

6.1040 · software studio · fall 2022

seeking simplicity

Daniel Jackson & Arvind Satyanarayan

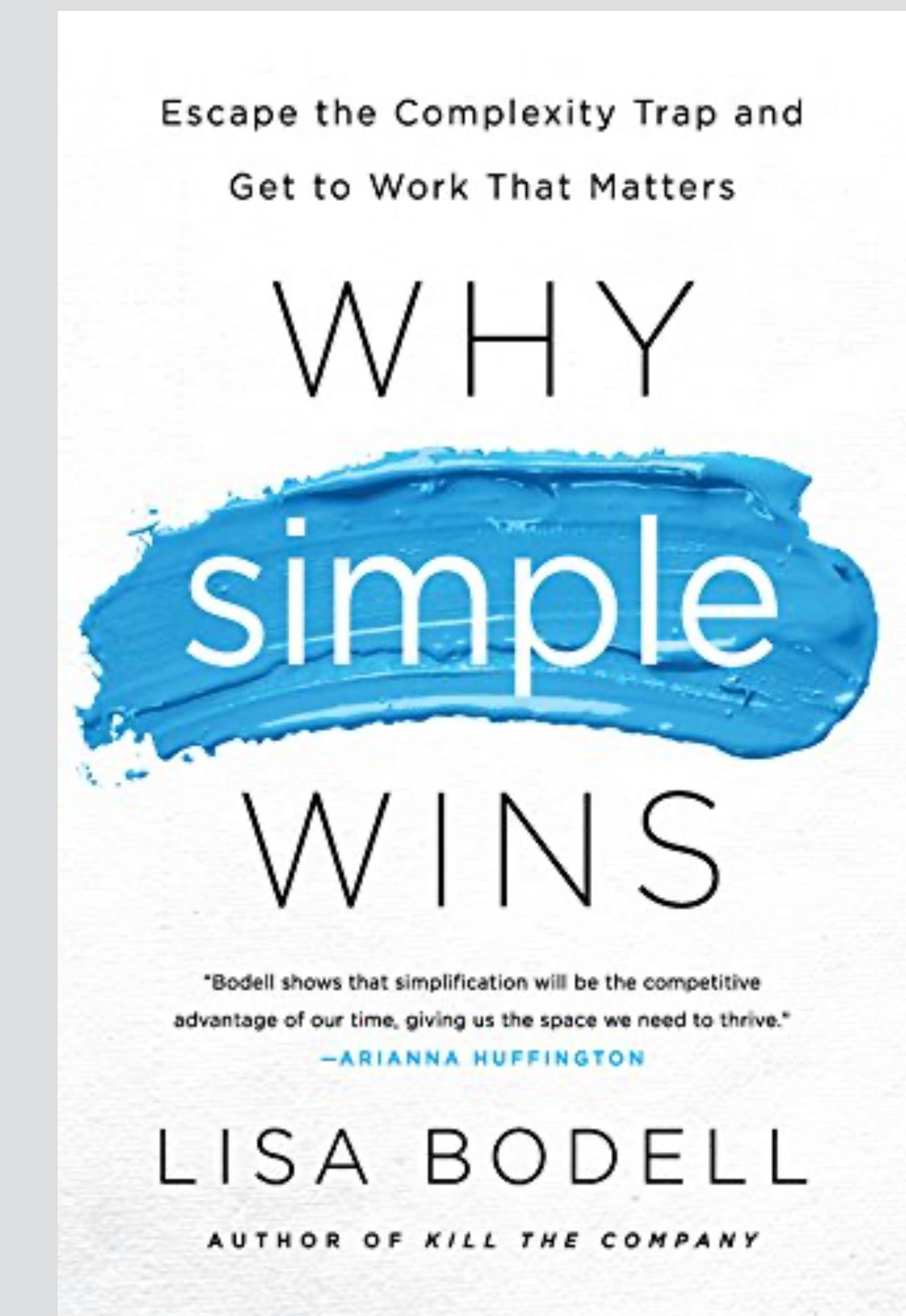
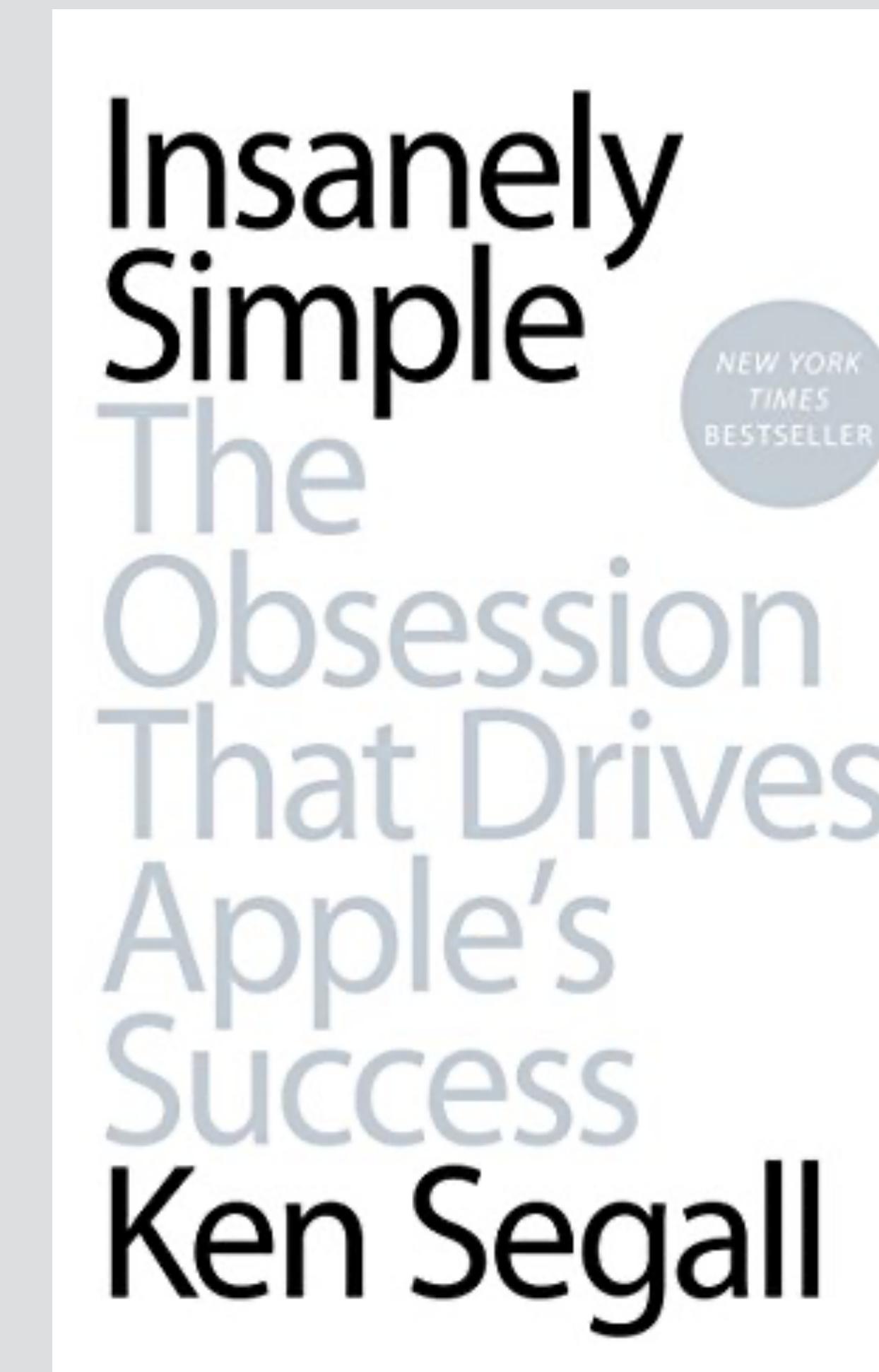
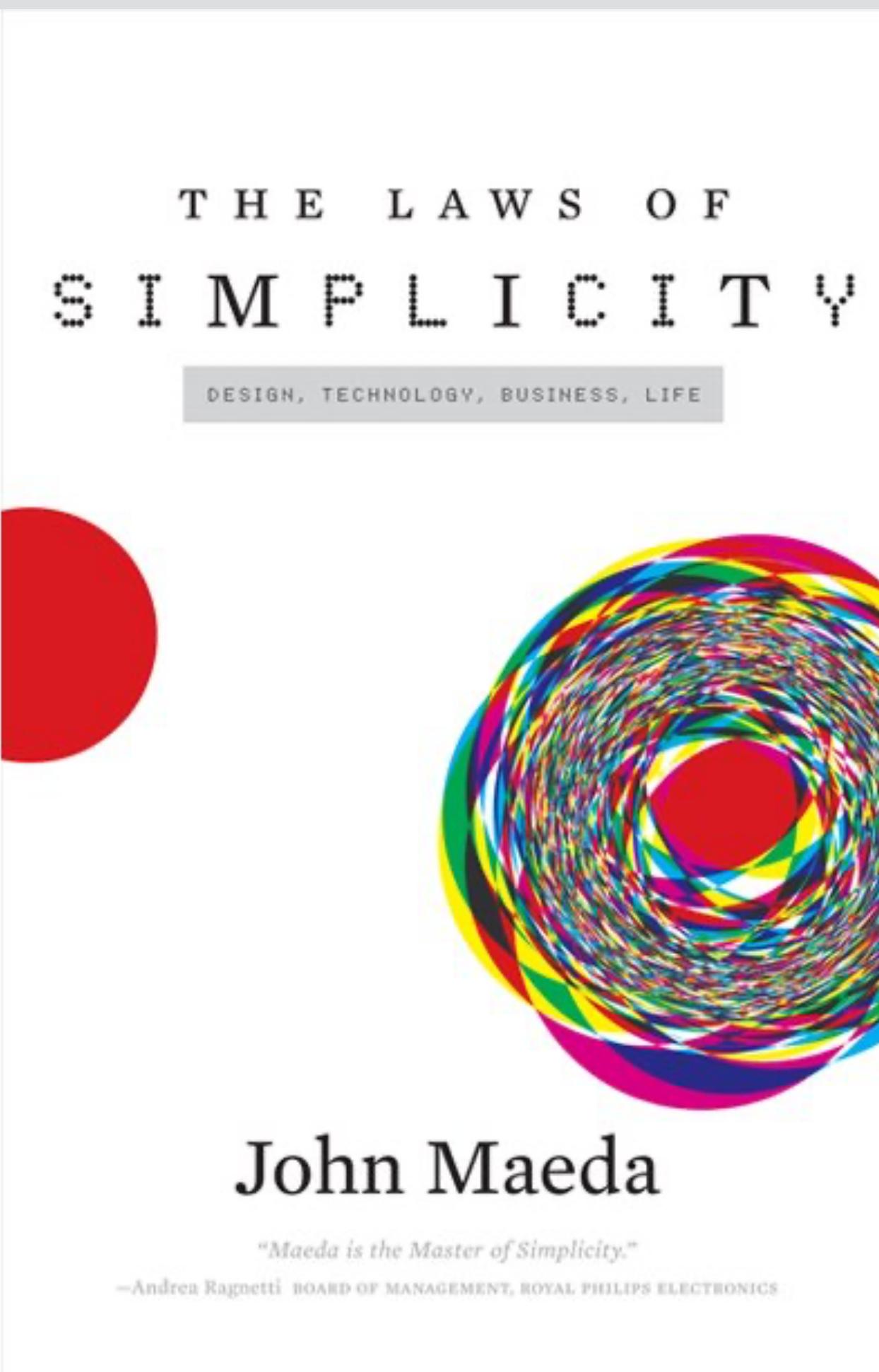
introduction

A complex system that works is invariably found to have evolved from a simple system that worked.

A complex system designed from scratch never works and cannot be patched up to make it work. You have to start over with a working simple system.

John Gall, *Systemantics*

everyone wants it, but how to get it?



today's plan

action-level simplicity

examining & simplifying scenarios
streamlining the user flow

concept-level simplicity

two moves: unify/specialize
eliminating redundancy & overloading

**streamlining
the user flow**

first idea: just have the user do less

Screenshot of an Amazon product page for the book "The Unfolding of Mankind" by Guy Deutscher.

The page shows the book cover, which features a silhouette of a person walking and the title "THE UNFOLDING OF LANGUAGE" in large letters.

Key details on the page include:

- Arriving Sep 27, 2022**
- FREE Prime Delivery**
- Sold by PearlAngel**
- Ship to**: Daniel Jackson, 150 Pleasant Street, Newton, Massachusetts, 02459, United States
- Pay with**: Amazon.com Visa Signature *6243 \$16.19 gift card
- Total**: \$10.27 (includes tax)
- Place your order** button
- Add to Cart** and **Buy Now** buttons
- Secure transaction** indicator
- Ships from**: Amazon
- Sold by**: PearlAngel
- Return policy**: Eligible for Return, Refund or Replacement within 30 days of receipt
- Add a gift receipt for easy** checkbox

The page also includes a sidebar for Cultura: Celebrating Hispanic culture, a "Look inside" button, and various navigation links like Books, Advanced Search, and Best Sellers.

tim tickets: creating an invitation

The screenshot shows a web browser window for the URL `visitors-admin.mit.edu`. The application is titled "Tim Tickets" and "Visitors Admin". On the left, there's a sidebar with a large letter "A" and a red button labeled "Invites" with an envelope icon. The main area has tabs for "People" and "Events", with "People" selected. A large section is titled "Tim Tickets" with a red "+ Add" button. Below it, there are filters for "All", "Active", and "Expired" and a search bar. A single ticket card is visible, showing "Daniel Jackson" from "September 26, 2022", and the status "Valid".

Tim Tickets

Visitors Admin

People Events

Tim Tickets

+ Add

All Active Expired

Search

Daniel Jackson
September 26, 2022

Valid

tim tickets: accepting an invitation

A screenshot of a web browser window showing the Tim Tickets system for MIT visitors. The browser address bar shows `visitors.mit.edu`. The main page is titled "Tim Tickets" and features the MIT logo. A large button labeled "Campus" is available for selection. A modal window titled "Tim Ticket" is open, displaying a red card with a clock icon and text explaining QR code activation. The card also includes a link to <https://covidapps.mit.edu/visitors>. The ticket details shown in the modal are:

Valid from	6:00 am Sep 26, 2022
Valid until	6:00 pm Sep 26, 2022

// inviter steps

- click get started button
- click add ticket button
- enter invitee contact number
- enter invitee email address
- enter start date
- enter end date
- click invite

// inviter steps

- click on button in email
- click on visitor option
- enter mobile number
- enter PIN code
- click on ticket
- screenshot QR code
- transfer screenshot to phone

concrete steps

createInvitation

acceptInvitation

requestAuthCode

submitAuthCode

requestQR

abstract actions

concrete steps

for inviter steps, eg.

which steps are most costly?

can any steps be dropped?

can any steps be simplified?

abstract actions & concepts

can any actions be sync'd?

can any concepts be dropped?

summary so far

reducing cost of concrete steps

not just cost of data entry (get visitor's mobile number, eg)

consider cost of moving between platforms (2FA, final QR)

simplify with defaults (eg, start = end = today)

simplifying OP

replace [acceptInvitation; requestQR] by one action?

synchronize concepts

automatically request code to phone?

remove concepts

not clear that Auth is needed for invitee

remember: must maintain richer functions too

be redundant: QR in email and on website

unify-specialize: tradeoff simplicity/specificity



set of wrenches

unify

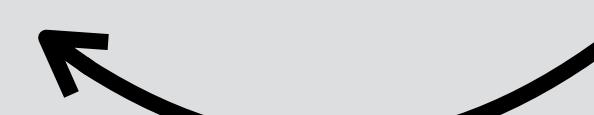


adjustable wrench



macro lens

specialize



general-purpose lens

eliminating
redundancy

example:
gmail categories

gmail's categories

 Primary	 Social 23 new	 Promotions 100+ new	
   Google	New sign-in from Chrome on Mac - New sign-in from Cl	 12:30 pm	
   Keith Muhammad at DeMont.	DeMontrond Auto Group - 14101 North Freeway Houston		12:19 pm
   AT&T High Speed Internet.	AT&T High Speed Internet Service Activation - Your A1		10:37 am
   Keith Muhammad at DeMont.	DeMontrond Auto Group - 14101 North Freeway Houston		Aug 26
   betterbatonrougejobs.com	Job Update -- 2015-08-26 - Looking For An Advantage W		Aug 26

category tab settings

Categories:

[Learn more](#)

- Primary
- Social
- Promotions
- Updates
- Forums

Starred messages

- Include starred in Primary



Choose which message categories to show as inbox tabs. Other messages will appear in the Primary tab.

some reactions when categories came out

Google gets it terribly, terribly wrong with Gmail tabs and makes me angry



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Quick Tech Tip: Disabling Gmail's Category Tabs

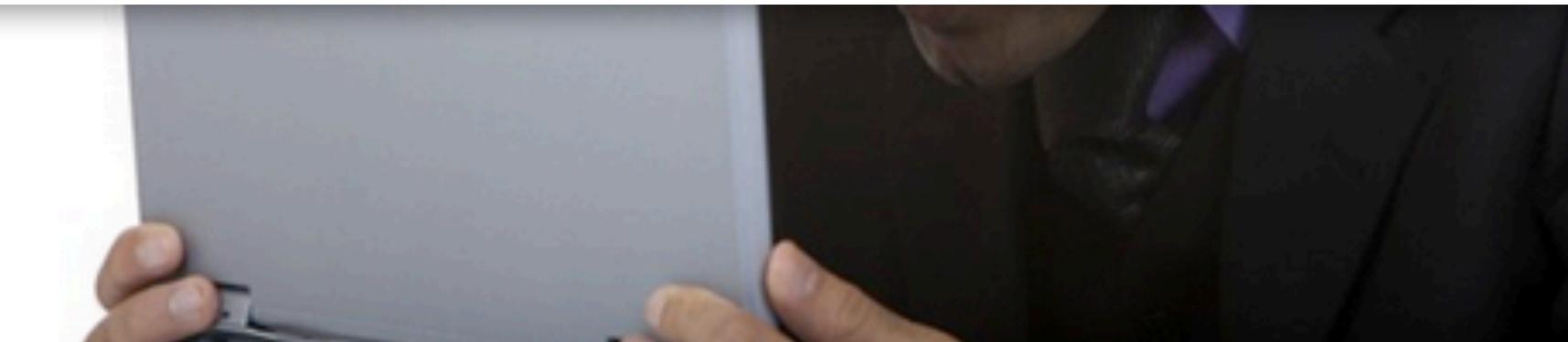
Mon, 07/29/2013 - 12:17 | [Chuck Gray](#)

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Are you a Gmail user? Did you wake up a week or two ago to find that your new messages were now being automatically organized by Gmail into tabs of different, pre-determined categories? And, did you think, like me, that they were really ugly, stupid, and unnecessary? Here's a quick tip on how to rid yourself of them!

see that tabs were now available to me. Excitement was short-lived, however; it quickly became apparent that this new feature is a disaster.



Why the Tabs Are So Confusing

The tabs do give you a convenient way to automatically sort your inbox according to Gmail's preset categories and get notifications at a glance for when new emails come in.

However, the tabbed view introduces a new, not-so-clear element in Gmail called "categories."

The problem is, you already have labels that *also* match these categories. Gmail, for example, adds Social Updates, Promotions, and Forums as SmartLabels in the left menu. The "Notifications" SmartLabel corresponds to the Updates tab (I wonder why they didn't just call the tab Notifications), but

SmartLabels are not the same as Categories. Gmail's pre-designed SmartLabel filters makes it seem like that, but they're really two different things.

how google explains labels (!)

The image shows a screenshot of a web page from 'Gmail Help'. The header is orange with white text. It says 'Gmail Help' on the left and has a magnifying glass icon on the right. Below the header, there are two buttons: 'GMAIL' with a mail icon and 'FORUM'. The main content area is white and features a large, bold title 'Using labels'. Below the title is a paragraph of text explaining what labels are and how they work.

Using labels

Labels help you organize your messages into categories -- work, family, to do, read later, jokes, recipes, any category you want. Labels do all the work that folders do, but with an added bonus: you can add more than one to a message.

comparing Category and Label

common purpose

organize messages

common functionality

filtering (whether by buttons, queries or tabs)

system-defined classification (sent, social)

incomparable features

associate classification with tabs: categories only

create new classifications: labels only

apply outside inbox: labels only

Category concept is redundant; Label was enough

example:
Apple Mail

Searching "@SaneLater - csail.mit.edu"
Found 0 results (Connection Logging Enabled)

Mailboxes Search: All @SaneLater Copies Groups

Search All Mailboxes

csail.mit.edu

- Inbox
- Drafts
- Sent
- Junk
- Trash
- Archive
- @SaneBlackHole
- @SaneLater**

imap

- _Archive
- Admin
- Personal
- Photography
- Projects
- Teaching
- Transient
- TripsAndEvents

MissedSpam

NotSpam

Spam

Favorites

- Copies
- Groups

Smart Mailboxes

23

software

People

- softwaredesigngroup@mit.edu
- 6.1040 Software Studio — notifications@instruct...
- sdg-software — sdg-software@mit.edu
- Daniel Jackson — essence-of-software@buttond...
- Sender contains: software

Subjects

- Subject contains: software
- Software Studio Cross-Registration Form
- software design book
- Software in the news post
- Software Development Fundamentals - Course Re...

Attachments

- Attachment name contains: software

SUBJECT software

✓ Subject

Entire Message

No Message Selected

Rules



General



Accounts



Junk Mail



Fonts & Colors



Viewing



Composing



Signatures



Rules



Extensions



Privacy

Active | Description

Add Rule

Edit

Duplicate

Remove

Description: Software design

If any of the following conditions are met:

Subject

contains

software

Perform the following actions:

Move Message

to mailbox: Discussions

Cancel

OK





No Mailbox Selected
0 messages



Move to...



Search

Favorites

csail.mit.edu



Inbox

Drafts

7

Sent

Junk

Trash

Archive

@SaneBlackHole

@SaneLater

2

imap

9

MissedSpam

NotSpam

Spam

On My Mac

Smart Mailboxes



Smart Mailbox Name:

Contains messages that match all of the following conditions:

Date last viewed is today



Include messages from Trash

Include messages from Sent

Cancel

OK

3 concepts: Filter, Rule, SmartFolder

The image contains three separate windows demonstrating Mail filtering:

- Filter:** Shows a search bar with "SUBJECT software". A tooltip indicates "Subject" and "Entire Message" are selected. Below, a search description is "Software design". It specifies "any" condition where "Subject" "contains" "software".

Description: Software design

If any of the following conditions are met:

Subject contains software
- Rule:** Shows a rule configuration. The action is "Move Message" to mailbox "Discussions".

Move Message to mailbox: Discussions
- SmartFolder:** Shows a search bar with "ANY Daniel Jackson". A tooltip indicates "From", "To", and "Entire Message" are selected. Below, it says "Smart Mailbox Name: Today" and "Contains messages that match all of the following conditions: Date last viewed is today".

Smart Mailbox Name: Today

Contains messages that match all of the following conditions:

Date last viewed is today

3 incomparable sets of filtering options

This window displays a massive list of filtering criteria, organized into several main sections:

- Entire message:** From, To, Entire Message.
- From:** Any recipient, Subject.
- Date received:** Date last viewed.
- Account:** Sender is member of group, Sender is VIP.
- Sender information:** Message is flagged, Message is unread, Priority is low, Priority is normal, Priority is high.
- Message content:** Message has flag, Message was replied to, Message was not replied to.
- Priority:** Priority is high, Priority is normal.
- Attachment:** Contains attachments, Any attachment name, Attachment type.
- Header:** Edit header list...

unifying
concepts

unify design move



set of wrenches

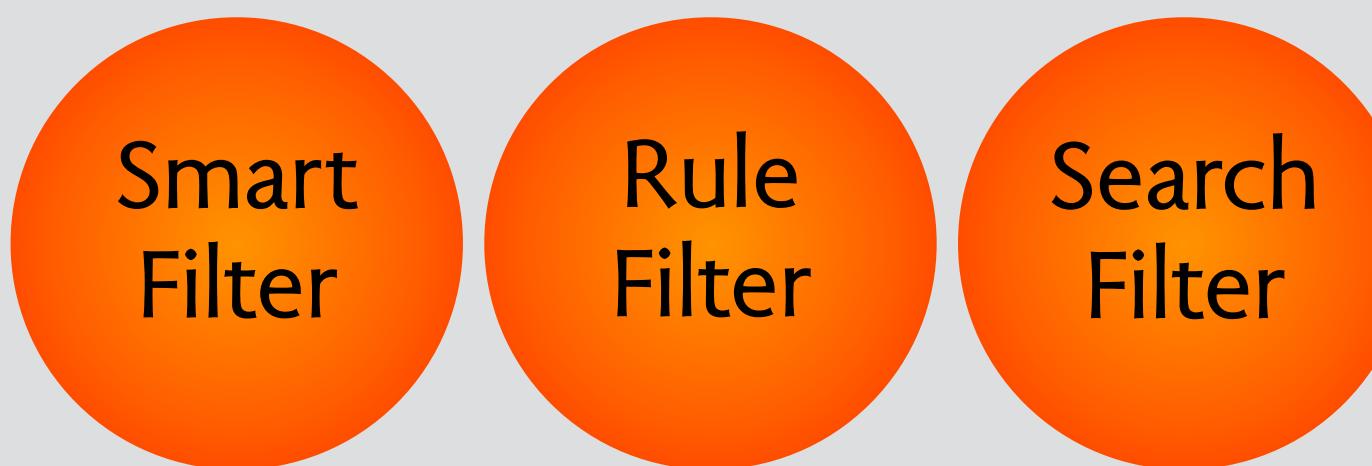
unify



adjustable wrench



unify



unify



unify: subsuming access control in MIT's Moira

can toggle
mailing list
attribute

can create
admin list
with no
login users!

WebMoira List Manager : Daniel Jackson

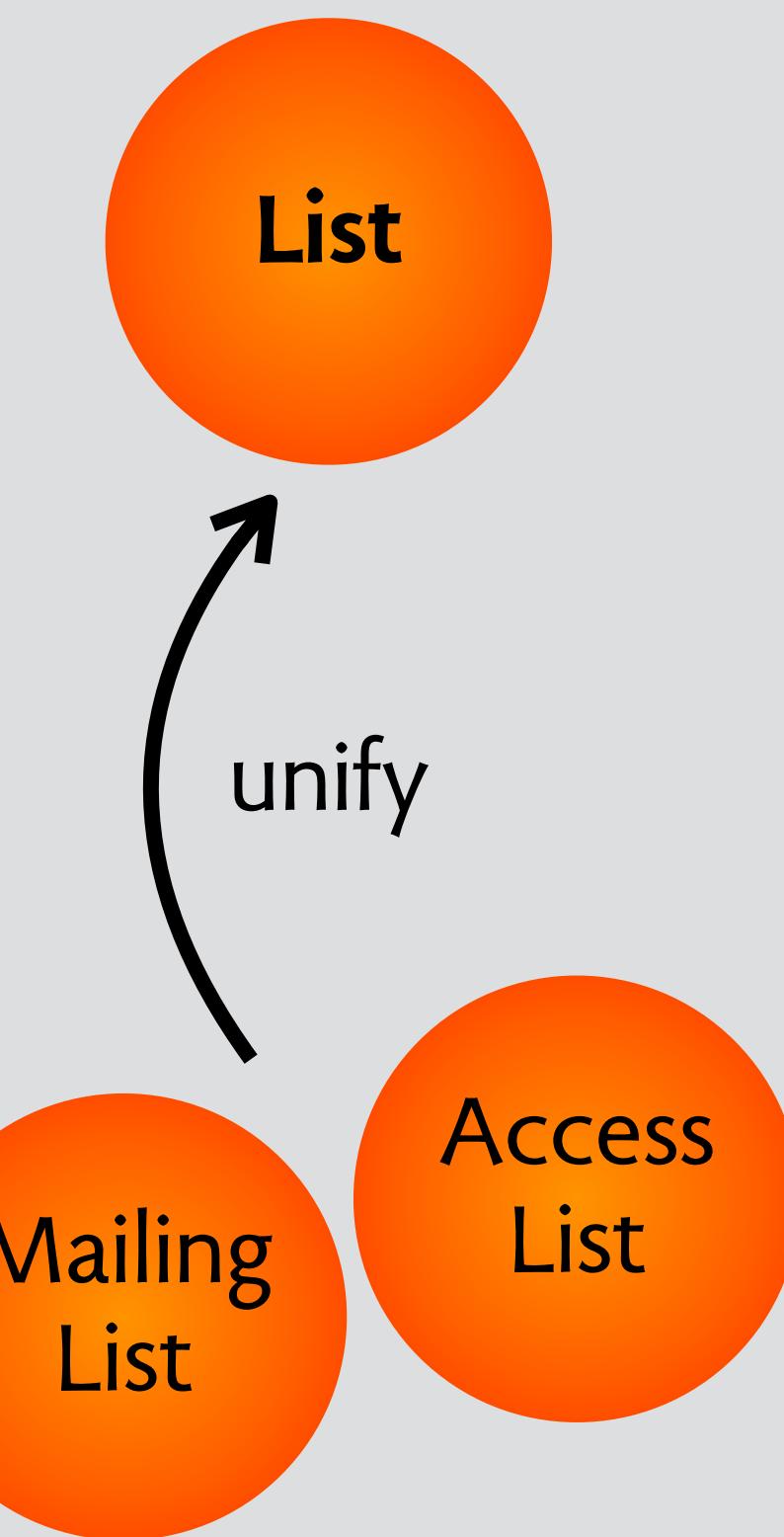
List Name: dnj-play1
Description: none
Attributes: active, moira mailing list
Permissions: private, visible
Last Modified: by dnj with moiraws on 22-mar-2022 09:39:00

[Edit](#)

Members	
Add Member:	<input type="text"/> Add
Leave List: Remove Me	
MIT Users	
Daniel Jackson (dnj)	remove
Email Addresses	
daniel@dnj.photo	remove

Administrators	
Owner:	dnj-play2 (List)
Change Owner:	<input type="text"/> Change
Add Administrator:	<input type="text"/> Add
Leave Owner List: Remove Me	
MIT Users	
Daniel Jackson (dnj)	remove

[Help](#) | [My Lists](#) | [Undo Log \(1\)](#)



eliminating
overloading

aspect ratio in
Fujifilm cameras

a lovely camera fuji x100



complex menu system: image quality setting



aspect ratio



image size setting



non-standard ratio + raw?



problem #1: no non-standard ratio unless also save JPG!



raw image showing non-destructive aspect ratio crop

problem #2: very few ratio options

change.org

Petition details Comments Updates

Fuji, give us 4:3, 5:4, and 6:7 aspect ratios on X-series cameras

636 have signed. Let's get to 1,000!

At 1,000 signatures, this petition is more likely to be featured in recommendations!

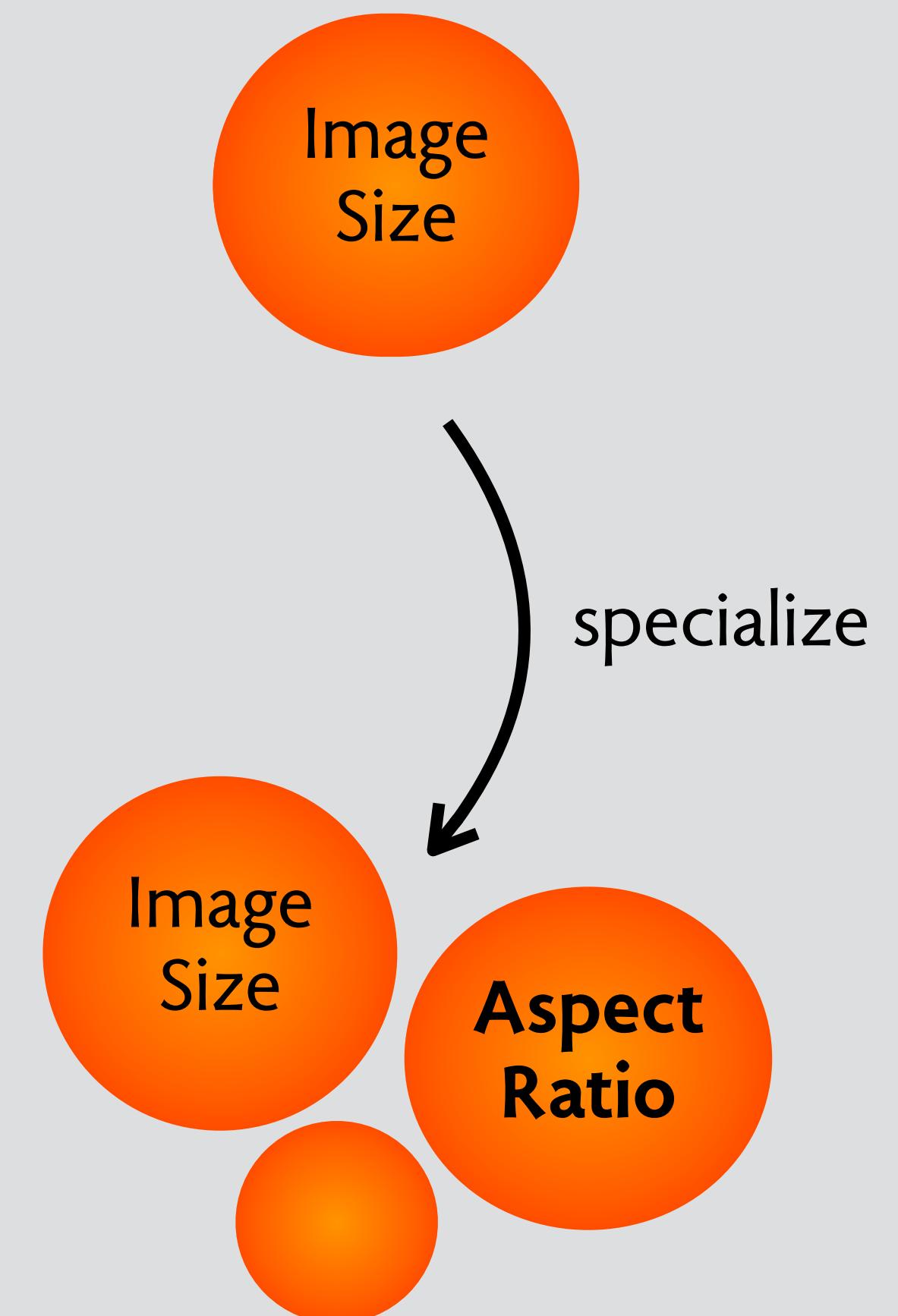
Aspect Ratio	Count
L 3:2	664
L 16:9	681
L 1:1	702
M 3:2	707
M 16:9	719
M 1:1	734
S 3:2	746

diagnosis?

aspect ratio not implemented as a concept
merged into ImageSize concept (JPEG only)
so cannot be controlled independently
attempt at unification doesn't work

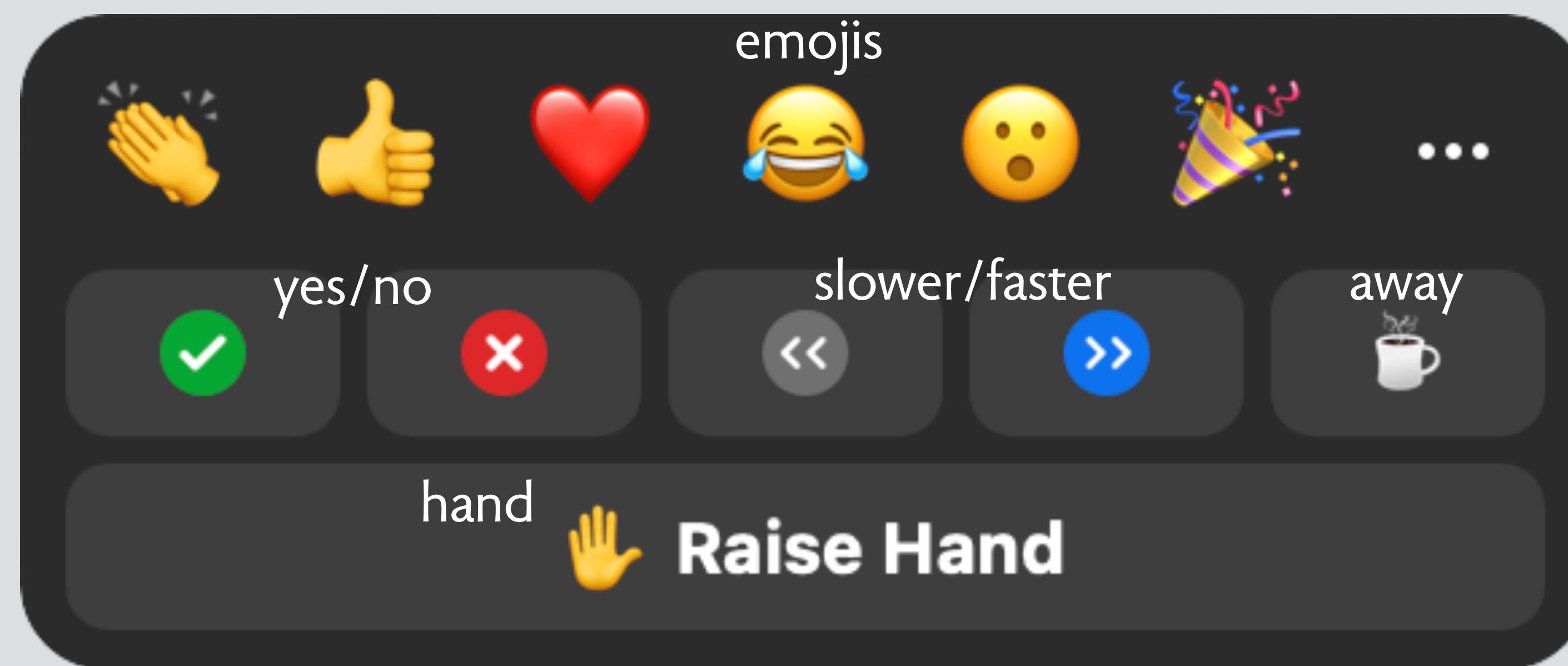
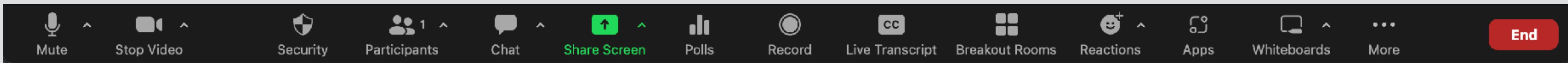
solution: specialize into >1 concept

separate out AspectRatio concept
would allow ratio change to raws without JPEGs
would avoid combinatoric explosion of options

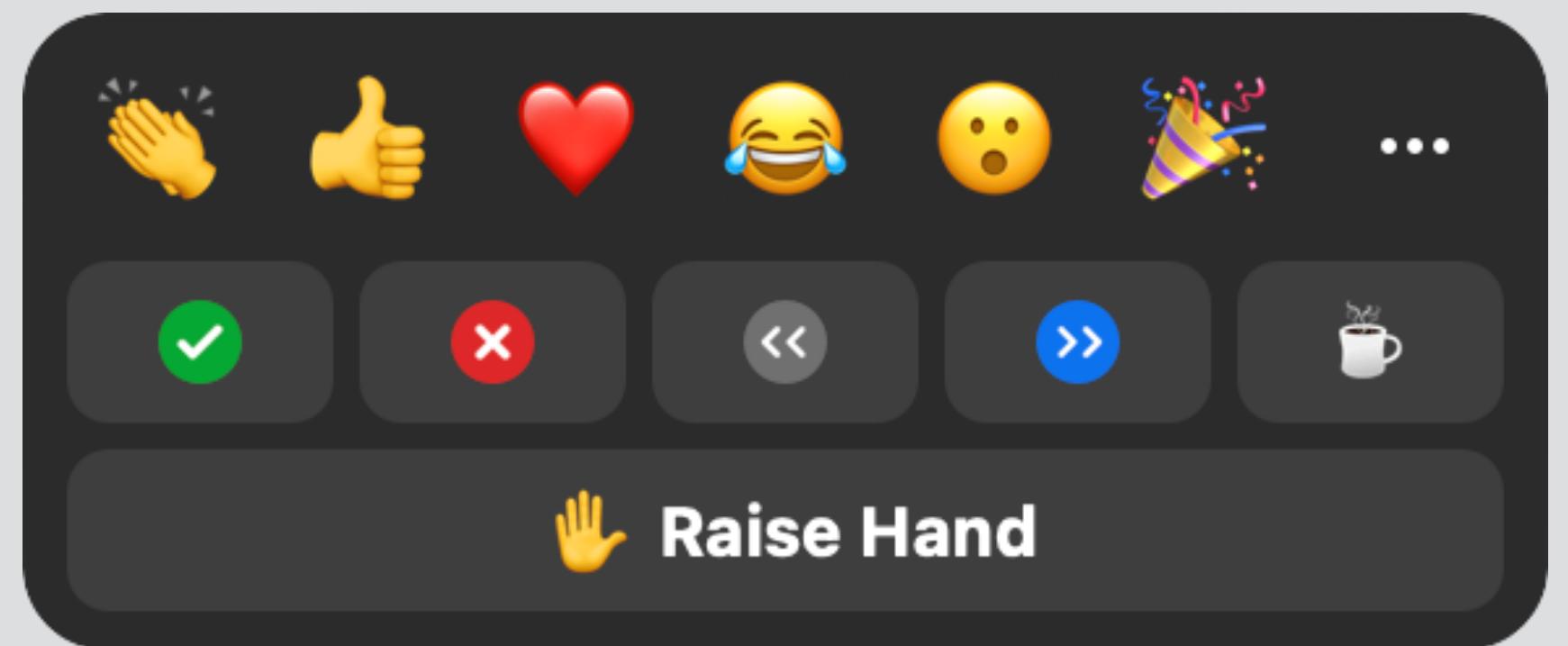


reactions in Zoom

Zoom's Reaction concept



participant view



Participants (1)

	Daniel Jackson (Host, me)	
--	---------------------------	--

1

Invite Mute All More ▾

- Ask All to Unmute
- Clear All Feedback
-
- Mute All Upon Entry
- Play Join and Leave Sound
- Lock Meeting
- Enable Waiting Room
- Hide Profile Pictures
-
- Allow Participants to:**
- ✓ Unmute Themselves
- ✓ Rename
- ✓ Start Video

functions by reaction type

Reaction	Disappears	Counted	Cancel by host
Emojis	✓	✓	
Yes/no		✓	✓
Slow/speed		✓	✓
Away		✓	✓
Hand		✓	✓

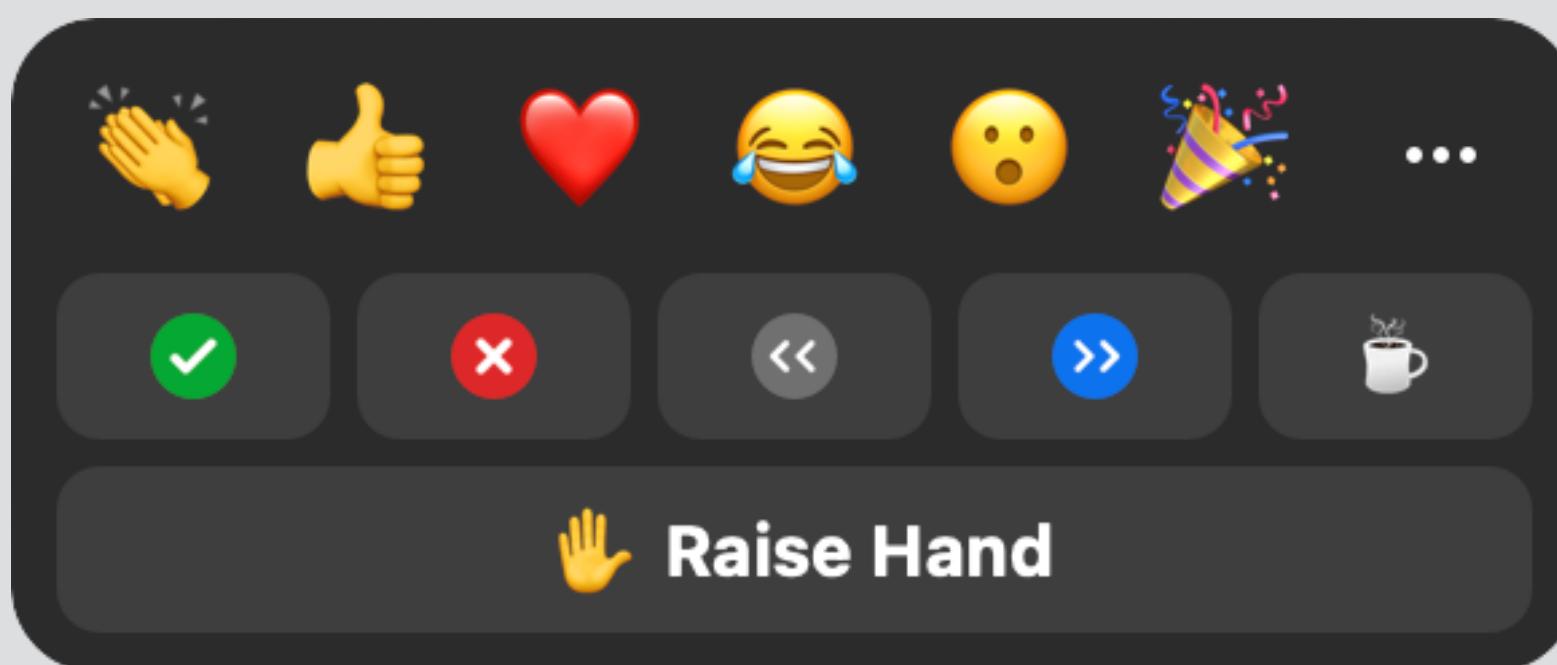


table shows Zoom's actual design
consider each entry, and ask:
would you choose the same?

functions by reaction type: my take

Reaction	Disappears	Counted	Cancel by host
Emojis	✓	(✓)	
Yes/no		✓	✓
Slow/speed		✓	✓
Away		(✓)	(✓)
Hand		(✓)	✓

✓ yes

(✓) yes, but should probably be no

disjointness of reaction types

Reaction	Emojis	Yes/no	Slow/speed	Away	Hand
Emojis	✓				
Yes/no		✓	✓	✓	✓
Slow/speed		✓	✓	✓	✓
Away		✓	✓	✓	✓
Hand		✓	✓	✓	✓

table shows Zoom's actual design
consider each entry, and ask:
would you choose the same?

disjointness of reaction types: my take

Reaction	Emojis	Yes/no	Slow/speed	Away	Hand
Emojis	✓				
Yes/no		✓	(✓)	(✓)	(✓)
Slow/speed		(✓)	✓	(✓)	(✓)
Away		(✓)	(✓)	✓	(✓)
Hand		(✓)	(✓)	(✓)	✓

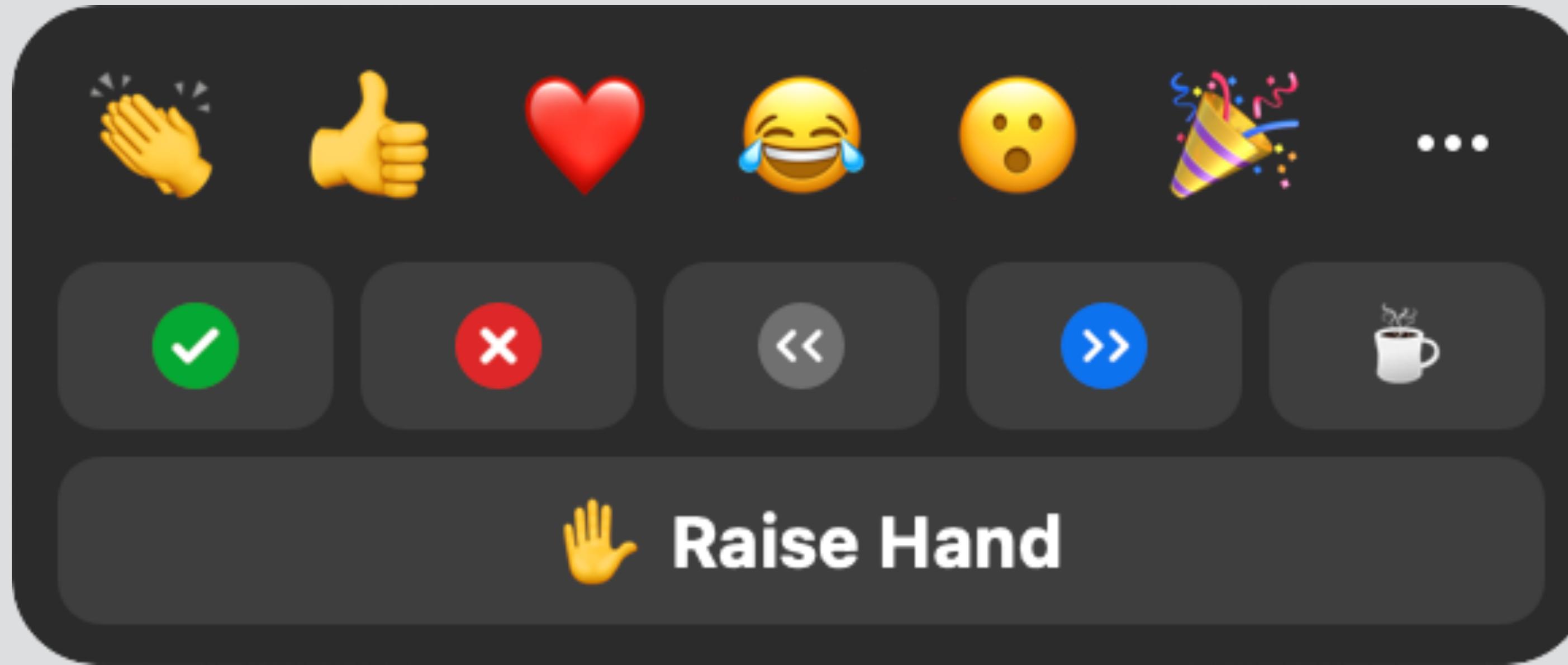


yes

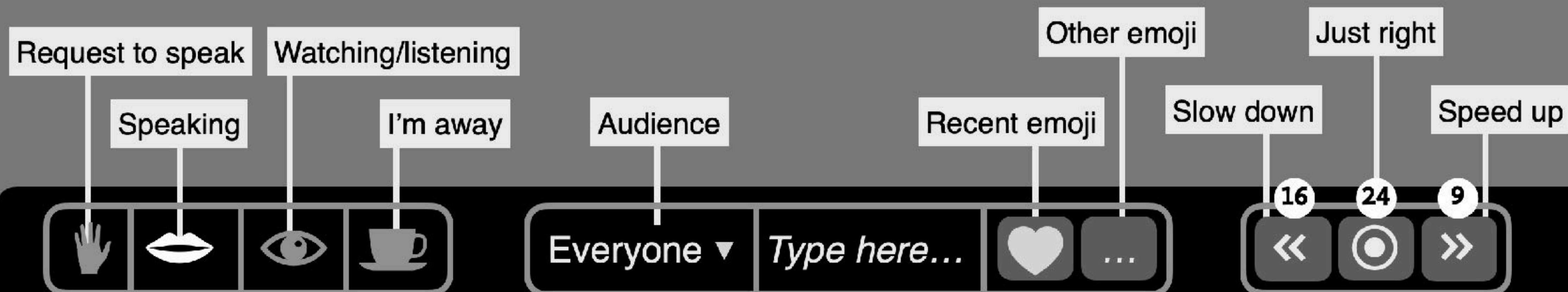
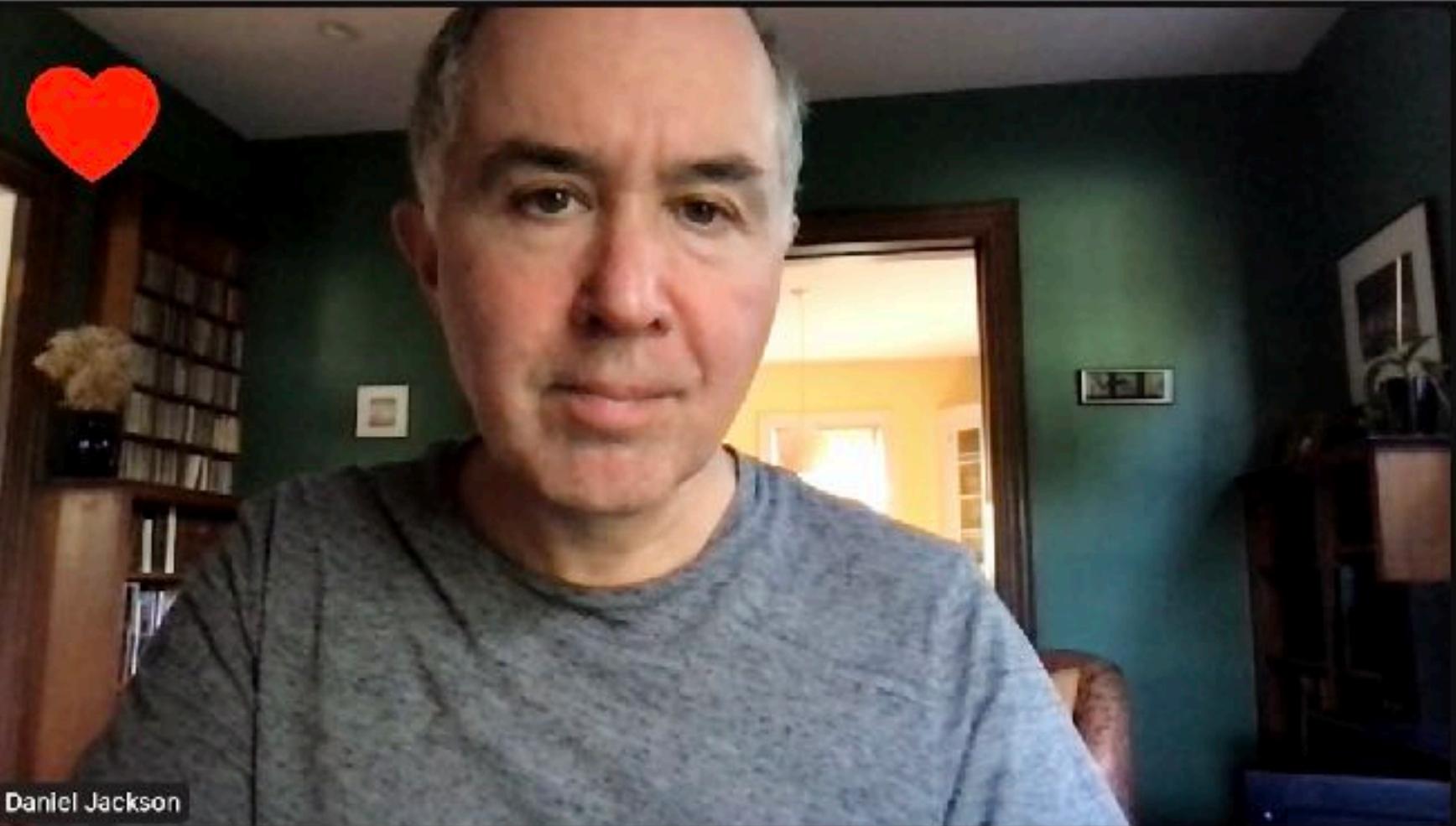


yes, but should probably be no

splitting Reaction



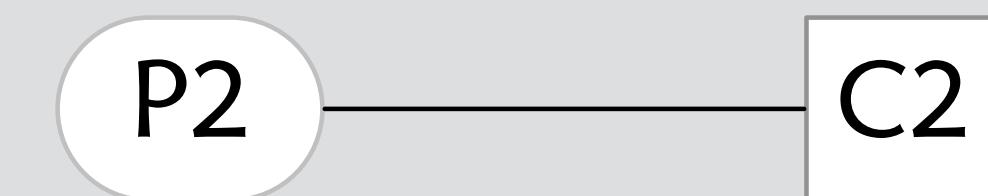
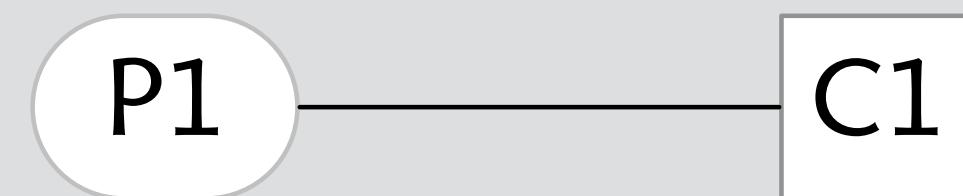
what concepts would you factor out of this concept?



takeaways

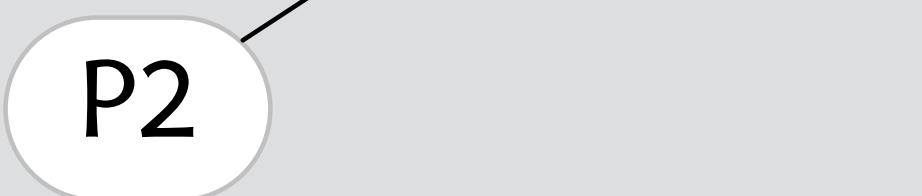
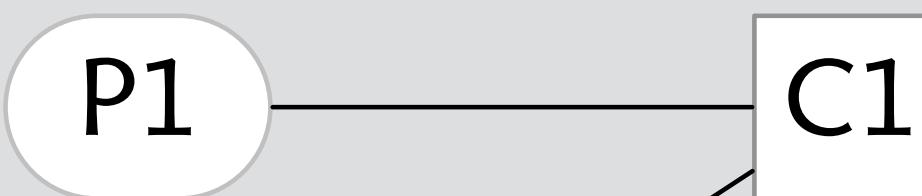
the specificity rule

specificity
purposes:concepts are 1:1

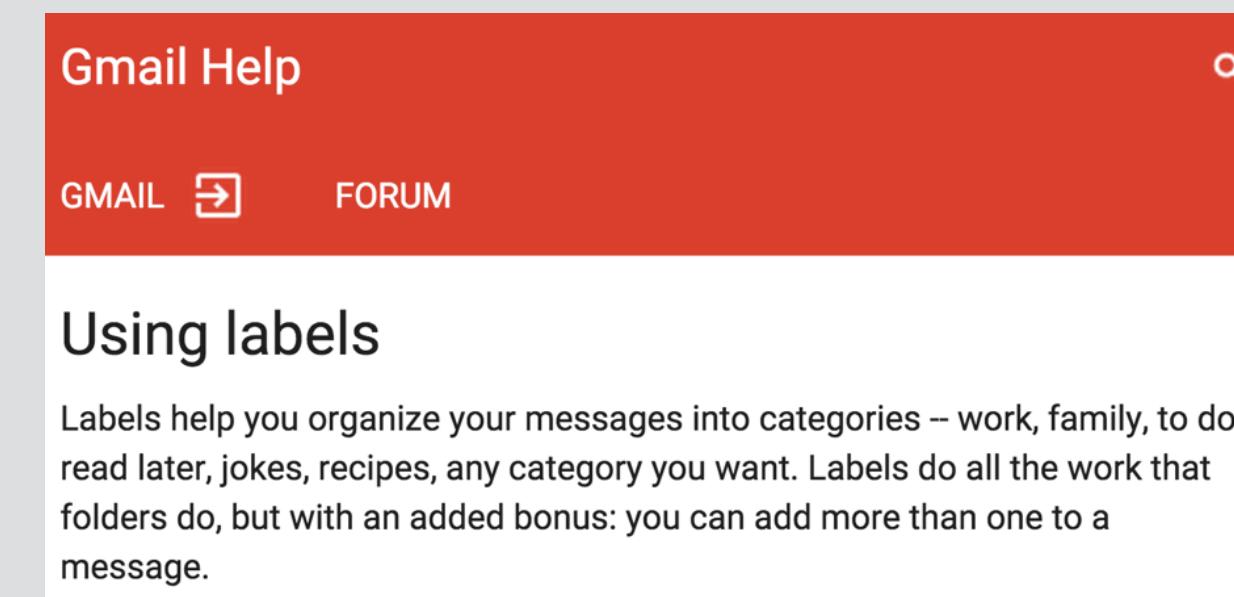


redundancy
>1 concept per purpose

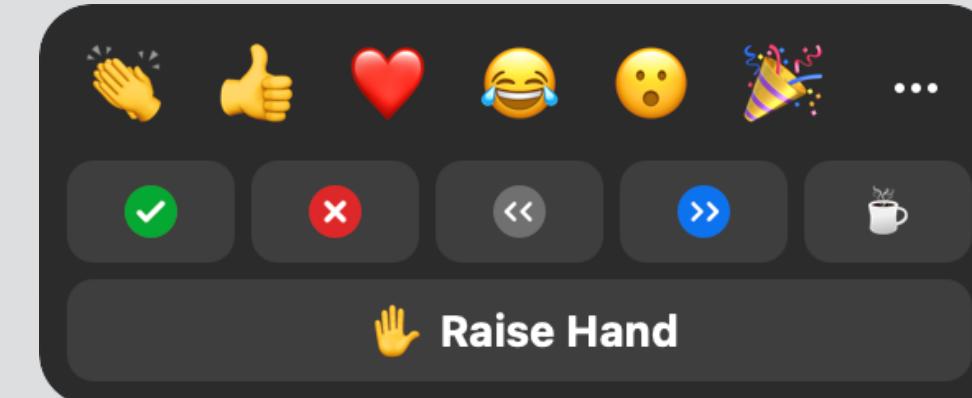
overloading
>1 purpose per concept



example
Category vs Label in Gmail



example
Reaction in Zoom



strategies for simplification

streamline the user flow

simplify the OP, add sync, or remove entire concept

simplify mapping of concept actions to concrete steps

unify: eliminate redundancy

identify concepts or subconcepts with same purpose

unify specialized concepts into general concept

specialize: eliminate overloading

identify concept that has multiple purpose

split into separate concepts