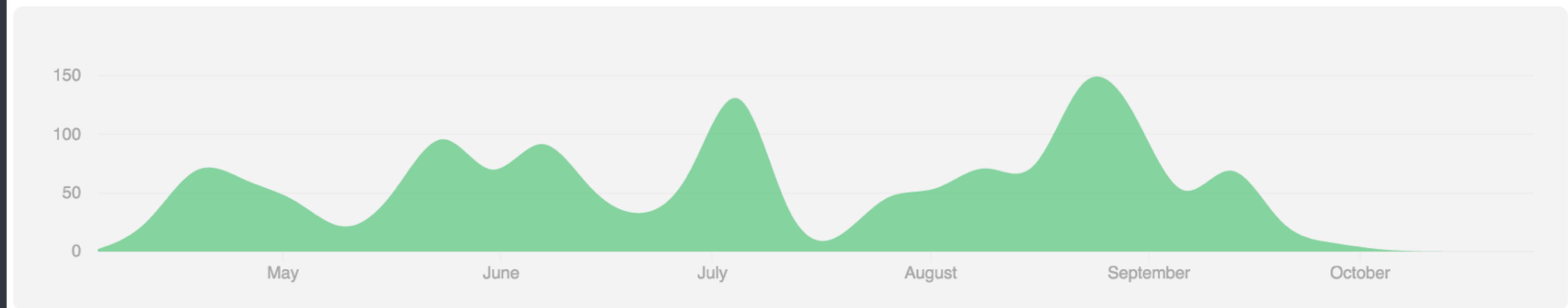
Read paper on the future of crowdwork 7

ENGINEERING

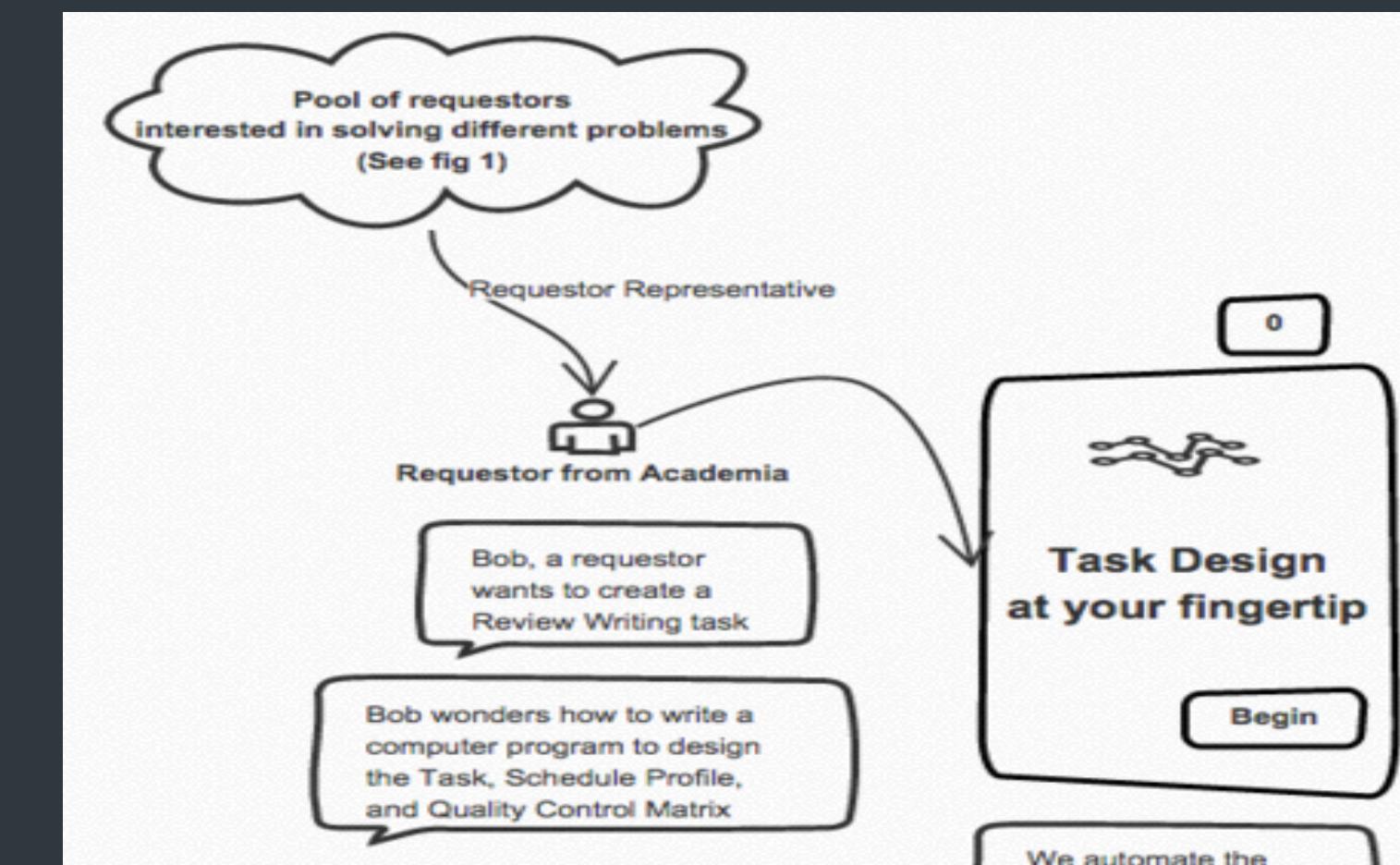
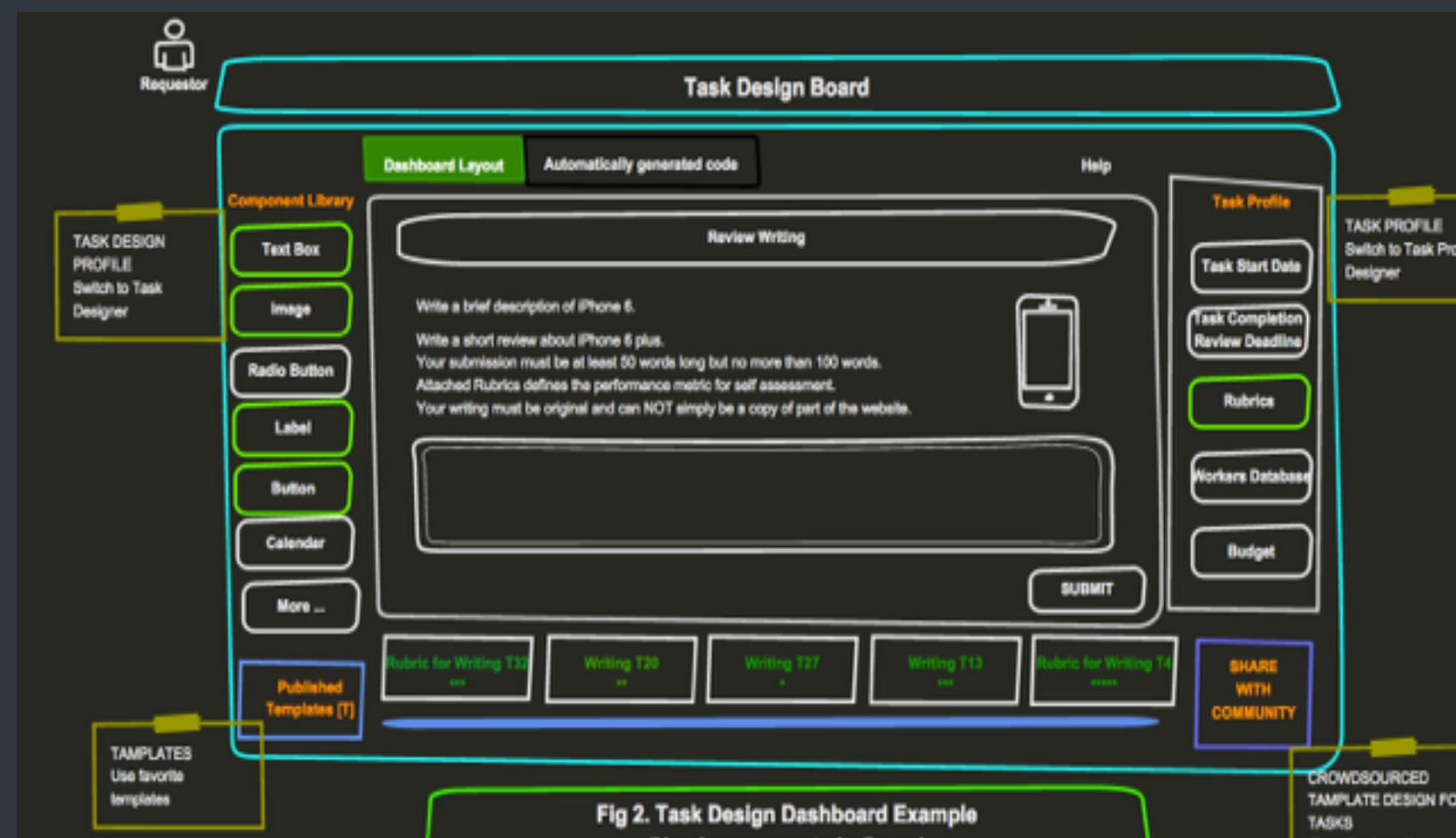
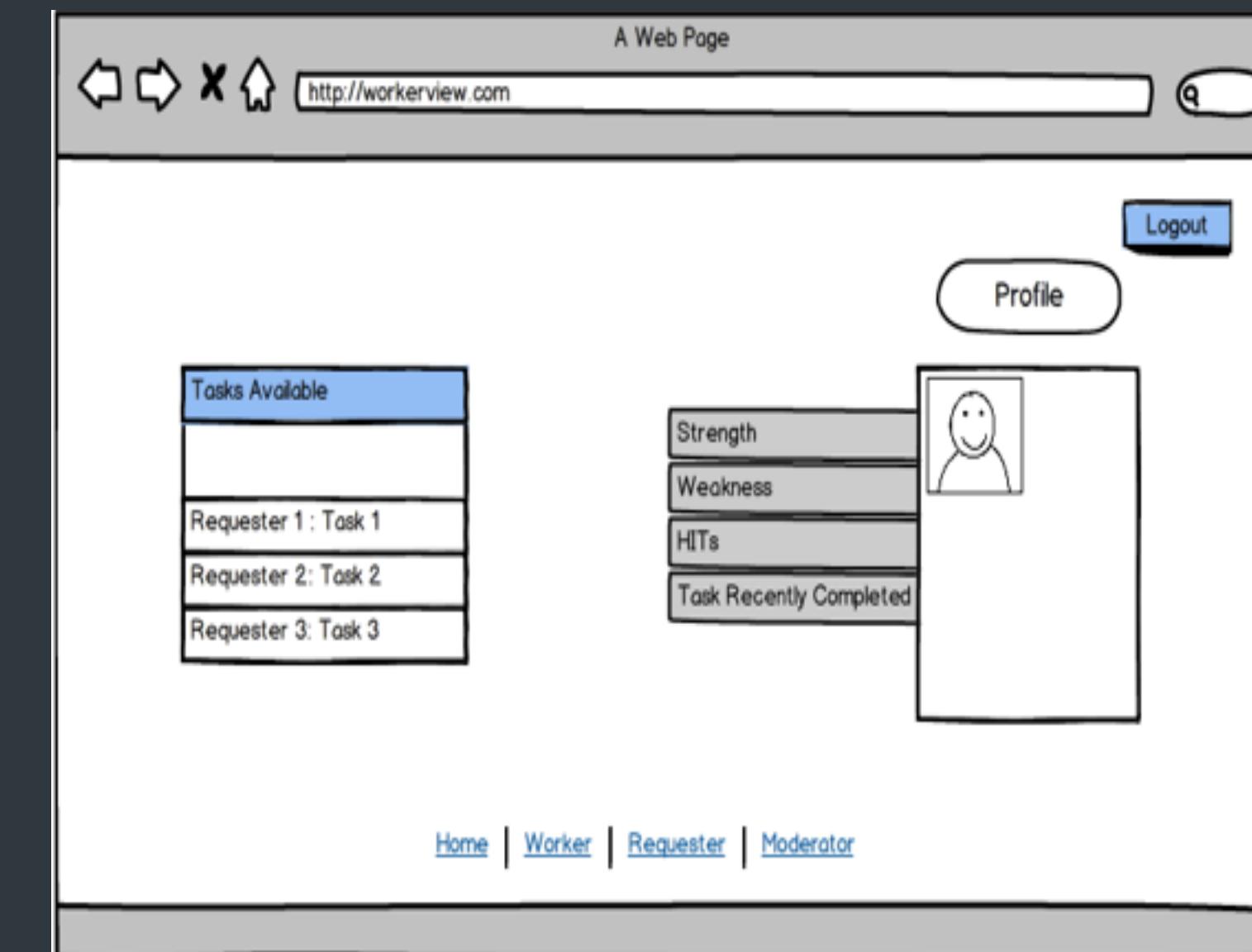
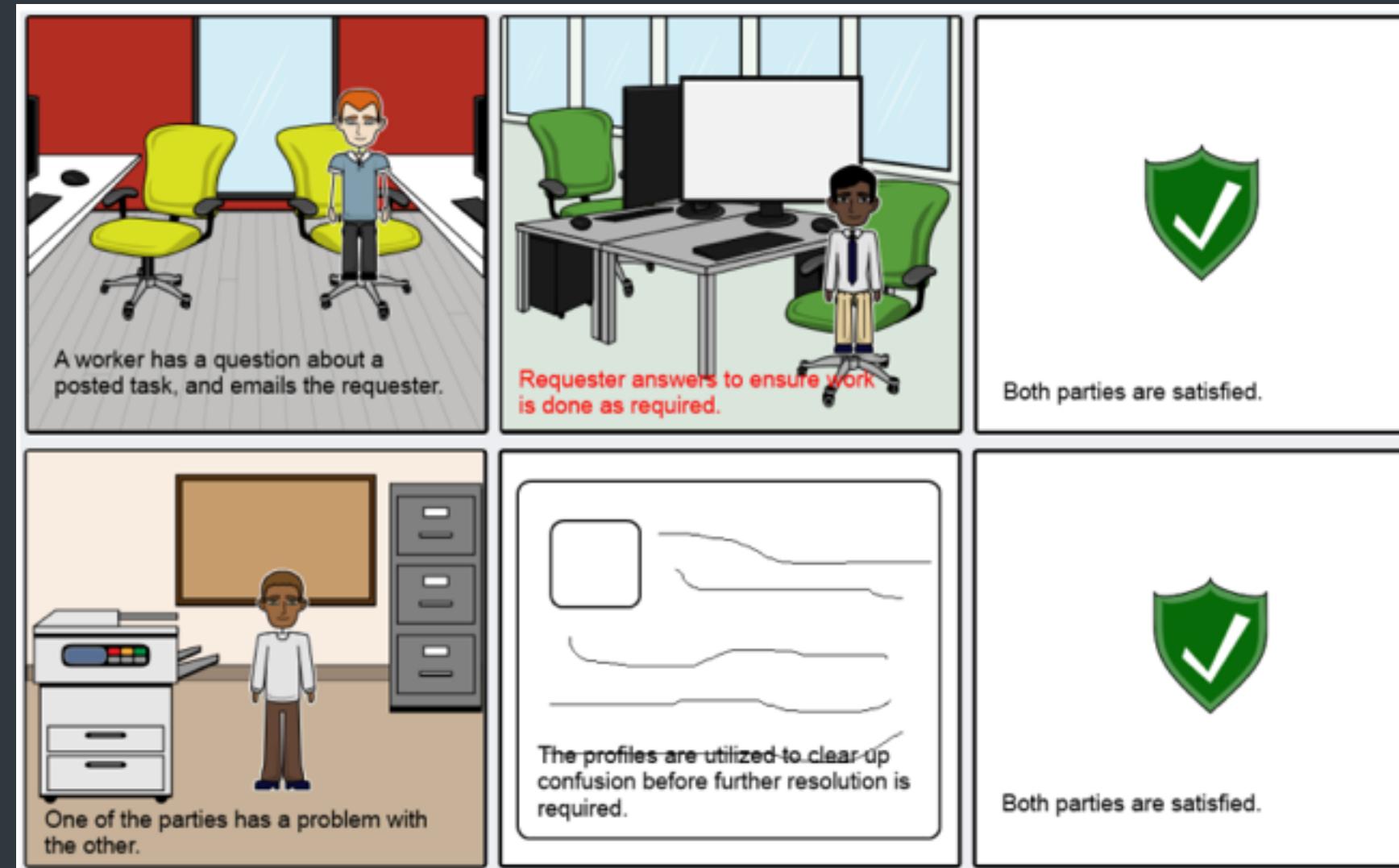
Apr 5, 2015 – Oct 26, 2015

Contributions to develop2, excluding merge commits

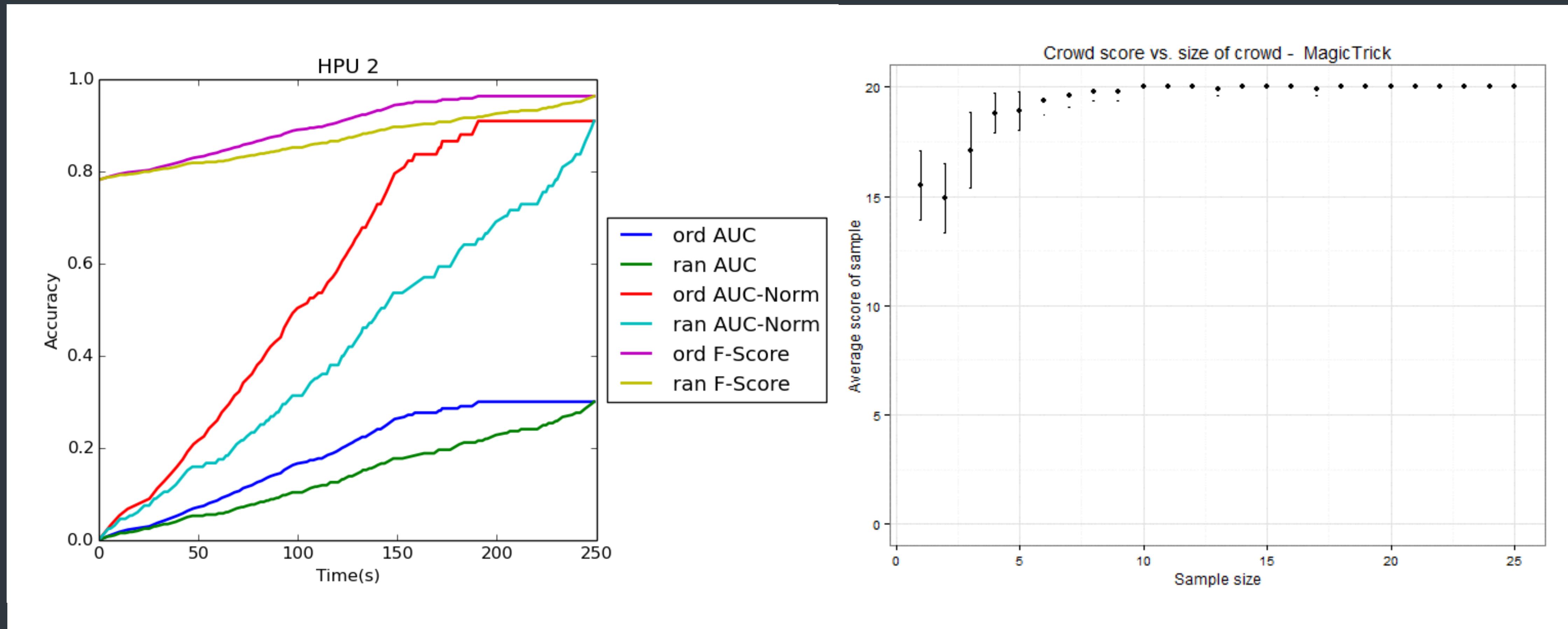
Contributions: **Commits** ▾



PROTOTYPES AND STORYBOARDS



DATA ANALYSIS



BRAINSTORMING AND WRITING

1. Anyone can pitch an idea. If it gets enough support, it goes to the next election and needs majority support from both workers+requesters.
 - o **(original) Direct democracy:** anyone can pitch a policy idea, and once it gets past a threshold of support (e.g., 1000 votes), it goes up on a ballot. Twice a year, ideas go out to a direct vote for everyone on the platform. If it gets majority support from both workers and requesters, it passes.
2. Members get elected as worker or requester representatives (3 each) to a panel. Tiebreaking from a 7th member (jointly elected president).
 - o **(original) Representative democracy:** once a year, members of the platform can be elected as either worker or requester representatives for a small panel (e.g, six people). Anybody can pitch a policy idea, and once it gets past a threshold of support (e.g., 1000 votes), the elected representatives must discuss it and vote on it.
3. Wikimocracy: the site's rules and policies are a wiki. Anyone can discuss, and if they edit, policies change directly.
4. Any idea that gets enough support enters a public one-month voting period. It's completely voluntary to vote. (Like a Kickstarter campaign.)
 - o **Original: Fast-paced referendums:** similar concept as direct democracy, but instead of per year, you do it as vote thresholds within a month (within time of posting), and it's completely voluntary to vote. Kinda like a campaign on kickstarter. Fast pace and flexible deadlines will help the ideas continually flowing in.
5. For low-level changes, highlight the interface and suggest changes directly. Upvote/downvote directly on the interface.

majority of workers and requestors and not only one side. this could help balancing the platform.



Adam Marcus

5:05 AM May 9

Resolve

equal representation of workers and requesters? pro: seems fair, con: might run into the same sorts of paralysis issues the FEC is in now (<http://mobile.nytimes.com/2015/05/03/us/politics/fec-cant-curb-2016-election-abuse-commission-chief-says.html>)



Saloni Kogta

11:52 AM May 13

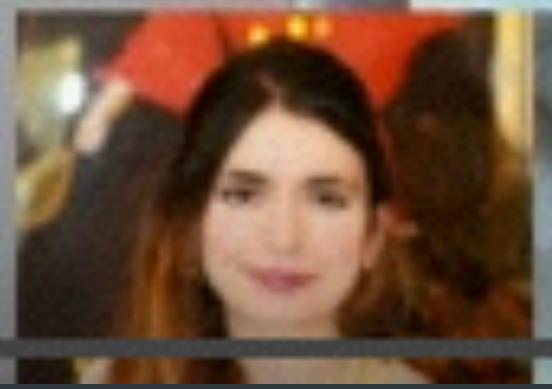
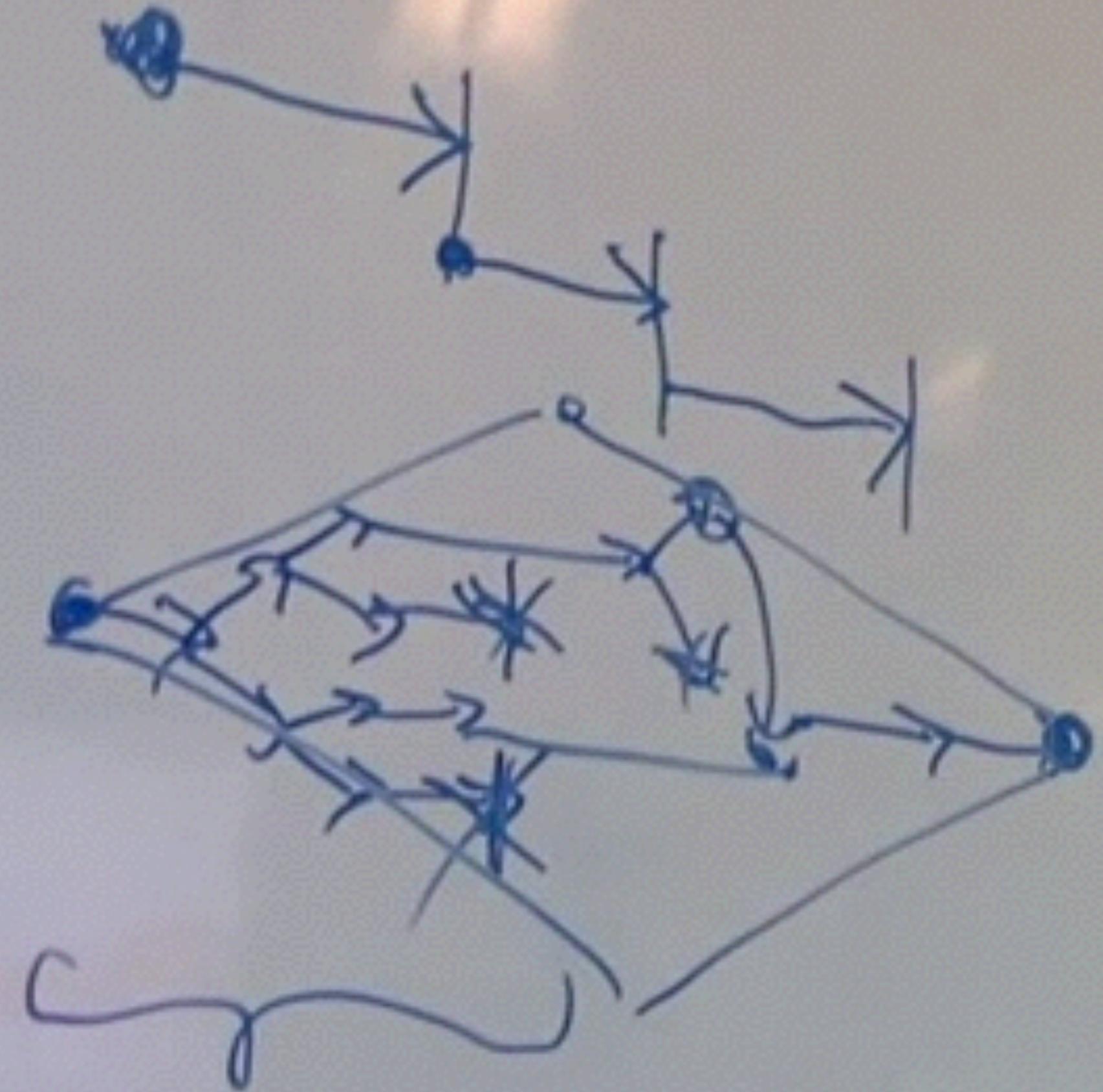
Resolve

I am not sure how "fair" these elections would be. Money and power could play a major role here. I may be referring to a case that has extremely small possibility of occurring, but, what if the intentions of the elected members are changed or are influenced by some other party?

Reply...



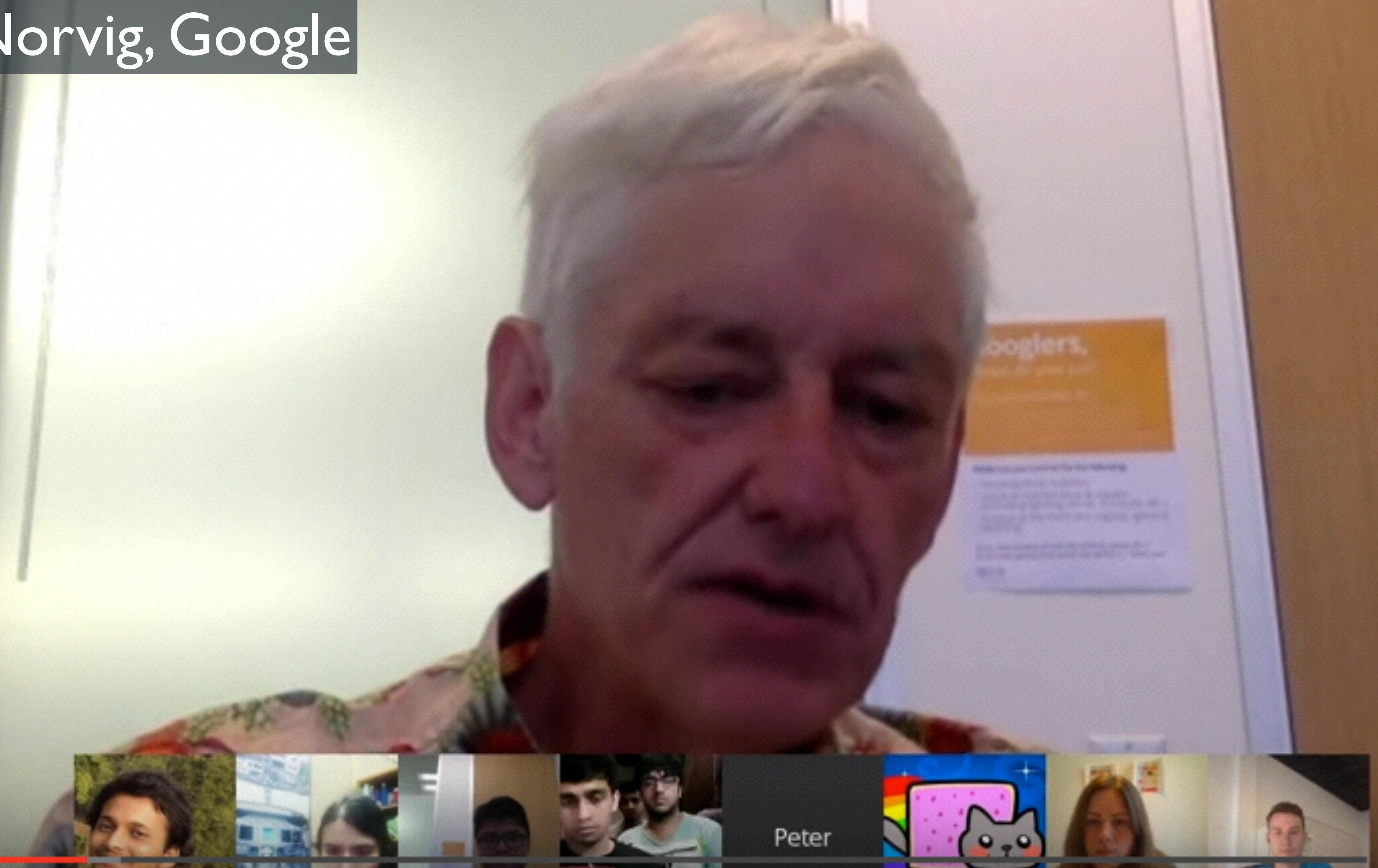
Anonymous



Andrew



Peter Norvig, Google

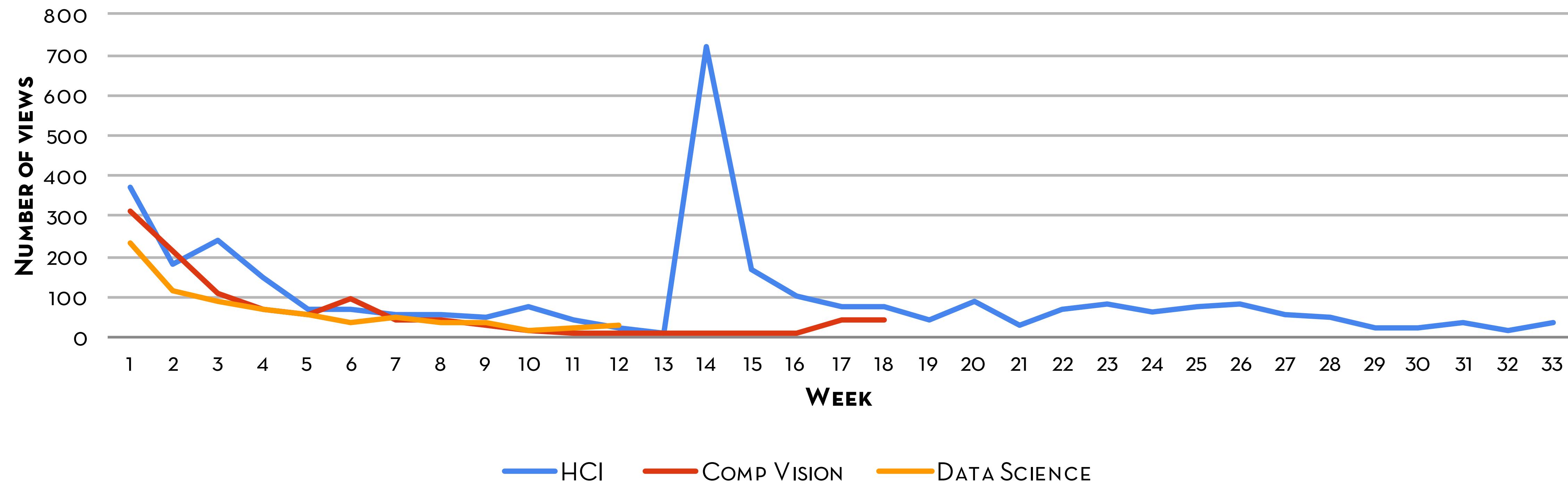


Anant Agarwal, MIT and EdX

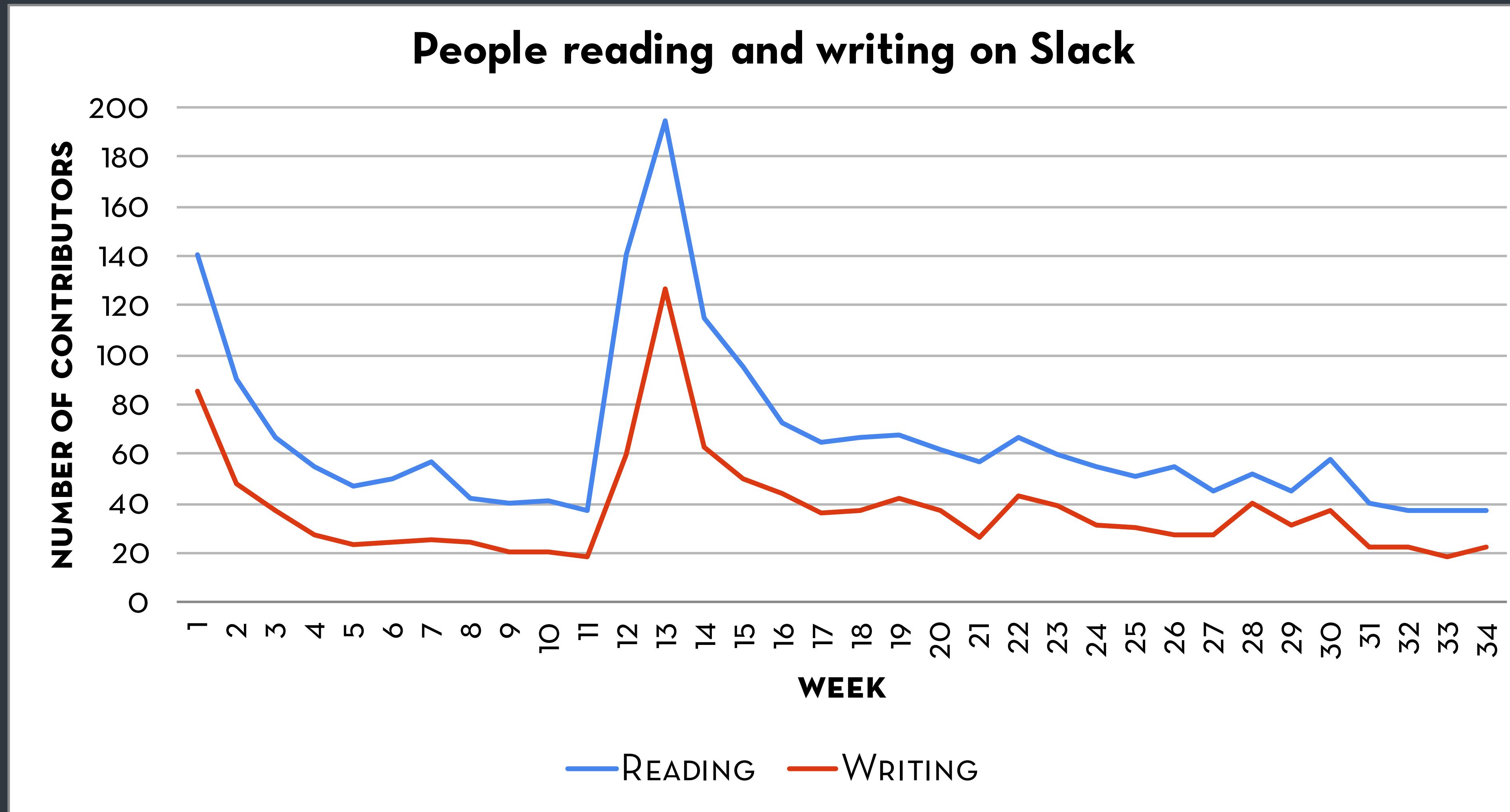


LONGEVITY

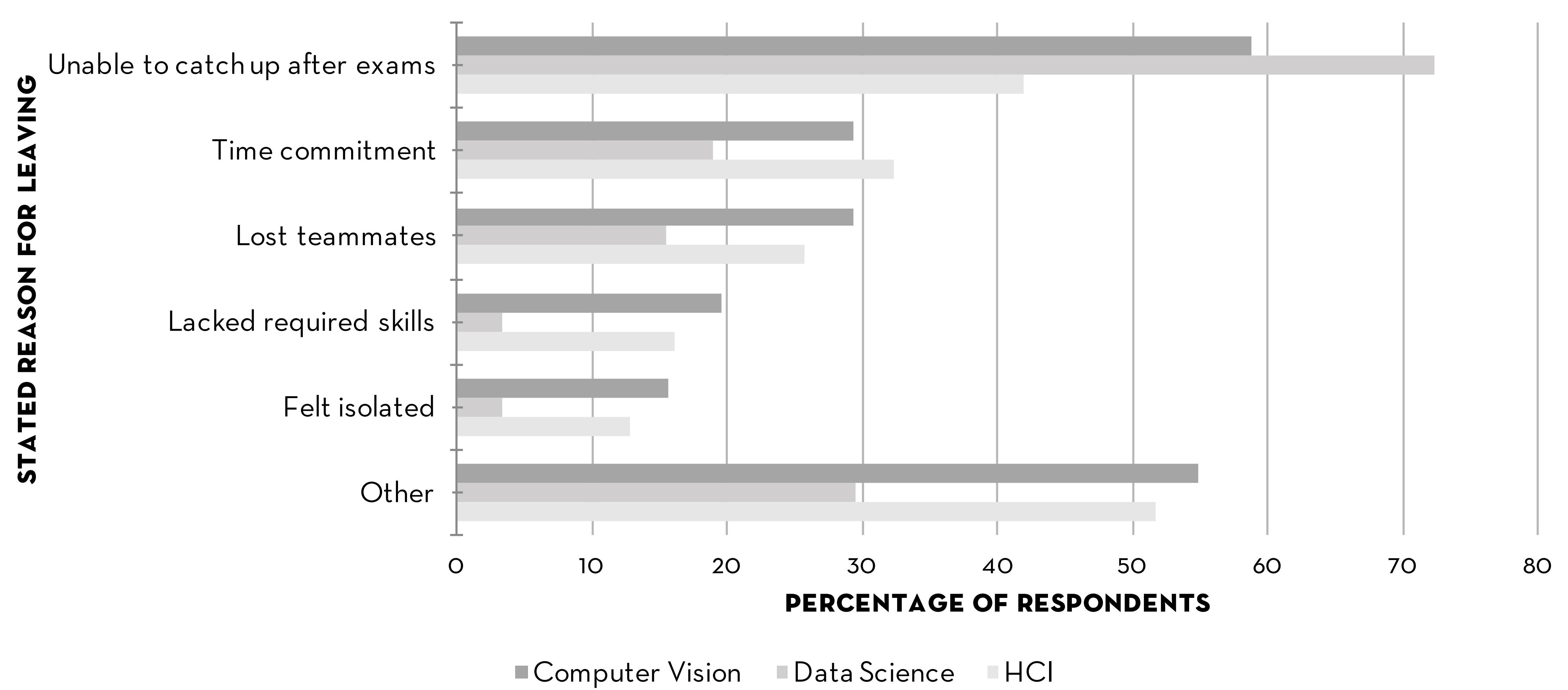
YouTube views of weekly meetings



LONGEVITY

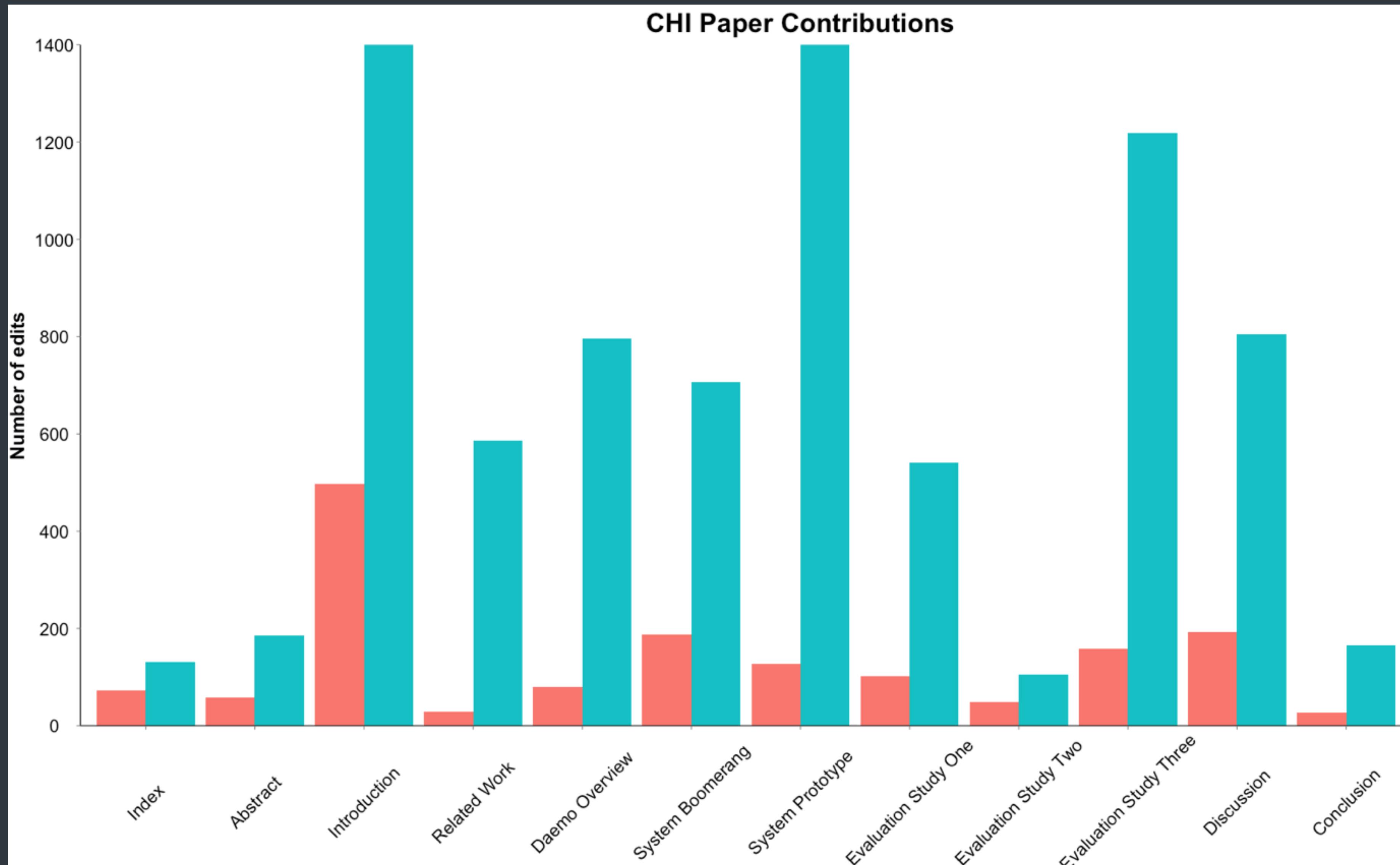


REASONS FOR DROP-OFF



PAPER WRITING

a.k.a. “Michael loves editing intros.”

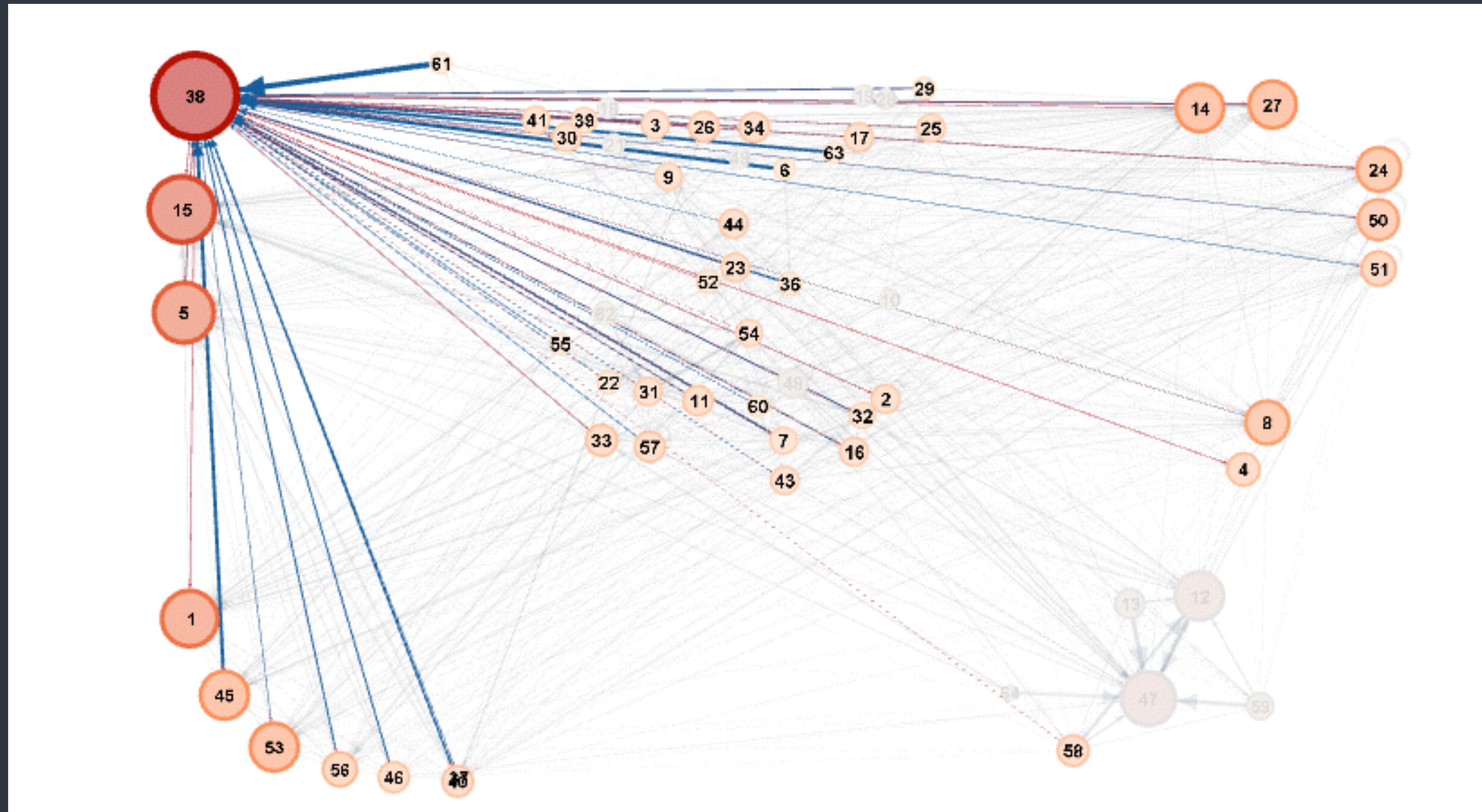


Crowd
Advisor

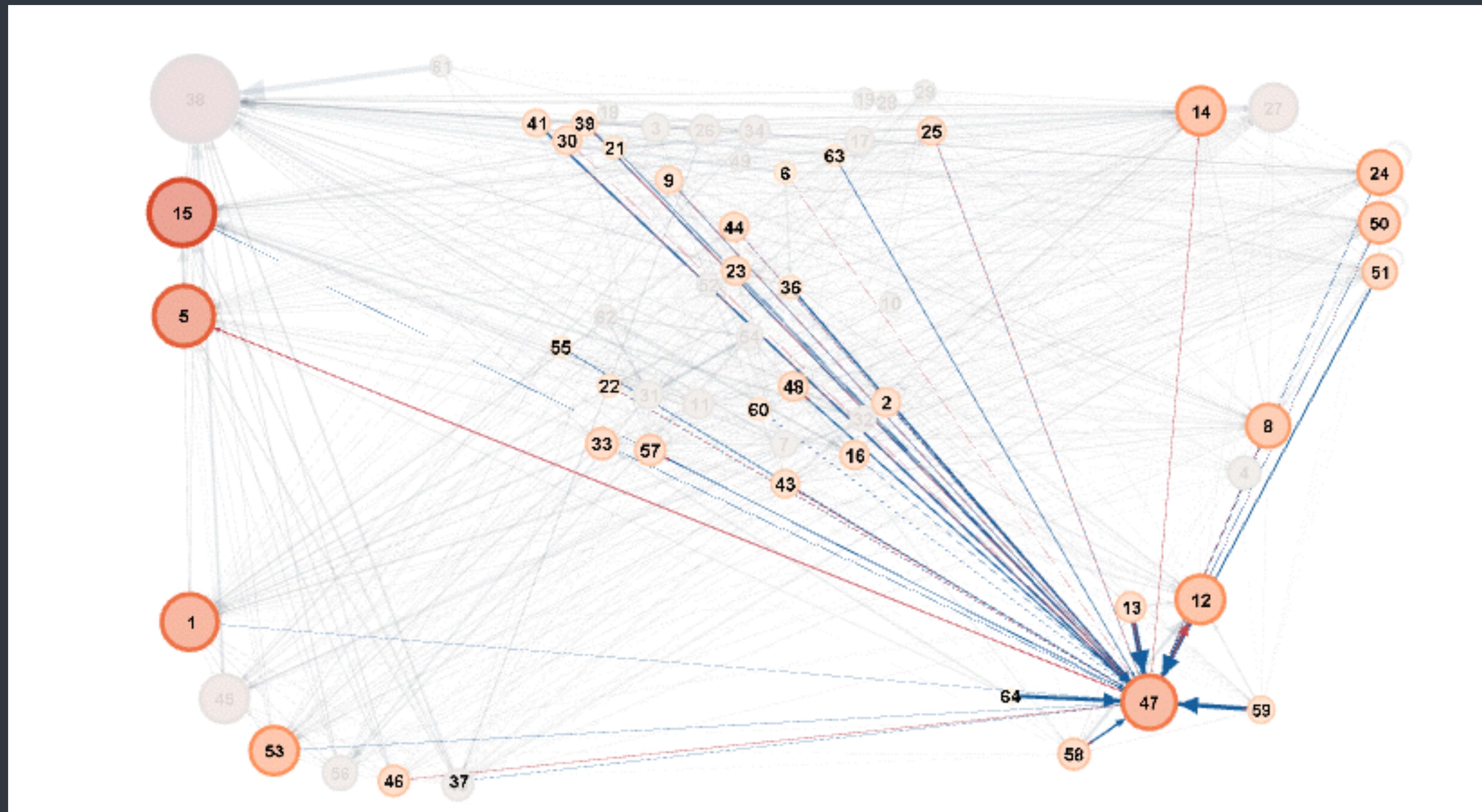
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CROWD RESEARCH

We aim to...

Tackle open-ended and messy research problems where a static interface won't be enough

Tackle big problems while mentoring new researchers

Recognize contributions (more) fairly and share credit

THE FUTURE OF WORK IS...

Complex and interdependent

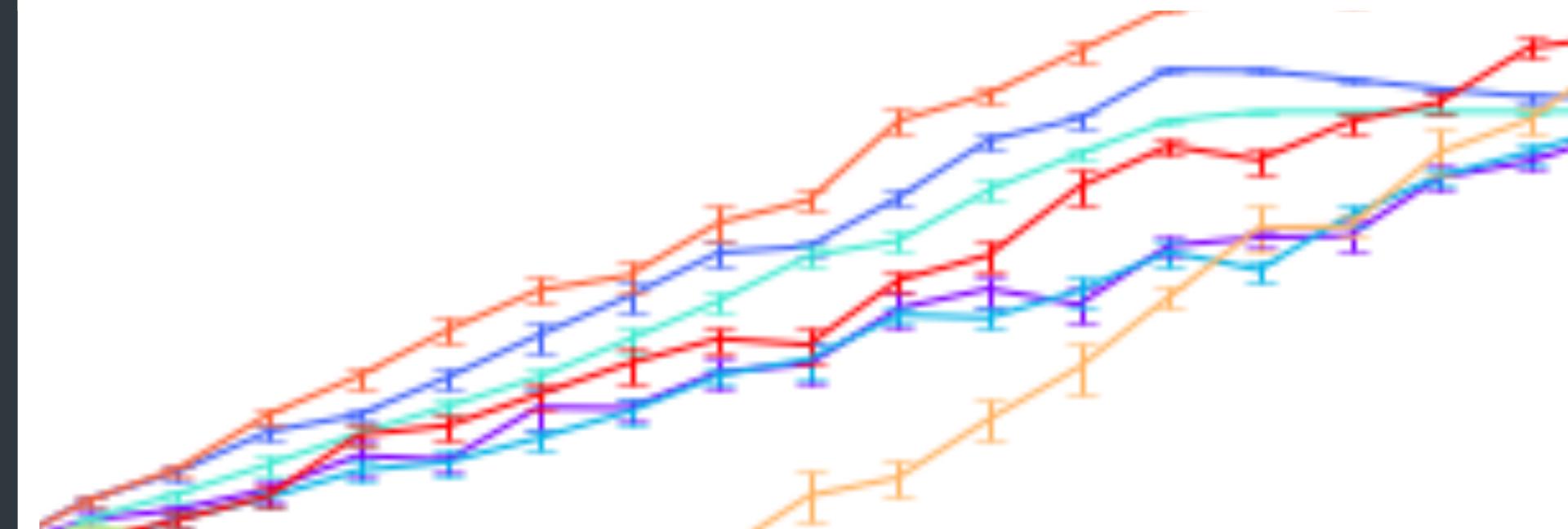
Advocating for pro-social outcomes

Solving open-ended challenges



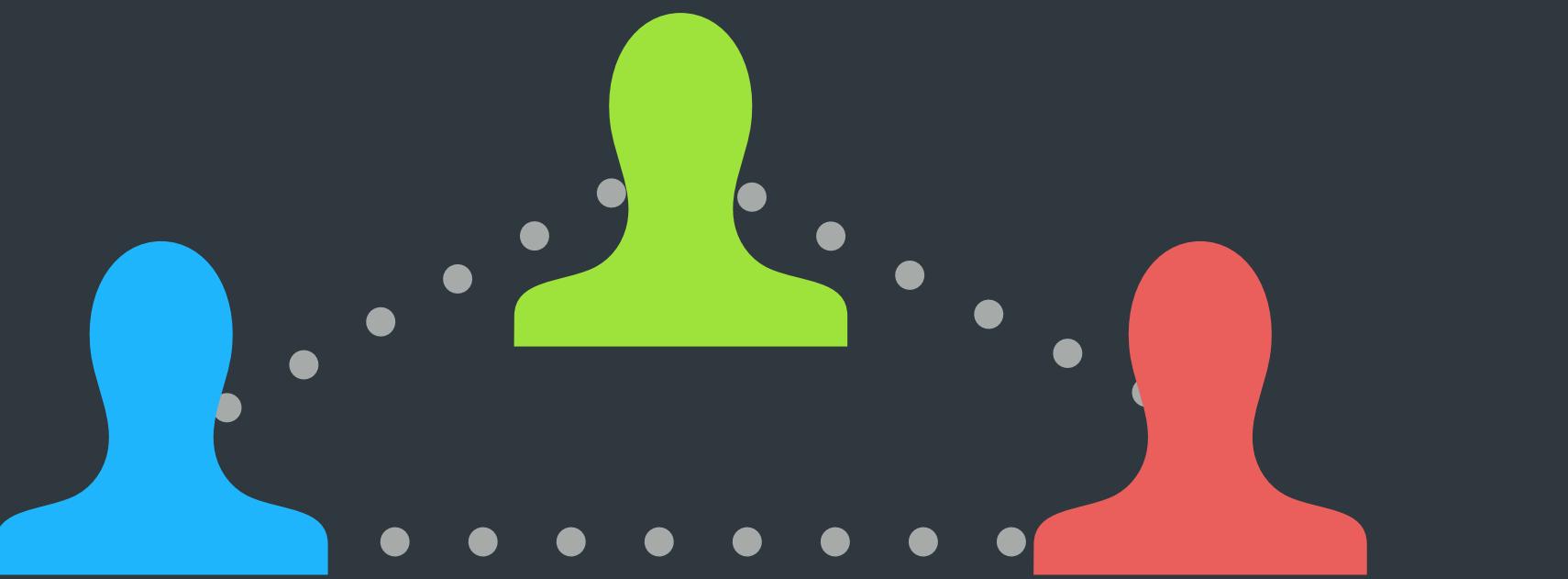
Powering change

We are a community of 485 Turke



THE FUTURE OF WORK IS...

Complex and interdependent



Advocating for pro-social outcomes



Solving open-ended challenges