the quintessential design move

Daniel Jackson · Autodesk · Woodinville, WA · Dec 3-5, 2024

finding
karma

an app composed of familiar concepts

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▲ Jackson structured programming (wikipedia.org)   **Post**   **Session**

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▲ danielnicholas 63 days ago [–]

user: danielnicholas
created: 63 days ago
karma: 11

...u might find helpful an annotated version [0] of Hoare's explanation of JSP that I edited for a Michael Jackson festschrift

..., I'd point to these ideas as worth knowing:

Comment

...ing problem that involves traversing ...ructures can be solved very systematically. HTDP addresses this class, but bases code structure only on input structure; JSP synthesized i...it.

Profile

- The ...e archetypal problems that, however you code, can't be pushed under the rug—most notably structure clashes—and just recognizing them ...

- Coroutines (or code transformation) let you structure code more cleanly when you need to read or write more than one structure. It's why real iterators (with yield), which offer a limited form of this, are (in my view) better than Java-style iterators with a next method.

- The idea of viewing a system as a collection of asynchronous processes (Ch. 11 in the JSP book, which later became JSD) with a long-running process for each real-world entity. This was a notable contrast to OOP, and led to a strategy (seeing a resurgence with event storming for DDD) that began with events rather than objects.

[0] https://groups.csail.mit.edu/sdg/pubs/2009/hoare-jsp-3-29-09...

▲ ob-nix 63 days ago [–]

... this brings back memories! In the late eighties I, as a teenager, found a Jackson Struct. Pr. book at the town library. I remember I was amazed at the text and wondered why I hadn't heard about the method before.

If I remember correctly did the book clearly point out backtracking as a standard method, while mentioning that most languages lacked that, so it had to be implemented manually.

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▲ Jackson structured programming (wikipedia.org)
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▲ danielnicholas 63 days ago [–]

If you want an intro to JSP,   a Michael Jackson festschrift in 2009.

For those who don't know

- There's a class of progra   ly. HTDP addresses this class, but bases code structure o

- There are some archetyp   shes—and just recognizing them helps.

- Coroutines (or code trans   structure. It's why real iterators (with yield), which   od.

- The idea of viewing a sys   ) with a long-running process for each real-world entity.   ing for DDD) that began with events rather than objects.

[0] https://groups.csail.mi

"combinational creativity" [Boden]
familiar elements combined in new ways

for HackerNews, things like
a post has a <u>title</u> and <u>either</u> just a link, <u>or</u> just a question
no comments on a post after 2 weeks, no edits after 2 hours
can't downvote a comment until your own post upvoted
…

▲ ob-nix 63 days ago [–

… this brings back   ary. I remember I was amazed at the text and wondered why I hadn't heard about the method before.

If I remember correctly did the book clearly point out backtracking as a standard method, while mentioning that most languages lacked that, so it had to be implemented manually.

how to add app-specific functionality?

concept Upvote

purpose rank items by popularity

actions
upvote (u: User, i: Item)
downvote (u: User, i: Item)
unvote (u: User, i: Item)

suppose I want this behavior:
you can't downvote an item
until you've received
an upvote on your own post

define a new concept!
a hint: not just used by Upvote

concept Karma

purpose privilege good users

state
karma: User -> one Int

actions
reward (u: User, r: Int)
permit (u: User, r: Int)

concept Post

purpose share content

state
author: Post -> one User
body: Post -> one Text

actions
create (u: User, t: Text): Post
delete (p: Post)
edit (p: Post, t: Text)
get_author (p: Post): User

compose concepts by action synchronization

when
  Upvote.upvote (u, i)
  Post.get_author (i) = u'
sync Karma.reward (u', 10)

concept Karma

**actions**
reward (u: User, r: Int)
permit (u: User, r: Int)

concept Upvote

actions
upvote (u: User, i: Item)
downvote (u: User, i: Item)
unvote (u: User, i: Item)

when Upvote.downvote (u, i)
sync Karma.permit (u, 20)

concept Post

actions
create (u: User, t: Text): Post
delete (p: Post)
edit (p: Post, t: Text)
get_author (p: Post): User

synchronizing concepts

concept Upvote

concept Karma

concept Post

create (Alice, ...) -> p1

create (Bob, ...) -> p2

upvote (Bob, p1) — — — reward (Alice, 10) — — — get_author (p1) -> Alice

upvote (Carol, p1) — — — reward (Alice, 10) — — — get_author (p1) -> Alice

downvote (Alice, p2) — — — permit (Alice, 20)

key properties

concept Upvote

what else can it be used for?

concept Karma

concept Post

create (Alice, ...) -> p1

create (Bob, ...) -> p2

not a call: decoupled

upvote (Bob, p1) — — — — — — — — reward (Alice, 10) — — — — — — — get_author (p1) -> Alice

upvote (Carol, p1) — — — — — — — reward (Alice, 10) — — — — — — — get_author (p1) -> Alice

downvote (Alice, p2) — — — — — — permit (Alice, 20)

trace meets concept spec

app-independent

the quintessential software design move

how to achieve familiarity & decoupling
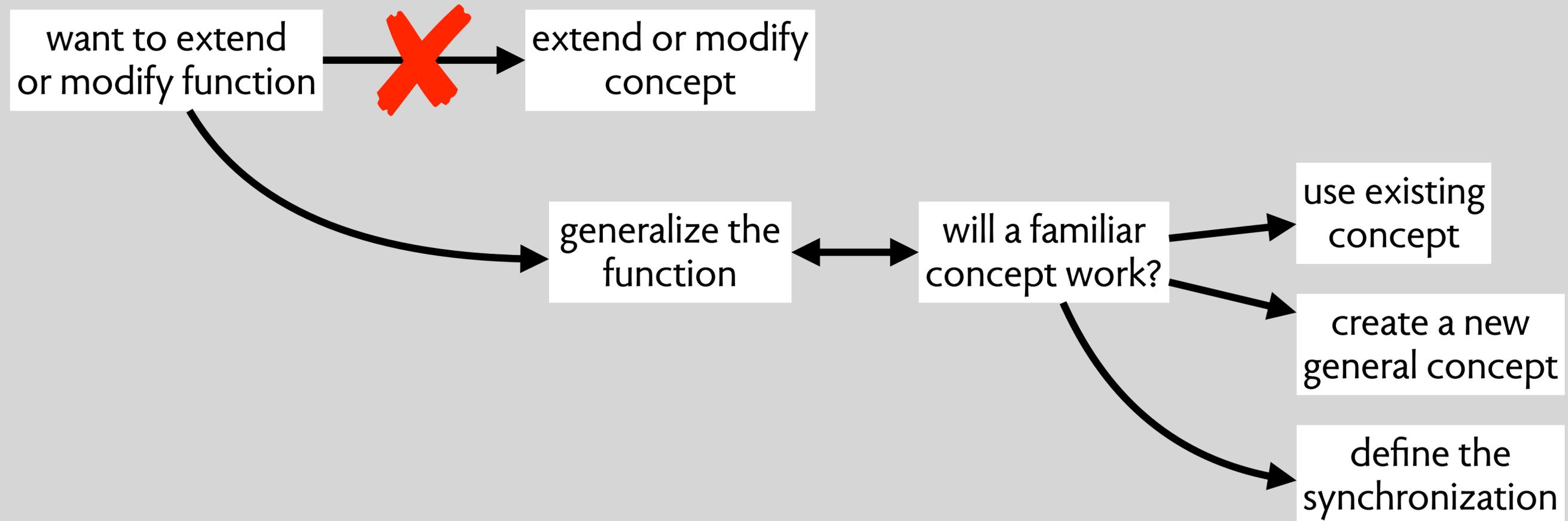
classification of emails in Gmail

assume we already have

Email Message, Rich Text, Trash concepts
can send and receive formatted messages
and can delete and undelete messages

and now we want to be able to see

messages we've sent
messages we've deleted

how to implement this?

custom buttons to filter on these properties?

a better solution: Labeling
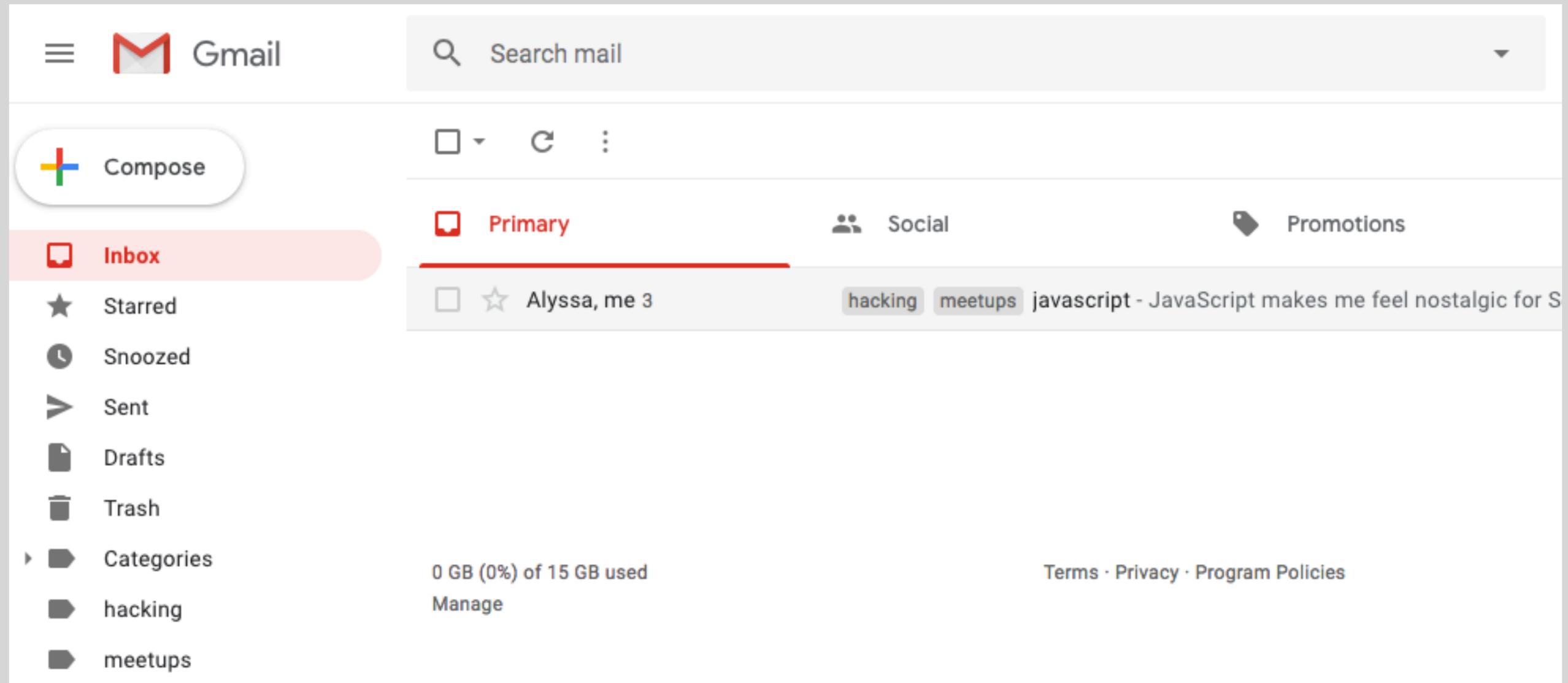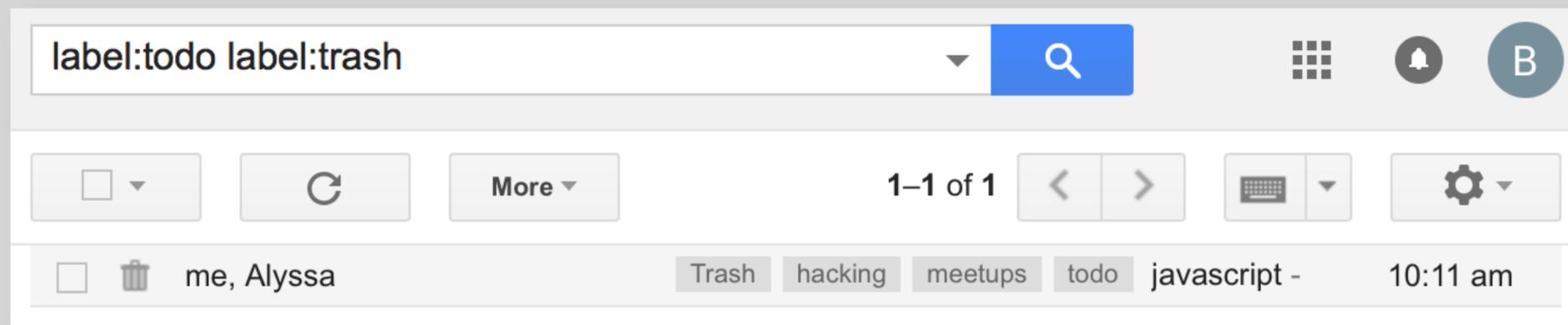
what's the sync?

concept Trash

purpose allow undeletion

principle if an object is deleted, and the trash is not emptied, it can be restored; if an object is deleted and the trash is emptied, the object is gone but its space is regained

actions
delete (o: Object)
restore (o: Object)
empty ()

concept Labeling

purpose organize items

principle if label is added to an item, then filtering on that label will display that item

actions
add (l: Label, i: Item)
remove (l: Label, i: Item)
filter (ls: set Label): set Item

sync rules

when Trash.delete(i) **sync** Labeling.add ('*trashed*', i) **and vv**
when Trash.restore(i) **sync** Labeling.remove ('*trashed*', i) **and vv**

multiple owners
for Moira lists

a Moira mailing list

List Name: concept-design
Description: concept design
Attributes: active, moira mailing list
Permissions: private, visible
Last Modified: by dnj with moiraws on 25-nov-2024 19:54:56

Edit

Members

Add Member:		**Add**
Leave List:	**Remove Me**	

MIT Users

Daniel Jackson (dnj)   remove

Email Addresses

daniel@dnj.photo   remove

Administrator

Owner: **Daniel Jackson (dnj)**

Change Owner: | | **Change**

assume we already have

Mailing List, User Auth concepts
can create and use mailing lists
can authenticate as user to modify list

and now we want multiple owners

eg, let my assistant edit my lists too

how to implement this?

modify Mailing List to allow >1 owner?

a better solution: make the owner a ... mailing list!

WebMoira List Manager : Daniel Jackson

List Name: concept-design
Description: concept design
Attributes: active, moira mailing list
Permissions: private, visible
Last Modified: by dnj with moiraws on 25-nov-2024 20:00:17

Edit

what other benefits does this design bring?

Members

Add Member: [   ] Add

Leave List: Remove Me

MIT Users

Daniel Jackson (dnj)   remove

Email Addresses

daniel@dnj.photo   remove

Administrators

Owner: dnj-admin (List)

Change Owner: [   ] Change

Add Administrator: [   ] Add

Leave Owner List: Remove Me

MIT Users

Daniel Jackson (dnj)   remove

                                                        remove

date deleted
in macOS trash

assume we already have

a Trash concept

can delete and undelete files

imagine back to early Windows days: deleted files are a special list

and now we want to sort by deletion date

for example, to see file most recently deleted

how to implement this?

add date deleted to trash list?

a better solution: make the trash a folder
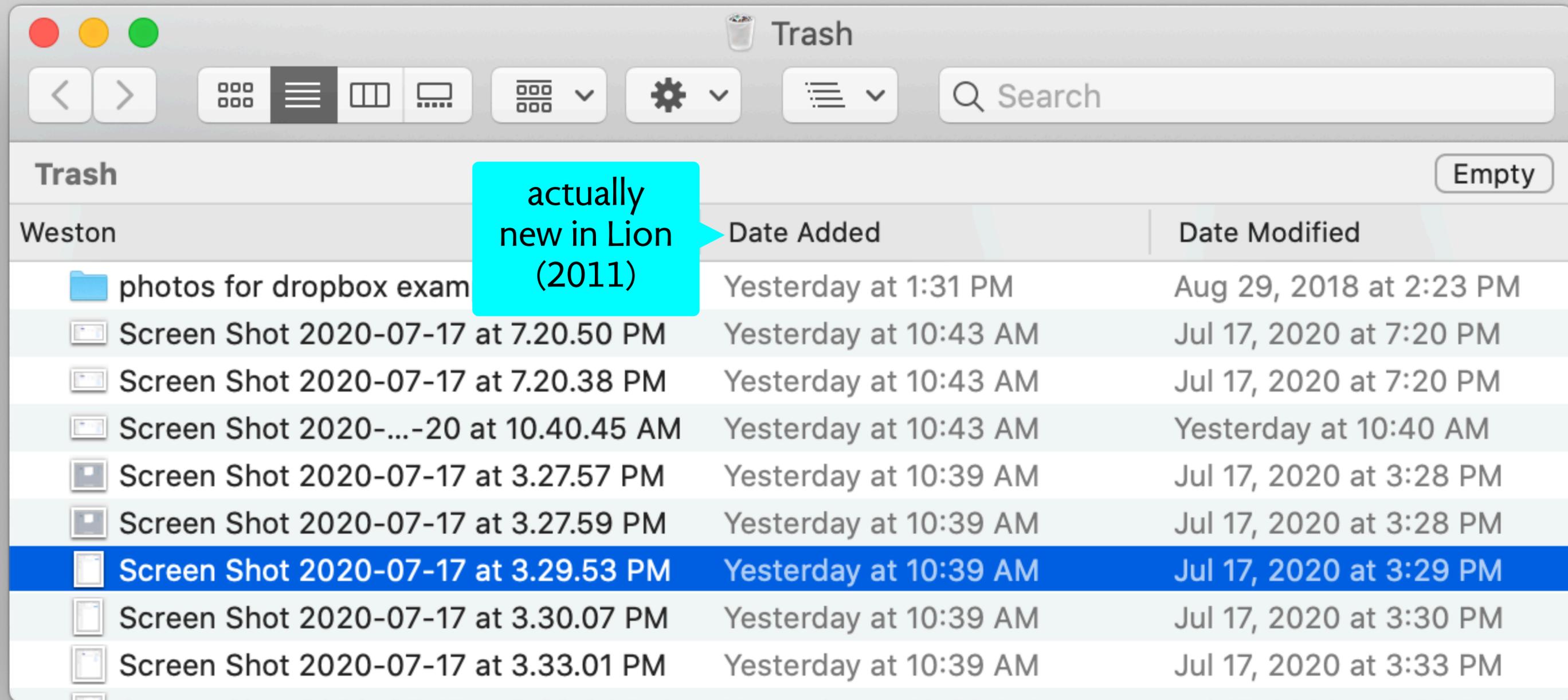
actually new in Lion (2011)

what other benefits does this design bring?

adding
local adjustments
to Photoshop

how to darken the sky
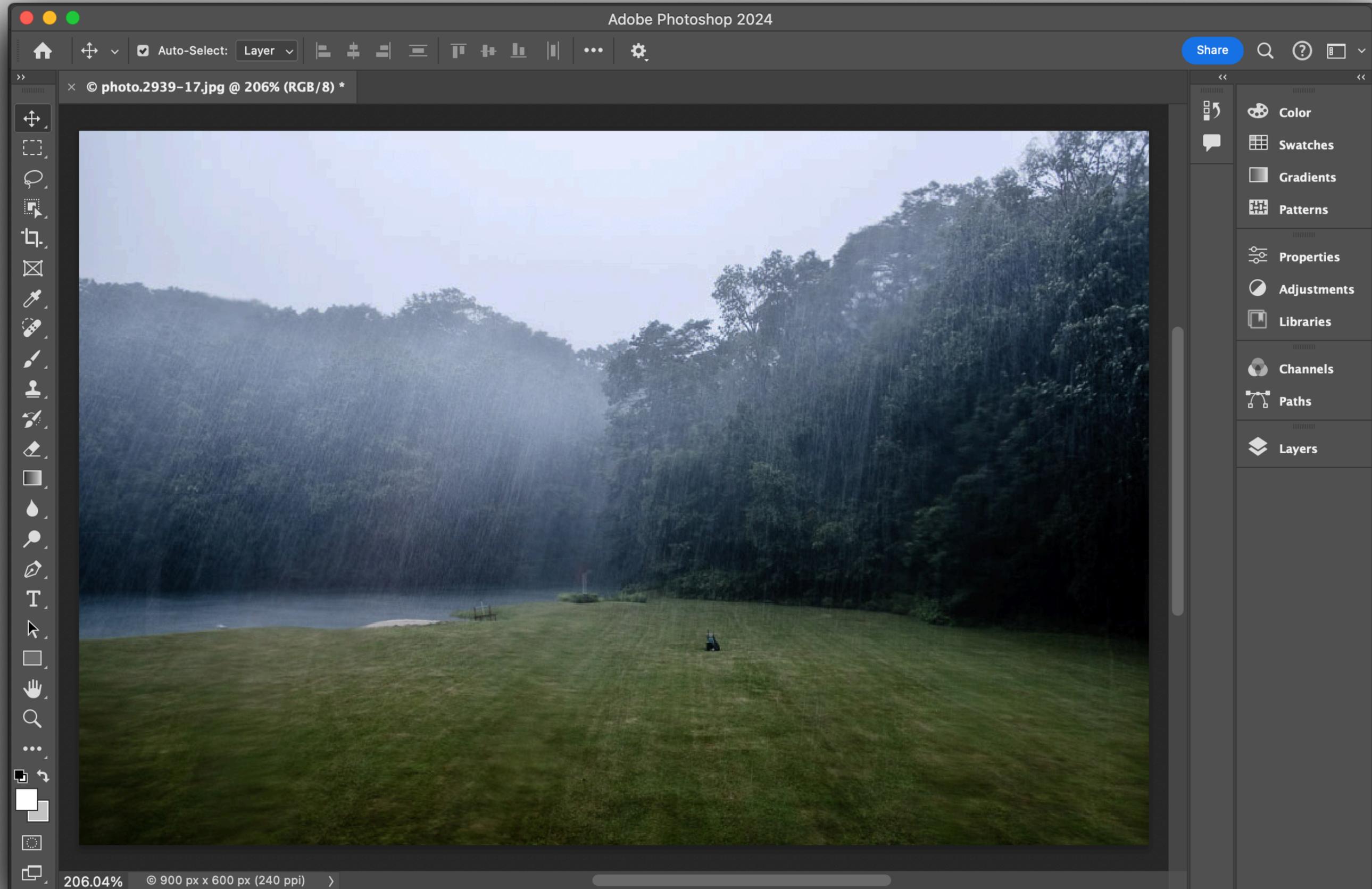
assume we already have

an Adjustment concept that includes brightness controls
a Selection concept that lets us select pixels for cut and paste

and now we want to apply adjustments locally

for example, to darken just the sky

first move

use selection to limit where adjustment is applied

second move

change selection from 0/1 to 0..1, so adjustment can be attenuated

the mother of all synergies
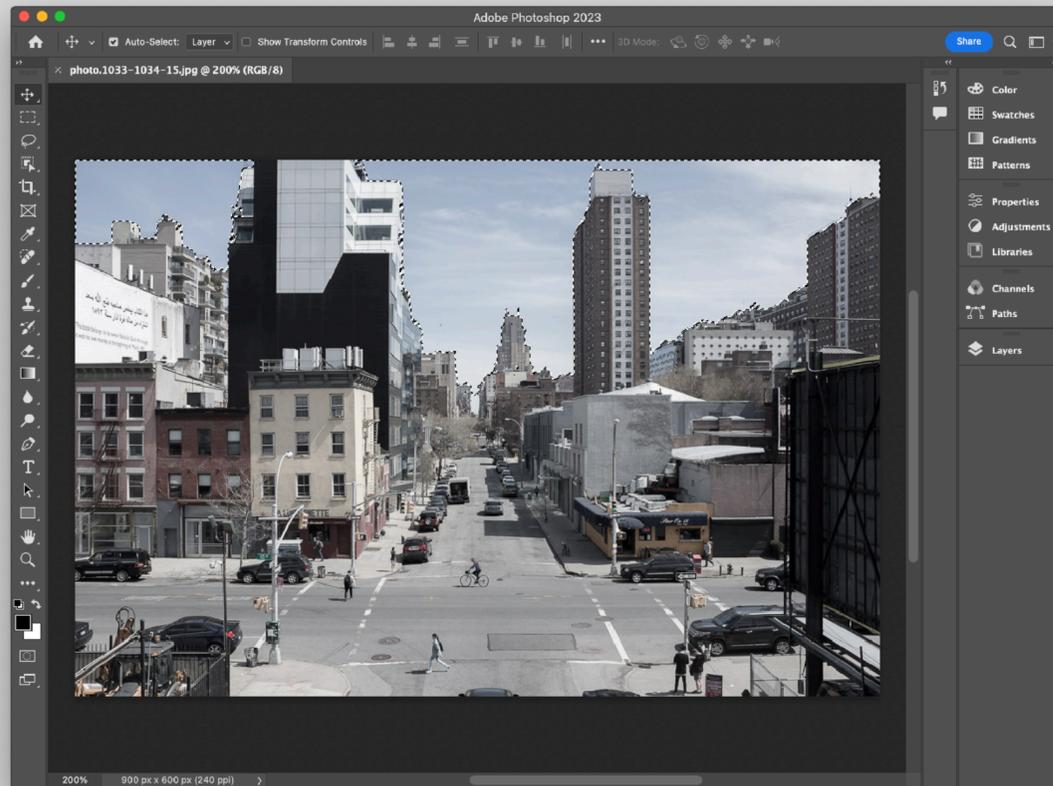
selection (shown as "marching ants")
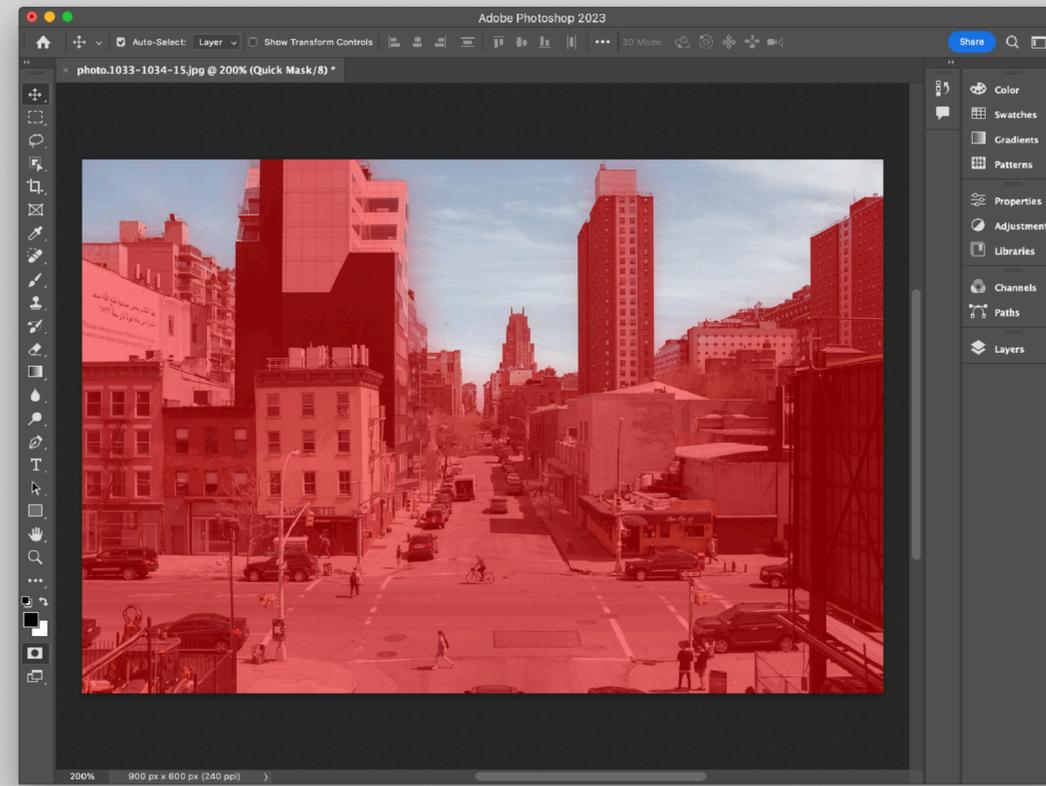
edit selection as **mask**
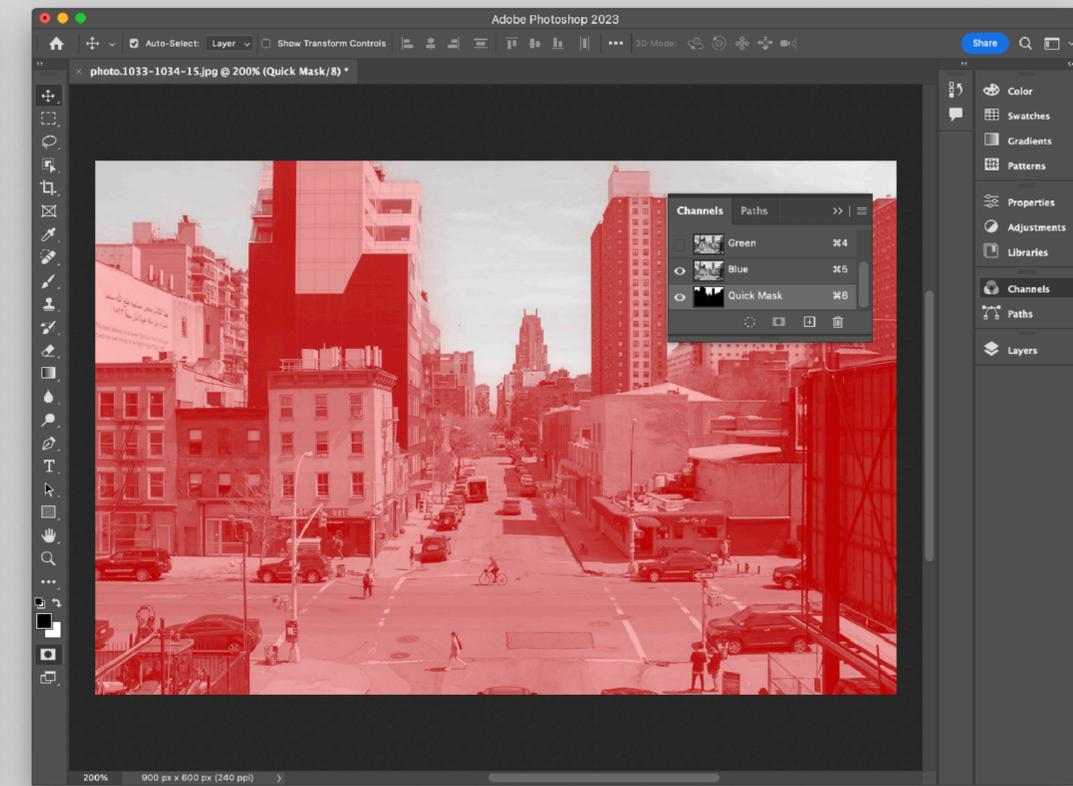
toggle mask as **channel**

selection = mask = channel = grey scale image

scheduling
posts in Hugo

assume we already have

a Markdown concept formats posts for a website

a Metadata concept that lets set title, author, etc (and refer as variables)

and now we want to schedule posts for future dates

what's the user interface?

static website builder doesn't have a UI; it's just a pile of files

a special JSON configuration file for scheduling?

a better solution: use the metadata date for scheduling

Published
Publish this post now.

Scheduled
Publish this post in the future.

Needs Review
Mark this post for review.

Draft
Save this post for later editing.

DUPLICATE   APPLY
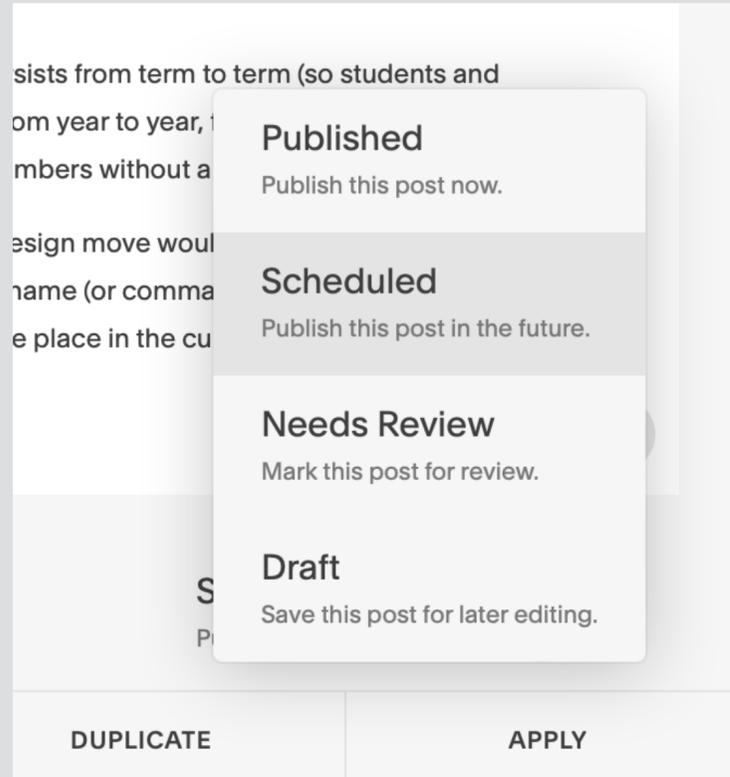
```
---
author: "Daniel Jackson"
title: "The Class Number Dilemma"
date: "2022-02-24"
description: "A Concept Example in Everyday Life"
summary: "Who knew such a simple thing could be so challenging?"

---
```

The Class Number Dilemma

Who knew such a simple thing could be so challenging?

February 24, 2022 · 3 min · Daniel Jackson
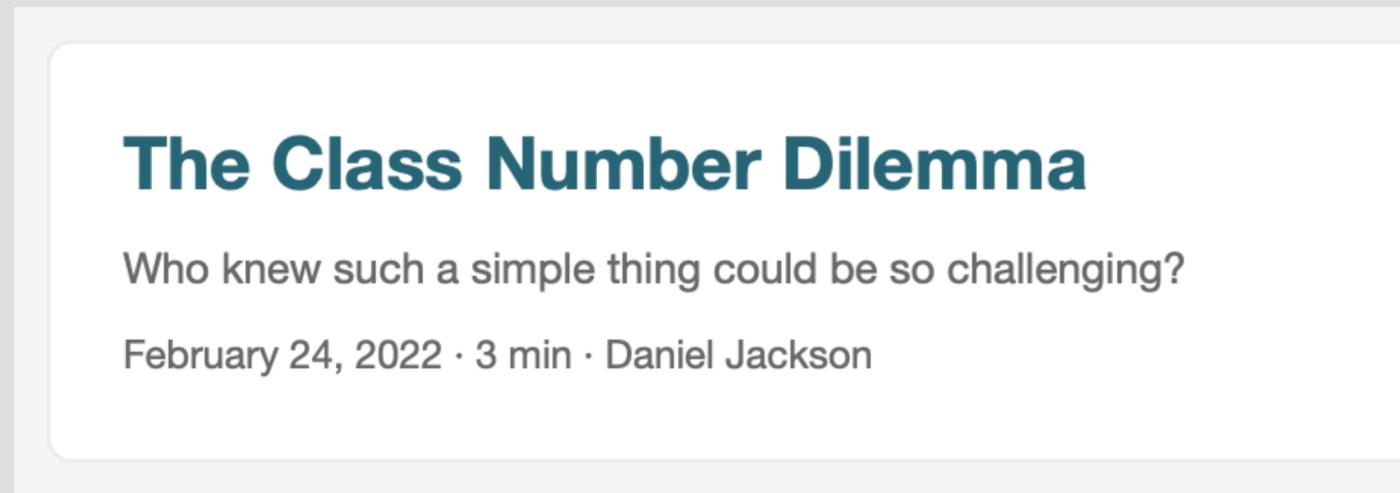
Squarespace: can schedule blog posts but not other pages, and can change pub date independently (only affects order)

Hugo: any page can have date field to schedule, just set date in future

Metadata

Schedule
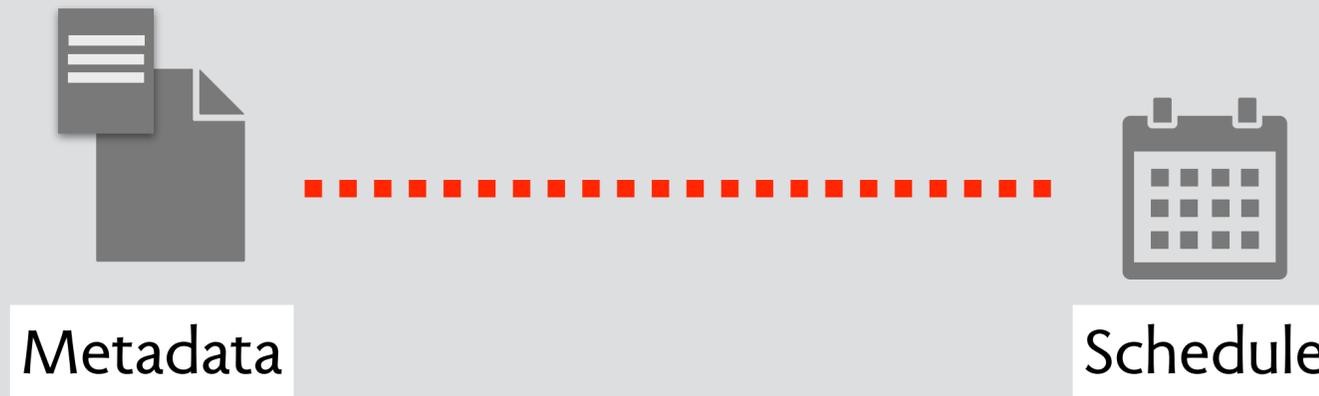
there's no
free lunch

how to achieve familiarity & decoupling
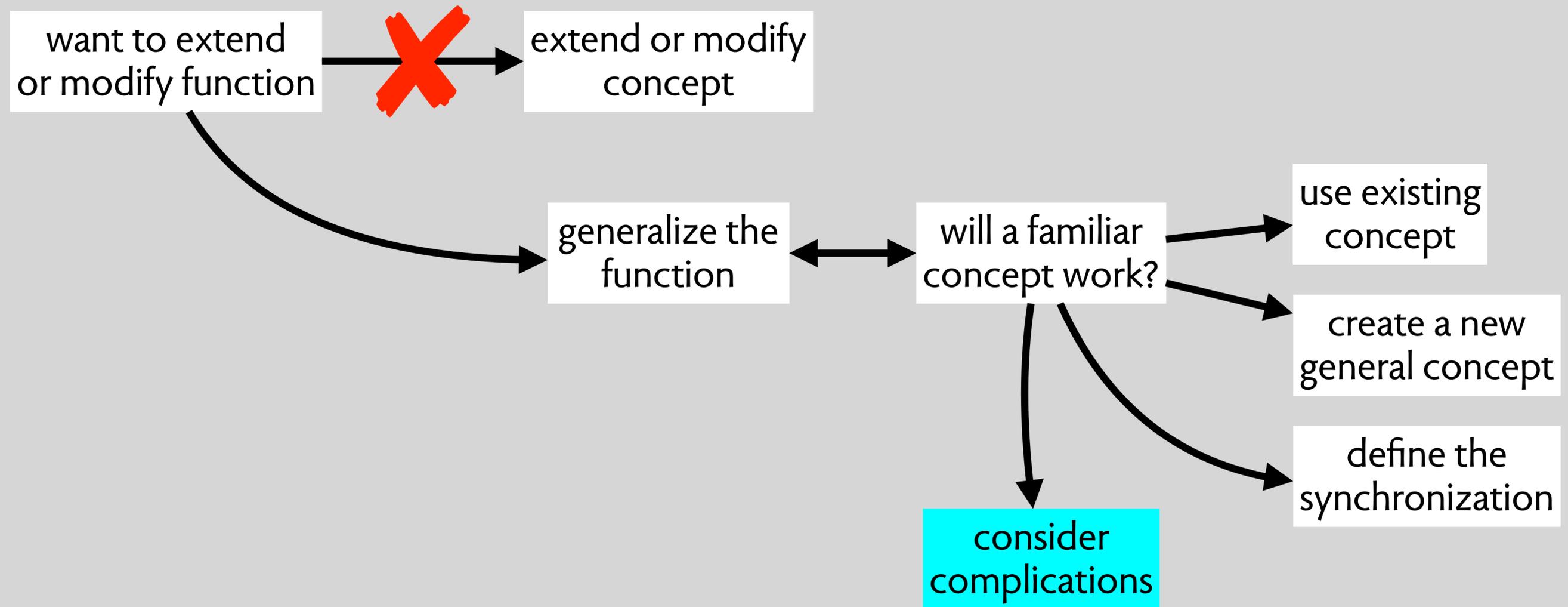
Gmail complications
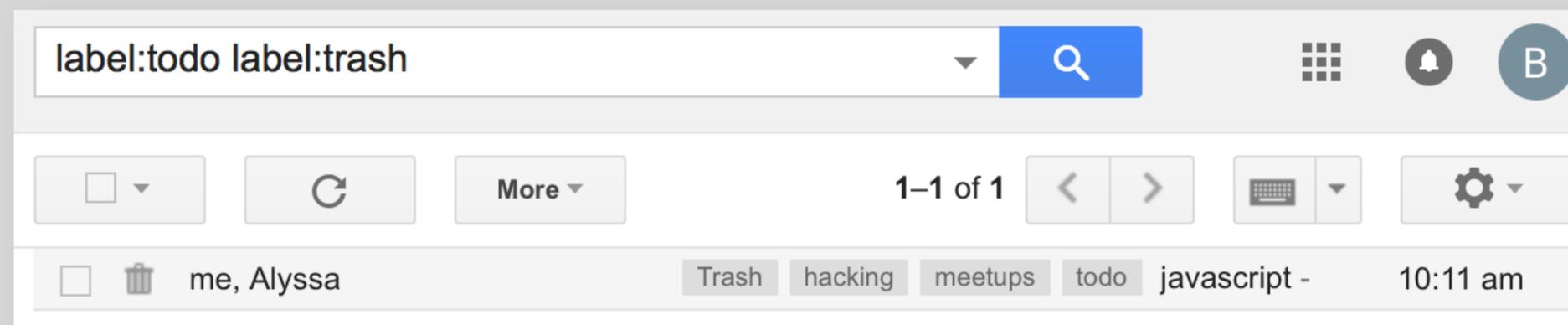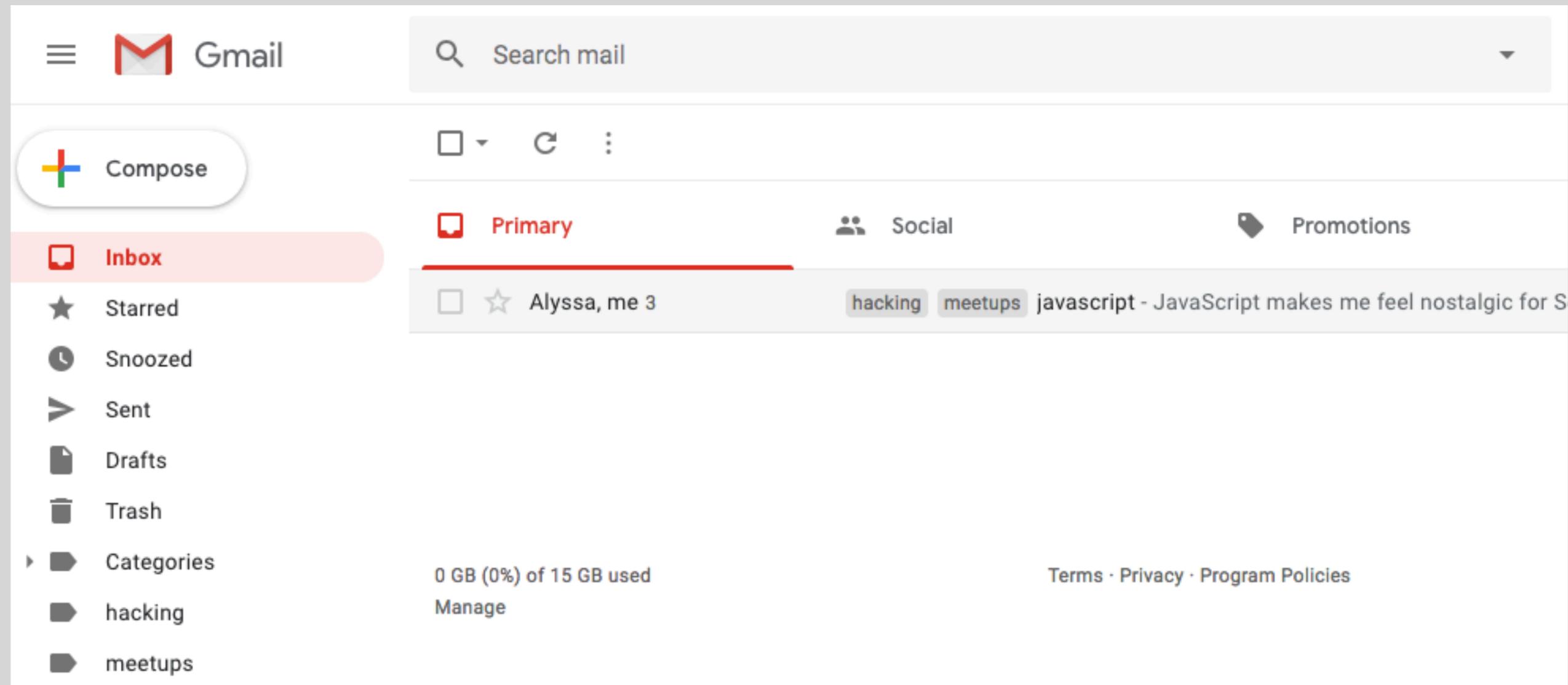
what new problems might this design result in?

a tricky aspect of this synchronization...

click on trash

				1–2 of 2	< >		

Empty Trash now (messages that have been in Trash more than 30 days will be automatically deleted)

☐	🗑	me, Alyssa (13)	hacking meetups todo	javascript - Hello a	11:48 am
☐	🗑	**Andy from Google**	Updates	**Ben, welcome to your new Googl**	9:01 am

filter on todo and trash

label:todo label:trash

				1–1 of 1	< >		

☐	🗑	me, Alyssa	Trash hacking meetups todo	javascript -	10:11 am

filter on something else

label:todo OR label:meetup

Some messages in Trash or Spam match your search. View messages.

filter on todo label

label:todo

There are no conversations with this label.

moira mailing lists as access control lists

WebMoira List Manager : Daniel Jackson

List Name: concept-design
Description: concept design
Attributes: active, moira mailing list
Permissions: private, visible
Last Modified: by dnj with moiraws on 25-nov-2024 20:00:17

Edit

what new problems might this design result in?

Members

Add Member: [ ] **Add**

Leave List: **Remove Me**

MIT Users

Daniel Jackson (dnj)   remove

Email Addresses

daniel@dnj.photo   remove

### Administrators

Owner: **dnj-admin** (List)

Change Owner: [ ] **Change**

Add Administrator: [ ] **Add**

Leave Owner List: **Remove Me**

MIT Users

Daniel Jackson (dnj)   remove

remove

making the trash a folder
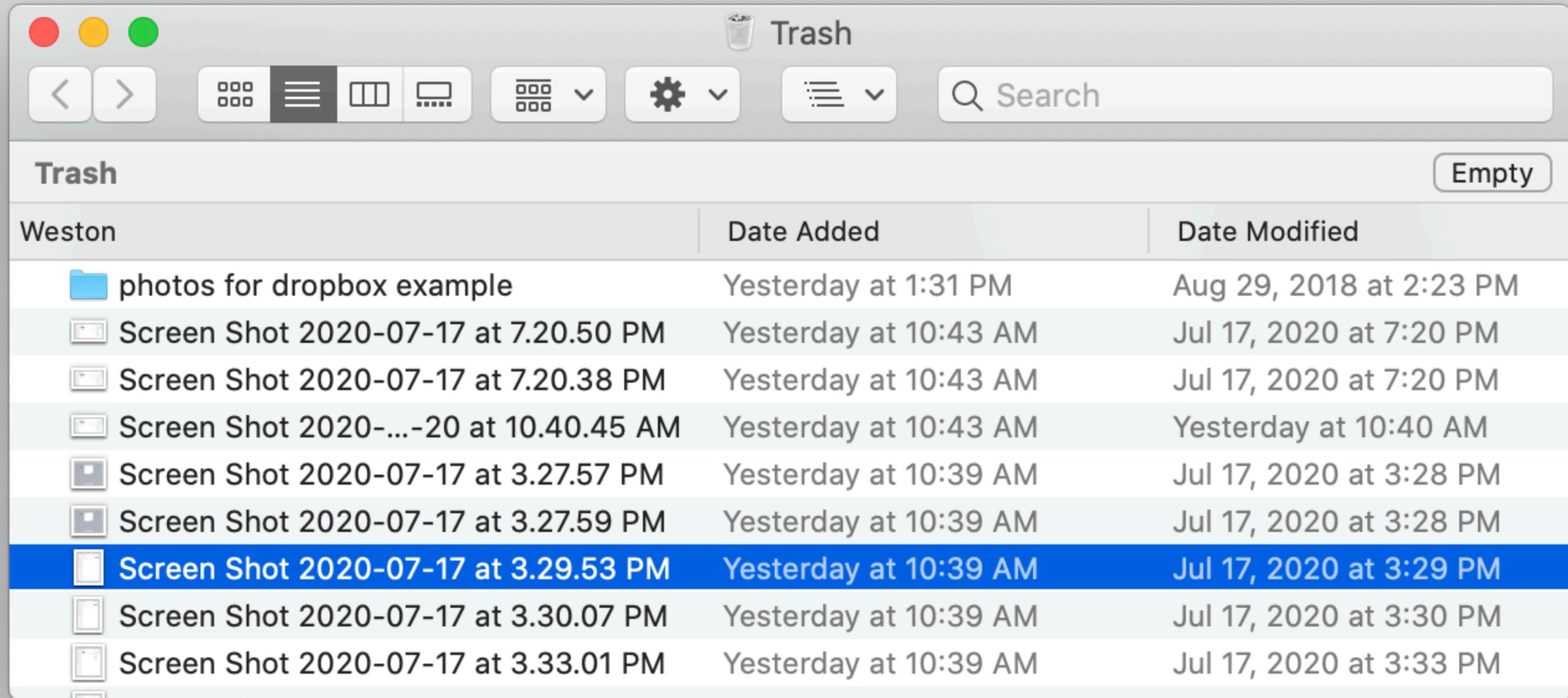
what new problems might this design result in?

exercise: the
QDM at Autodesk

what examples of the QDM in Autodesk products?
what power do they bring?
what additional complexities?

do you see opportunities to generalize existing concepts?
apply the QDM to improve on current conceptual structure?

takeaways

QDM examples

in social media app, want to allow downvote only if upvote
-> add **Karma** concept

in email client, want to let user see sent messages
-> add **Label** concept

in trash, want to allow sorting of files by date of deletion
-> add **Folder** concept, with "date added"

in photoshop, want to allow adjustment to be localized
-> generalize **Selection** concept from 0/1 to 0..1

in discussion forum, want only moderator to delete posts
-> add **RBAC** concept

in slide presentation app, want to break slides into sections
-> add **TreeOutline** concept (how about it, Powerpoint?)

keep concepts familiar & conventional

support more functionality than we needed

but sometimes additional complications

what's next

what does a set of concepts characterize?
a single product?
a family of products?
a domain?

how can structure such a set in a useful way?