

6.1040 · software studio · fall 2025

problem framing

Daniel Jackson

your goals for today's class

be ready for problem framing assignment

so you'll be able to pick a good problem & succeed in your project

understand some obstacles to problem framing

also called "needfinding", "requirements", etc

be aware of common failure modes

some ways in which software innovation can go wrong

what's success?

post an ad

search craigslist

event calendar

S	M	T	W	T	F	S
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27

help, faq, abuse, legal

avoid scams & fraud

personal safety tips

about craigslist

best-of-craigslist

craigslist is hiring

what's new

system status

craigslist charitable

craig newmark philanthropies

Cambridge ± 15 mi

post

acct

community

activities

artists

childcare

classes

events

general

groups

local news

lost+found

missed

connections

musicians

pets

politics

rants & raves

rideshare

volunteers

services

automotive

beauty

cell/mobile

computer

creative

cycle

event

farm+garden

financial

health/well

household

labor/move

legal

lessons

marine

pet

real estate

skilled trade

sm biz ads

travel/vac

write/ed/tran

discussion forums

apple

arts

atheist

autos

beauty

bikes

celebs

comp

cosmos

diet

divorce

dying

eco

feedbk

film

fixit

food

frugal

gaming

garden

haiku

help

history

housing

jobs

jokes

legal

manners

marriage

money

music

open

parent

pets

philos

photo

politics

psych

recover

religion

rofo

science

spirit

sports

super

tax

travel

tv

vegan

words

writing

housing

apts / housing

housing swap

housing wanted

office / commercial

parking / storage

real estate for sale

rooms / shared

rooms wanted

sublets / temporary

vacation rentals

for sale

antiques

appliances

arts+crafts

atv/utv/sno

auto parts

aviation

baby+kid

barter

beauty+hlth

bike parts

bikes

boat parts

boats

books

business

cars+trucks

cds/dvd/vhs

cell phones

clothes+acc

collectibles

computer parts

computers

electronics

farm+garden

free

furniture

garage sale

general

heavy equip

household

jewelry

materials

motorcycle parts

motorcycles

music instr

photo+video

rvs+camp

sporting

tickets

tools

toys+games

trailers

video gaming

wanted

wheels+tires

jobs

accounting+finance

admin / office

arch / engineering

art / media / design

biotech / science

business / mgmt

customer service

education

etc / misc

food / bev / hosp

general labor

government

human resources

legal / paralegal

manufacturing

marketing / pr / ad

medical / health

nonprofit sector

real estate

retail / wholesale

sales / biz dev

salon / spa / fitness

security

skilled trade / craft

software / qa / dba

systems / network

technical support

transport

tv / film / video

web / info design

writing / editing

gigs

computer

creative

crew

domestic

event

labor

talent

writing

resumes

english

nearby cl

albany

allentown

binghamton

cape cod

catskills

central nj

eastern ct

glens falls

hartford

hudson valley

jersey shore

long island

maine

new hampshire

new haven

new york

north jersey

northwest ct

oneonta

plattsburgh

poconos

potsdam-massena

rhode island

scranton

south coast

syracuse

utica

vermont

western mass

worcester

us cities

us states

canada

cl worldwide

not a “unicorn”

not a shiny website

no quantum, crypto or AI

but

140m global monthly visitors

>\$500m in annual revenue

what explains its popularity?

OTOH

issues with illegal services & scams

popularity is dropping

Share what's new...



Text



Photos



Link



Video



Hangout



Mother Jones

Shared publicly - 10:25 AM

How much solar, wind, and geothermal energy is your state using?

We've got a map for that: <http://bit.ly/10ZYCdV>



Talking Points Memo

Shared publicly - 10:27 AM

Boehner piles on:



Boehner: Obama Administration Displaying 'Arrogance Of Power'

<http://livewire.talkingpointsmemo.com/entry/b...>

+1



Add a comment...



Chicago Mayor's Office

Shared publicly - 9:48 AM

[Live at 11:30am CT] Mayor Emanuel will mark his two-year anniversary in office with the launch of Elevate Chicago, a multi-faceted program that will create new jobs and shape Chicago's convention and tourism for the future. Tune in: <http://bit.ly/VKJmz>



In this circle

Off



Add by name or email



Slate

Shared publicly - 9:53 AM

"When you attack one Muslim, you attack all Muslims," the note added. <http://ow.ly/l6aJ0>



Reports: Dzhokhar Left Note Inside Watertown Boat

http://www.slate.com/blogs/the_slatest/2013/...

+3



Google+ (2010-2019): "one of the most ambitious bets in the company's history" (Eric Schmidt)

ttack all Americans. Now your brother is worm food and your last moments will be lived in fear and hopefully being sexual

How likely are you to recommend X to a friend or colleague? (0-10)



NPS for some apps

Spotify: 49-54
Slack: 50
X: 11
Waze: 10

NPS for some Apple products

AirPods: 75
MacBook: mid-60s
iPhone: 51-63
iPad: about 60
Music: about 55
iTunes: around 30

NPS for some companies

COMPANY		NPS SCORE
	Amazon	49
	Apple	48
	Google	42
	Toshiba	39
	Microsoft	38
	Sony	36
	Qualcomm	31
	Samsung Electronics	29
	IBM	28
	Acer	24
	Dell Technologies	16
	Samsung	14
	HP Inc.	0
	Comcast	-31

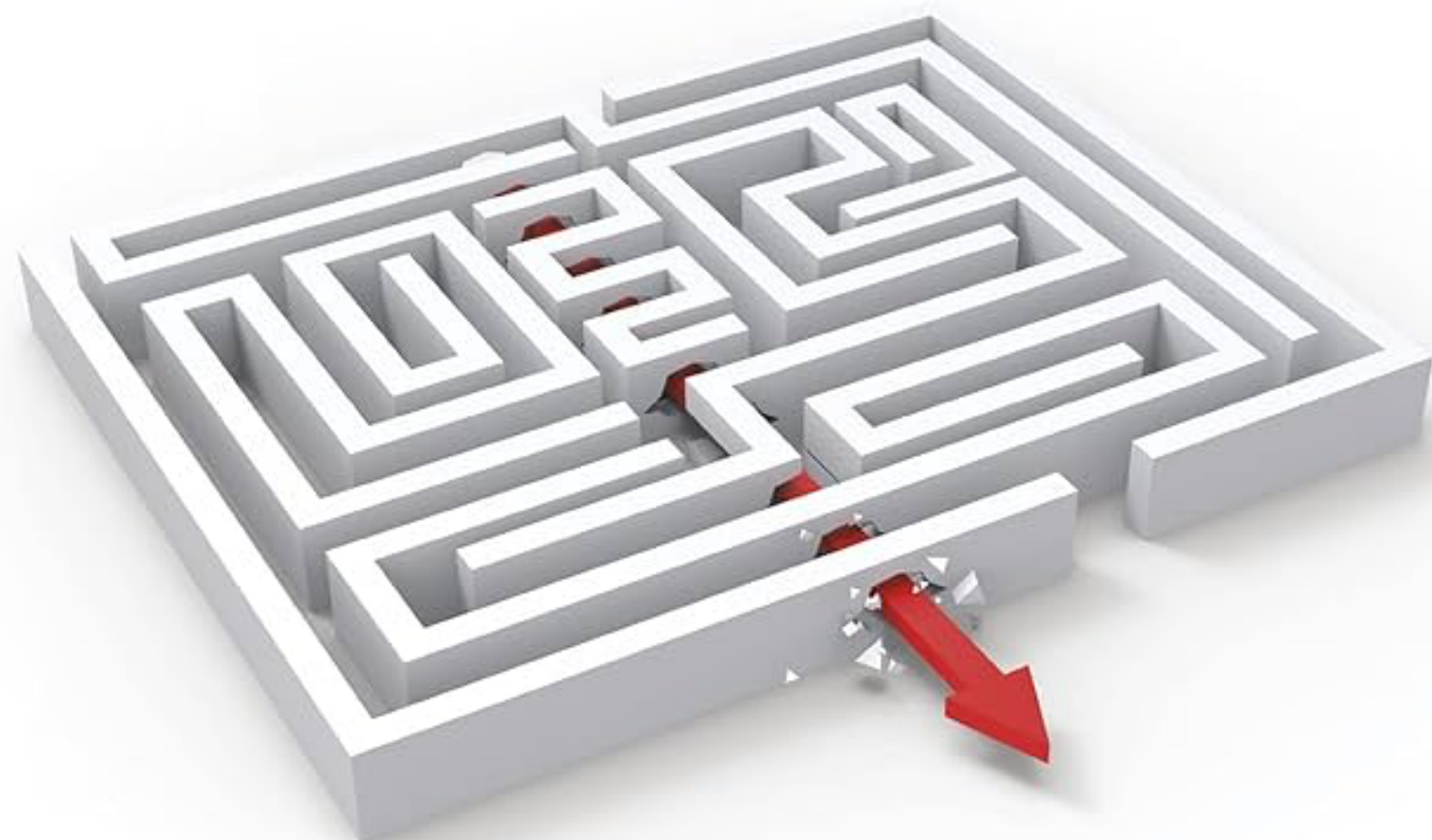
but how can you estimate likely success before you've launched?

authentic demand

FOREWORD BY ARVIND KRISHNA, CHAIRMAN AND CEO, IBM

THE HEART OF INNOVATION

A Field Guide for Navigating to
Authentic Demand



MATT CHANOFF, MERRICK FURST,
DANIEL SABBAAH, AND MARK WEGMAN

the “waking dream”

you know who your customers are, how they’re making decisions
you see people buying and using the product, so you make it
but it’s a waking dream: the real world is different

the essence of the problem

“being wrong feels like being right” (*Being Wrong* by Kathryn Schulz)
your thinking is skewed by cognitive biases

so what to do?

recognize this reality: you can’t fix it, but you can work with it
don’t look for confirmation; look for signs of indifference
search for “not nots”: not OK for people to not do something



images from Merrick Furst

what creating demand feels like

cognitive biases that affect needfinding

Biases that distort how designers *see, hear, and interpret* user needs

- **Confirmation bias** — Seeking data that supports your assumptions instead of what users really need.
- **False consensus effect** — Believing users think/ behave like you or your team.
- **Curse of knowledge** — Difficulty imagining what it's like to be a novice.
- **Social desirability bias** — Users give answers that sound acceptable, not truthful.
- **Illusion of transparency** — Overestimating your understanding of users' mental states (or theirs or yours)
- **Groupthink** — Teams overemphasize consensus or what's already known, ignoring divergent insights.
- **Outgroup homogeneity bias** — Risk of oversimplifying user groups, missing diversity of needs.
- **Availability heuristic** — Preferring most memorable or recent observations to systematic data
- **Salience bias** — Focusing on what's striking rather than what's important but less obvious.

interviews are often used for needfinding

which biases make **interviews** unreliable?

Best of Both Worlds: Improving Gmail Labels with the Affordances of Folders

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Abstract

Gmail's filing system for email conversations is based around labels, which are more flexible and powerful than folders. With its original user interface, many users did not discover labels, and wondered why Gmail had no folders. The Gmail team redesigned the user interface for labeling to make it more discoverable and understandable, and to add the most useful functionality of folders. The new design works for the simple use case (a conversation with only one label), while still making the more complex use case (multiple labels) easily available. It has been launched to millions of users worldwide and has resulted in much higher adoption of labels, especially by new users of Gmail.

CHI 2010: Gmail users can't make sense of labels, so Google made them look like folders

exercise: with person next to you, discuss which cognitive biases might have led to this

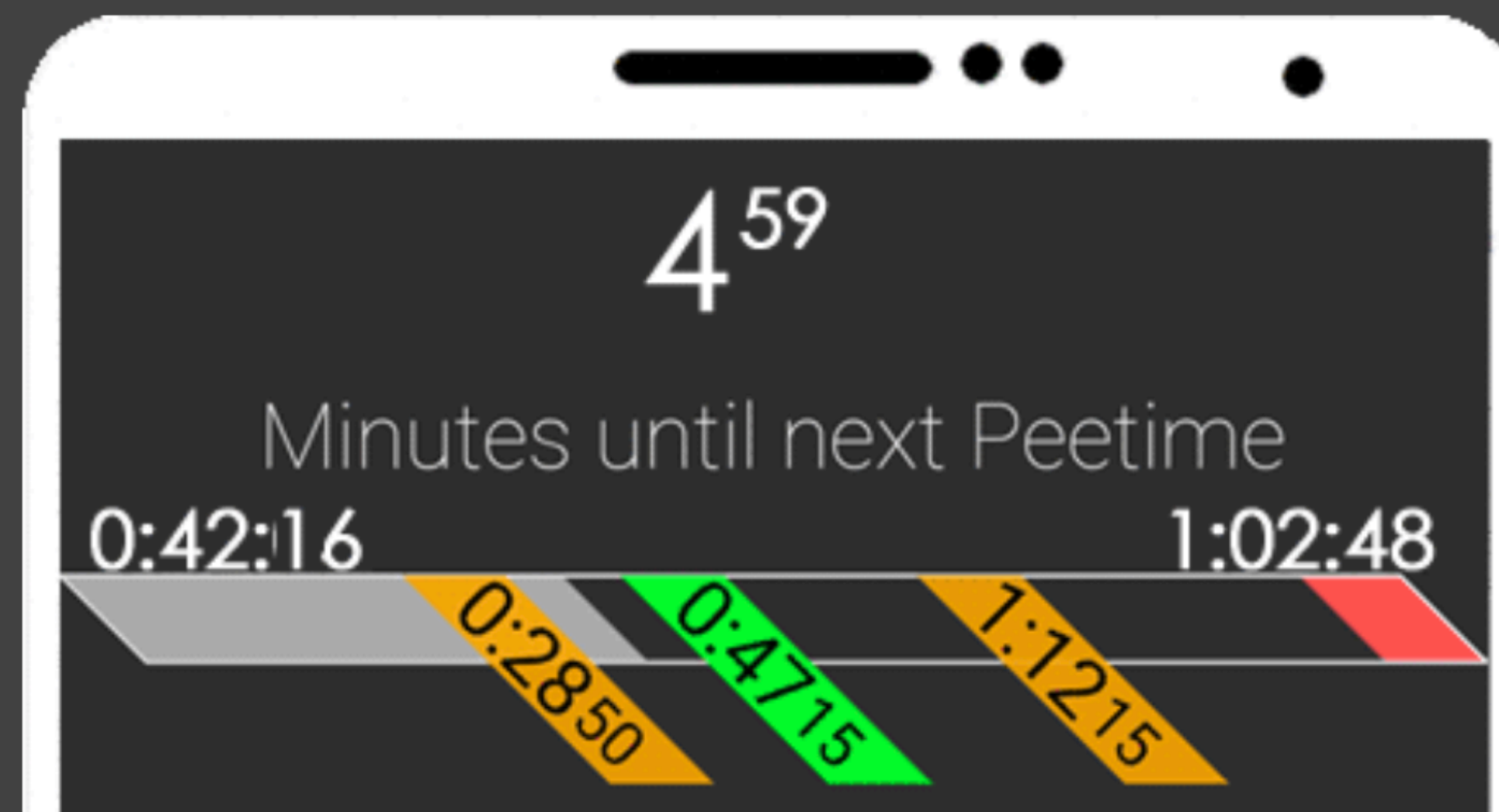
common pitfalls

indifference: problem matters, but not enough

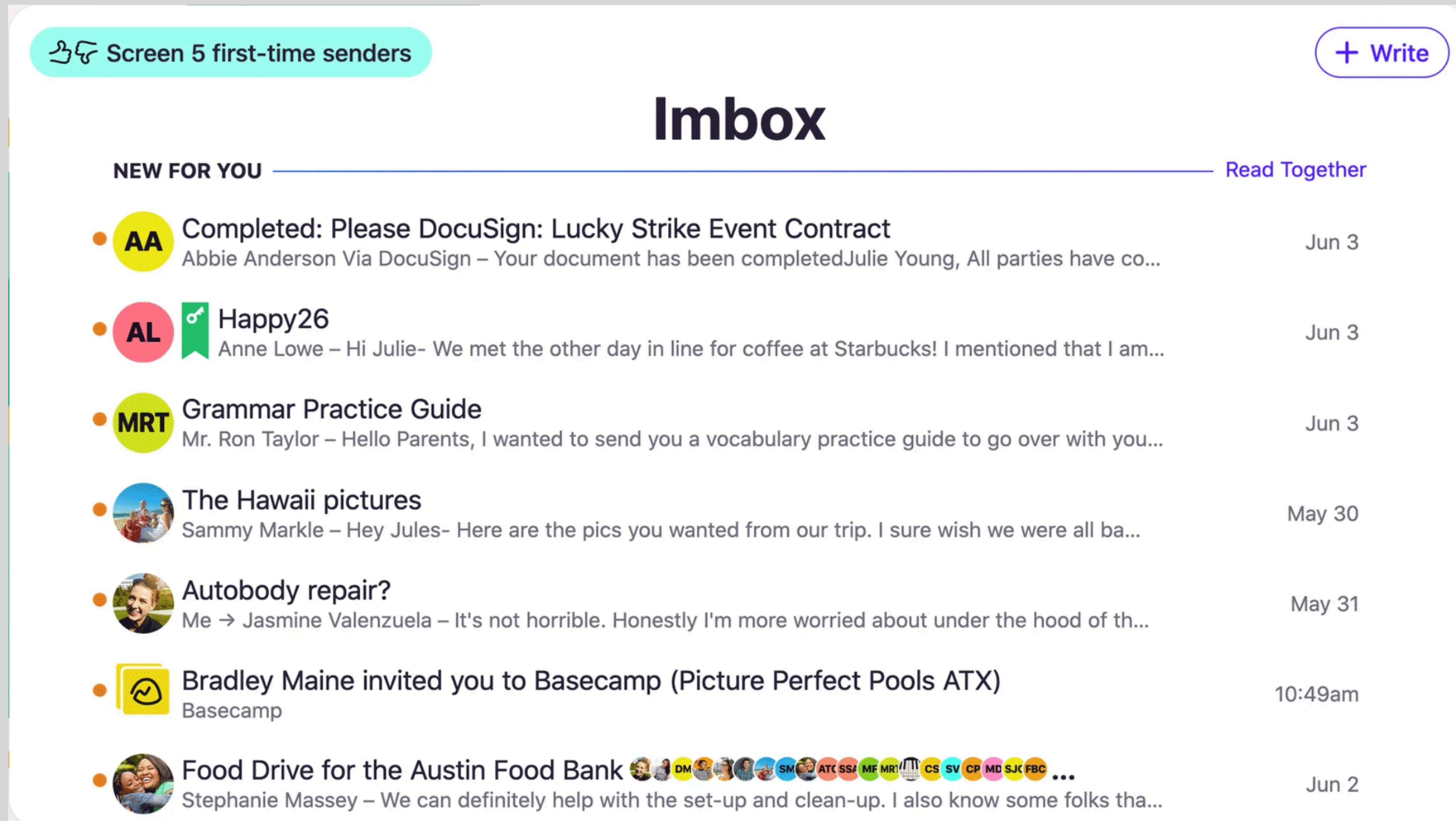
The World's Most Indispensable Movie App

The RunPee app tells you the best times to
run & pee during a movie
so you don't miss the best scenes.

As seen on

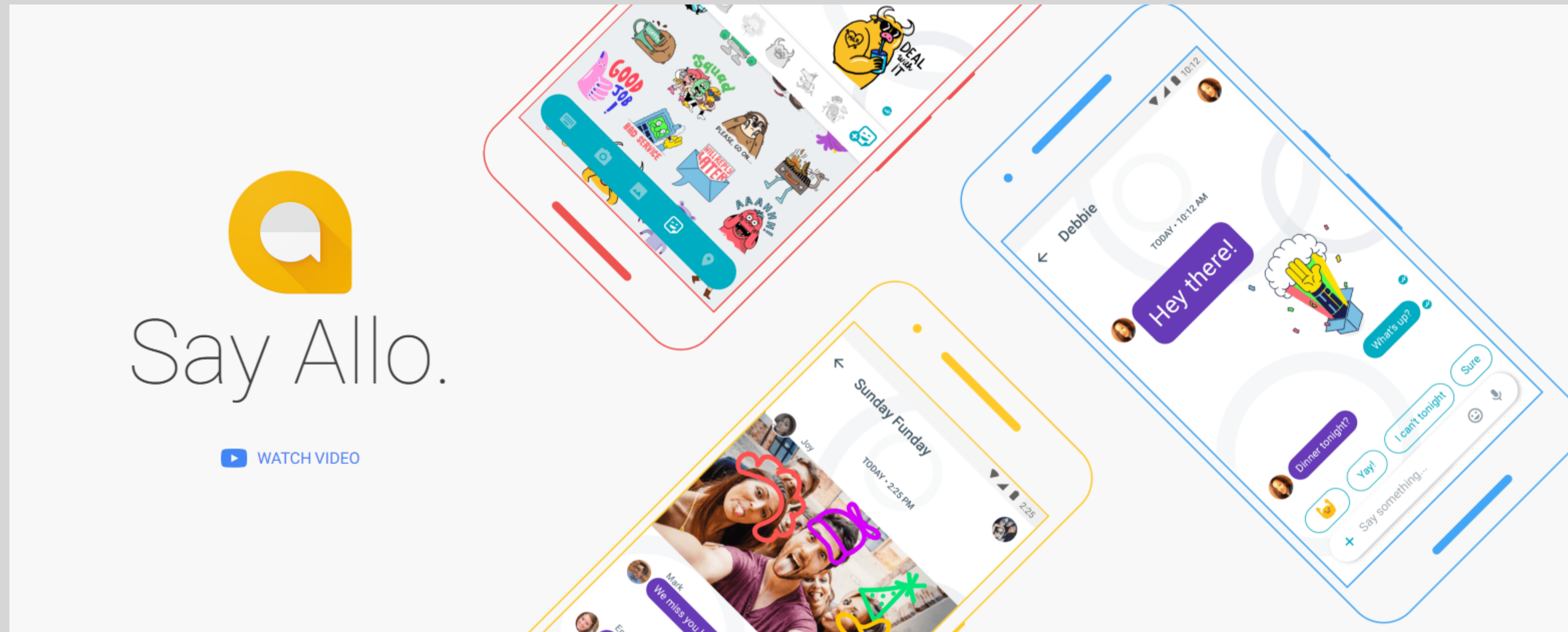


founder fallacy: you are not the user



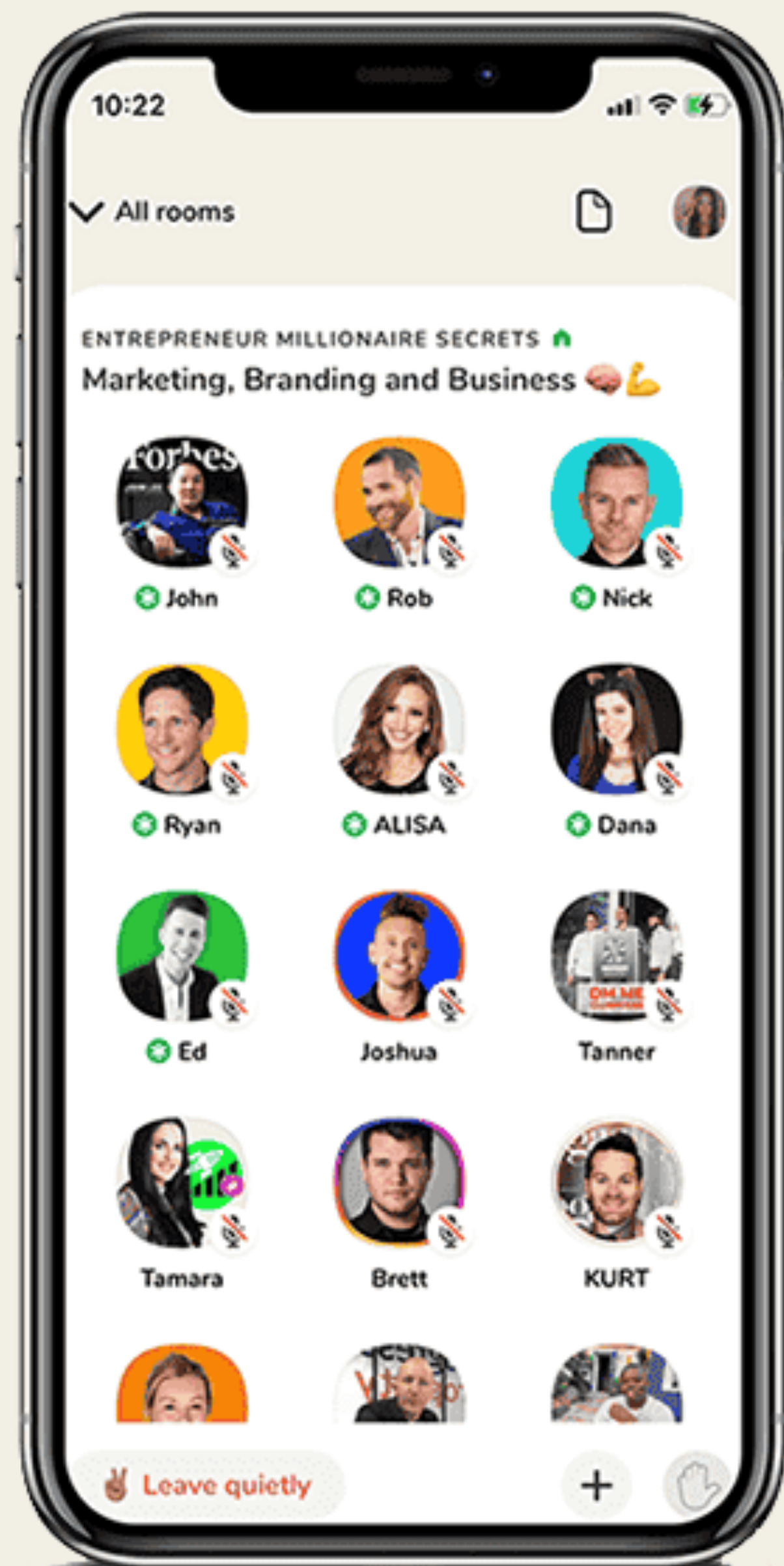
Hey Email (2020-2022)
many nice features (eg, focus)
but critics say designed for founders
no formatting in focus mode, eg

insufficient differentiation



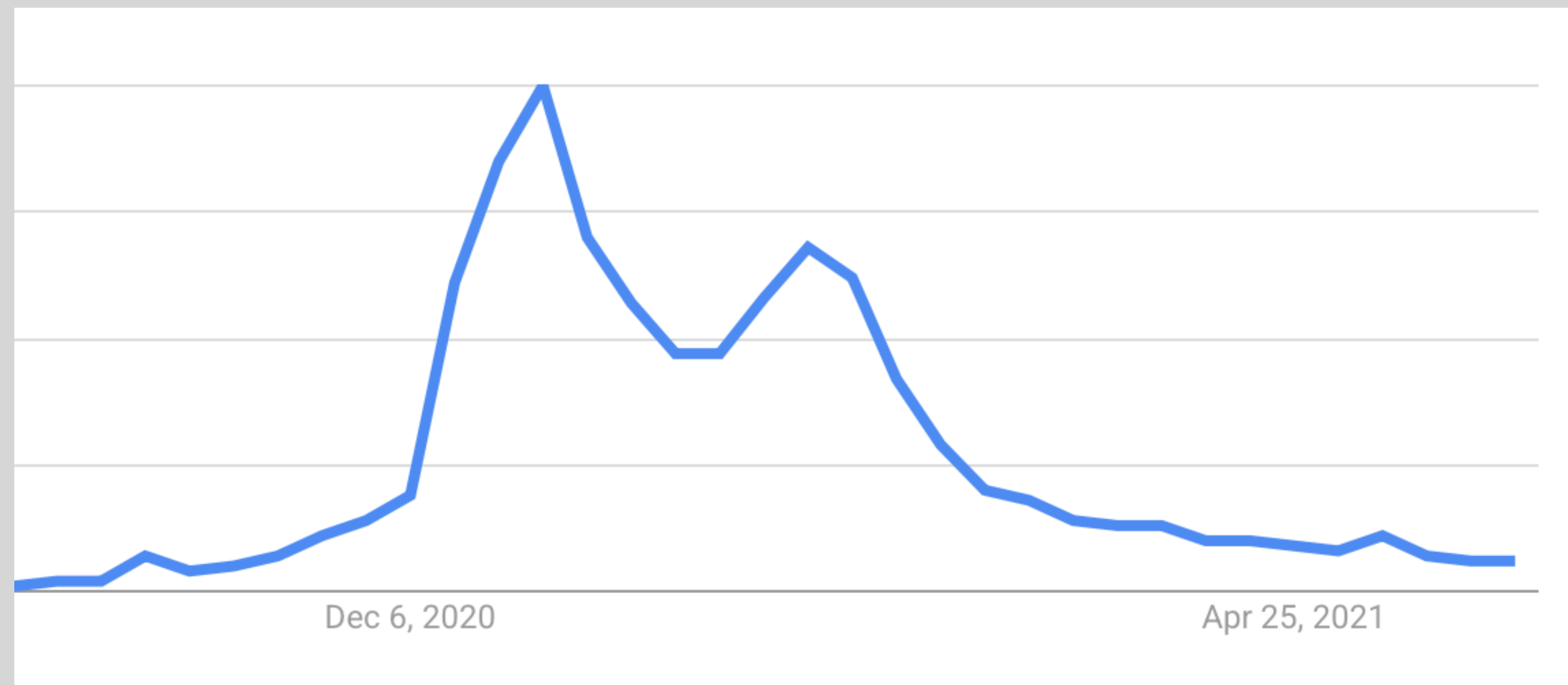
Google Allo (2016-2019)
mobile instant messaging app
smart replies & smart emojis
but WhatsApp, Telegram, Signal, Viber

lack of critical mass



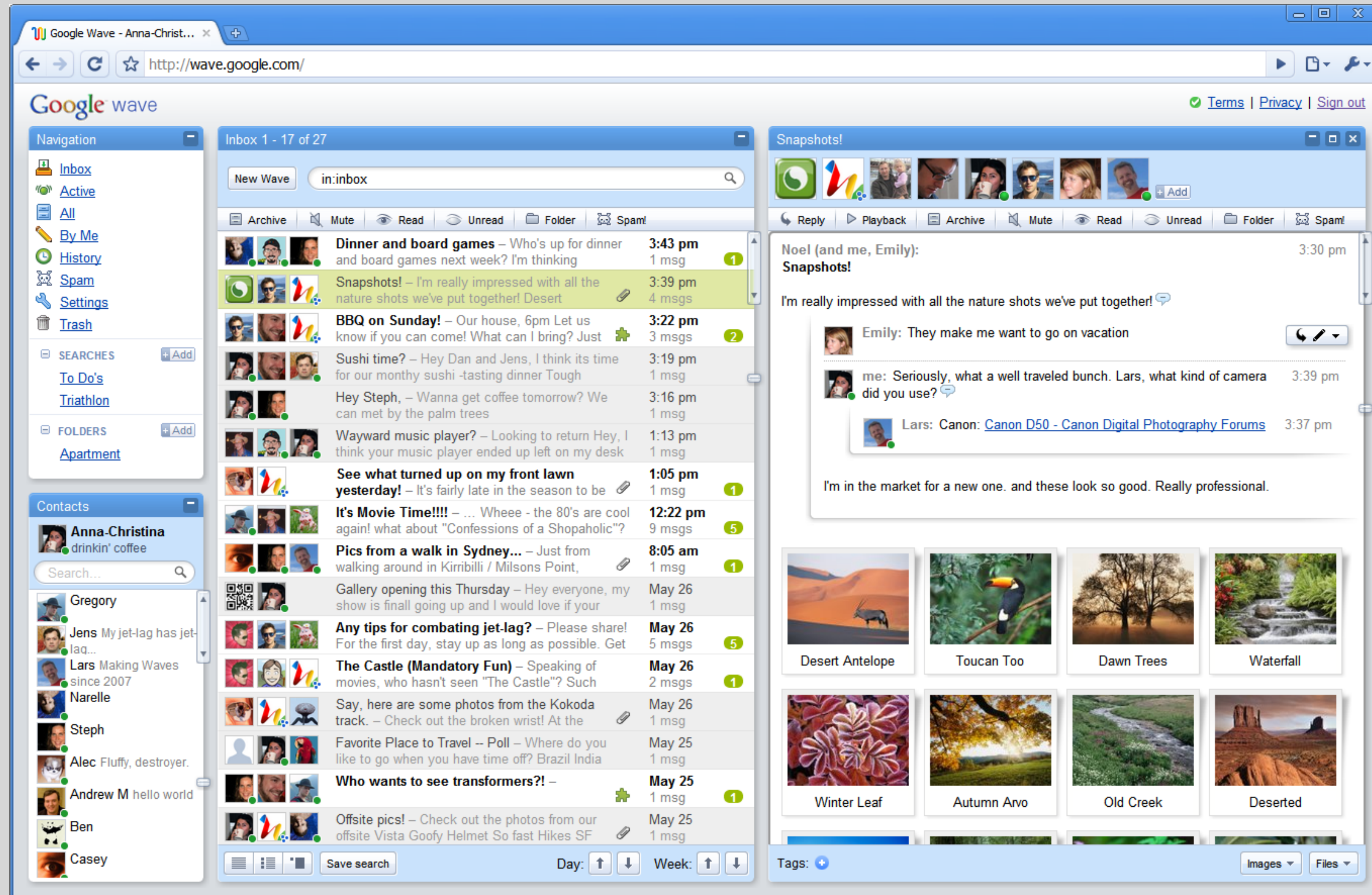
Clubhouse (2020)

live audio conversations
invite only, sense of exclusivity
pandemic timing helped
zero to 100m users in less than a year
valued at \$4 billion by a16z etc



Google Trends for "clubhouse app"

overambition



Google Wave (2009-2018)
unified workspace & collaboration platform
users weren't sure what to do with it

antibodies: users reject it

It looks like you're writing a letter.

Would you like help?

- Get help with writing the letter
- Just type the letter without help

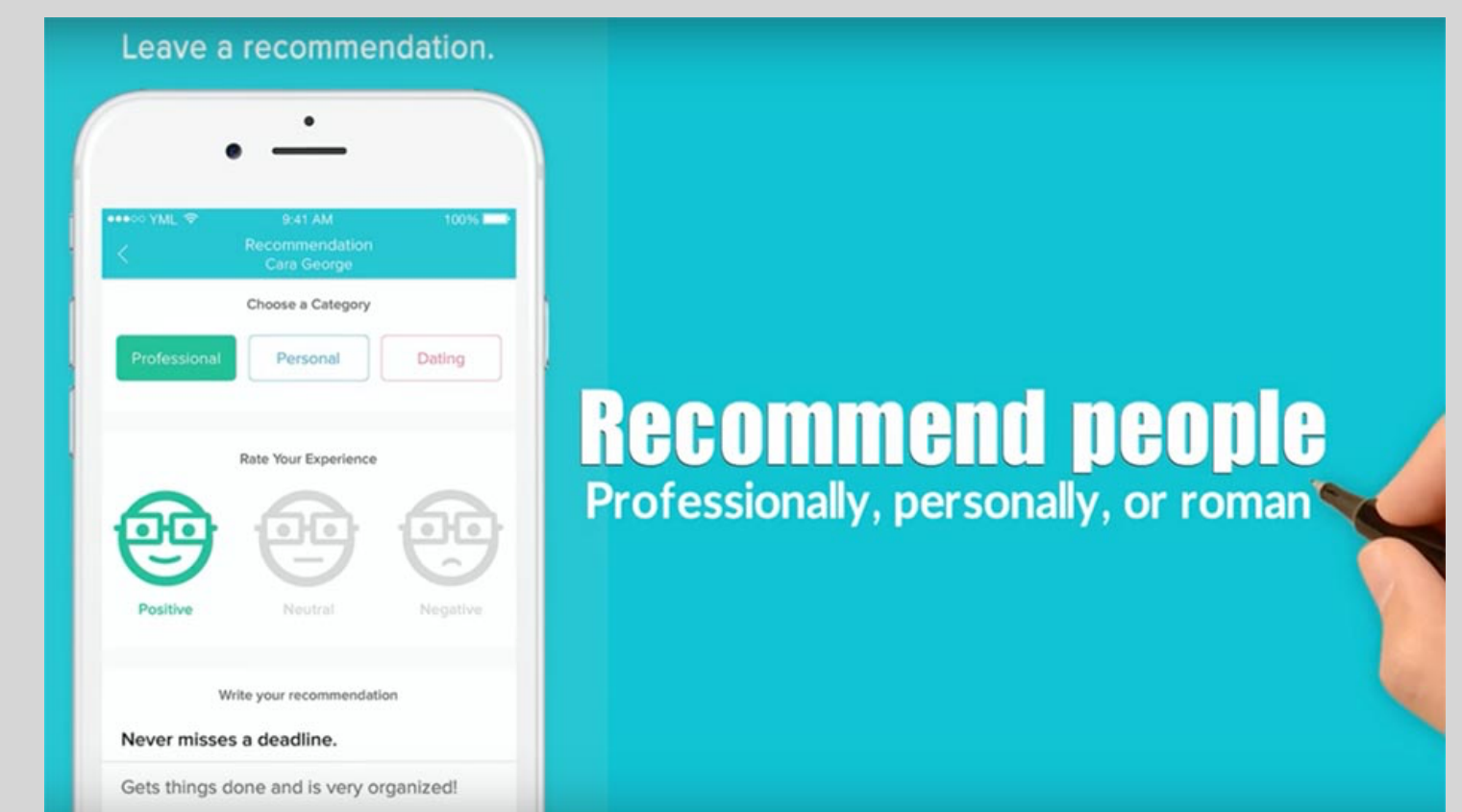
☐ Don't show me this tip again



Microsoft Clippy (1997-2001)
before your time, but lives on
became a cultural punchline



Facebook Beacon (2007-2009)
autoposted purchases on timeline
Dec 2007: allowed opt-out
2009: class action suit, shut down

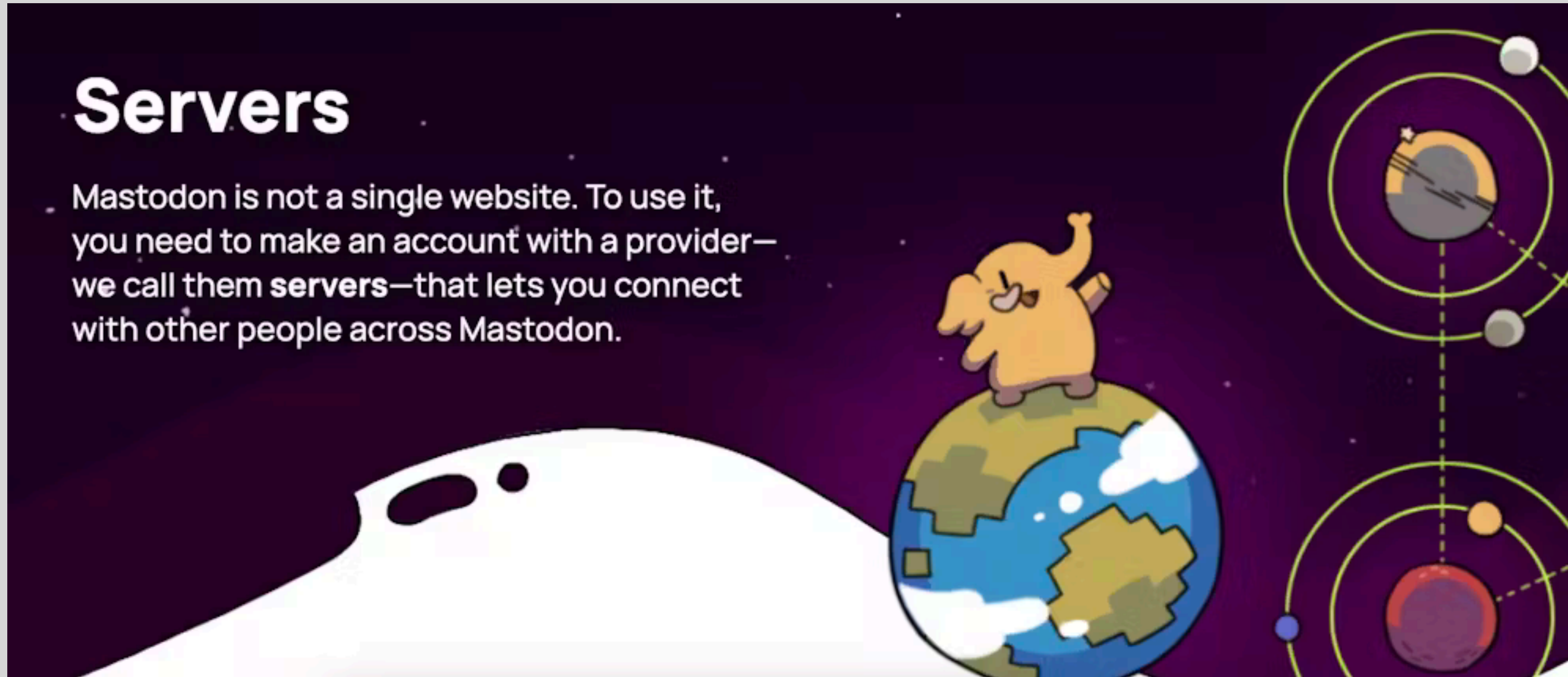


Peeples (2016)
"Yelp for people"
widely criticized

friction: obstacles to adoption

Servers

Mastodon is not a single website. To use it, you need to make an account with a provider—we call them **servers**—that lets you connect with other people across Mastodon.



Mastodon (since 2016)
open source social network
“federated”: servers managed independently
selecting a server too hard for most
peaked at >2m in 2022, but now <1m

ignoring key stakeholders

TECHNOLOGY

Google: How not to be a 'Glasshole'

by: [CNN Wire](#)

Posted: Feb 19, 2014 / 03:18 PM MST

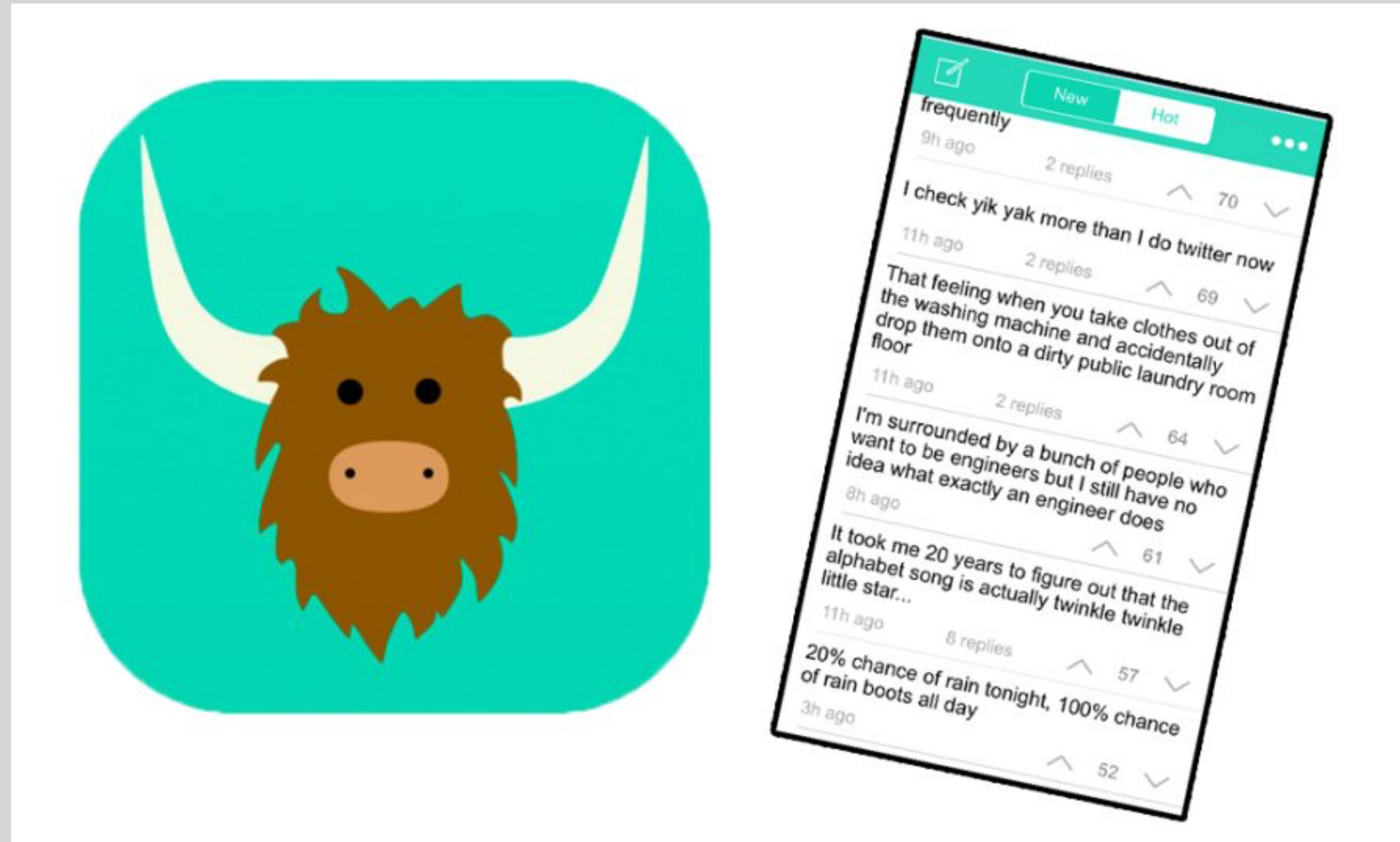
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(Photo: Courtesy Google)

Google Glass (2014-2015)
negative reaction from bystanders
privacy concerns: being recorded

unexpected consequences

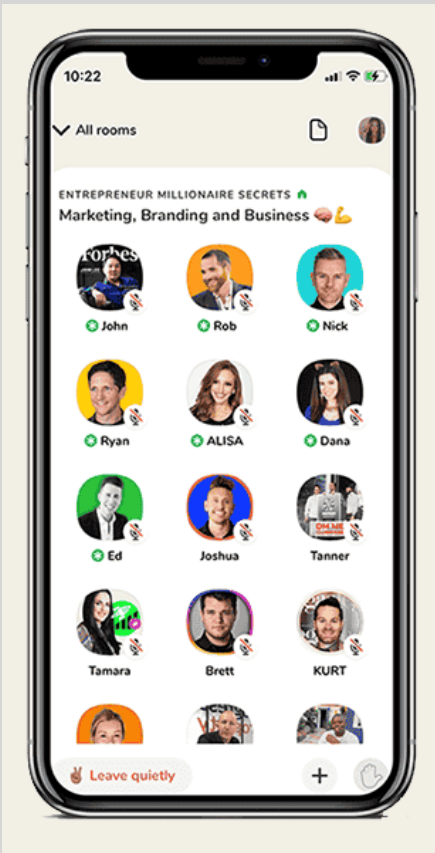


YikYak (2013-2017)

location-based, anonymous social media
“yaks” visible to others within 5 mile radius
shutdown due to cyberbullying and hate speech



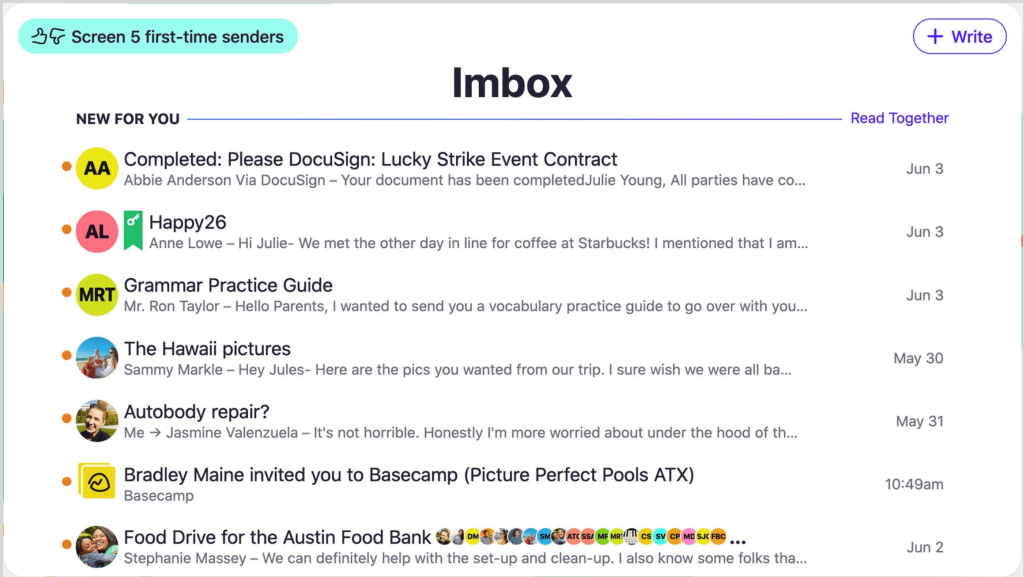
indifference



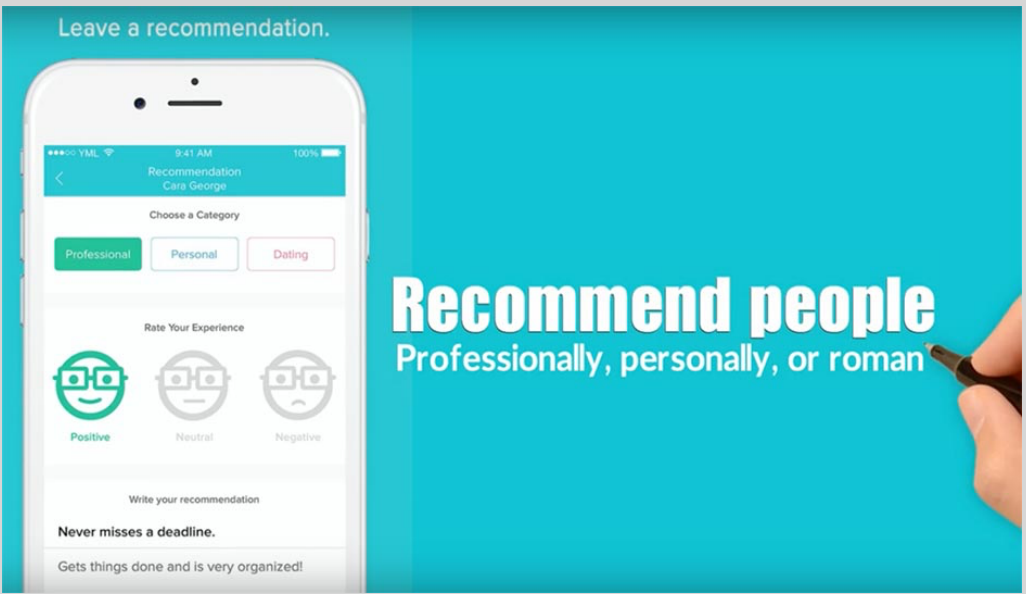
lack of critical mass



ignoring stakeholders



founder fallacy

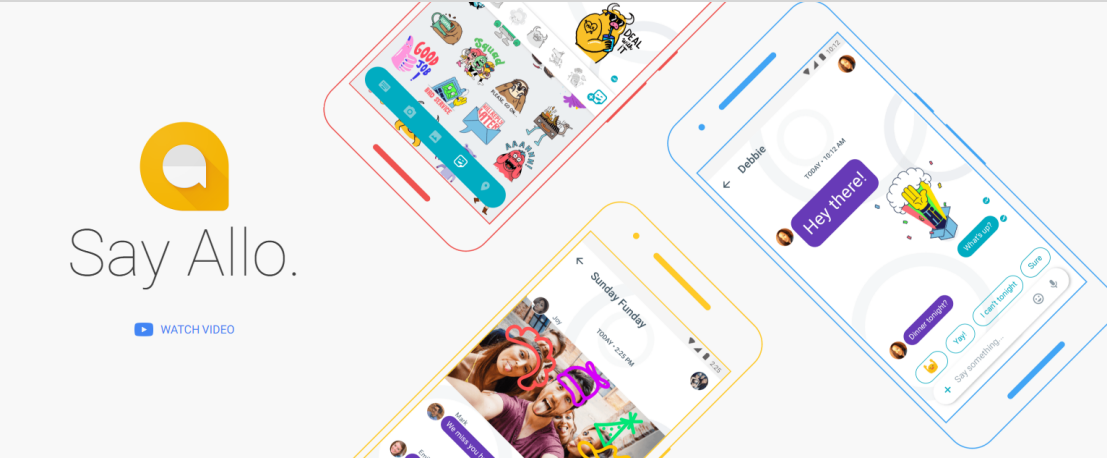


antibodies

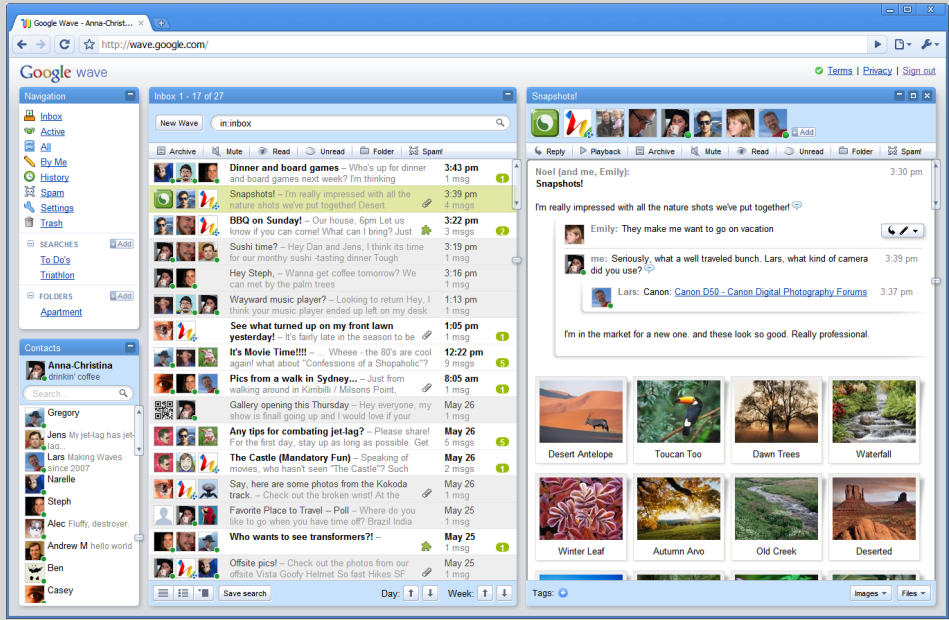
what might have limited the success of these past projects?

sharing food swipes
donate dining cash to others
fridge management
suggests meals, shopping lists, tracks expiry

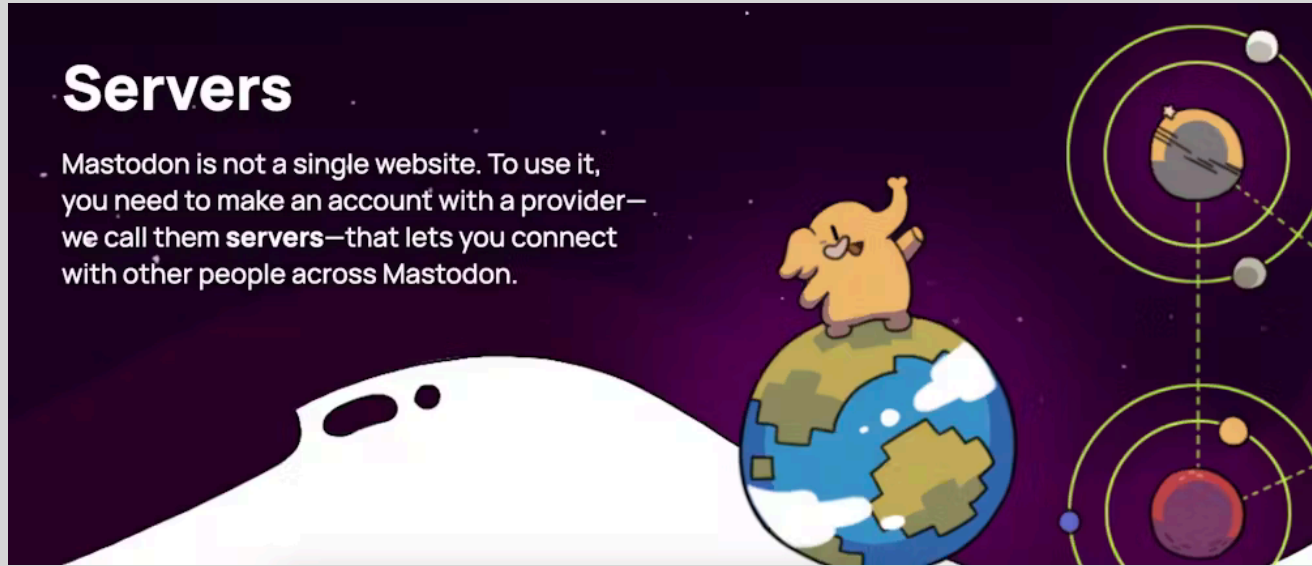
portfolio following
invest with a pro's asset choices
living group chore tracker
automate who takes out trash



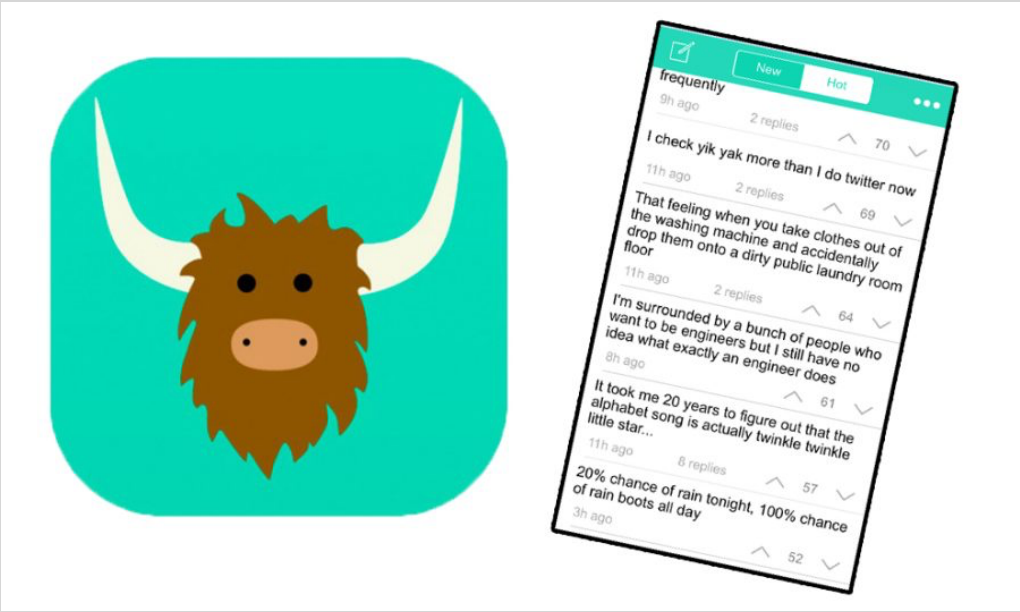
insufficient differentiation



overambition



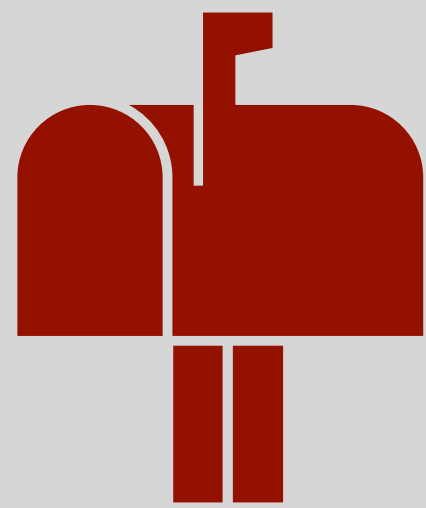
friction



unexpected consequences

tips for student projects

what makes a good student project?



real, not a toy or clone

will have some users
no essential function omitted
no showstopper friction



simple & focused

complexity will ruin your app
focusing can be scary
matters esp for small projects



innovative in some respect

a new context or problem
one novel enabling feature
a new combination of features

how to approach devising a good project



explore your surroundings

clubs, activities, friends
hobbies, special interests
your everyday life



notice gaps & friction

what's not working?
identify problems
but don't over analyze



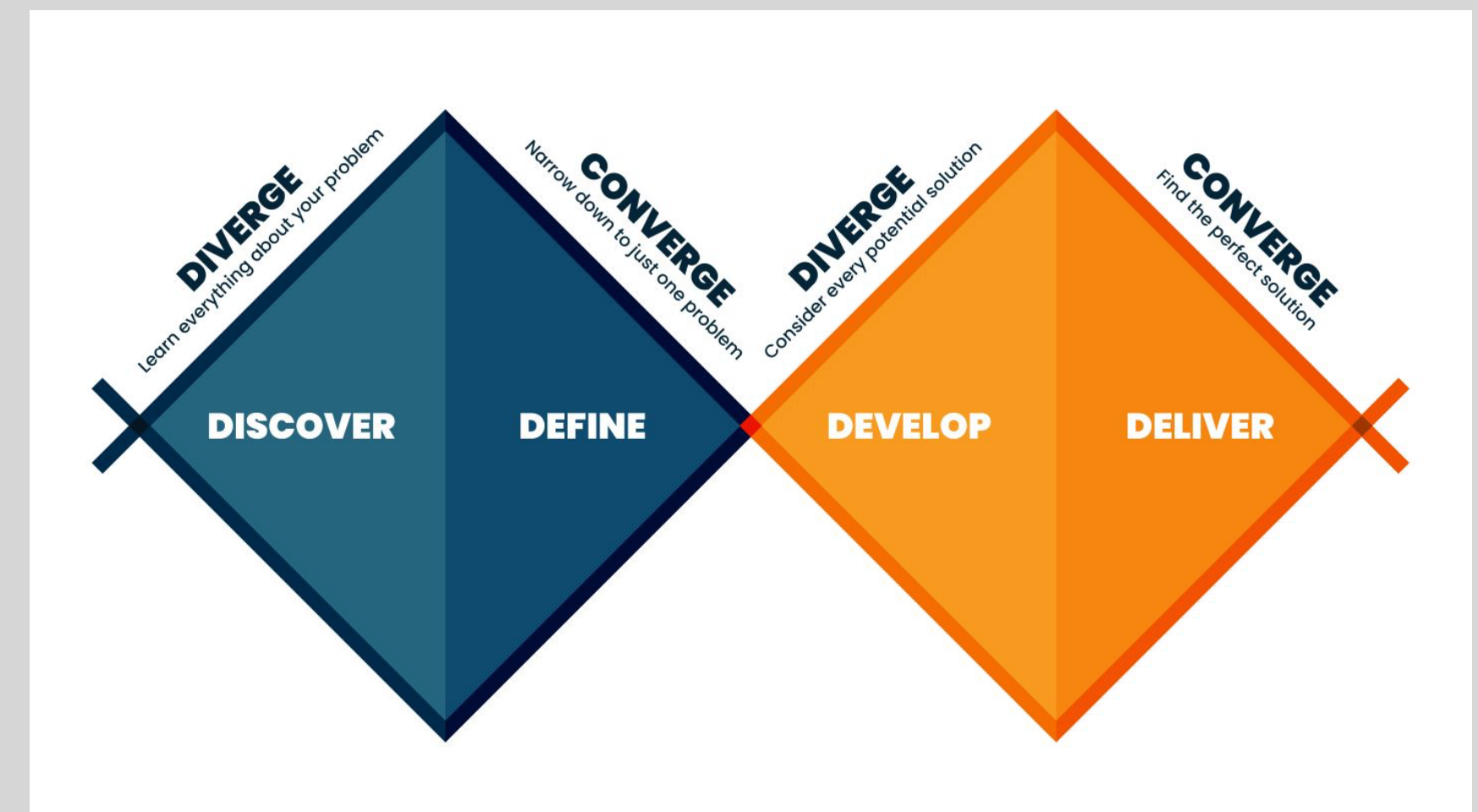
identify all stakeholders

not just direct users



collect evidence

search for data & opinions
find comparable apps
seek disconfirmation



diverge/converge

brainstorm without judgment
then refine and critique

takeaways

sneak preview of Prof Gordon's upcoming AI lectures

AI can already build software (but has a lot to learn)
you need: design sense + inquisitiveness + skepticism

authentic demand is elusive but essential

your own cognitive distortions as designer get in the way
actively seek disconfirmation and indifference

software innovations fail for many reasons

friction, unexpected consequences, unhappy stakeholders
many failure modes are about design (where tech meets people)

tips for your student projects

make it simple but real, and innovate in some respect
exploit your own connections but bolster with evidence