

rethinking software design

Daniel Jackson · CSAIL · MIT

SATURN Conference · San Diego · May 4, 2016

what is software design?



| | designer | engineer |
|----------|--|---|
| elements | door, window, wall | column, beam, truss |
| goals | comfortable, convenient, attractive | structural integrity, durable, sustainable |

| 🗰 File Edit | View Special | | |
|--------------|---------------|----------------|--------------|
| | | | |
| | System Disk | | |
| 5 items | 232K in disk | 167K available | System Disk |
| Empty Folder | System Folder | Disk Copy | Guided Tour |
| Font Mover | Fonts | | |
| | | 다면 | |
| SysVersion | My Folder | | Trash |

| | designer | engineer |
|----------|--------------------------------|-----------------------------|
| elements | | function, object, type |
| goals | learnable, effective, tolerant | maintainable, correct, fast |

| | designer | engineer |
|----------|--------------------------------|-----------------------------|
| elements | ? | function, object, type |
| goals | learnable, effective, tolerant | maintainable, correct, fast |

| | designer | engineer |
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| elements | ? | function, object, type |
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| goals | learnable, effective, tolerant | maintainable, correct, fast |

| | designer | engineer | |
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| elements | ? | function, object, type | |
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|----------|--------------------------------|-----------------------------|--|
| elements | ? | function, object, type | |
| criteria | | decoupling & localization | |
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| elements | ? | function, object, type | |
| criteria | ? | decoupling & localization | |
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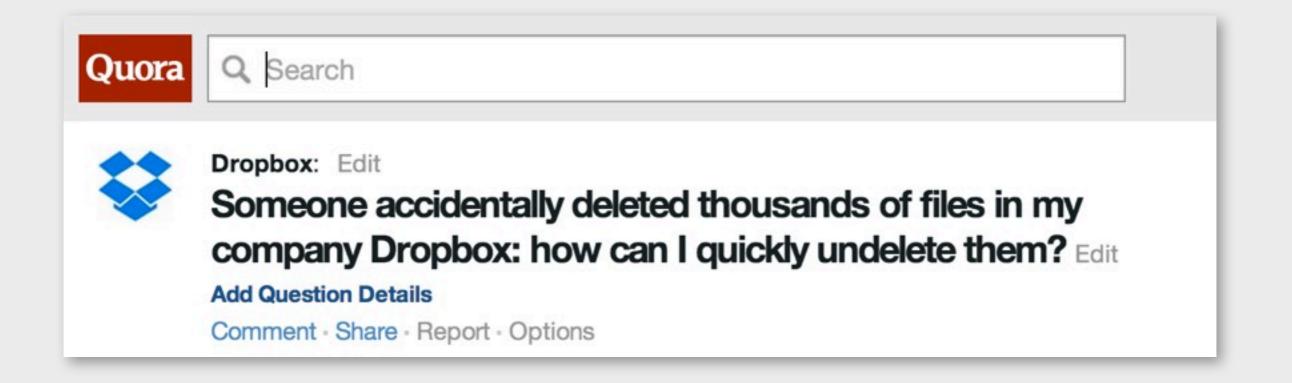
OBSESSIVE DETAILS AHEAD





That's quite obsessive, isn't it? Jonathan Ive in "Objectified"

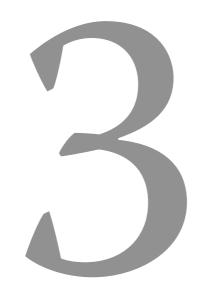
> The details are not the details. These make the design. attributed to Charles Eames by Garrett



survey of MIT dropbox users

correctly predicting behavior





software design problems

email categories

gmail's categories

| Primary | | Social 23 new | Promotions 100+ new | + |
|---------|--------------------------|-------------------------|--|---|
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| ☆ 🗅 | betterbatonrougejobs.co | m Job Update 2015-0 | 08-26 - Looking For An Advantage W Aug 2 | 6 |

category tab settings

Categories: ✓ Primary Learn more ✓ Social ✓ Promotions Updates □ 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.

Everything You Need to Know About Gmail's New, Super-Confusing Layout



Melanie Pinola

Filed to: GMAIL 6/07/13 9:00am

301,482 🕚 12 📩 🗸



Home > Quick Tech Tip: Disabling Gmail's Category Tabs Quick Tech Tip: Disabling Gmail's Category Tabs

Mon, 07/29/2013 - 12:17 | Chuck Gray in LibraryPoint Blog Tech Tutorials Teen Blog Tech Answers Science and Technology Self-Help and Instructional



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!

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

f Like < 55

in Share

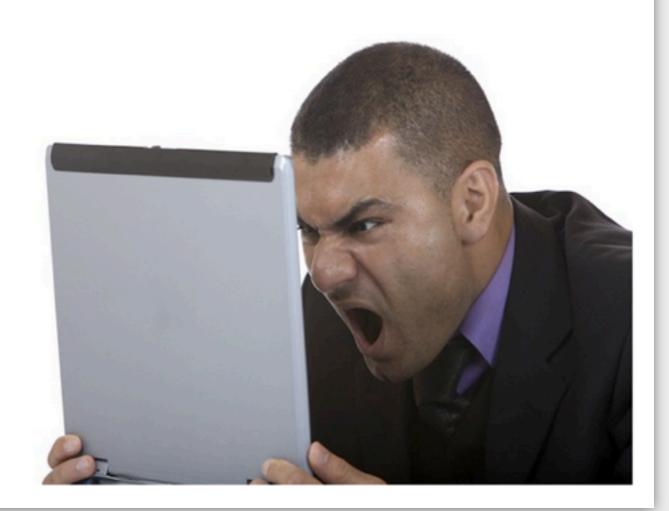
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By Mark Wilson Published 2 years ago

71 Comments

Like many Gmail users, I greeted the news of the introduction of tabs to the interface with a degree of anticipation -- now it was just a matter of waiting for the feature to roll out so I could try it for myself. Earlier today I was randomly signed out of my Gmail account, and after signing back in and checking the settings menus, I could see that tabs were now available to me. Excitement was short-lived, however; it quickly became apparent that this new feature is a disaster.



8+1

37

Tweet

30

how google explains labels (!)



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.

what you can't do

what you can't do

associate tabs with labels feature available only for categories

what you can't do

associate tabs with labels feature available only for categories

use tabs outside inbox tabs disappear when you filter on a label



camera settings

my camera fuji x100s





image quality setting



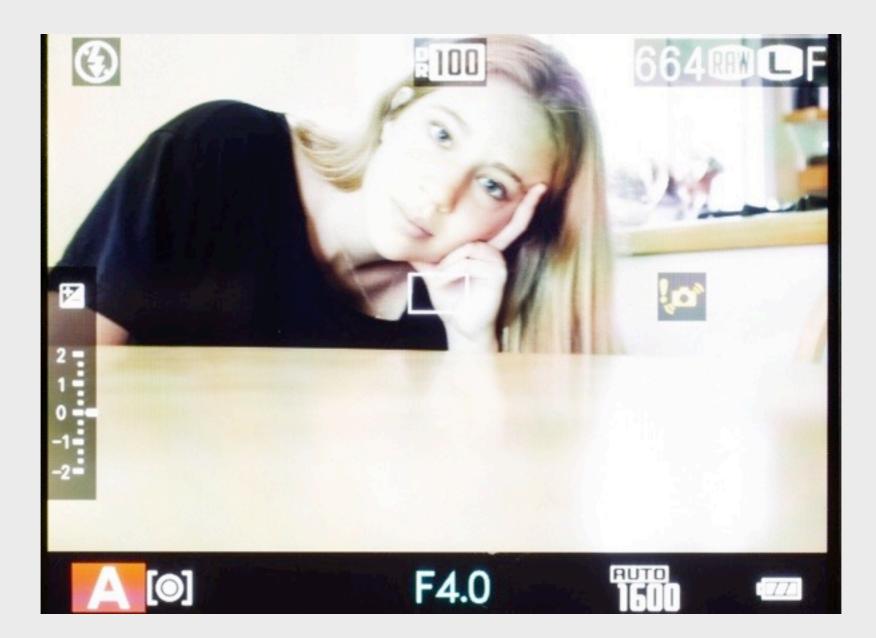
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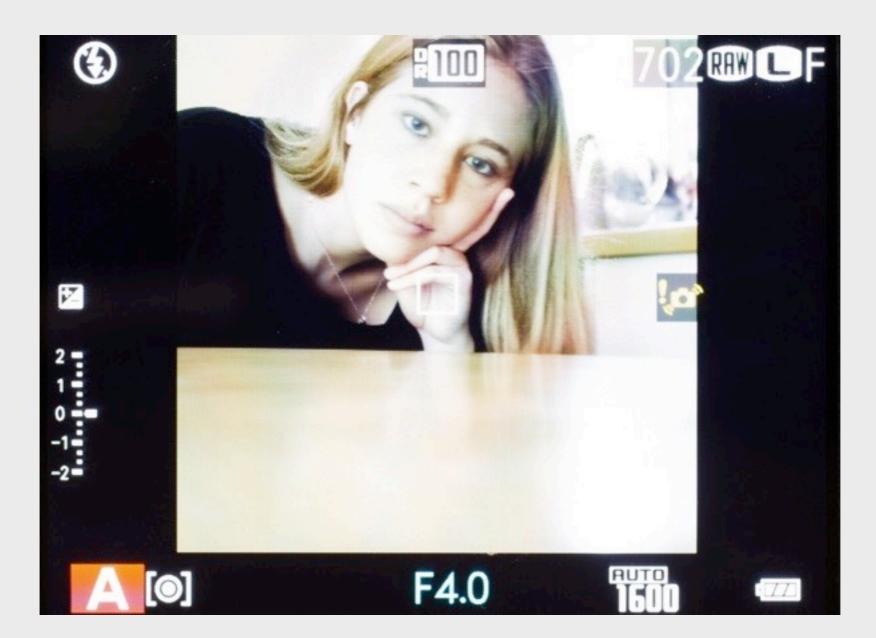


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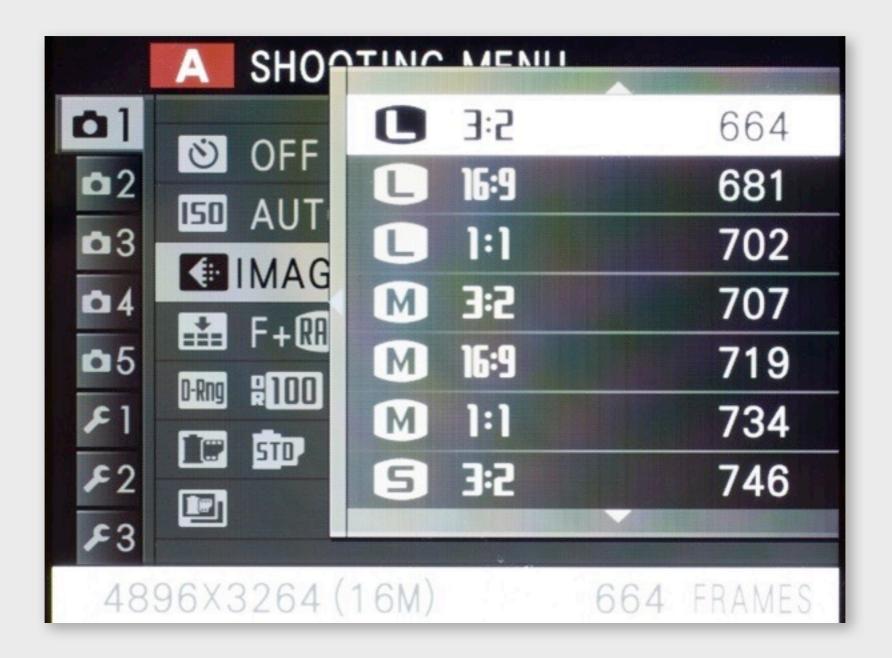


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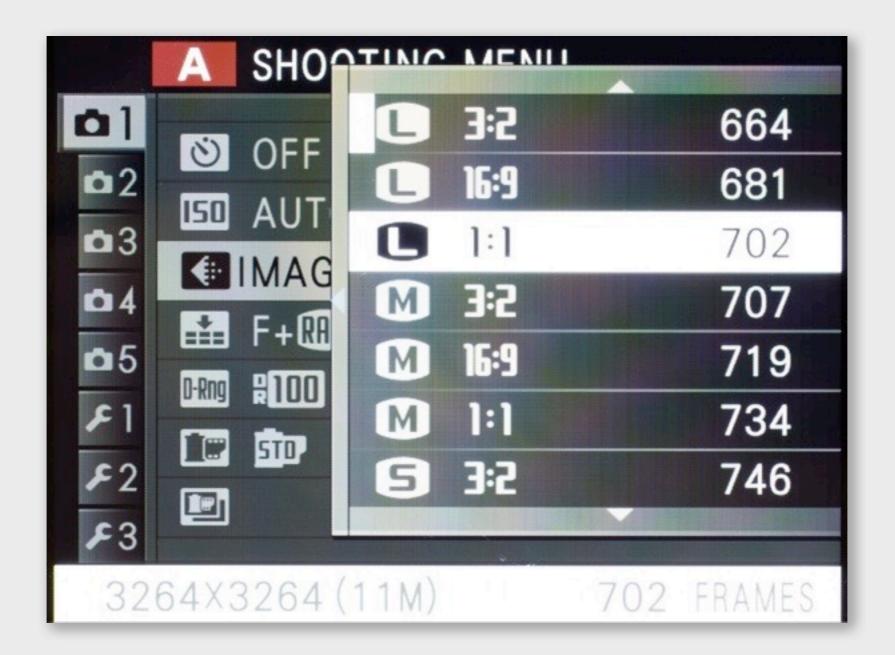
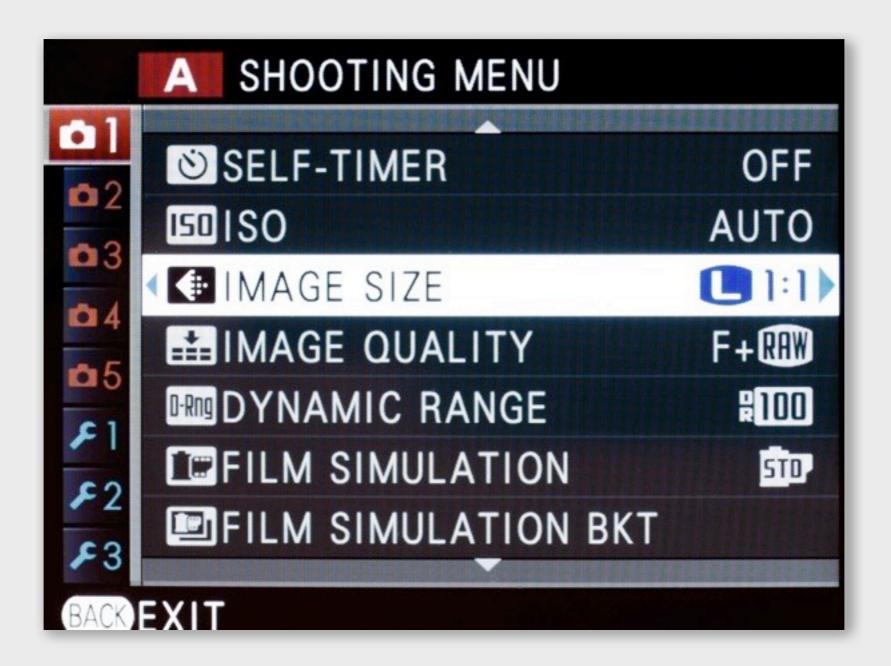


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non-standard ratio + raw?



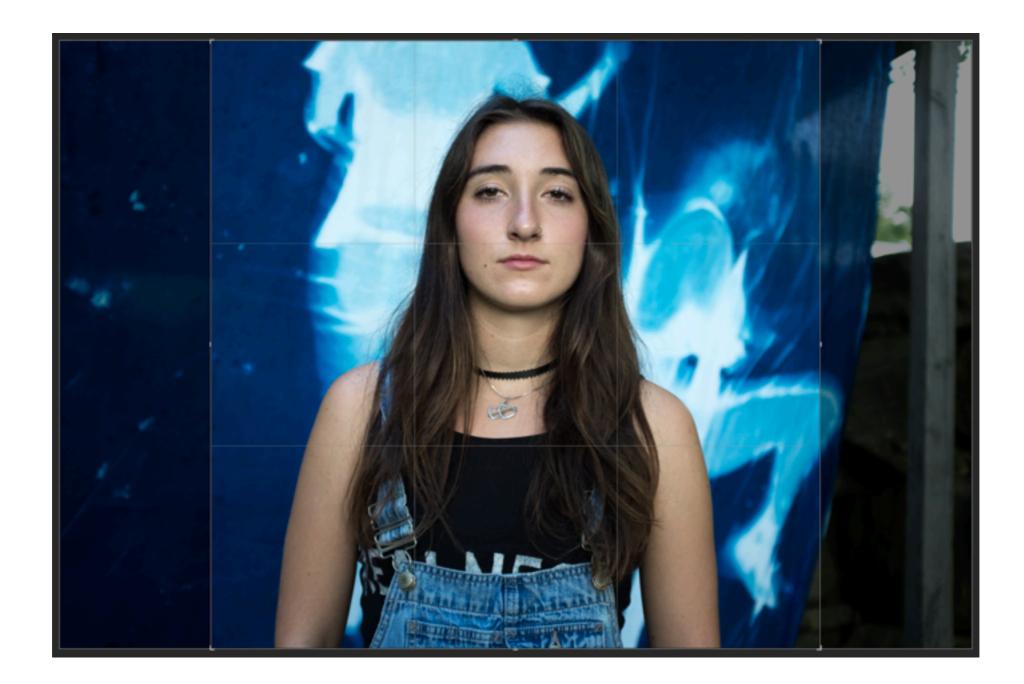
what you can't do

non-standard aspect ratio + raw

even though raw images get nice nondestructive crop!

what you can't do

non-standard aspect ratio + raw even though raw images get nice nondestructive crop!





fonts & styles

what's a font?

| General | Style Name: Emphasis |
|---|---|
| Basic Character Formats Advanced Character Formats Character Color OpenType Features Underline Options Strikethrough Options | Location: Basic Character Formats Font Family: Font Style: Italic Size: + Kerning: + Case: + Underline Ligatures No Break |
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what's a font?

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what you can't do

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minor nitpicks? in all cases, can't do useful things

minor nitpicks? in all cases, can't do useful things

coding bugs? code seems to meet a coherent spec

minor nitpicks? in all cases, can't do useful things

coding bugs? code seems to meet a coherent spec

user interface flaws?

interfaces are clear and faithful to function

getting to the essence of an app

what characterizes an app?

Apple Mail

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Apple Mail

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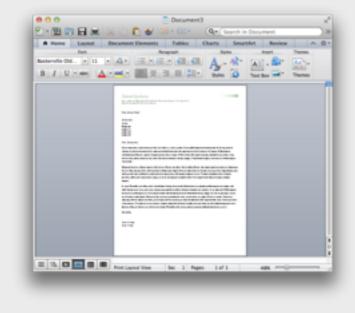


Apple Mail

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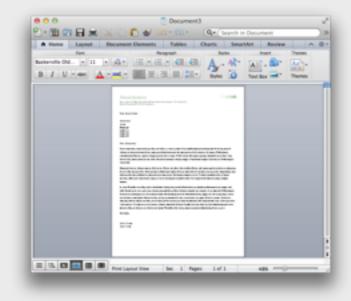


Apple Mail

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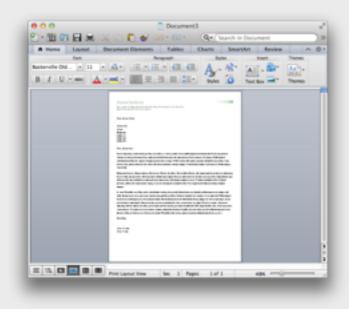


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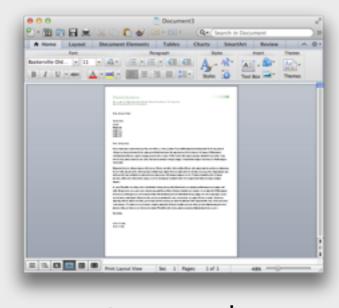
Tweet Hashtag Following

Apple Mail

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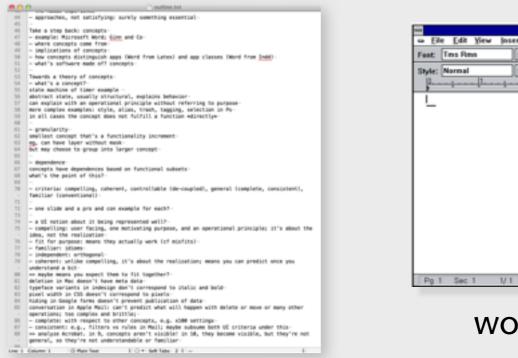
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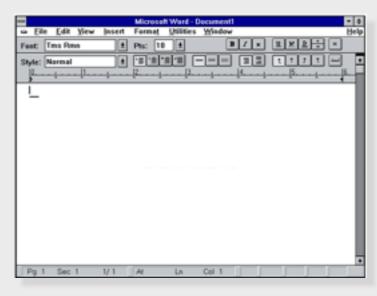
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| 81. | deletion in Rac doesn't have meta data- |
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| 63 | pixel width in CSI deen't correspond to pixels- |
| 14 | hiding in Google forms doesn't prevent publication of data- |
| 85 | conversation in Apple Mail: can't predict what will happen with delete or move or many other |
| | operations; too complex and brittle;- |
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text editor



text editor

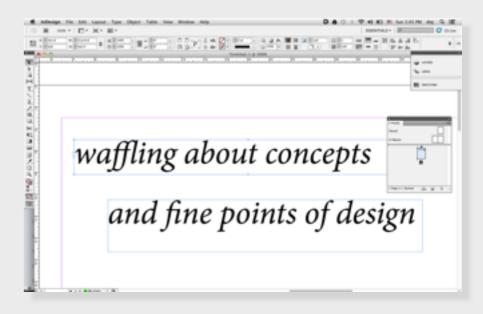


word processor



text editor



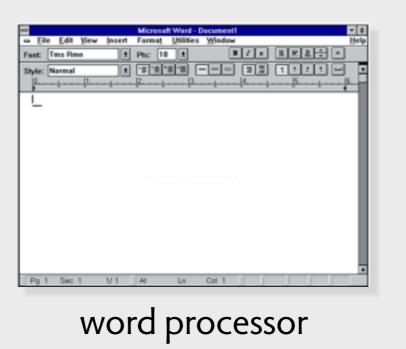


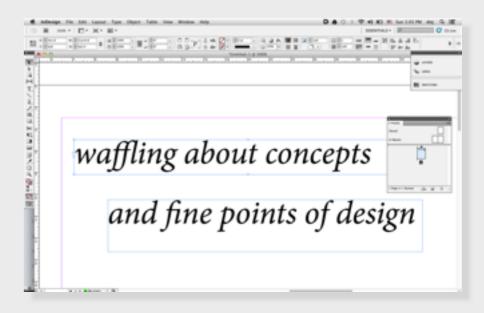
desktop publishing app



text editor

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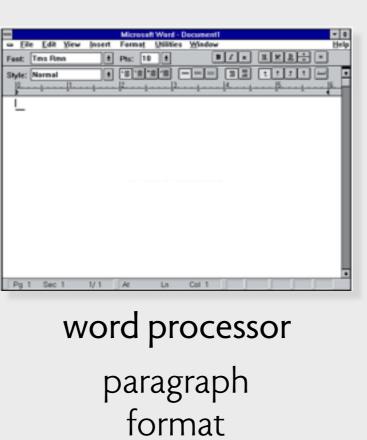


desktop publishing app

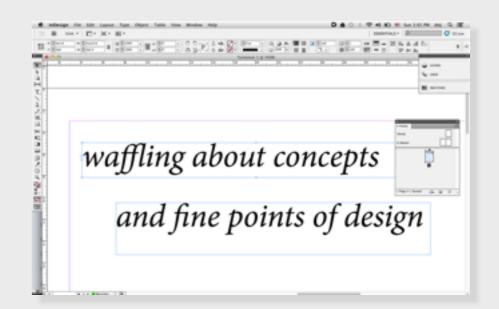


text editor

line buffer



style



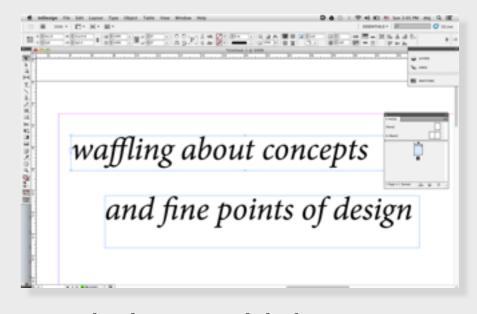
desktop publishing app



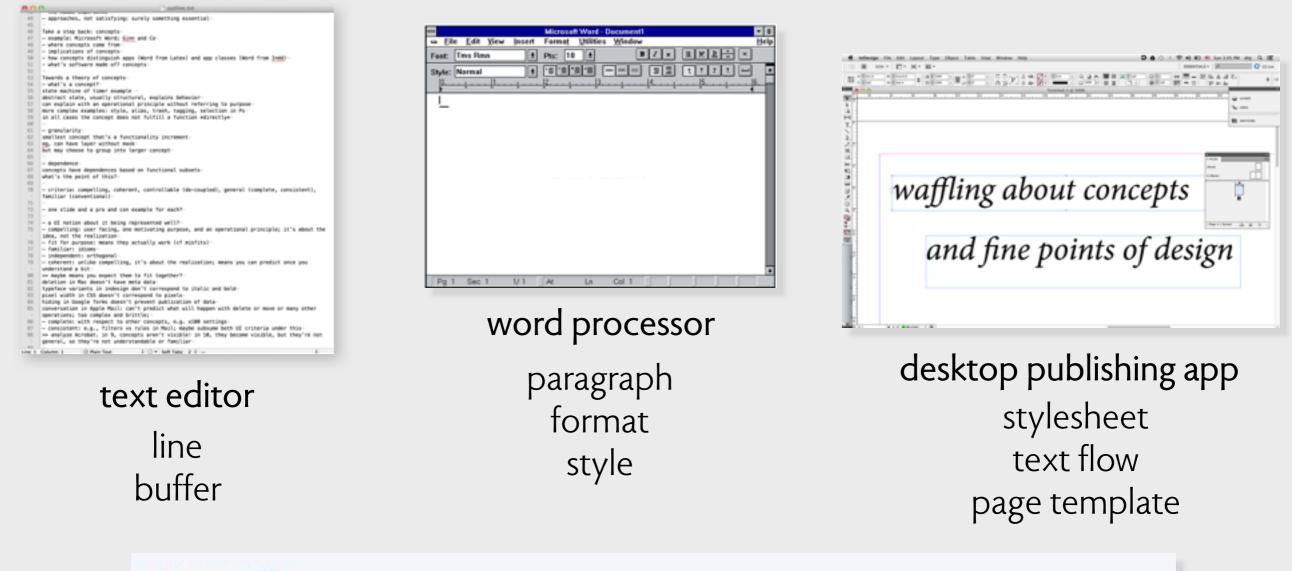
text editor

line buffer





desktop publishing app stylesheet text flow page template



jamonh

Oct 22, 2013 7:19 PM

Just upgraded to the new Pages and can't find a way to link text boxes anymore like

http://www.macobserver.com/tmo/article/pages-linking-text-boxes

Am I missing something, or is it really not possible anymore?

where are Word's concepts from?

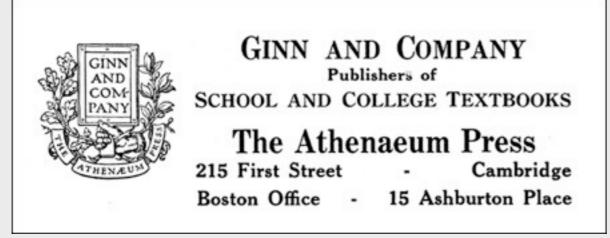
where are Word's concepts from?



where are Word's concepts from?



Charles Simonyi: brought key concepts to Word from Xerox PARC



Ginn & Co, since 1868



GINN AND COMPANY Publishers of SCHOOL AND COLLEGE TEXTBOOKS The Athenaeum Press

215 First Street - Cambridge Boston Office - 15 Ashburton Place

Ginn & Co, since 1868

READY: Select operand or type command Last command was LOOK {A_substa..!_wayJ} {Computer...JXEROXJ}\$

Personal Distributed Computing The Alto and Ethernet Software

Butler W. Lampson Digital Equipment Corp. Systems Research Center

Abstract

The personal distributed computing system based on the Alto and the Ethernet was a major effort to make computers help people to think and communicate. A complex and diverse collection of software was built to pursue this goal, ranging from operating systems, programming environments, and communications software to printing and file servers, user interfaces, and applications such as editors, illustrators, and mail systems.

1. Introduction

A substantial computing system based on the Alto [Thacker et al.

Computer Science Laboratory Xerox Palo Alto Research Center 3333 Coyote Hill Road Palo Alto, California 94334

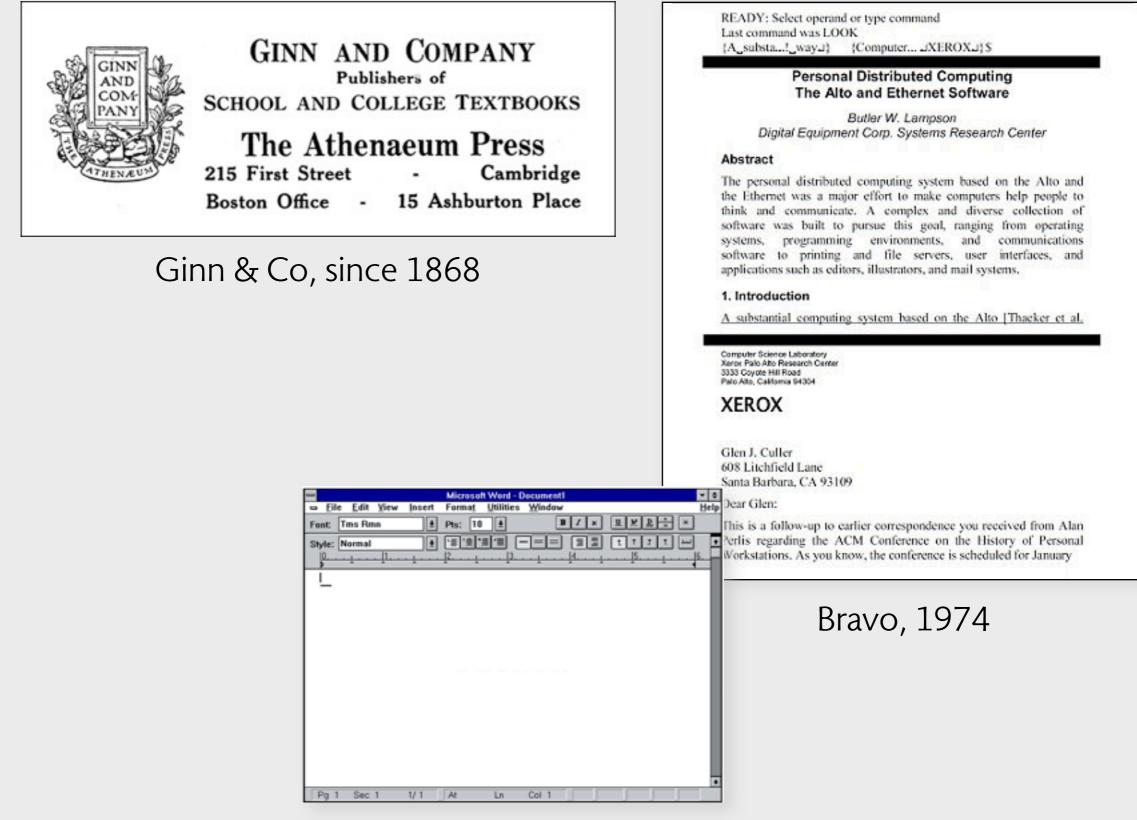
XEROX

Glen J. Culler 608 Litchfield Lane Santa Barbara, CA 93109

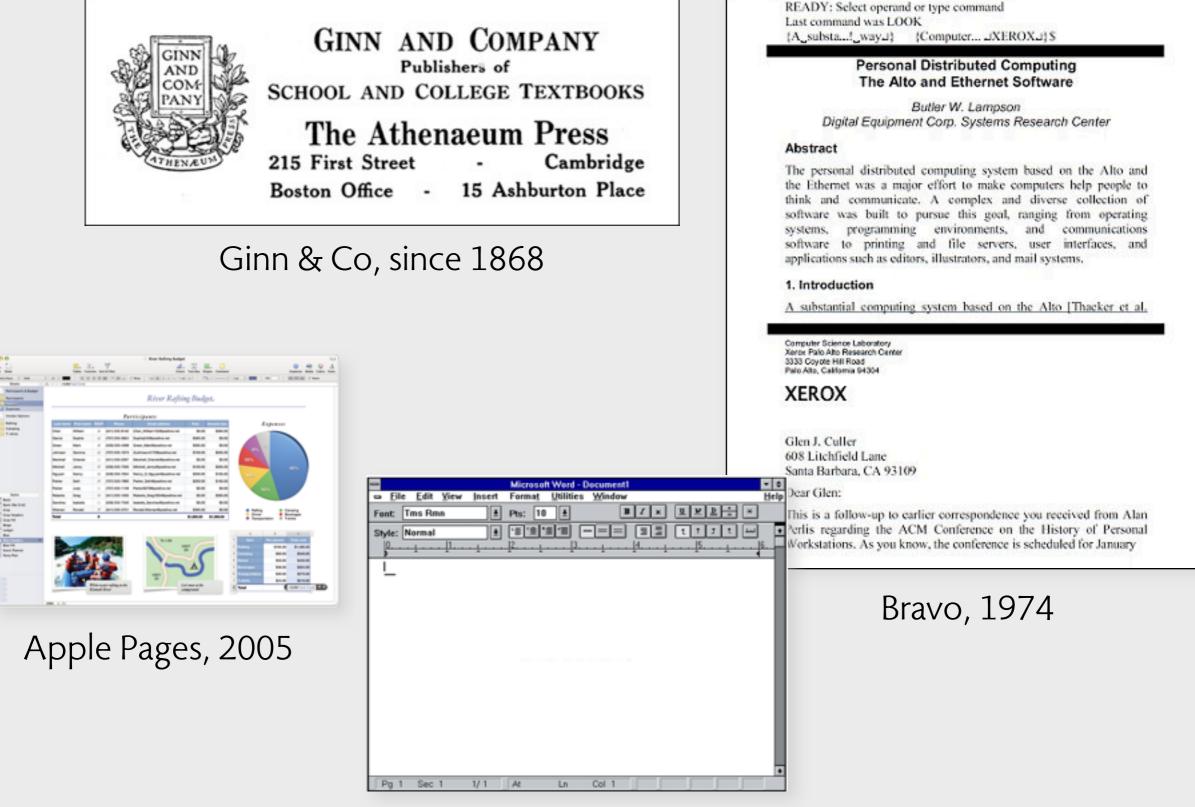
Dear Glen:

This is a follow-up to earlier correspondence you received from Alan Perlis regarding the ACM Conference on the History of Personal Workstations. As you know, the conference is scheduled for January

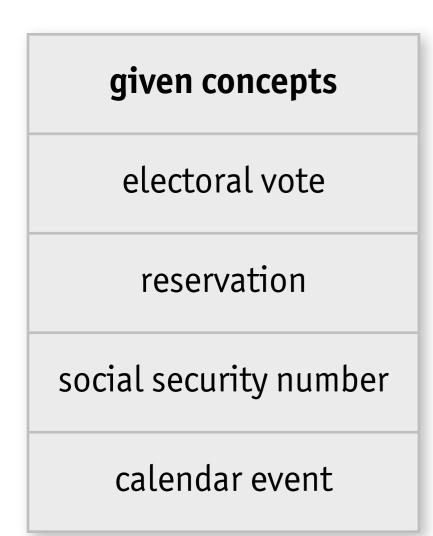
Bravo, 1974



Microsoft Word, 1983

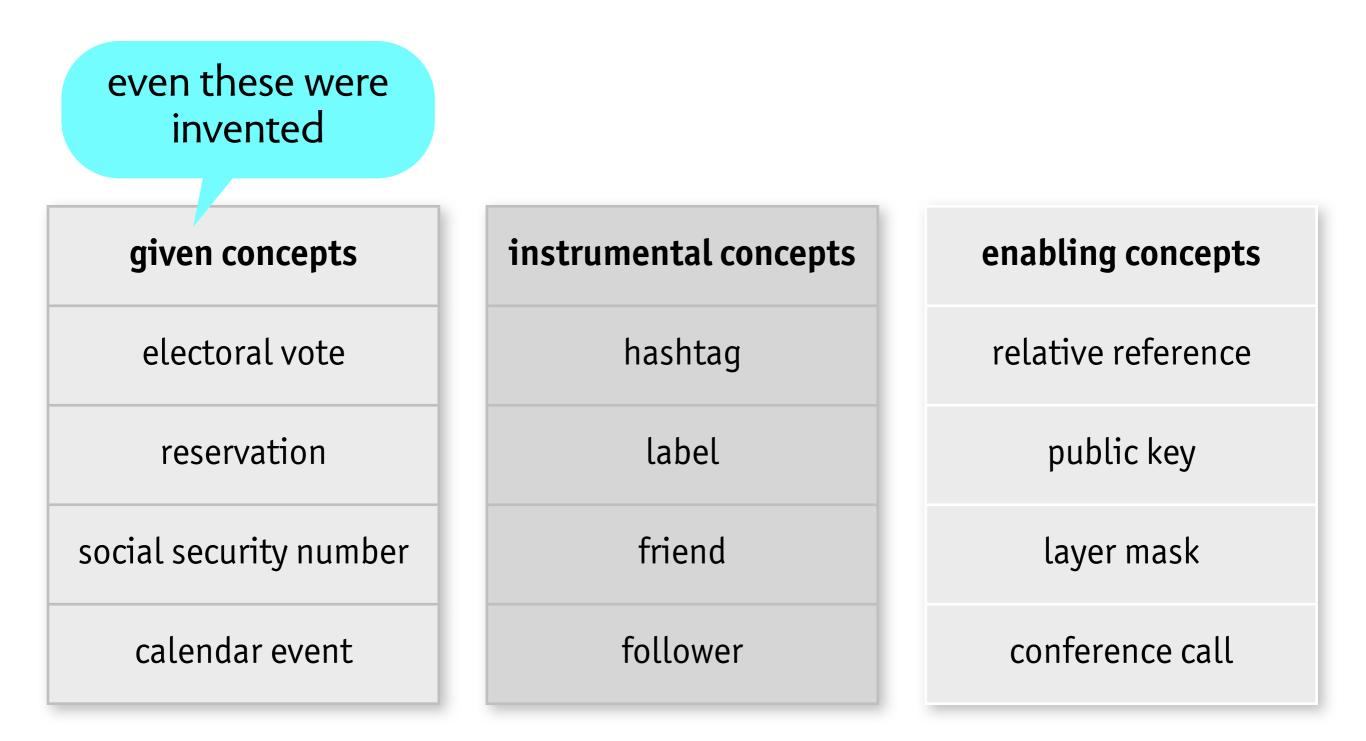


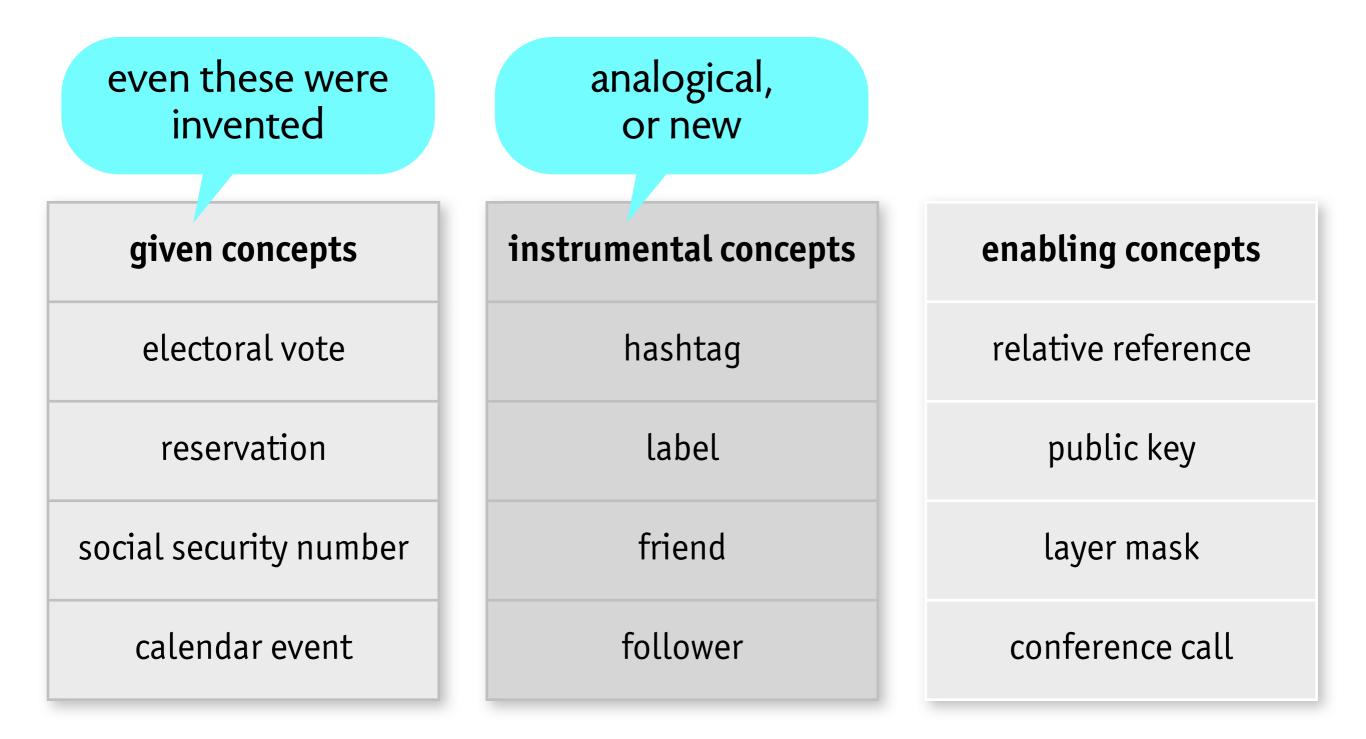
Microsoft Word, 1983

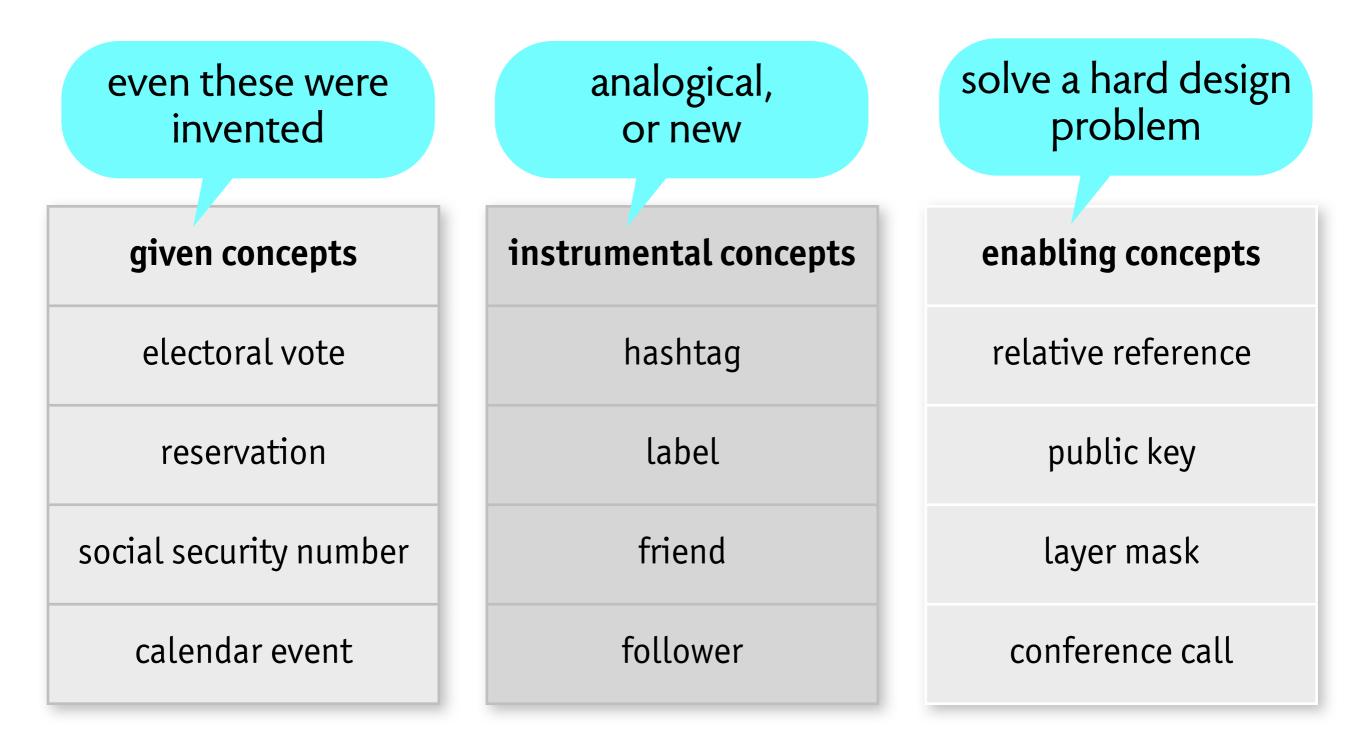


| given concepts | instrumental concepts |
|------------------------|-----------------------|
| electoral vote | hashtag |
| reservation | label |
| social security number | friend |
| calendar event | follower |

| given concepts | instrumental concepts | enabling concepts |
|------------------------|-----------------------|--------------------|
| electoral vote | hashtag | relative reference |
| reservation | label | public key |
| social security number | friend | layer mask |
| calendar event | follower | conference call |







how to sketch a concept

how would you explain this?

how would you explain this?



an archetypal scenario

separates essential from accidental aspects shows how purpose is fulfilled by combination of user & system actions

an archetypal scenario

separates essential from accidental aspects shows how purpose is fulfilled by combination of user & system actions



"**if** you pull a tab out, **then** when that time slot comes around, the light will go on"

an archetypal scenario

separates essential from accidental aspects shows how purpose is fulfilled by combination of user & system actions



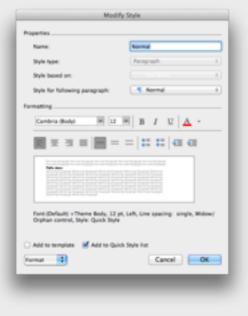
Michael Polanyi



"**if** you pull a tab out, **then** when that time slot comes around, the light will go on"

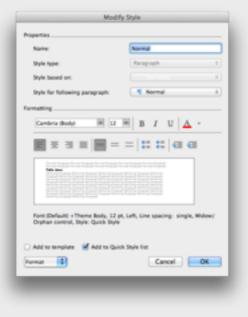






"**if** you change a style's format, **then** all paragraphs of that style will change format accordingly"



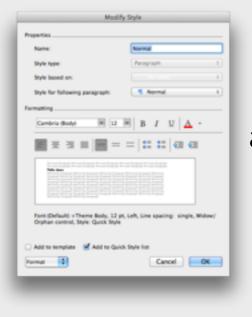


"**if** you change a style's format, **then** all paragraphs of that style will change format accordingly"



"if you tag a photo, then all friends of the person tagged will be able to see the photo"

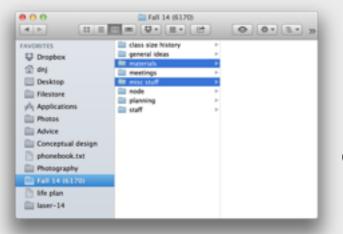




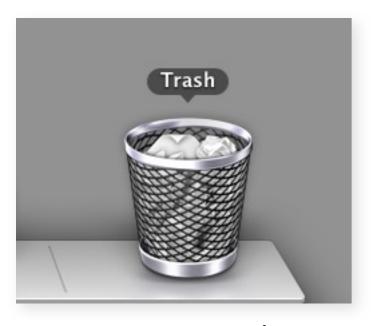
"**if** you change a style's format, **then** all paragraphs of that style will change format accordingly"



"**if** you tag a photo, **then** all friends of the person tagged will be able to see the photo"

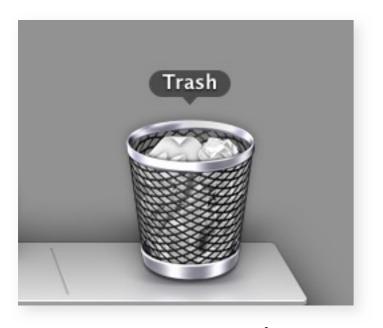


"**if** you select some files and they belong to a folder with keyboard focus, **then** pressing delete will move the files to the trash"



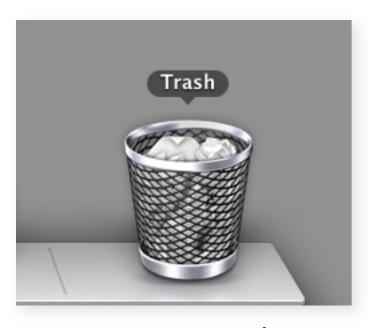
concept: trash

purpose: allow undo of deletions



concept: trash

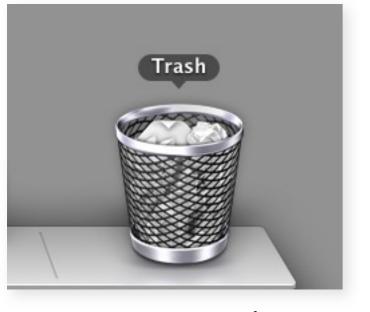
purpose: allow undo of deletions



concept: trash

operational principle: if you delete a file, it moves to a special folder; you can restore from there, but emptying it removes contents for good (and makes space on disk)

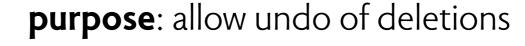
purpose: allow undo of deletions

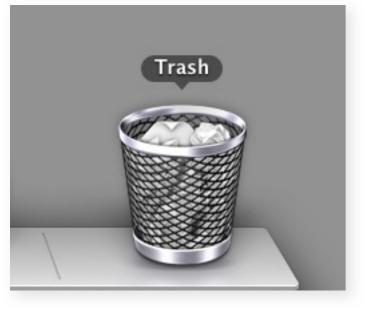


concept: trash

operational principle: if you delete a file, it moves to a special folder; you can restore from there, but emptying it removes contents for good (and makes space on disk)

misfit: if you delete a file on an external drive, you cannot reclaim the space until you empty the trash, but then you'll lose the ability to restore files deleted from the main drive





concept: trash

operational principle: if you delete a file, it moves to a special folder; you can restore from there, but emptying it removes contents for good (and makes space on disk)

misfit: if you delete a file on an external drive, you cannot reclaim the space until you empty the trash, but then you'll lose the ability to restore files deleted from the main drive

misfit: if you delete an old file and change your mind, you may not be able to find it again in the trash (if there are many deleted files and you forgot the file's name)

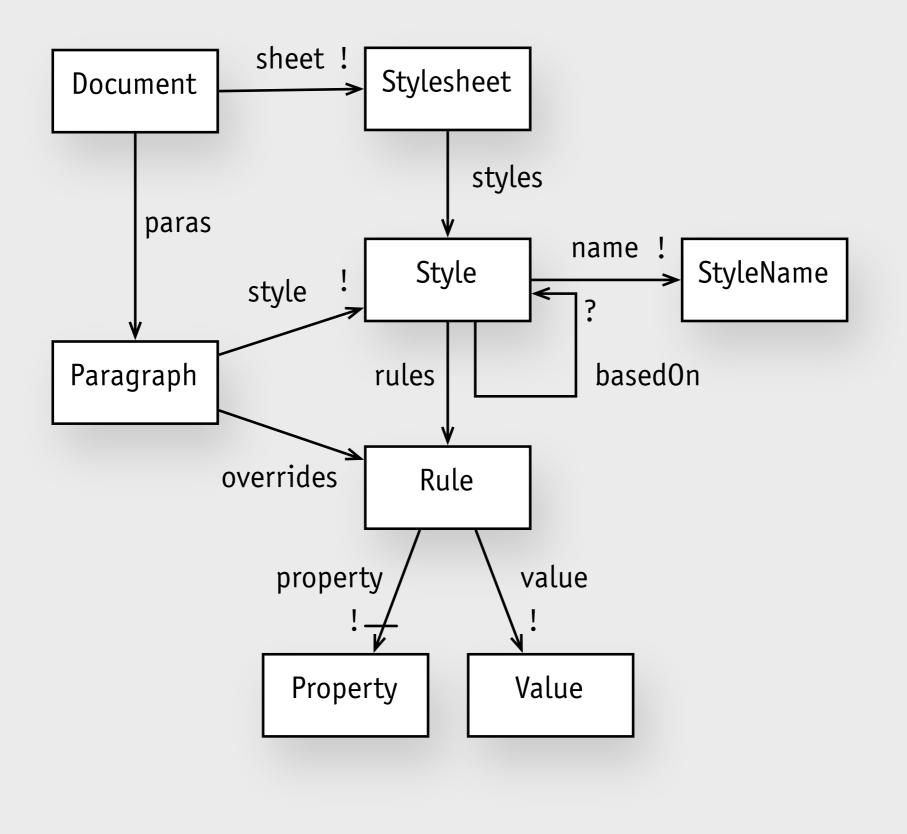
how to model a concept

example word styles

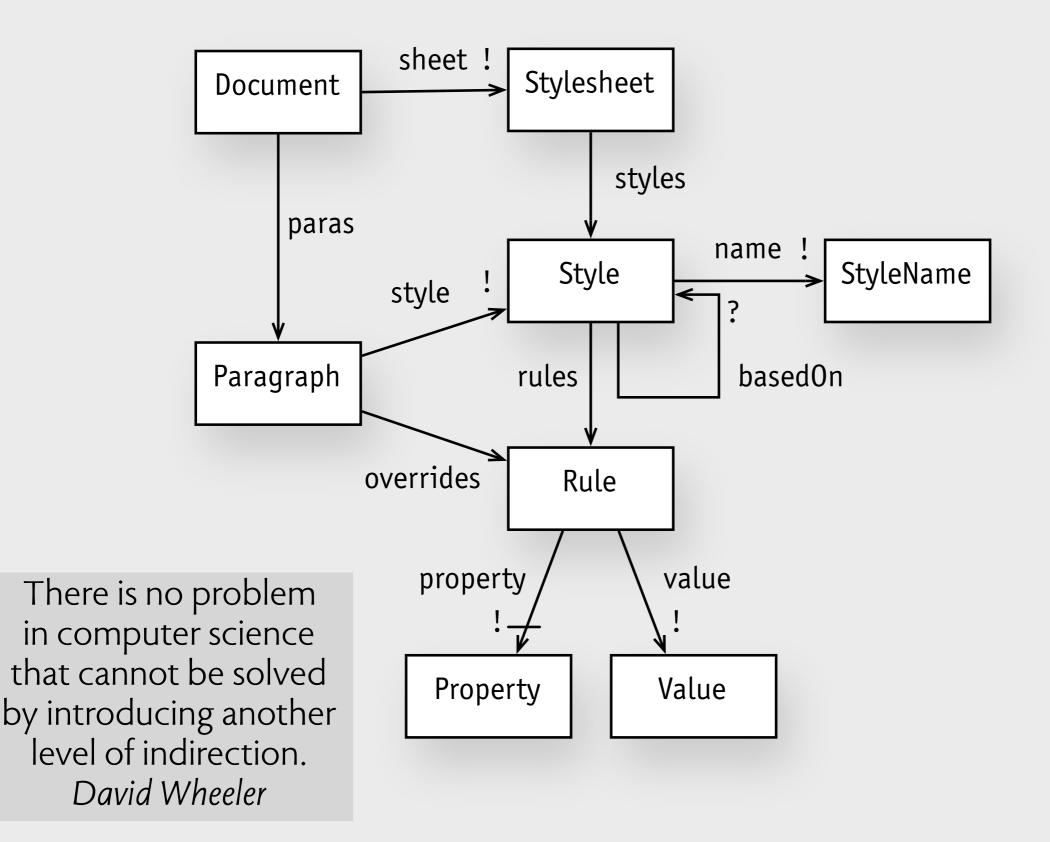
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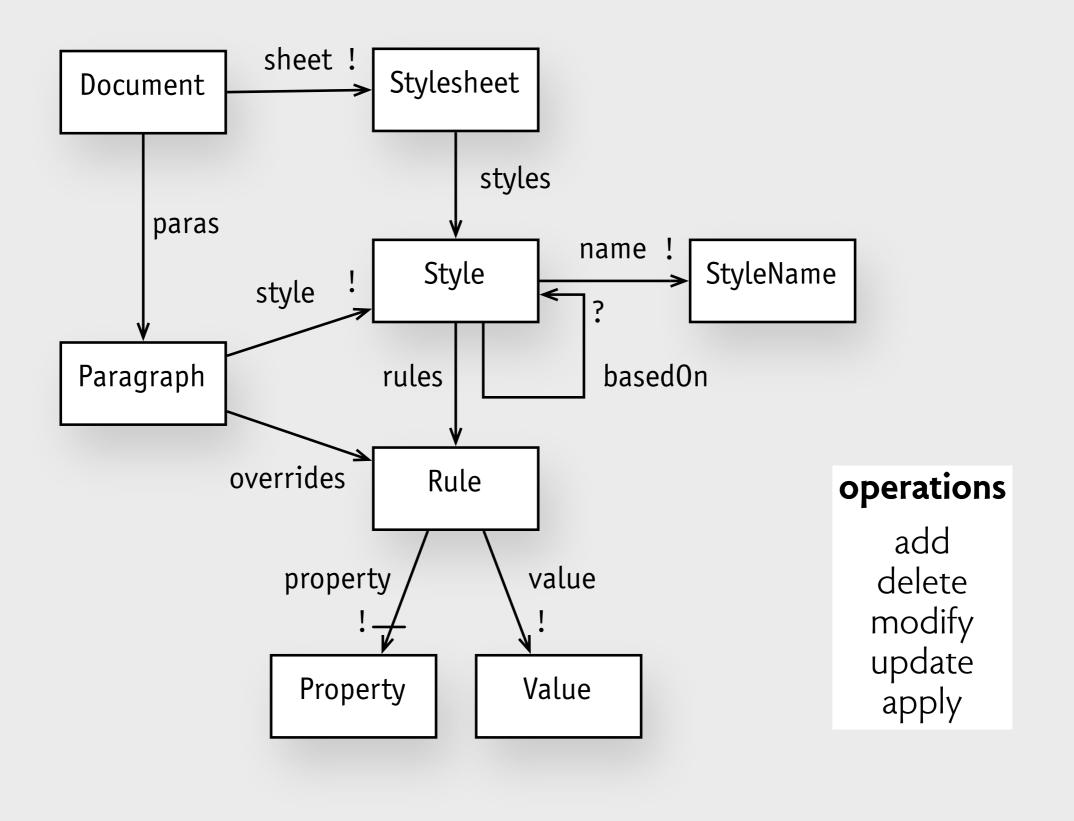
data model word styles

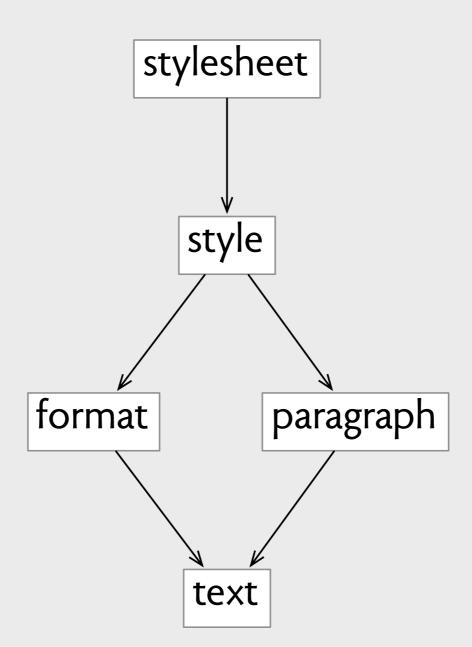


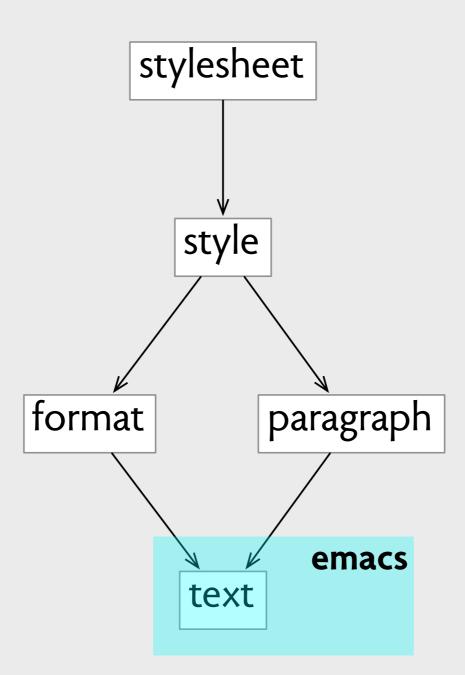
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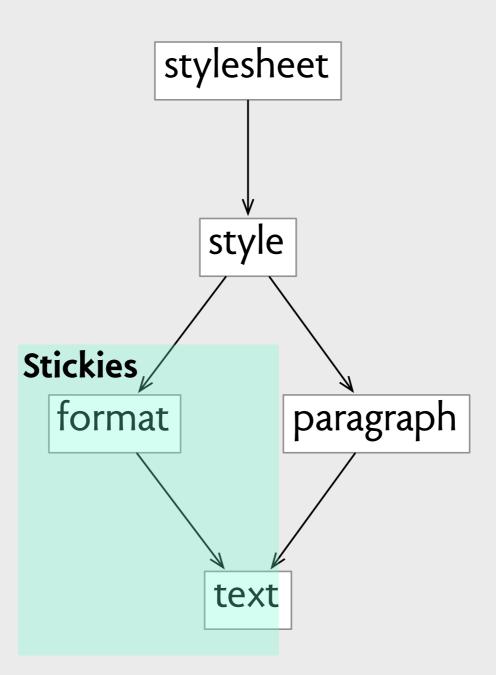


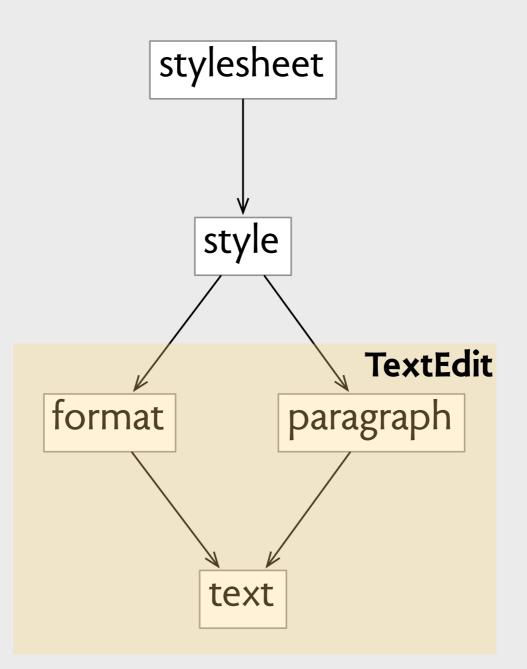
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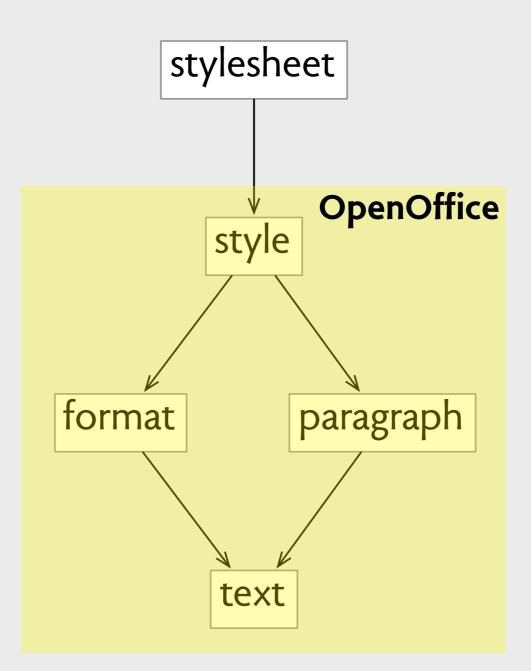






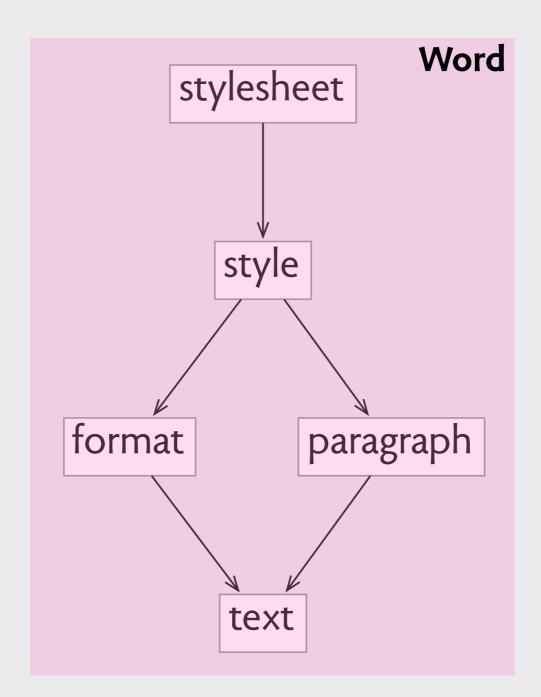






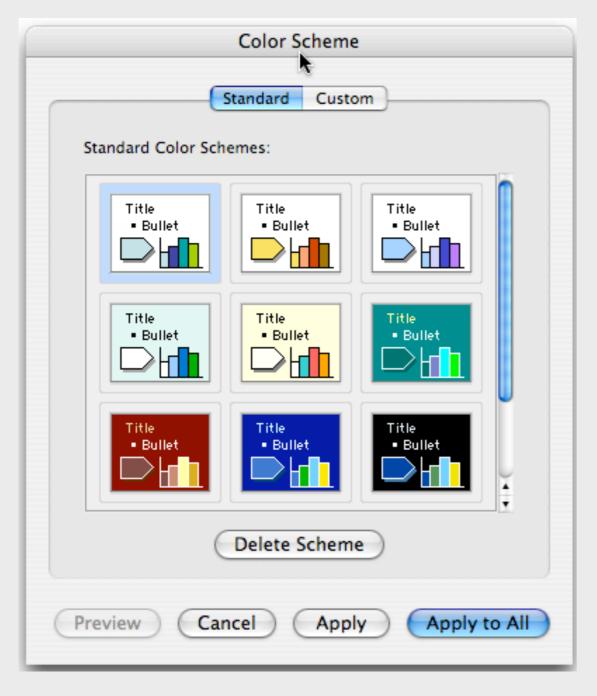
concept dependences

 $\langle c,c' \rangle \in depends \Leftrightarrow \forall a: apps \cdot c \in concepts(a) \Rightarrow c' \in concepts(a)$

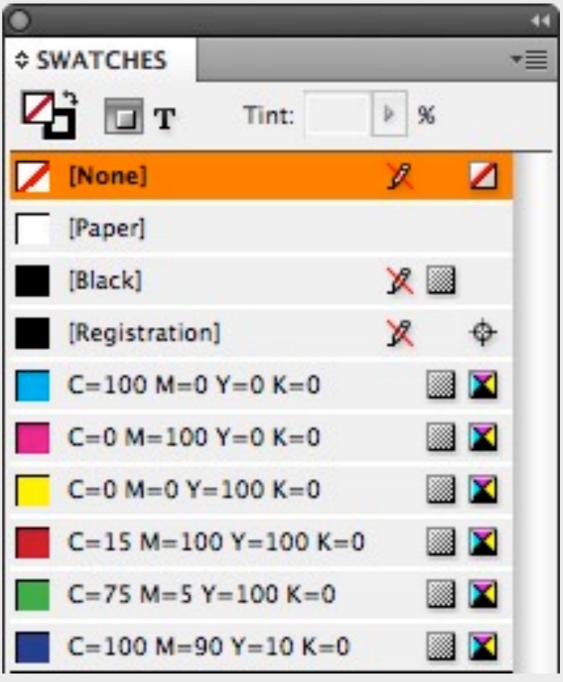


how to reuse a concept

other instantiations style



Powerpoint schemes



Indesign swatches

non-instantiations style

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Apple color picker swatch-color mapping fixed

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Write 2 text editor

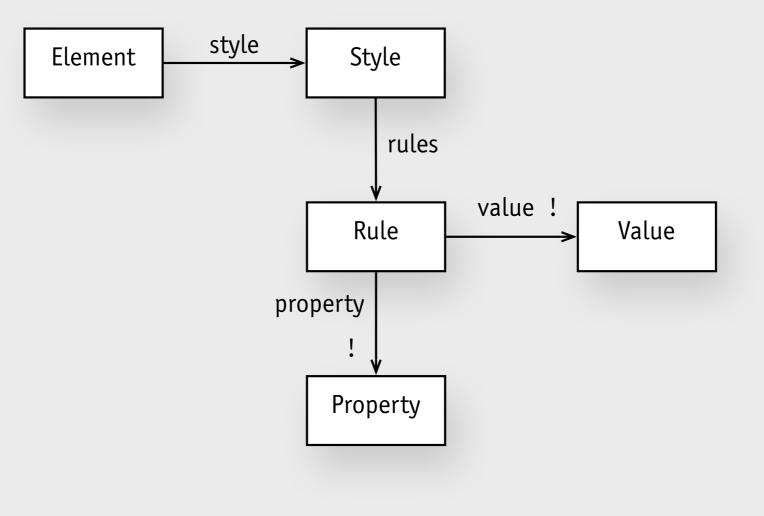
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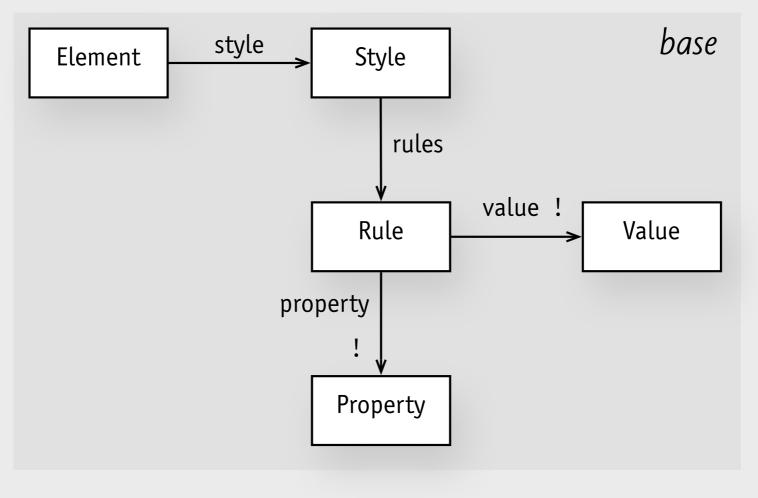
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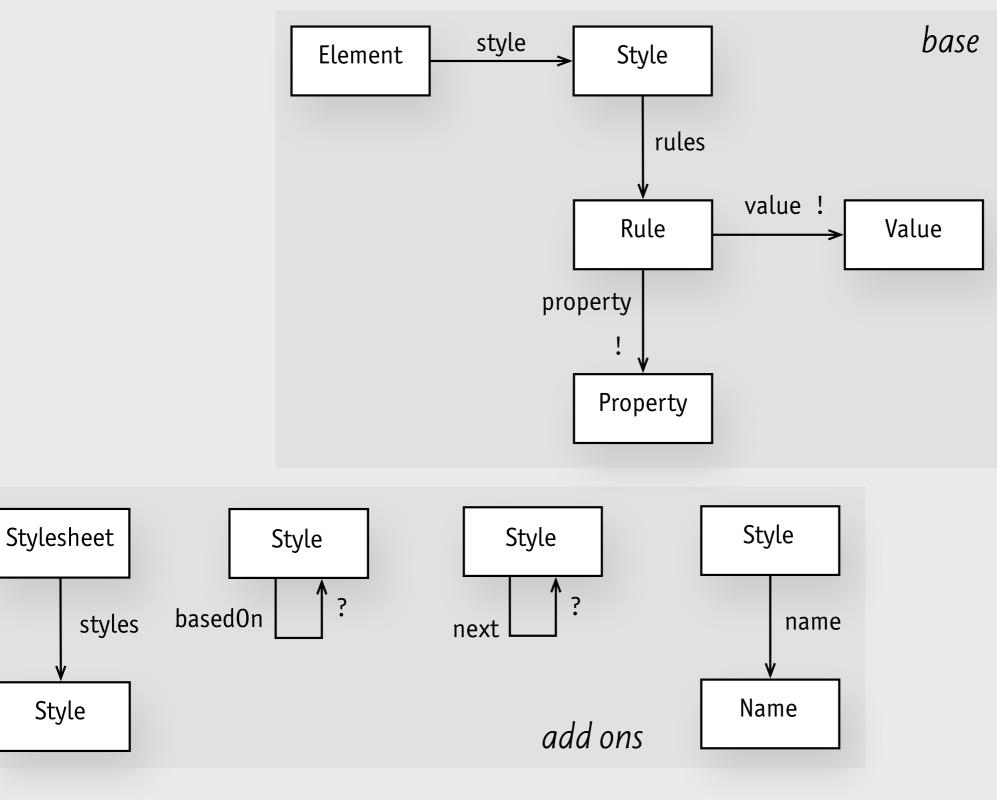
Apple color picker swatch-color mapping fixed

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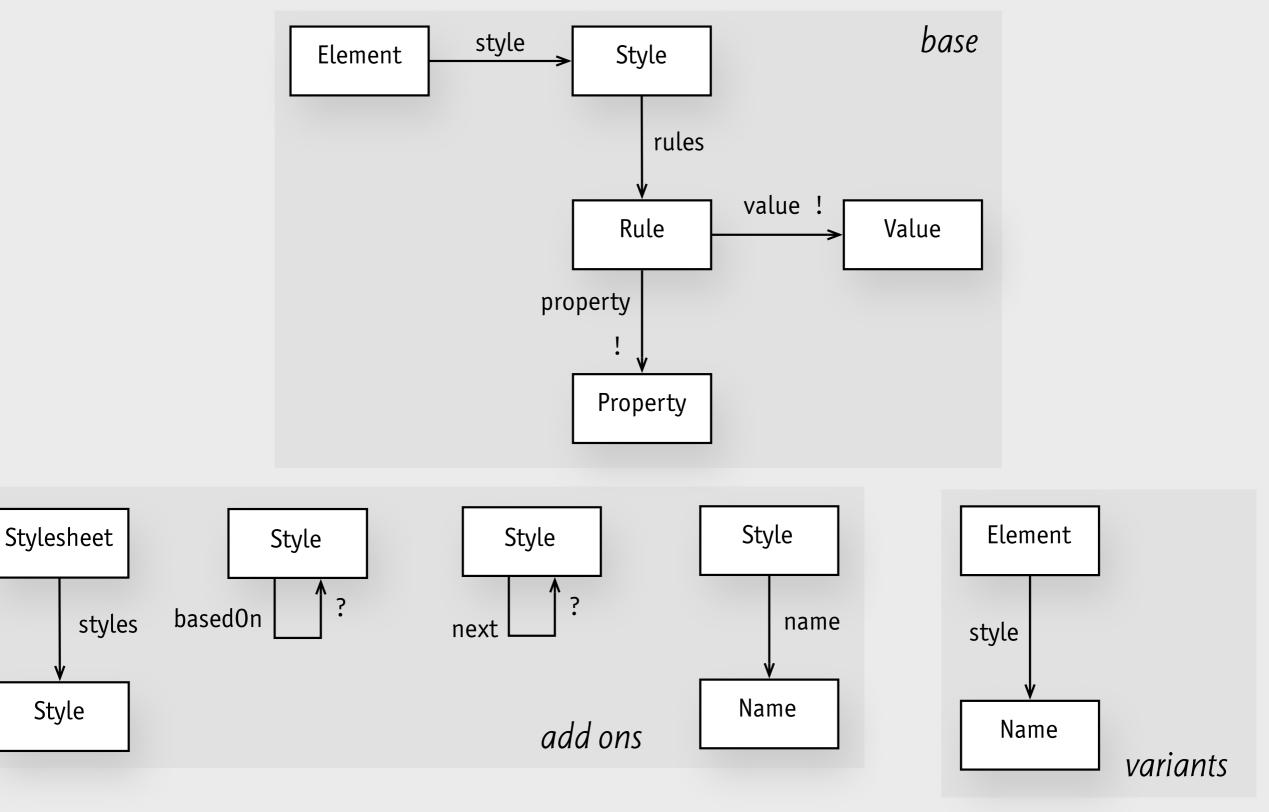
Write 2 text editor **no element-style mapping**







Style



generic concept parts

| part | example |
|-------------|--|
| name | Style |
| purpose | make it easy to maintain consistent format across set of elements |
| sample uses | Text formatting in word processors/layout apps (Word, Indesign, Pages, etc); rules in CSS; color themes in Powerpoint. |
| model | base, add-ons, variants |
| operations | add, delete, modify, apply, update |
| related to | StyleBuffer, Stencil, Master |
| issues | optional rules problem |



slides in Keynote



slides in Keynote



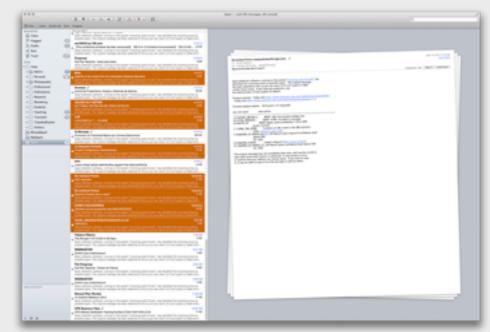
photos in Adobe Lightroom



slides in Keynote



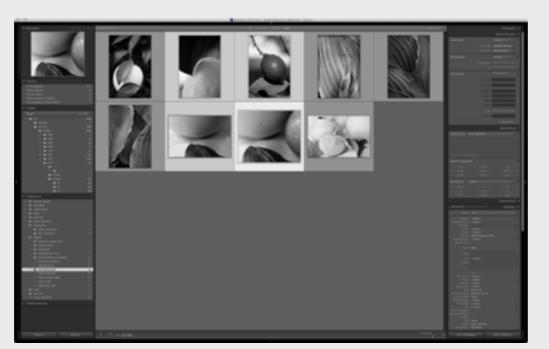
photos in Adobe Lightroom



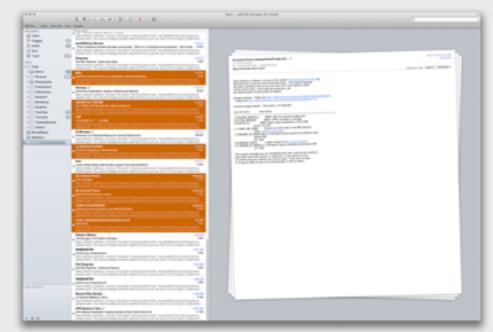
messages in Apple Mail



slides in Keynote



photos in Adobe Lightroom



messages in Apple Mail

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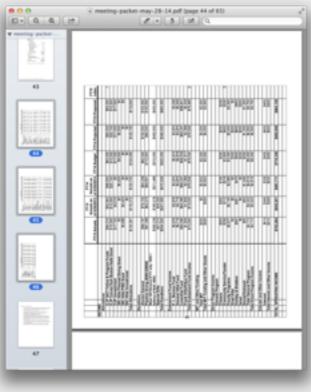
notes in Evernote



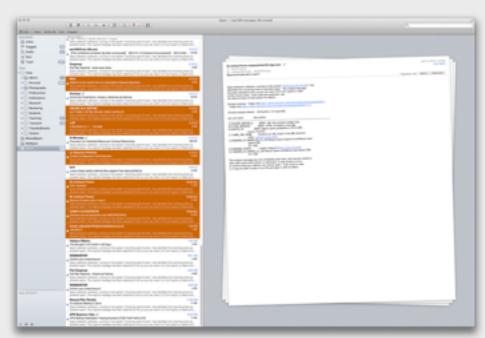
slides in Keynote



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messages in Apple Mail

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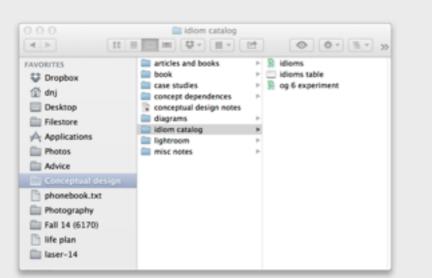
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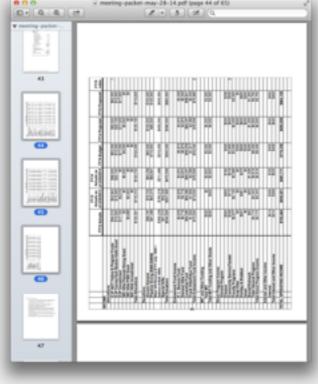


slides in Keynote

photos in Adobe Lightroom



objects in OS X Finder



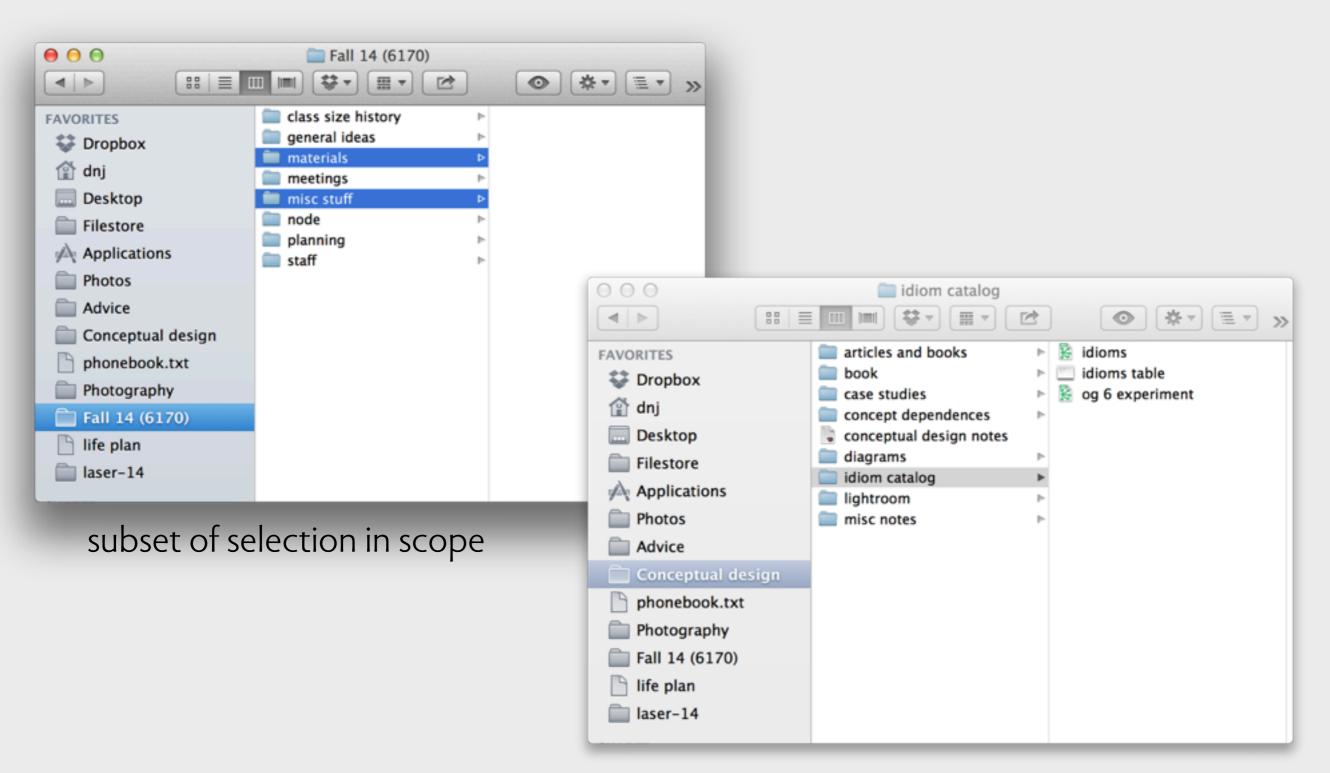
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| - | MARCH 2014 | |
| Nanana Nanana Nanana | Development skype 3/20/14 Area 2 development status fail and Michael Sunday March 10, 2014 Pro do sees success Environ | Email Marge Sone Attachments Create Table of Contents Nate |
| 💼 | 0070809.3913 1 | Read Presentation |
| in an | spotated to do list 1011/13 things for michael to-do - submitting grades caused a creat: fix this hug - display and test all functionality - 0 community and | More to solution. * |
| | DNJ networks on fixes 9/30/13 Minor changes to autijects of emails and headings for email dialogs Ohanged to and co for rejecting ROE an | |

notes in Evernote

thumbnails in Preview

subtlety selection scope



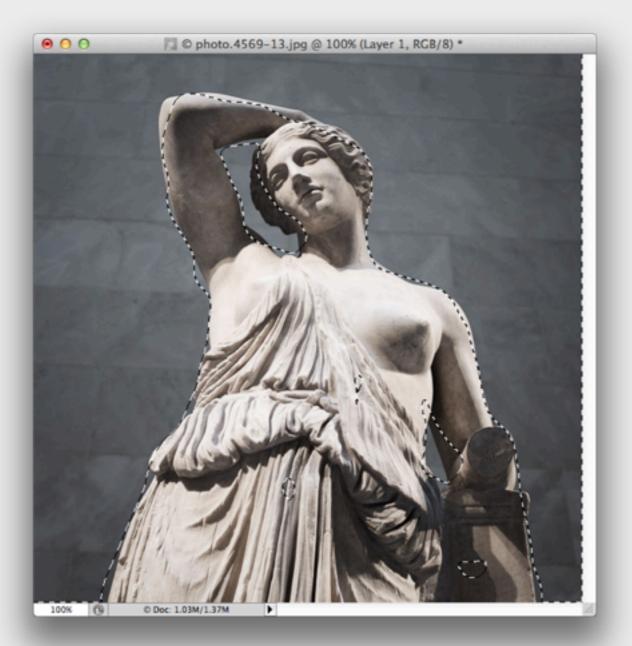
subset of selection out of scope

subtlety active element



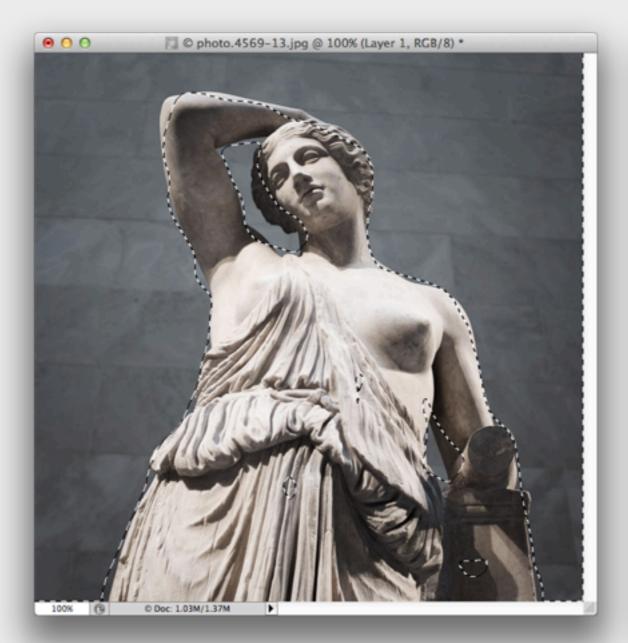
Adobe Lightroom: brightest thumbnail is the "active photo"

subtlety continuous selection



Photoshop: outline shown with "marching ants"

subtlety continuous selection





Photoshop: outline shown with "marching ants" Photoshop: selection shown in Quick Mask mode

subtlety folder selection

| ⊖ ⊖ ⊖ Linda Connor Haines Gall × 🍐 MIT – Google Drive × | | | | | |
|---|--|--|--|--|--|
| \leftarrow \rightarrow C \triangleq https://drive.google.com/#folders/0Bwep8RIJnuqGVU10 \searrow \equiv | | | | | |
| Google | | | | | |
| Drive | ⊥+ ■ ■ ● More ▼ | | | | |
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| Install Drive for your computer | ✓ ☆ ■ 6.170 Spring 2012 Shared | | | | |
| 0.01 GB (0%) of 15 GB used Manage | | | | | |

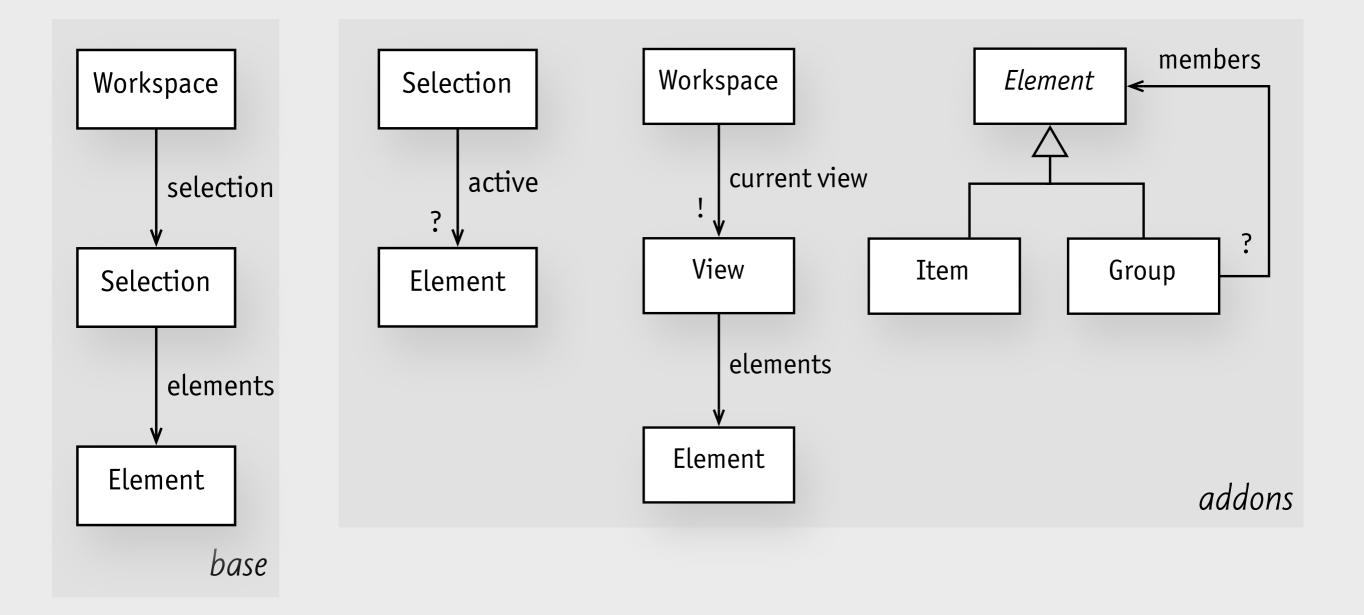
Google Drive: selecting folder = selecting children

subtlety folder selection

| | | 000 | | CrashPlan | | ~ |
|--------------------------------------|--|---------------------------|--|-----------|-------------|-------------------|
| ⊖ ⊖ ⊖ □ Linda Connor | Haines Gall × AMIT - Google Drive × | Backup | Congratulations! | | Music | |
| | | Restore | CrashPlan is backing up! There are two parts to Crash | • | Pictures | |
| ← → C 🔒 https://d | rive.google.com/#folders/0Bwep8RlJnuqGVU10 😭 🔳 | ن History دُنْ Friends | CrashPlan Central Next backup in 15 minutes To do: 2 files (3.6MB) Completed: 47,837 files (643CB) | | My Pictures | •• |
| C I | | -O Destinations | Last backup: 13.5 hours ago | 1 | 🔻 🧊 Photos | |
| Google | | | - Files | 1 | 2002 | |
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| Drive | + ■ 💼 💿 More - | | Change | 1 | 2004 | 5GB 3GB |
| | | | Inbound Inbound Invite your friends to back up to you Cate your friends back up to you with this backup code: TXM | 1 | 2005 | |
| | My Drive MIT | | Attach a backup archive Disable inbound backup | 1 | 2006 | |
| - My Drive | | | | 1 | 2007 | |
| | 🗹 🚖 🔲 6170 Staff Info (Responses) | | | 1 | 2008 | |
| MIT Hillel | 🗹 🚖 😑 6170 Staff Info | | | 1 | 2009 | |
| Personal | C 🏠 🖪 6.813/831 Spring 14 Shared | | | 1 | 2010 | |
| Shared with Me Starred | 🗹 🚖 🖪 6.813/831 2013 Shared | | | 1 | 2011 | |
| Recent | ✓ ☆ ■ 6170 Fa13 Shared | | | 1 | 2012 | |
| Trash | 🗹 ☆ 🖿 Area 2 | | | 1 | 2013 | |
| More - | ✓ ☆ ■ 6170 Sp13 Shared | | | 1 | 2014 | |
| Install Drive for | 🗹 🚖 🖪 6.170 Spring 2012 Shared | | | 1 | Archive | |
| your computer | | | | 1 | Catalogs | |
| 0.01 GP (0%) of 15 GP used | | | | 1 | ▶ □ Library | |
| 0.01 GB (0%) of 15 GB used Manage | | | | 1 | Presets | |
| | | | | | Public | |

Google Drive: selecting folder = selecting children

CrashPlan: selecting folder = selecting all future children



Purposes: apply action in aggregate to many items at once

concept catalog (so far)

| instantiate | organize | relate | resource | save | communicate | personalize |
|--------------|----------------------|------------|----------------|---------|-------------|-------------|
| stylesheet | selection | friend | access token | history | message | account |
| master | folder | clique | notification | buffer | posting | karma |
| stencil | group | invitation | reservation | cursor | | OOBA |
| style buffer | label | | REST | sync | | rating |
| | layer | | cart | export | | status |
| | stack | | subscription | | | |
| | alias | | purchase order | | | |
| | preset | | RMA | | | |
| | cursor | | coupon | | | |
| | filter | | catalog | | | |
| | property metadata | | | | | |
| | metadata | | | | | |

how to evaluate a concept

the fundamental principle



the fundamental principle

in a well-designed system



the fundamental principle

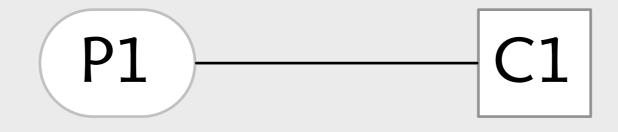
in a well-designed system each concept is motivated by one purpose

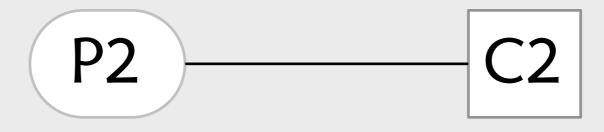


the ideal mapping

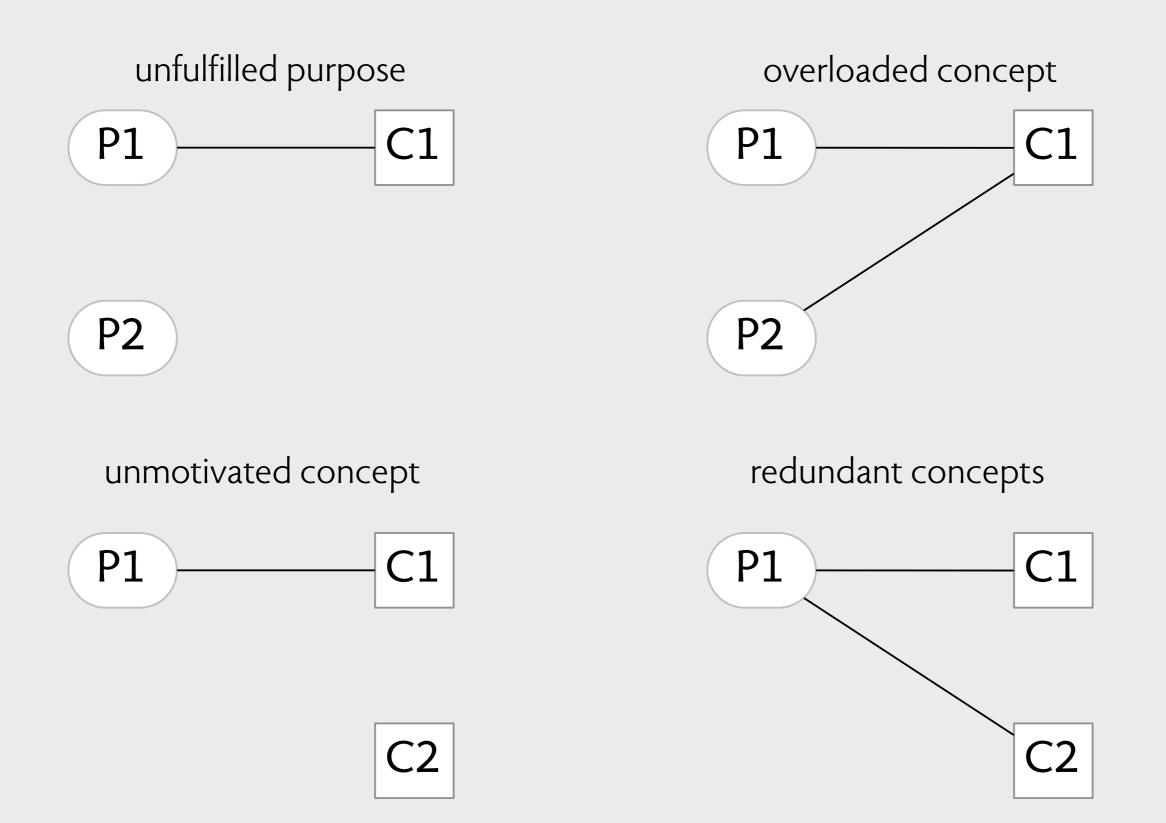


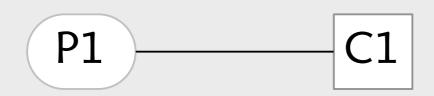
concepts



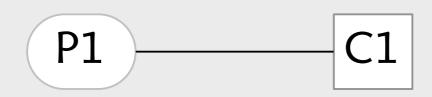


4 bad smells



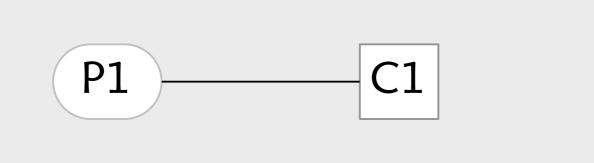


P2



P2



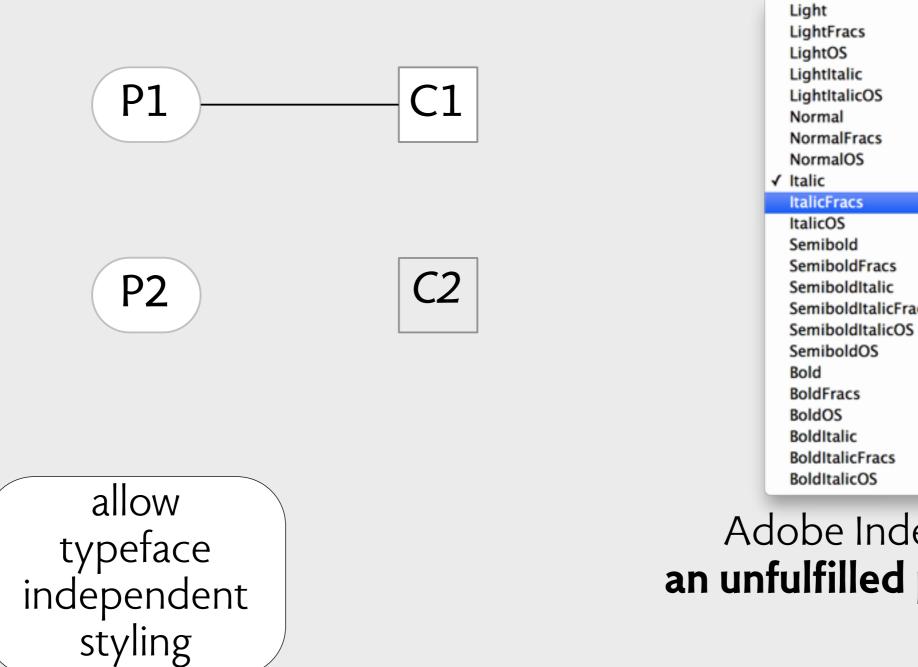


P2



Light LightFracs LightOS LightItalic LightItalicOS Normal NormalFracs NormalOS ✓ Italic ItalicFracs ItalicOS Semibold SemiboldFracs SemiboldItalic SemiboldItalicFracs SemiboldItalicOS SemiboldOS Bold BoldFracs BoldOS BoldItalic BoldItalicFracs BoldItalicOS

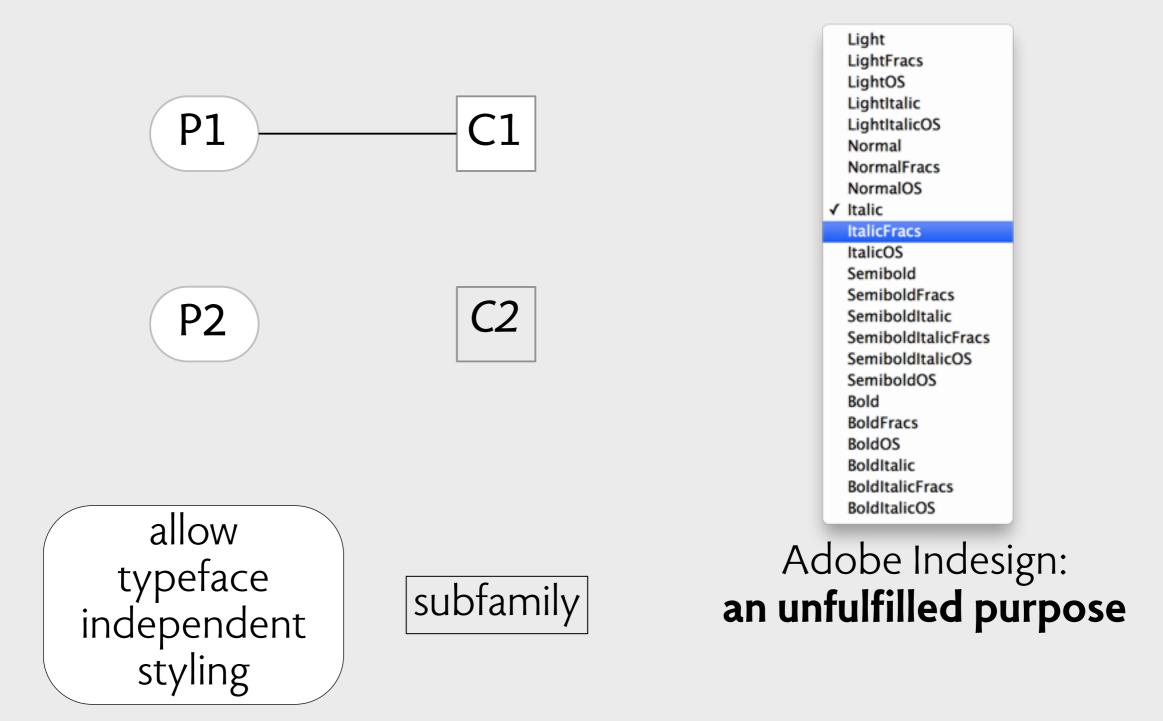
Adobe Indesign: **an unfulfilled purpose**



SemiboldItalicFracs

Adobe Indesign: an unfulfilled purpose

unfulfilled purposes



introducing a concept

introducing a concept

| New character style: | |
|-------------------------------------|----------------------------------|
| Name: Emphasis | |
| Include these character attributes: | |
| 🗹 Font: Magma Light | Capitalization: Standard |
| Size: 12.0 pt | Superscript: |
| Character Spacing: 0% | 🗹 Baseline Shift: 0.0 pt |
| 🗹 Bold: Off | ✓ Underline: None |
| 🗹 Italic: Off | Color: |
| Color: | Strikethrough: None |
| 🗹 Shadow: Off | Color: |
| V Fill: | |
| ✓ Ligatures: Default | Advanced Font Features |
| ✓ Language: English | See Typography in the Font Panel |
| Select All Deselect All | Select Overrides |
| Apply this new style on creation | Cancel OK |

Keynote '09: has subfamilies

introducing a concept

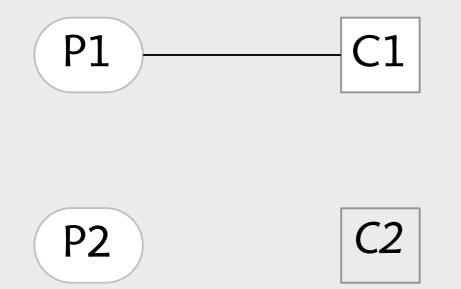
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| Name: Emphasis | |
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| 🗹 Size: 12.0 pt | Superscript: |
| 🗹 Character Spacing: 0% | 🗹 Baseline Shift: 0.0 pt |
| ✓ Bold: Off ✓ Italic: Off | Underline: None |
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| Shadow: Off | Color: |
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| 🗹 Language: English | See Typography in the Font Panel |
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Keynote '09: has subfamilies

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Keynote 6: gone again!

unfulfilled purposes (more)



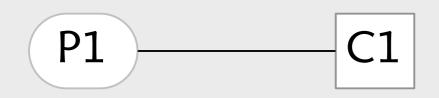
user (Apple Mail, Gmail) 'identify parties to communication' weak search, no authentication

slide hierarchy (Powerpoint) 'structure slides in a tree' sections provide just one level

eject-after-import (Lightroom) 'prevent accidental writing' feature removed (and reinstated!)

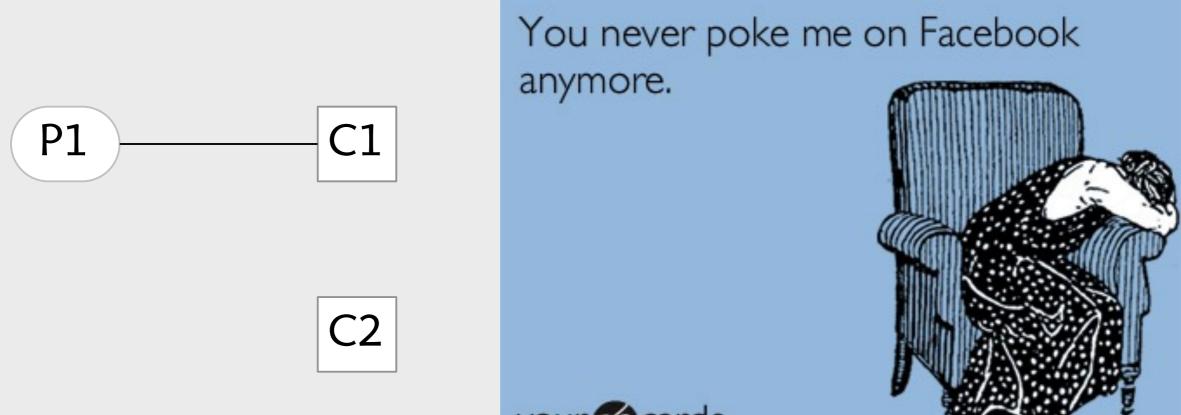
binder (Preview, Acrobat) 'maintain composite PDF doc' can insert pages, but forgets source

unmotivated concepts



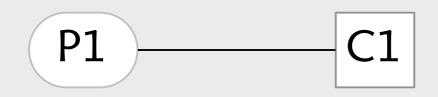


unmotivated concepts



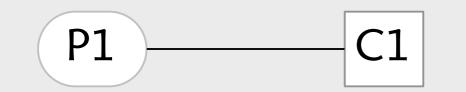


unmotivated concepts (more)





unmotivated concepts (more)



C2

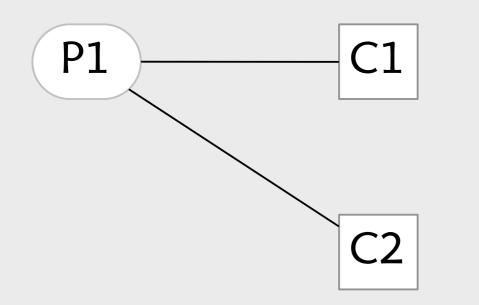
buffer (text editors) Apple got rid of it

stash (Git) addresses branching misfits

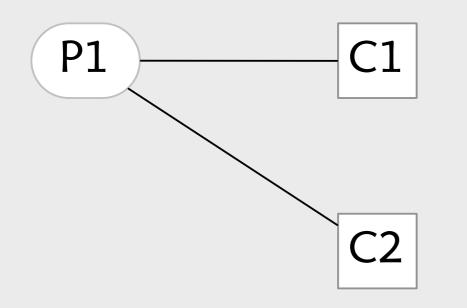
boxing (Java) addresses primitives vs objects misfit

> **null** (Javascript) when undefined is too vague

redundant concepts



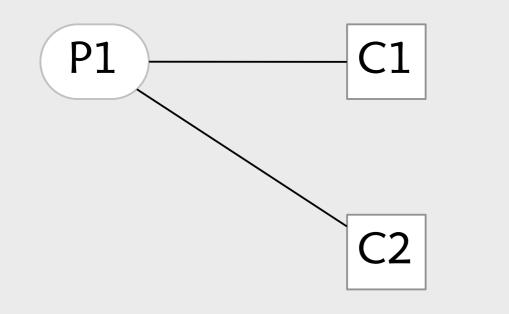
redundant concepts



| Primary | <u></u> | Social 23 now | Promotions 100+ new | + |
|---------|---------------------------|----------------------------------|-------------------------|----------|
| | Google | New sign-in from Chrome on Mac | - New sign-in from Ct 😄 | 12:30 pm |
| | Keith Muhammad at DeMont. | DeMontrond Auto Group - 14101 M | North Freeway Housto | 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 M | lorth Freeway Housto | Aug 26 |
| | betterbatonrougejobs.com | Job Update 2015-08-26 - Looking | For An Advantage W | Aug 26 |

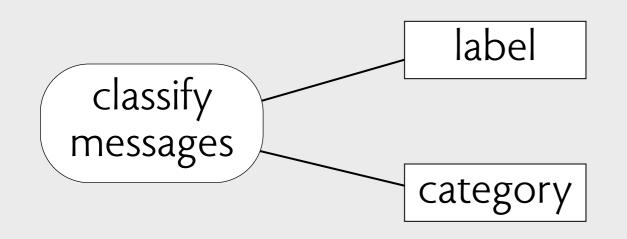
category in Gmail **a redundant concept**

redundant concepts



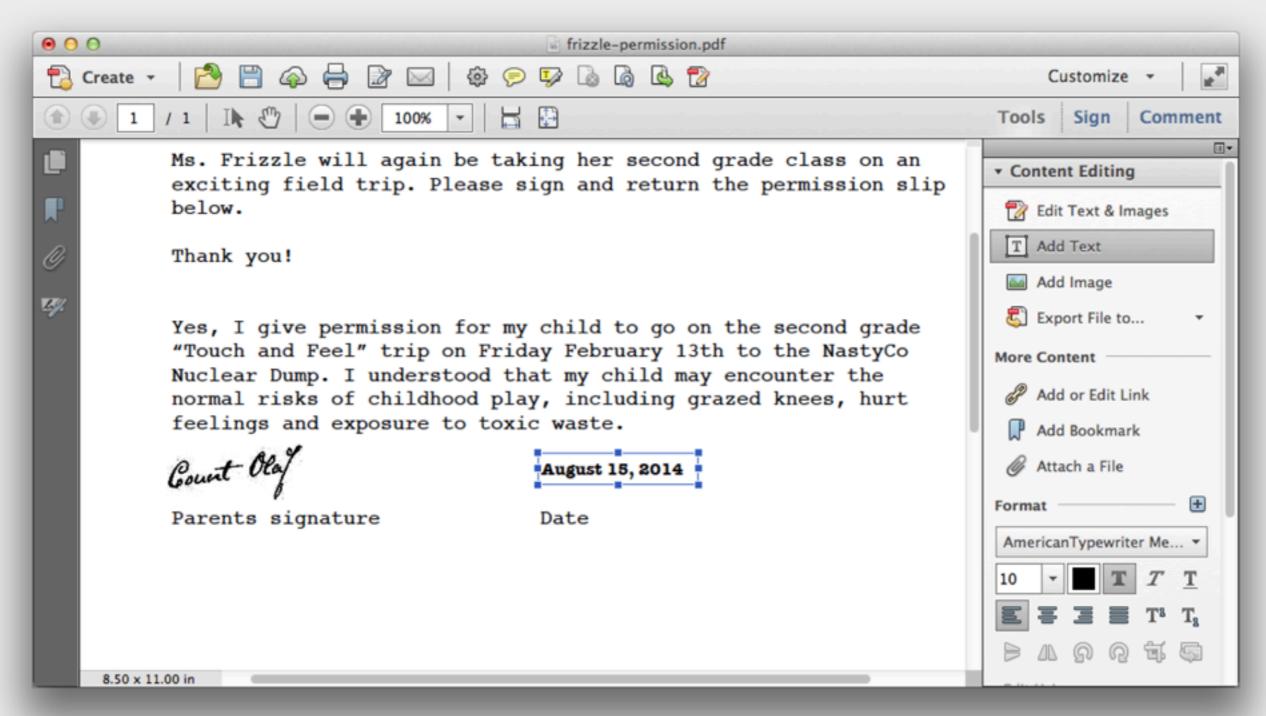
| Primary | <u></u> | Social 23 new | Promotions 100+ new | + |
|---------|---------------------------|-----------------------|------------------------------------|----------|
| | Google | New sign-in from Chro | ome on Mac - New sign-in from Ch 😄 | 12:30 pm |
| | Keith Muhammad at DeMont. | DeMontrond Auto Gro | up - 14101 North Freeway Housto | 12:19 pm |
| | AT&T High Speed Internet. | AT&T High Speed Inte | rnet Service Activation - Your Al | 10:37 am |
| | Keith Muhammad at DeMont. | DeMontrond Auto Gro | up - 14101 North Freeway Housto | Aug 26 |
| | betterbatonrougejobs.com | Job Update 2015-08- | 26 - Looking For An Advantage W | Aug 26 |

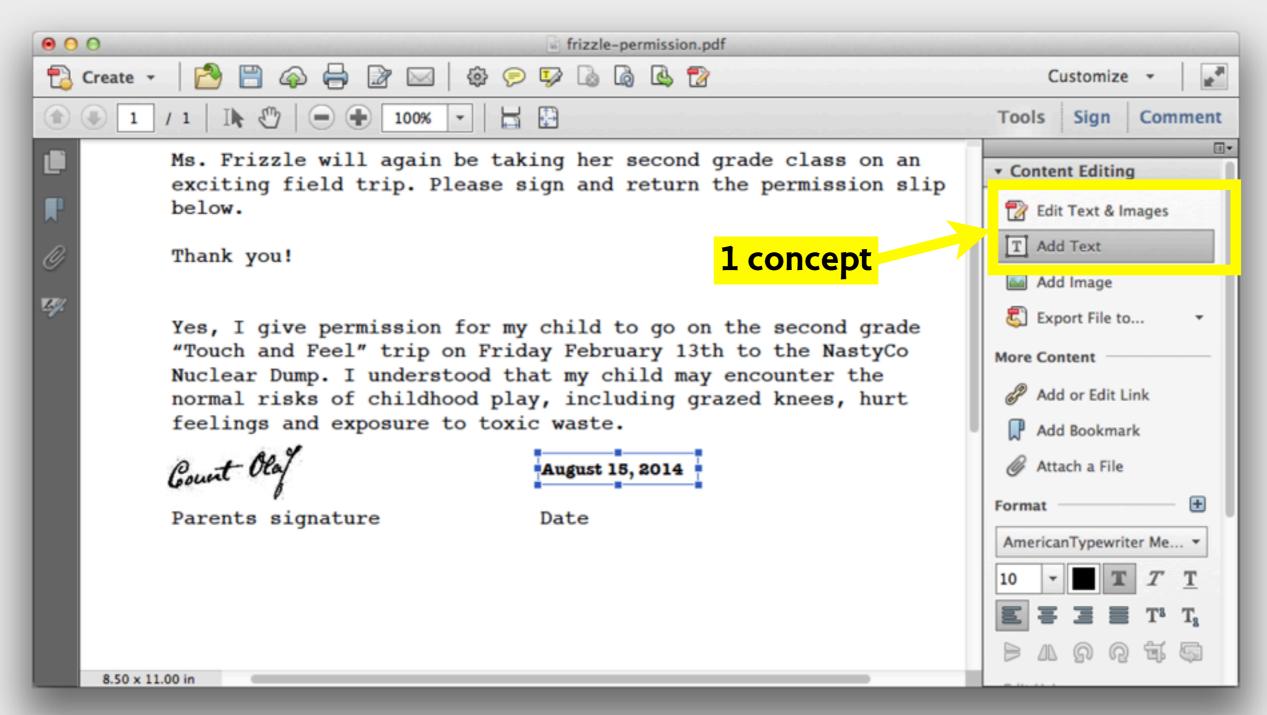
category in Gmail **a redundant concept**



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| Field Trip Permission Form Dear Parents: Ms. Frizzle will again be taking her second grade class on an exciting field trip. Please sign and return the permission slip below. Typewriter Thank you! Yes, I give permission for my child to go on the second grade "Touch and Feel" trip on Friday February 13th to the NastyCo Nuclear Dump. I understood that my child may encounter the normal risks of childhood play, including grazed knees, hurt feelings and exposure to toxic waste. Parents signature Date | Pages Content Add Bookmark Attach a File Edit Text & Objects T] Edit Document Text Edit Object Edit Object Add or Edit Interactive Object Link Button Select Object Forms |
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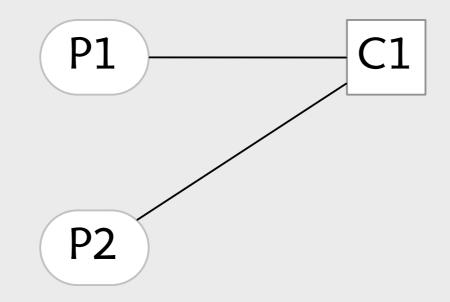
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| ۲ | I / 1 I I I I I I I I I I I I I I I I I I | Tools Comment Share |
| | Field Trip Permission Form Dear Parents: | |
| 0 | Ms. Frizzle will again be taking her second grade class on an exciting field trip. Please sign and return the permission slip | Attach a File |
| Ζ¥. | below. Thank you! Yes, I give permission for my child to go on the se 3 concepts "Touch and Feel" trip on Friday February 13th to th Nuclear Dump. I understood that my child may encounter the normal risks of childhood play, including grazed knees, hurt feelings and exposure to toxic waste. Parents signature Date | Edit Text & Objects TI Edit Document Text Edit Object Edit Object Add or Edit Text Box Add or Edit Interactive Object Link Enclose Multimedia Select Object Forms |
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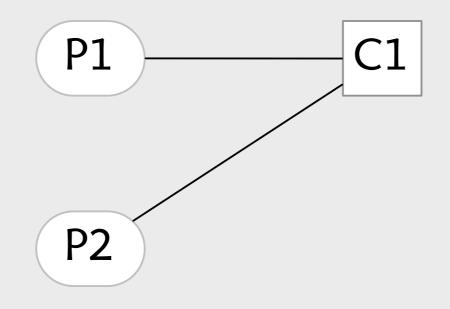
overloaded concepts

No one can serve two masters. Either you will hate the one and love the other, or you will be devoted to the one and despise the other. [Matthew 6:24]



overloaded concepts

No one can serve two masters. Either you will hate the one and love the other, or you will be devoted to the one and despise the other. [Matthew 6:24]



3 forms of overloading: **piggybacking** new purpose hacked onto old concept **false convergence** two purposes looked the same **emergent purpose** users found second purpose for concept

piggybacking fuji camera new purpose hacked onto old concept

piggybacking fuji camera new purpose hacked onto old concept

| | 1000 | |
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| L | 3:5 | 664 |
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image size aspect ratio piggybacked on JPEG dimensions

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result: can't create custom size for front loading also, page size presets in Lightroom hold feed setting

false convergence two purposes looked the same

Performance Review Form 2016

Performance Summary

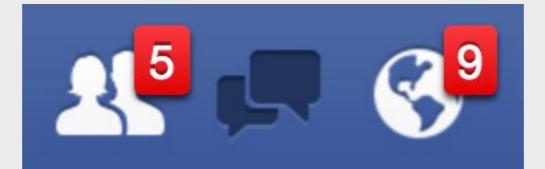
Evaluate and discuss the employee's performance. Base your evaluation on the position requirements, MIT Core Competencies, achievement of the goals established during the past year, and your assessment of the employee's accomplishments.

Goal Setting

State and discuss the expectations and goals for the upcoming review period. Give examples of how these goals can be met (e.g., training). How will you support the employee to accomplish these goals? Reference here

evaluation & goal setting incompatible purposes

false convergence two purposes looked the same



filter incoming posts control access to my posts **distinct purposes**

2011: Facebook added subscribe/follow

To: Daniel Jackson <dnj@mit.edu> Re: Catch me if you can in real life! initial purpose: summarize content

To: Daniel Jackson <dnj@mit.edu> Re: Catch me if you can in real life! initial purpose: summarize content

To: csail-related@lists.csail.mit.edu Re: [csail-related] turn off the lights? emergent purpose: show sender if you bcc a list, subject reveals to-address

thanks to Shriram Krishnamurthi

To: Daniel Jackson <dnj@mit.edu> Re: Catch me if you can in real life! initial purpose: summarize content

To: csail-related@lists.csail.mit.edu Re: [csail-related] turn off the lights? emergent purpose: show sender if you bcc a list, subject reveals to-address

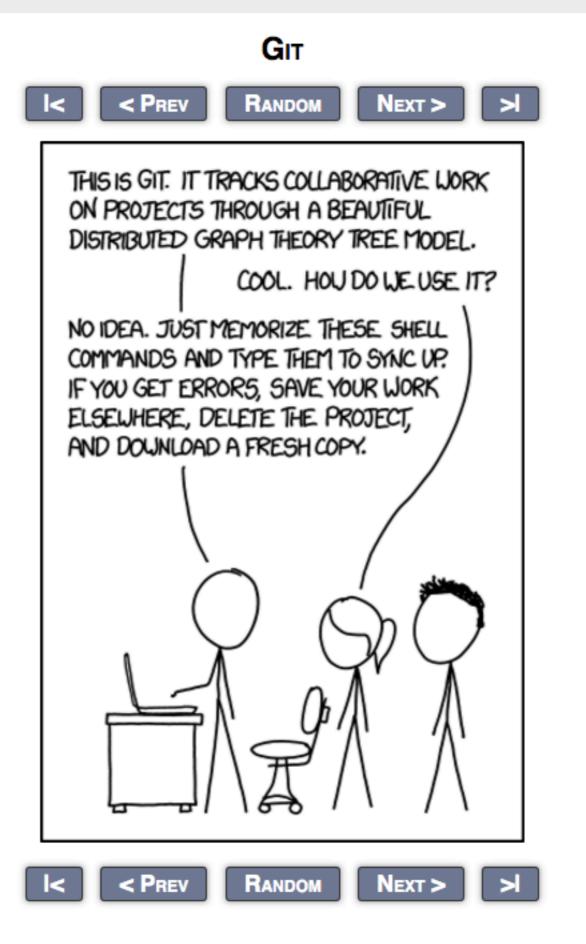
thanks to Shriram Krishnamurthi

To: Daniel Jackson <dnj@mit.edu> your trip reservation

emergent purpose: group by conversation can't label reservations from Expedia by trip

thanks to Eunsuk Kang

gitless: a case study



PERMANENT LINK TO THIS COMIC: HTTP://XKCD.COM/1597/ IMAGE URL (FOR HOTLINKING/EMBEDDING): HTTP://IMGS.XKCD.COM/COMICS/GIT.PNG

gitless: a reworking of git

Gitless: a version control system

About Gitless

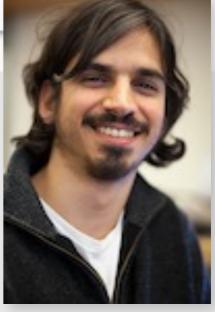
Gitless is an experimental version control system built on top of Git. Many people complain that Git is hard to use. We think the problem lies deeper than the user interface, in the concepts underlying Git. Gitless is an experiment to see what happens if you put a simple veneer on an app that changes the underlying concepts. Because Gitless is implemented on top of Git (could be considered what Git pros call a "porcelain" of Git), you can always fall back on Git. And of course your coworkers you share a repo with need never know that you're not a Git aficionado.

Check out the documentation to get started. If you are a novice user that never used any version control system the documentation should be enough to get you started. If you are a Git pro looking to see what's different from your beloved Git you'll be able to spot the differences by glancing through the Gitless vs. Git section.

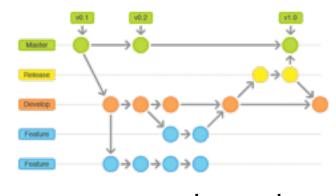
Download

- Mac OS X Binary (.tar.gz)
- Linux Binary (.tar.gz)
- Source Code (.tar.gz)

For installation instructions see the readme file. After installation, you should be able to execute the gl command. The current Gitless version is 0.7 which was released on 4/2015 (release notes).

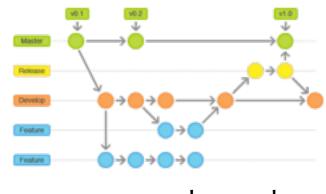


Santiago Perez De Rosso



concept: branch

purpose: support independent line of development



concept: branch

purpose: support independent line of development



concept: branch

operational principle: when you switch branches, your working directory is synchronized with the new branch, and you can make and commit changes which will be invisible on other branches; when you're done, you can merge the branch into the master branch...



concept: branch

purpose: support independent line of development

operational principle: when you switch branches, your working directory is synchronized with the new branch, and you can make and commit changes which will be invisible on other branches; when you're done, you can merge the branch into the master branch...

misfit: can't switch branches with uncommitted changes; can stash, but only if no conflicts...



concept: branch

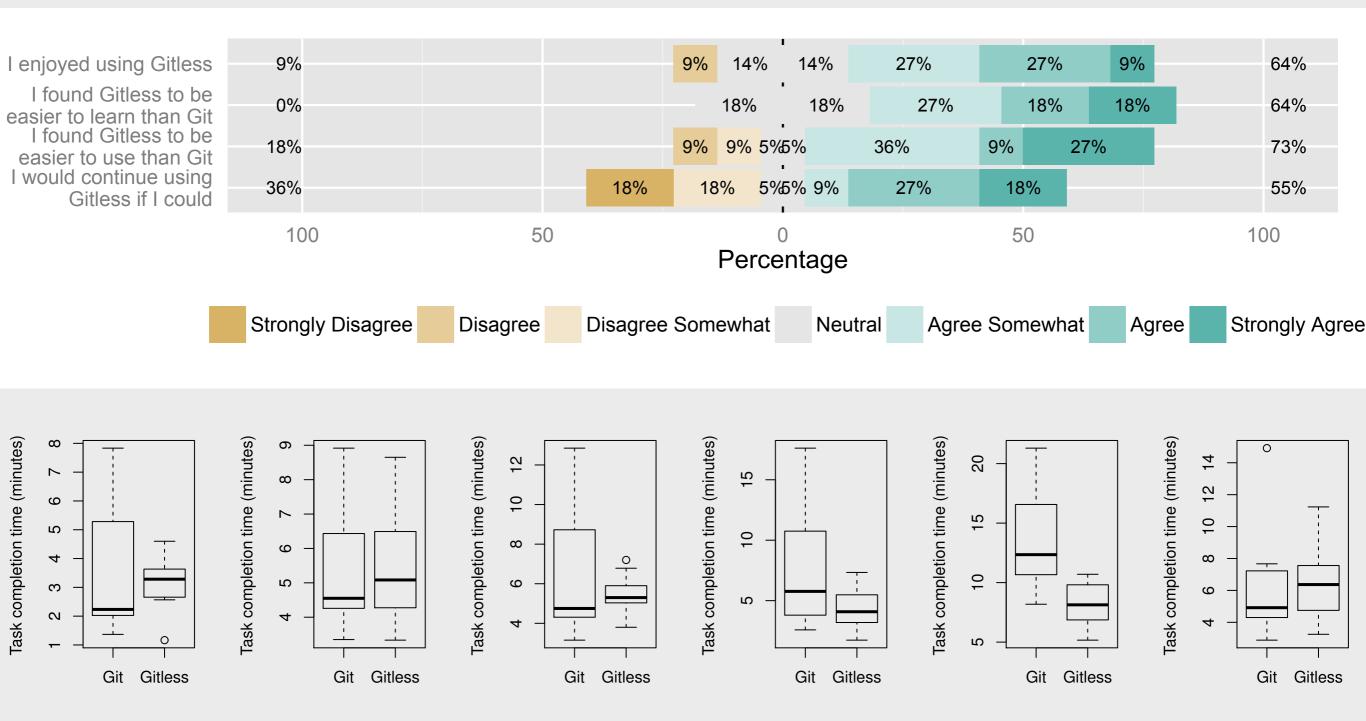
purpose: support independent line of development

operational principle: when you switch branches, your working directory is synchronized with the new branch, and you can make and commit changes which will be invisible on other branches; when you're done, you can merge the branch into the master branch...

misfit: can't switch branches with uncommitted changes; can stash, but only if no conflicts...

fix: give branch its own working directory; when you switch branches, the working directory changes too, and the working directory associated with the previous branch is preserved

results of a user study



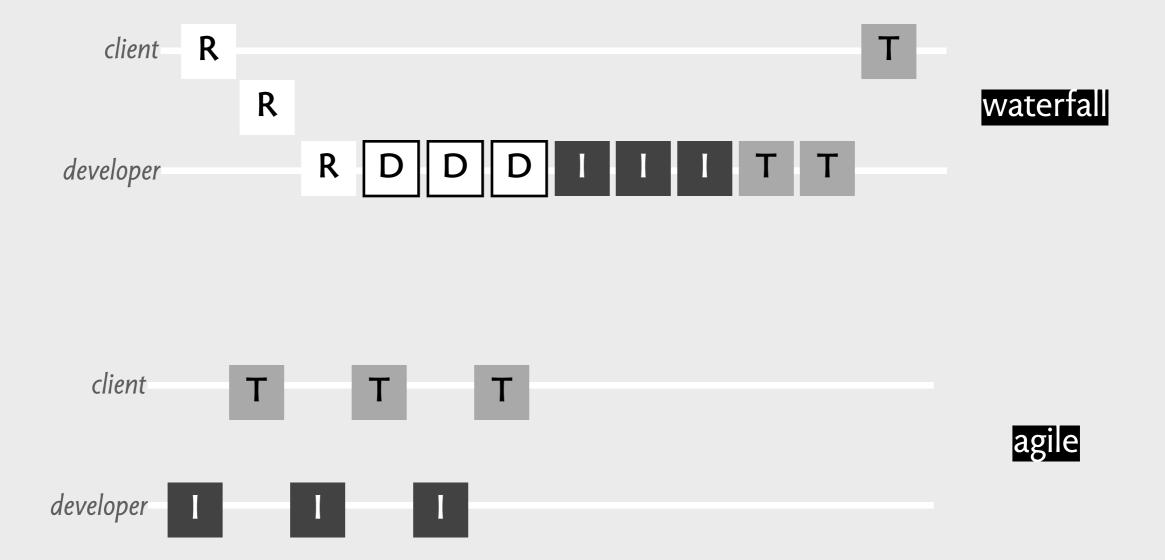
conclusions

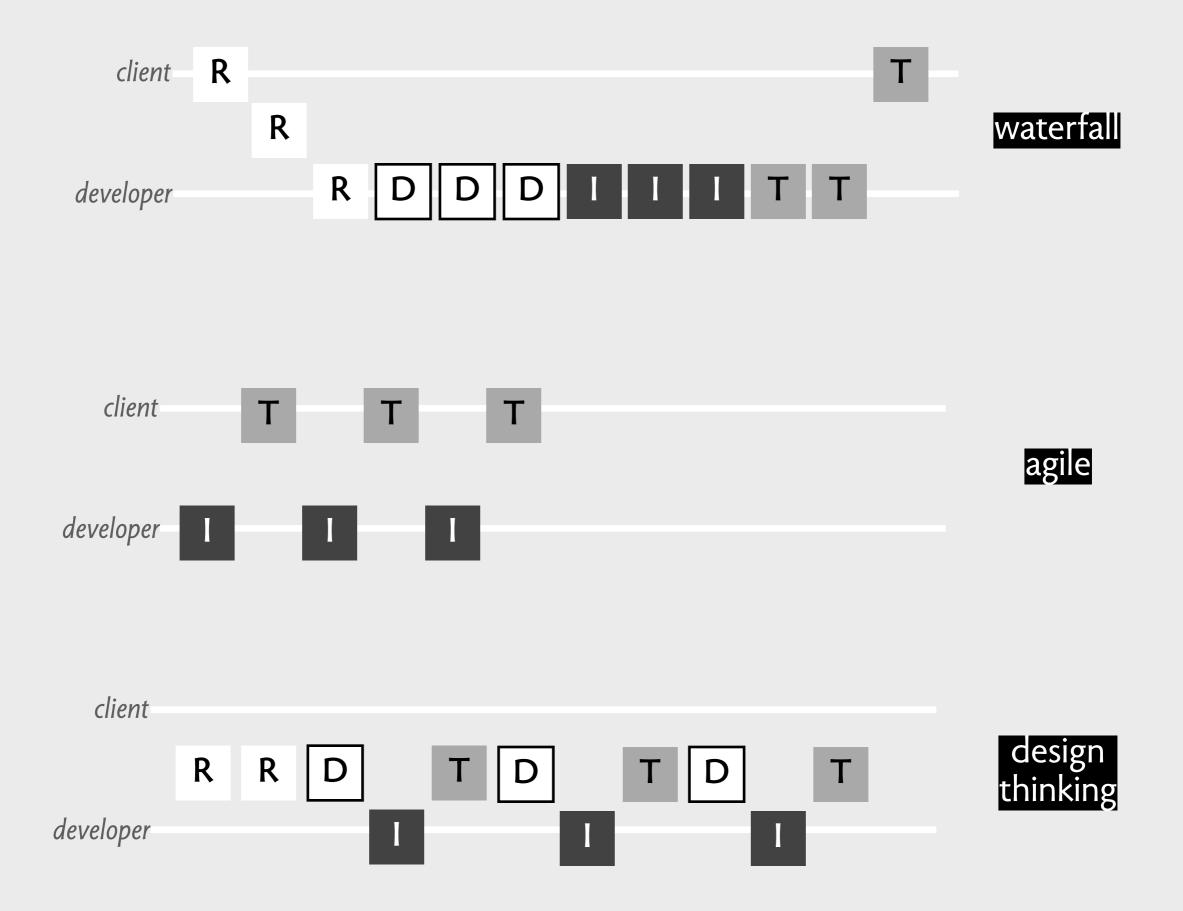
| | designer | engineer |
|----------|--------------------------------|-----------------------------|
| elements | ? | function, object, type |
| criteria | ? | decoupling & localization |
| goals | learnable, effective, tolerant | maintainable, correct, fast |

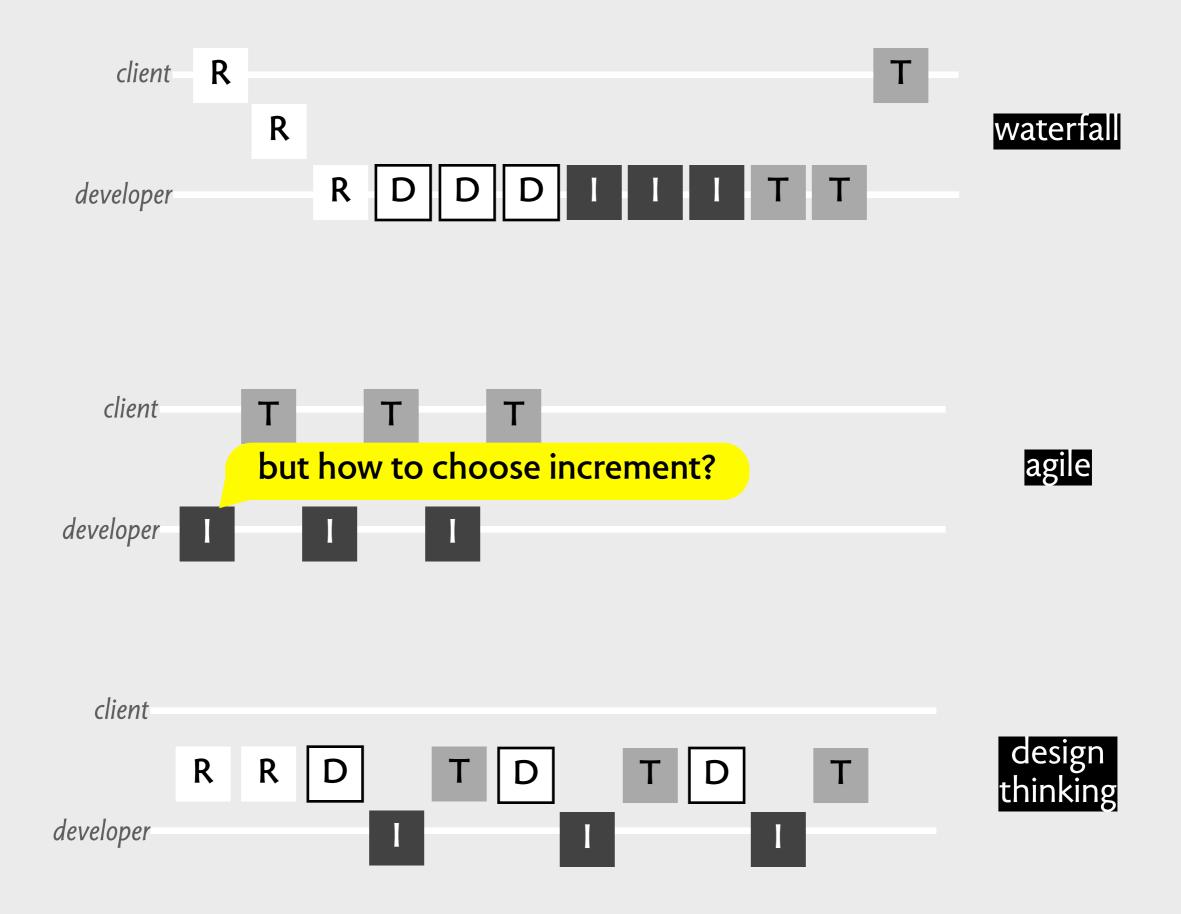
| | designer | engineer |
|----------|--------------------------------|-----------------------------|
| elements | concepts, purposes | function, object, type |
| criteria | ? | decoupling & localization |
| goals | learnable, effective, tolerant | maintainable, correct, fast |

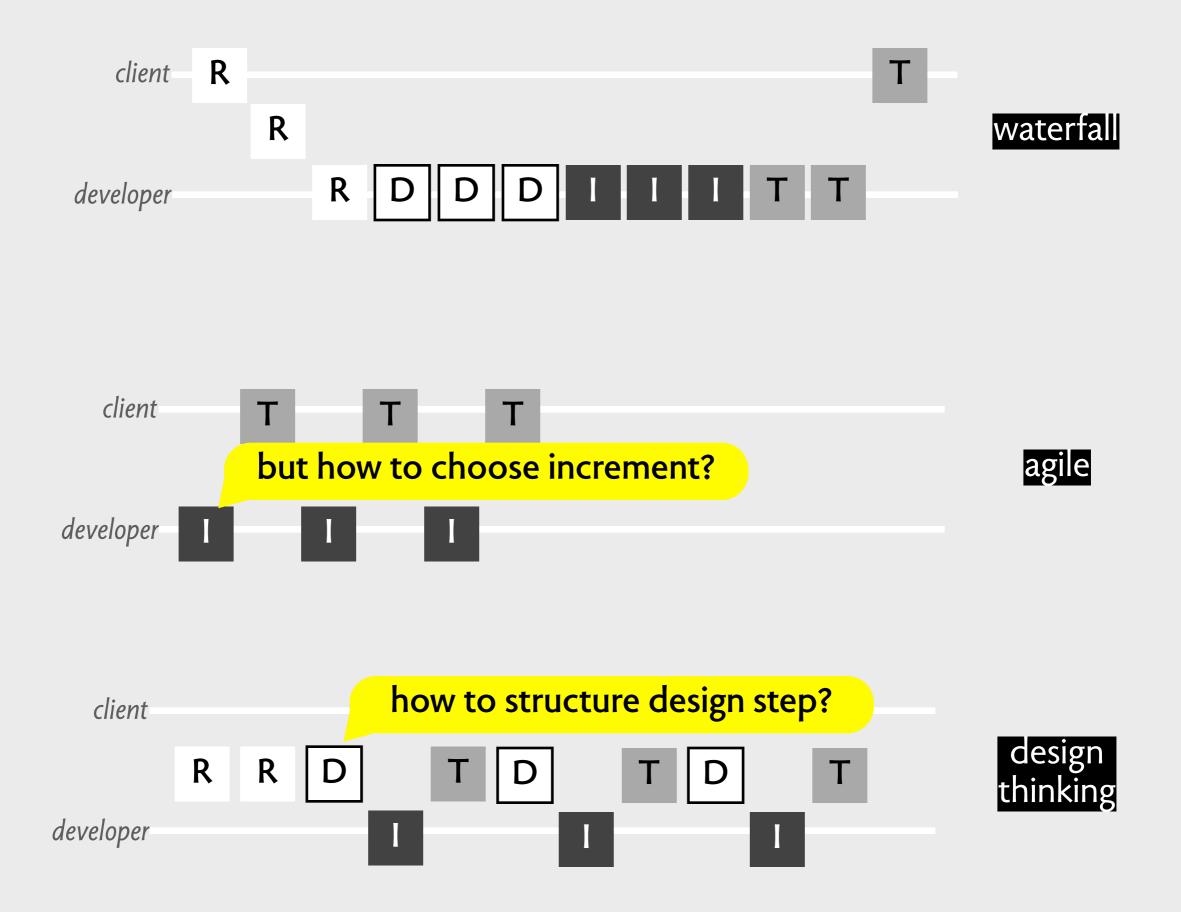
| | designer | engineer |
|----------|--------------------------------|-----------------------------|
| elements | concepts, purposes | function, object, type |
| criteria | 1:1 = concept:purpose | decoupling & localization |
| goals | learnable, effective, tolerant | maintainable, correct, fast |



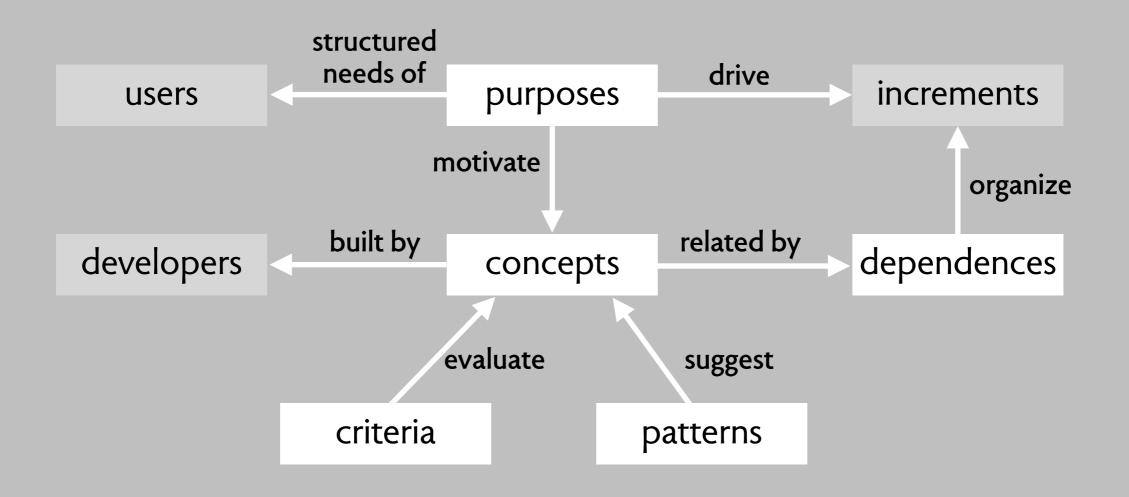








a software design approach



backup material

a new view

a common view of software design

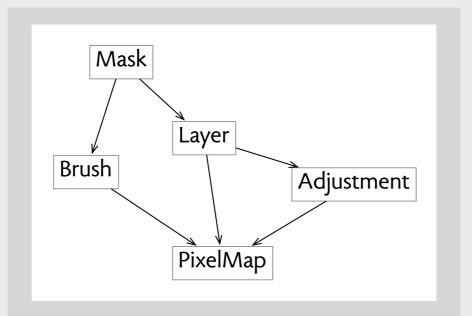
programming hard & technical about content

UI design

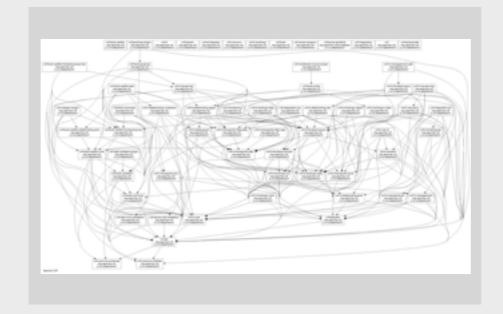
soft & human

about presentation

a better view of software design



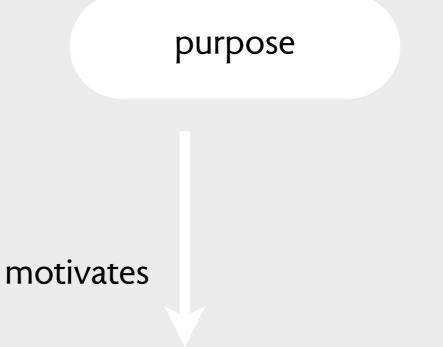
conceptual design: essential concepts & behavior

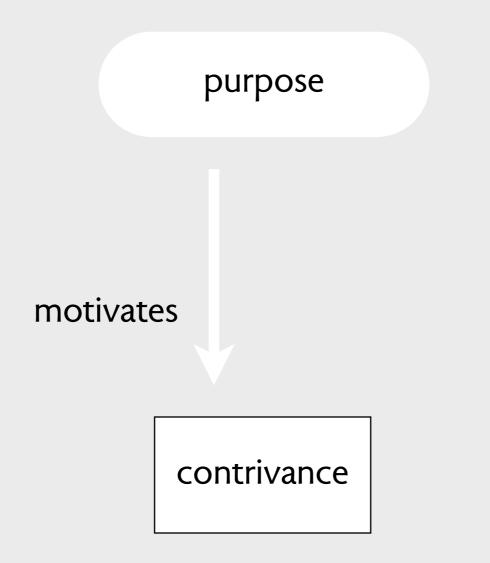


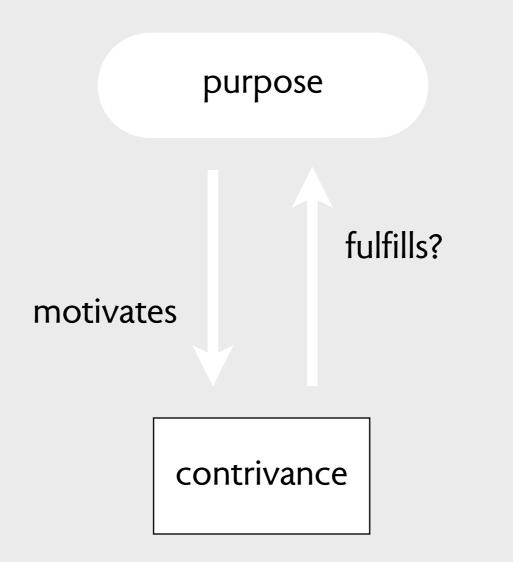
representation design: organization & performance

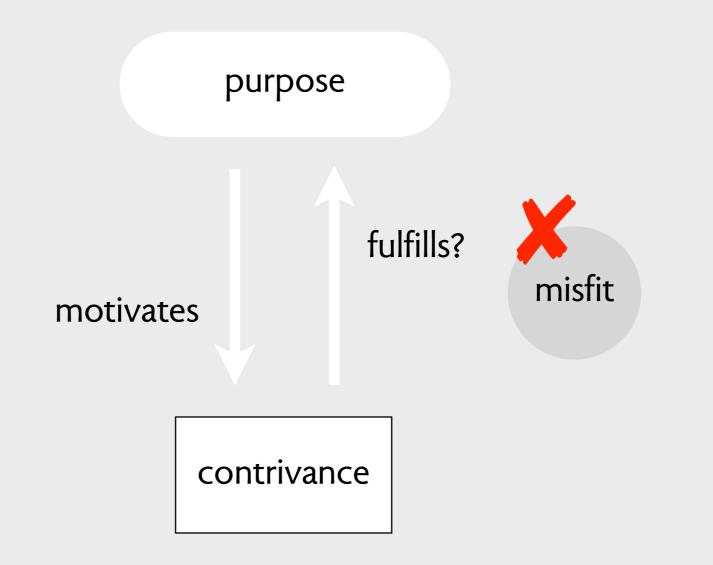
designing on purpose

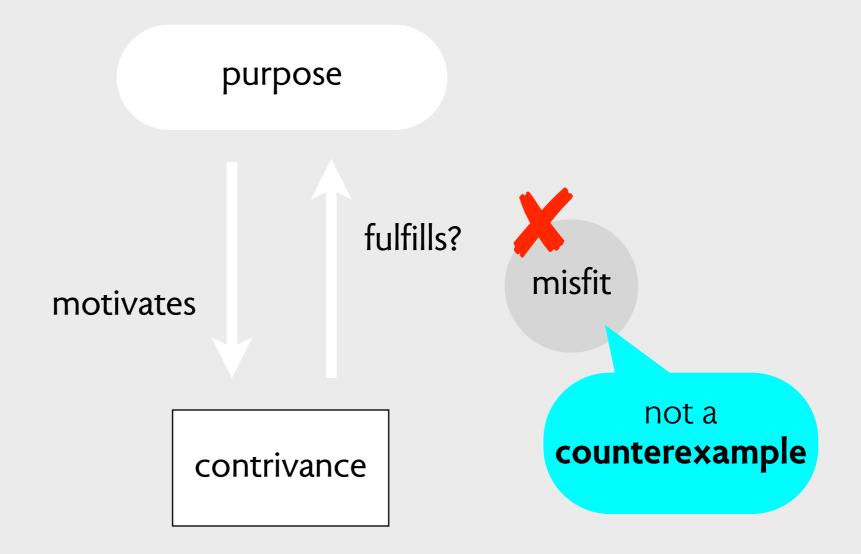
purpose











changeable wall display of prints

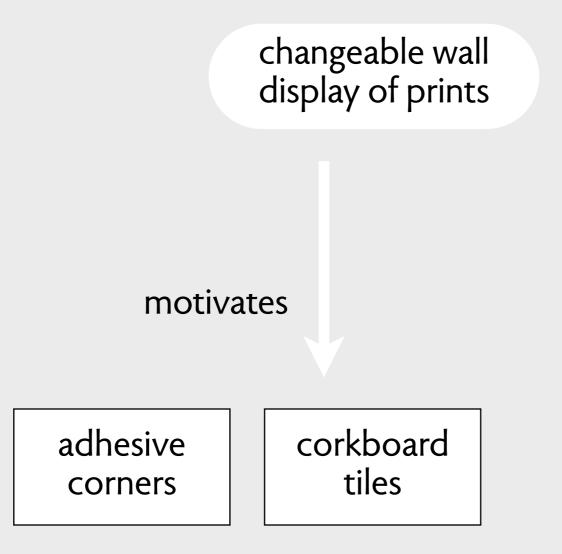
changeable wall display of prints

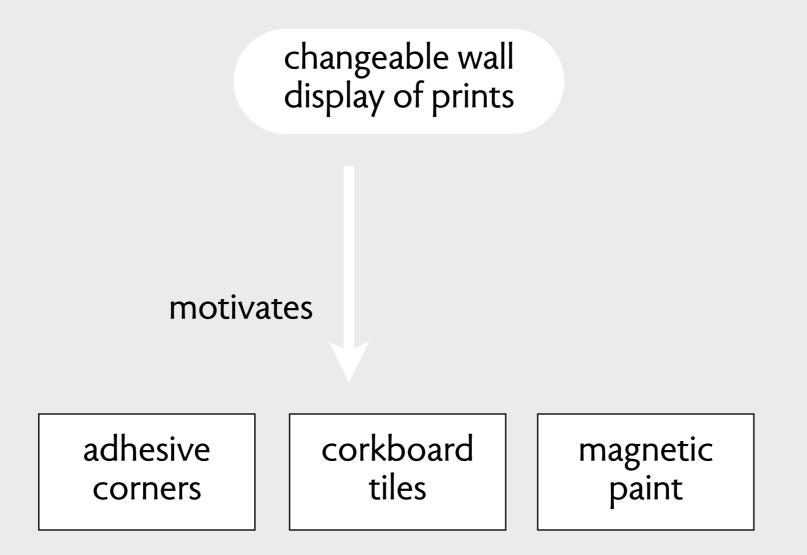
motivates

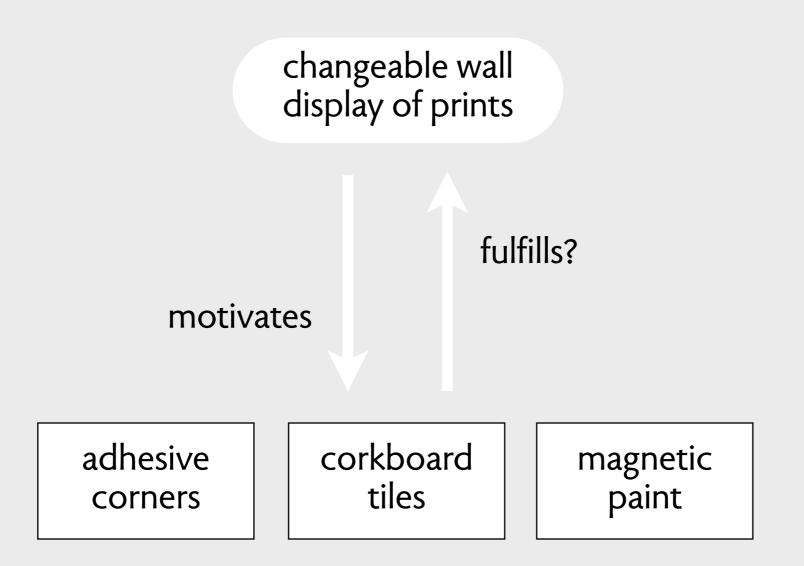
changeable wall display of prints

motivates

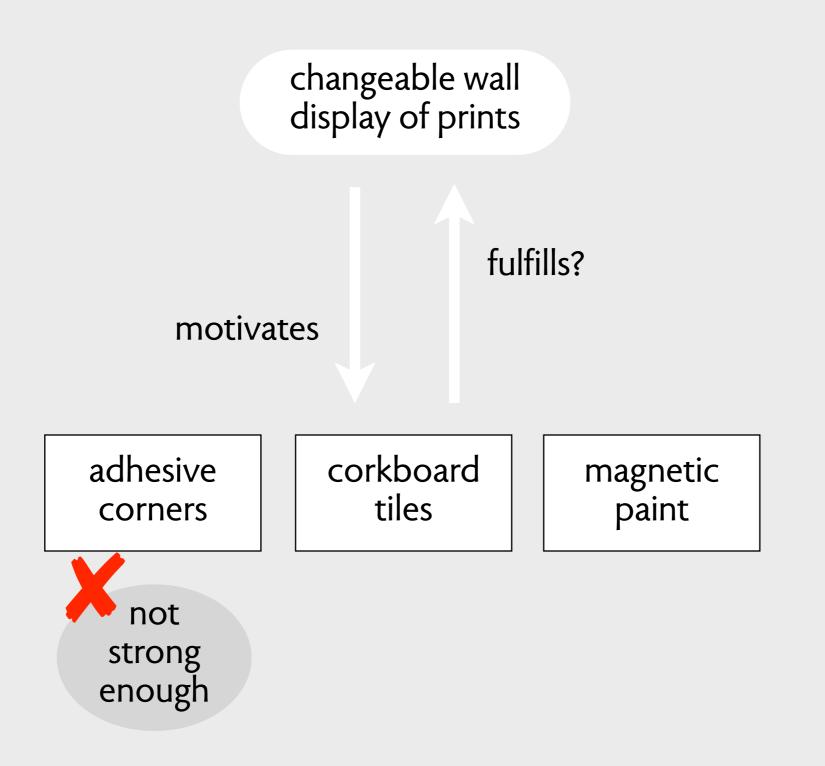
corkboard tiles



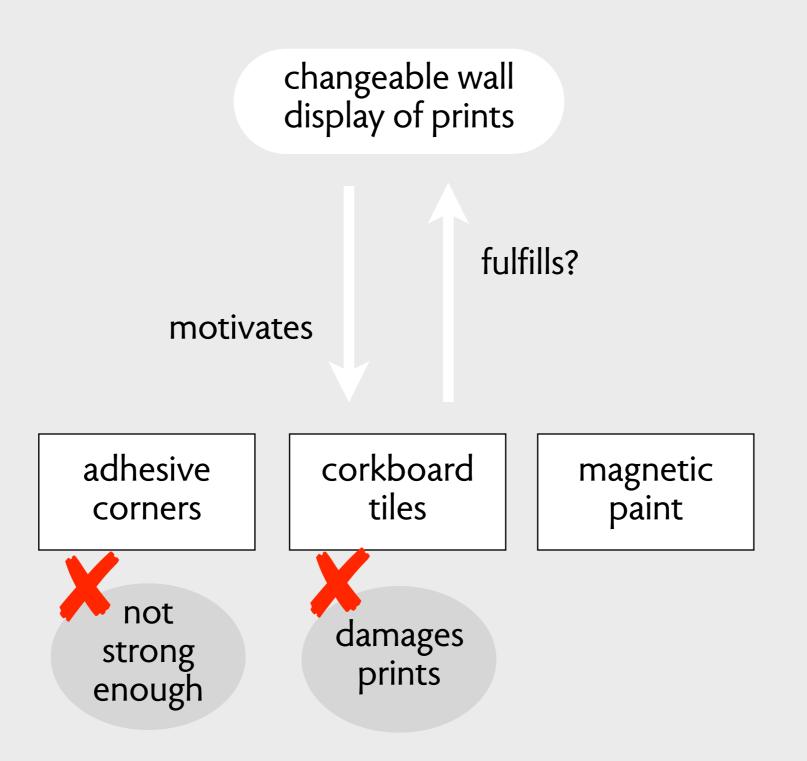




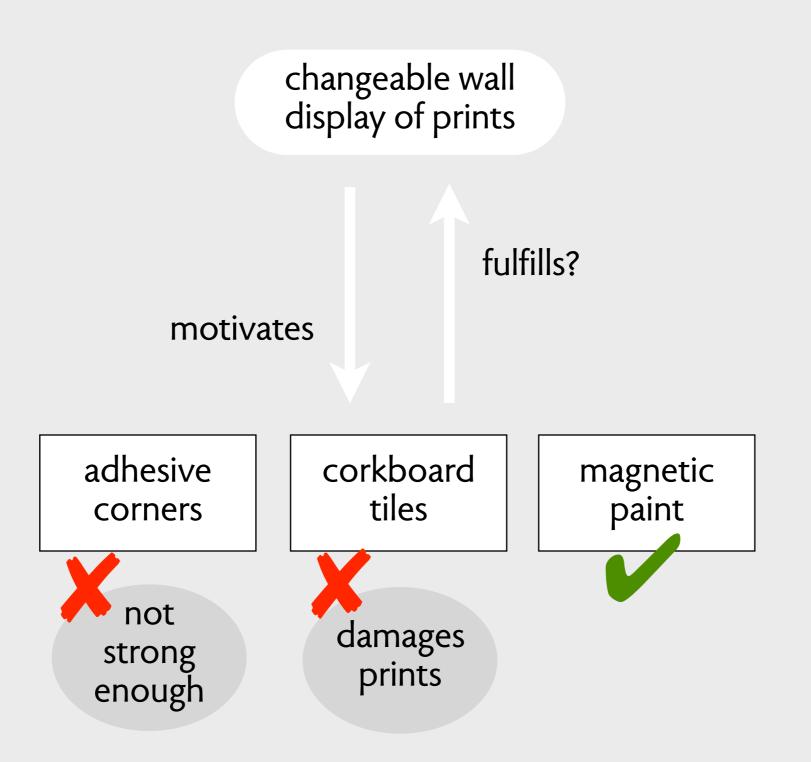
example: a photo wall



example: a photo wall



example: a photo wall

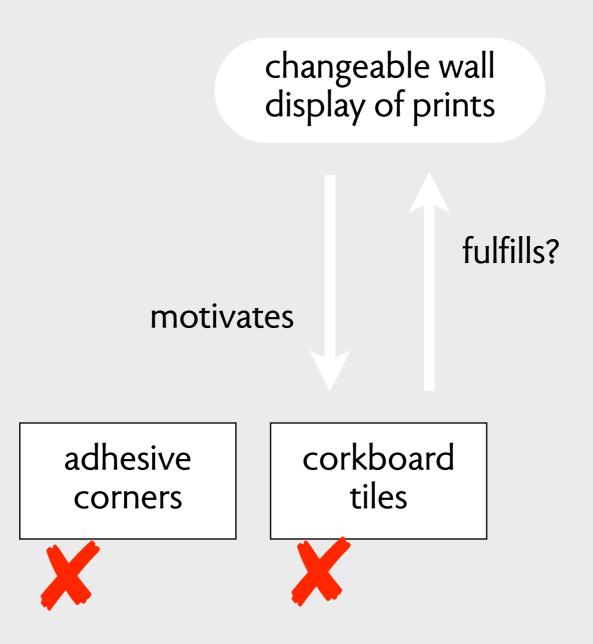


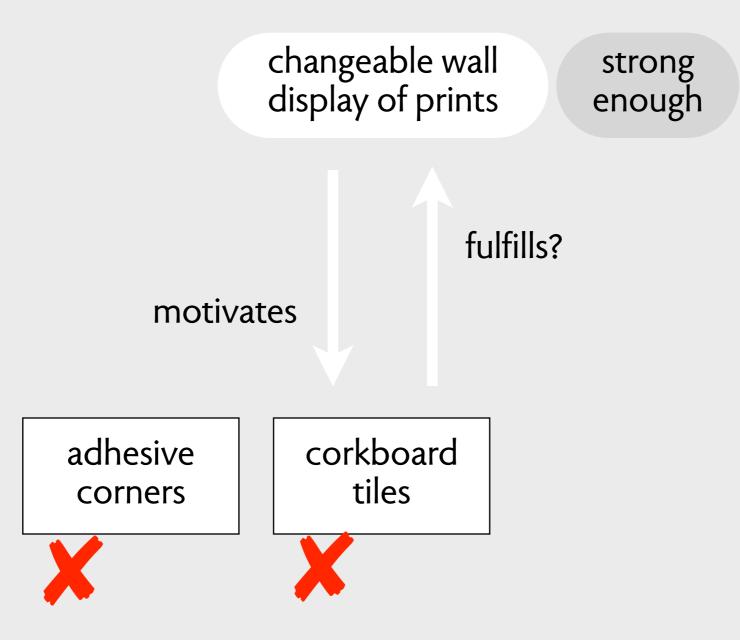
as implemented

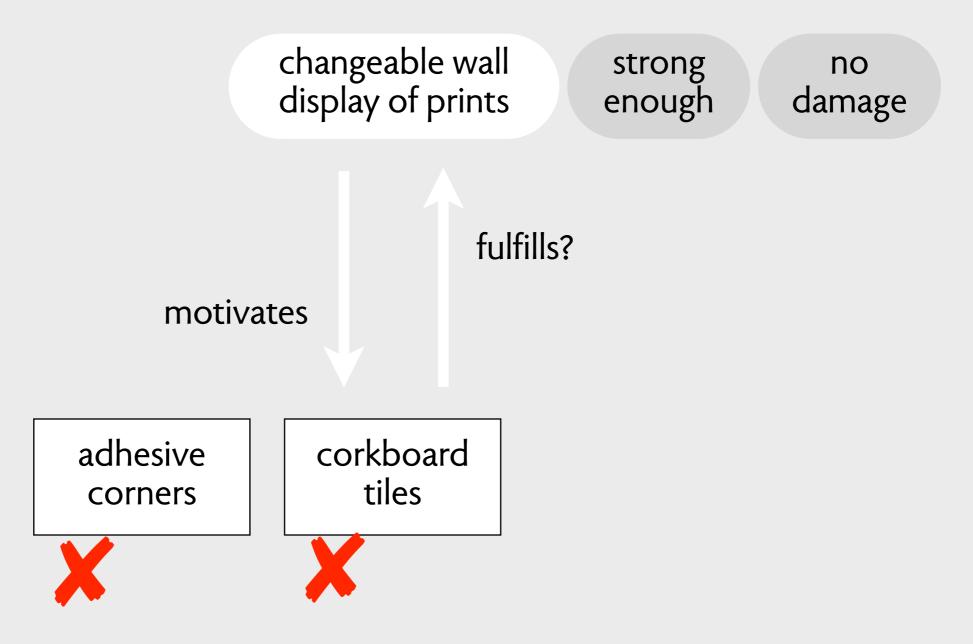


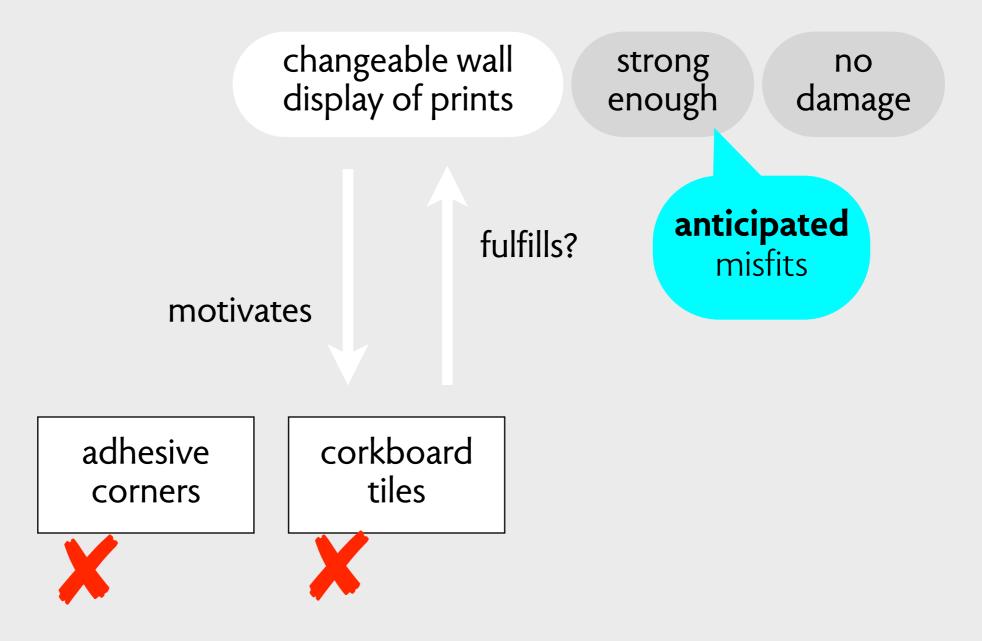


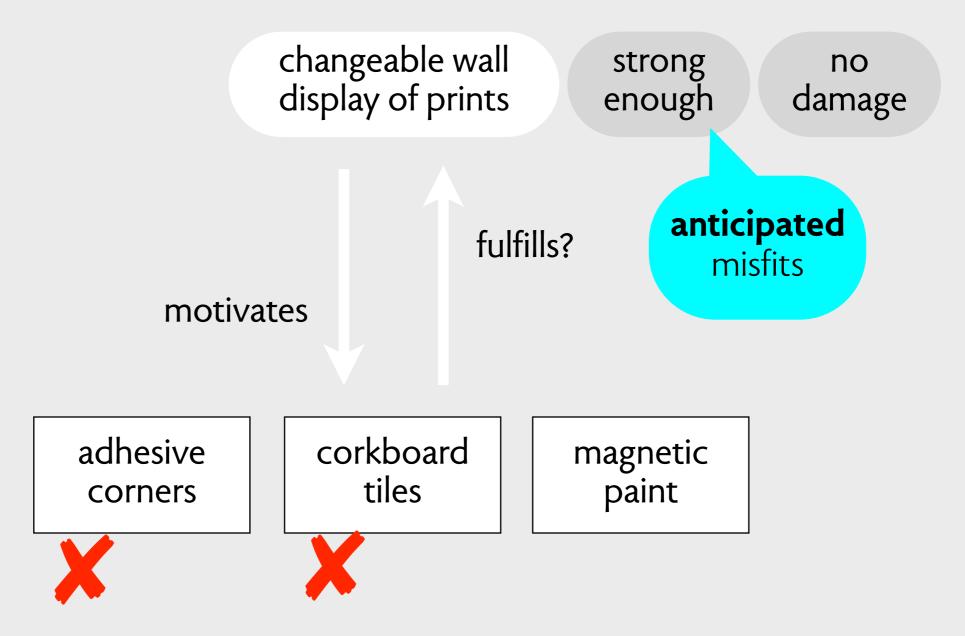


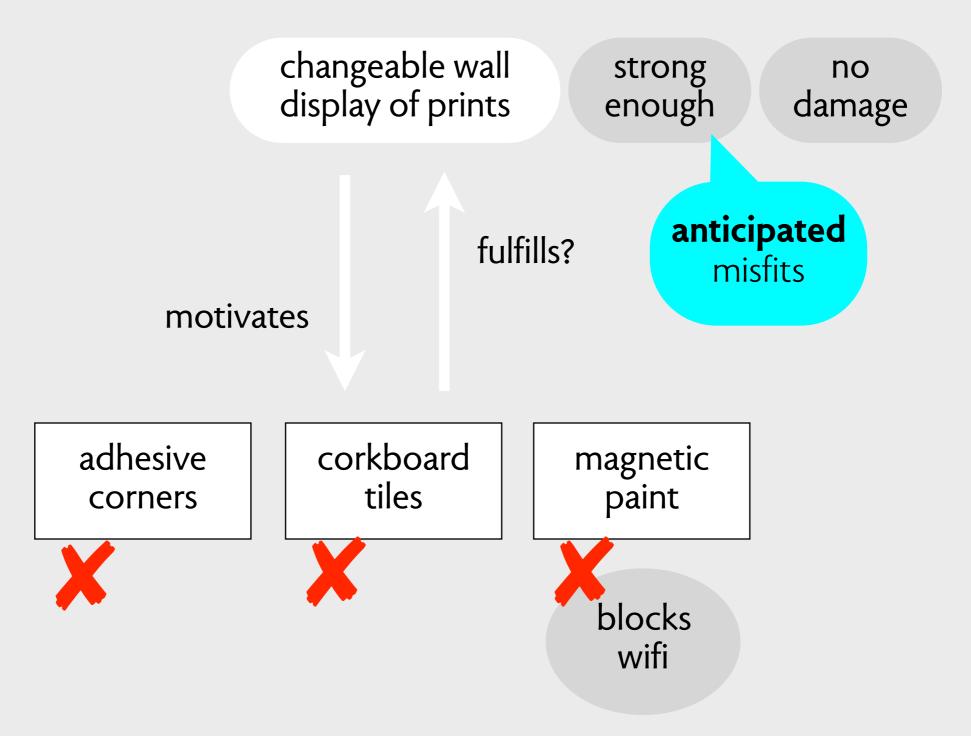


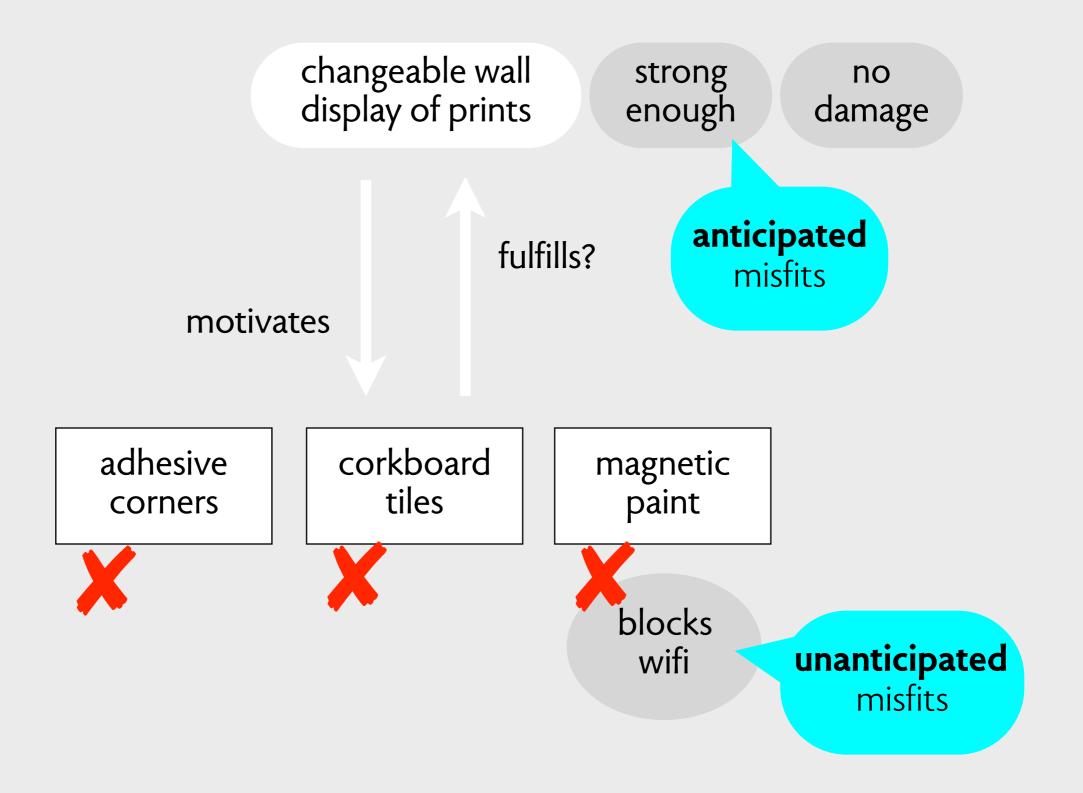


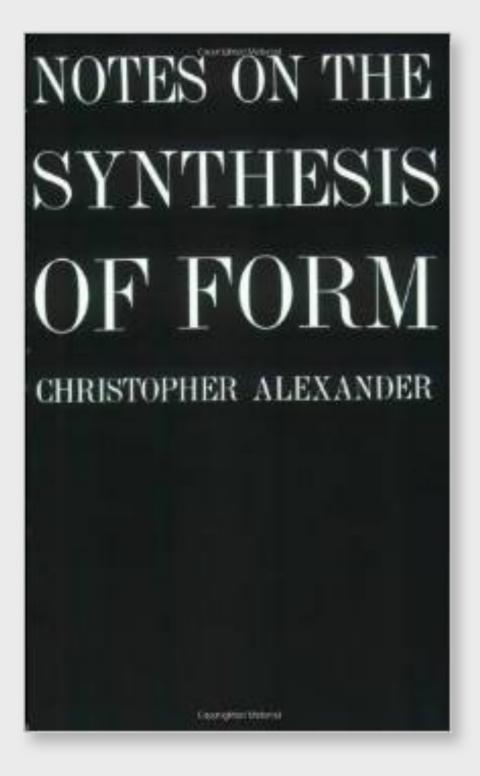












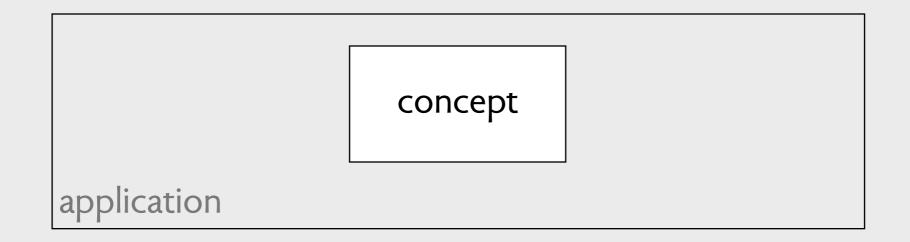
NOTES ON THE SYNTHESIS OF FORM HRISTOPHER ALEXANDER Lass of the University

Such a list of requirements is potentially endless... But if we think of the requirements from a negative point of view, as potential misfits, there is a simple way of picking a finite set.

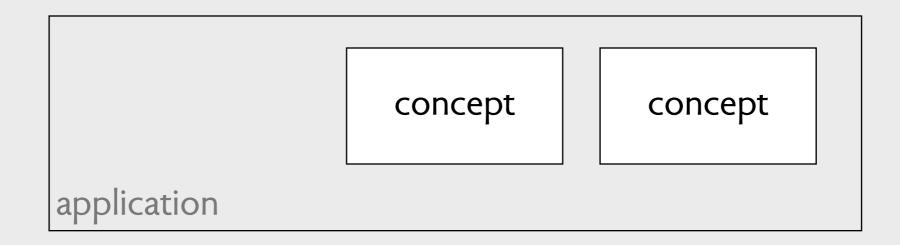
application purpose

application

application purpose



application purpose

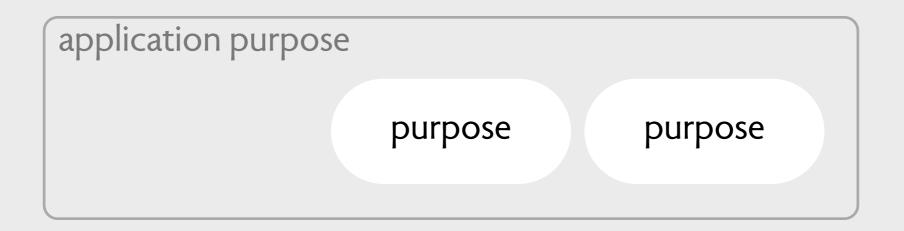


application purpose

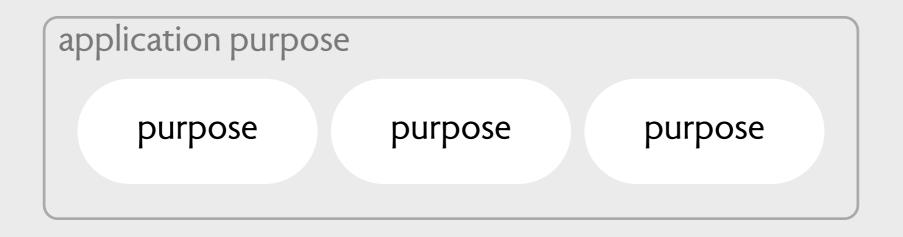
concept concept concept application

| application purpos | е | |
|--------------------|---------|--|
| | purpose | |
| | | |

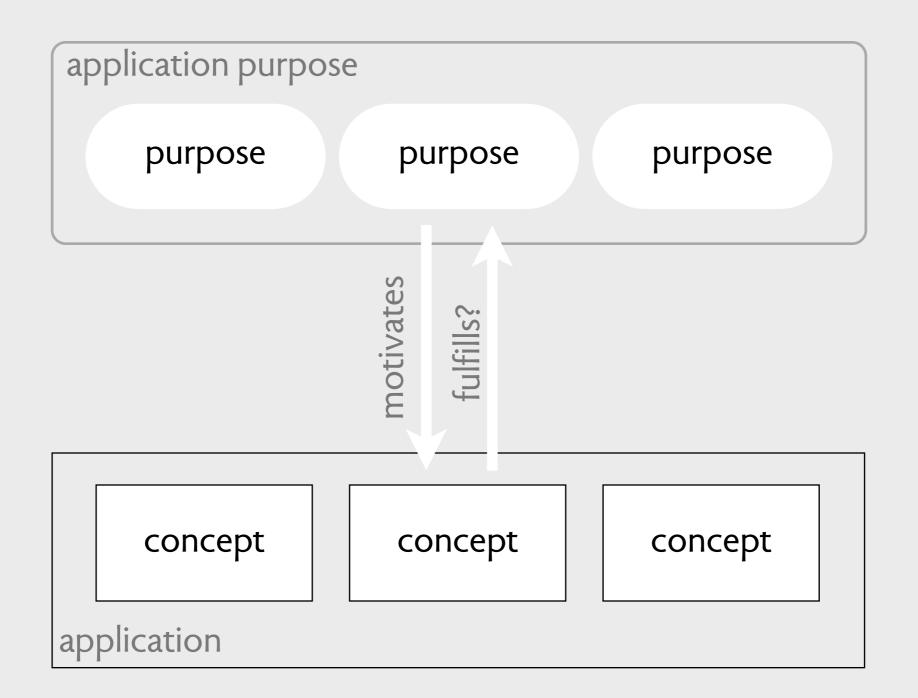
| | concept | concept | concept |
|----|-----------|---------|---------|
| ap | plication | | |

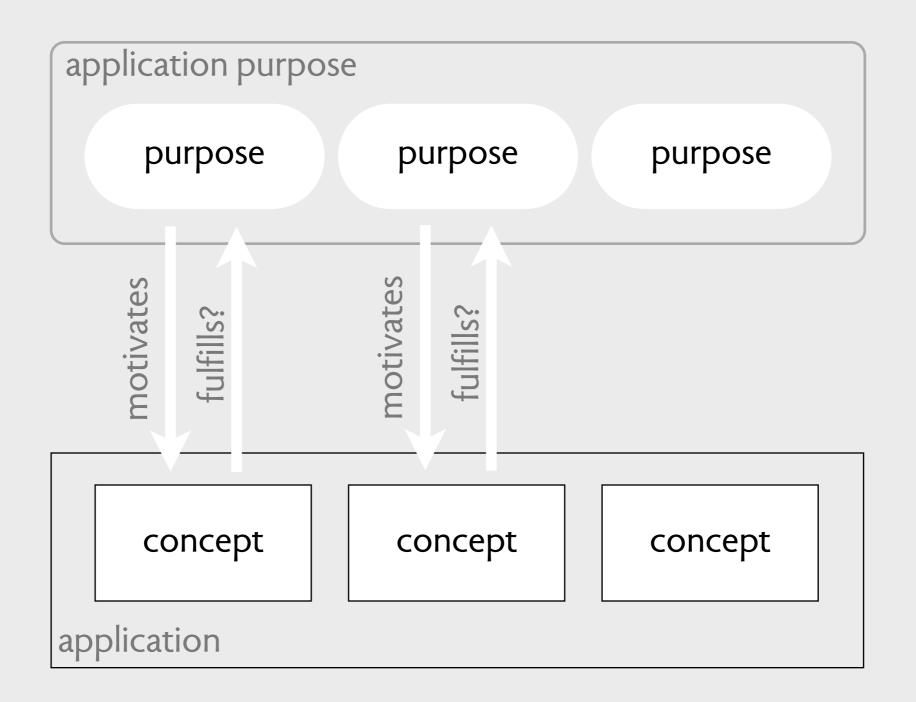


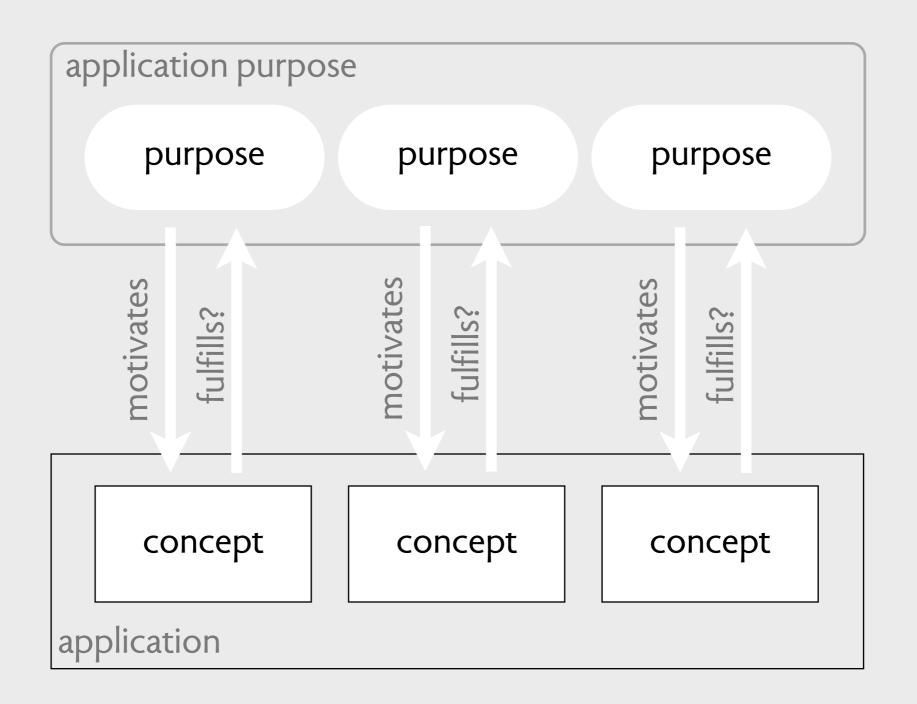
| | concept | concept | | concept | |
|-------------|---------|---------|--|---------|--|
| application | | | | | |



| | concept | concept | | concept | |
|-------------|---------|---------|--|---------|--|
| application | | | | | |



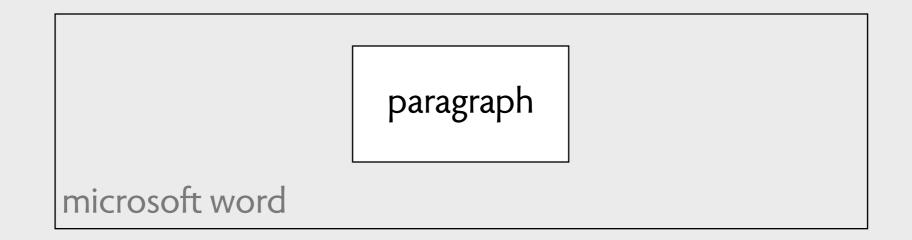




create & format documents

microsoft word

create & format documents



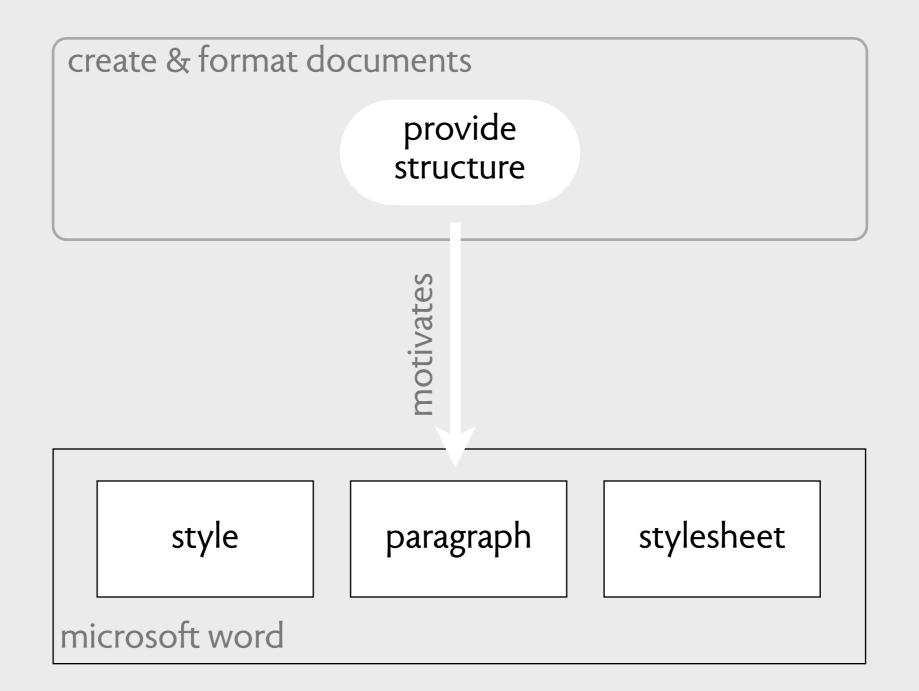
create & format documents

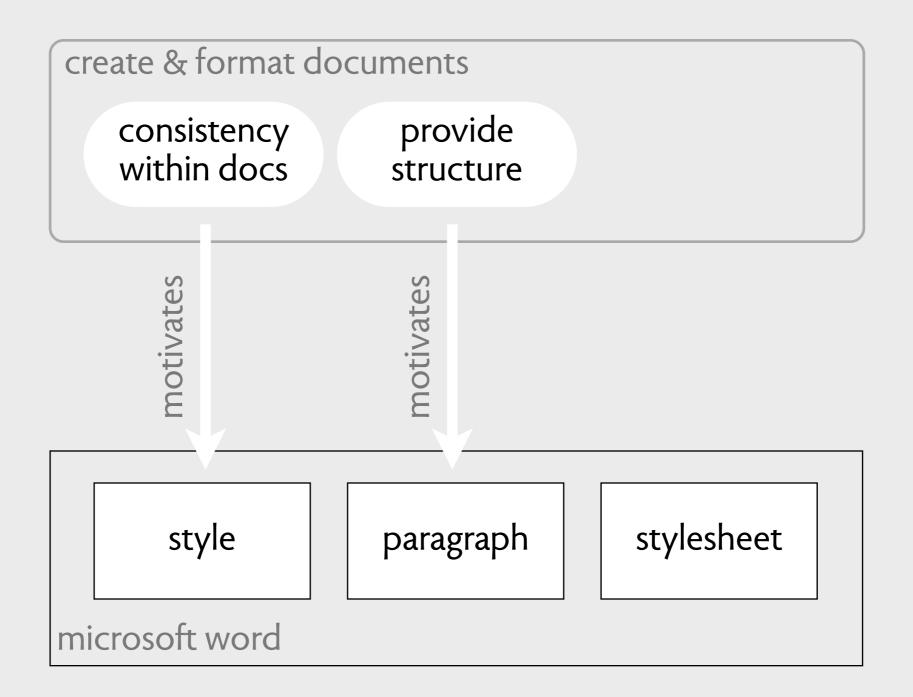
style paragraph microsoft word

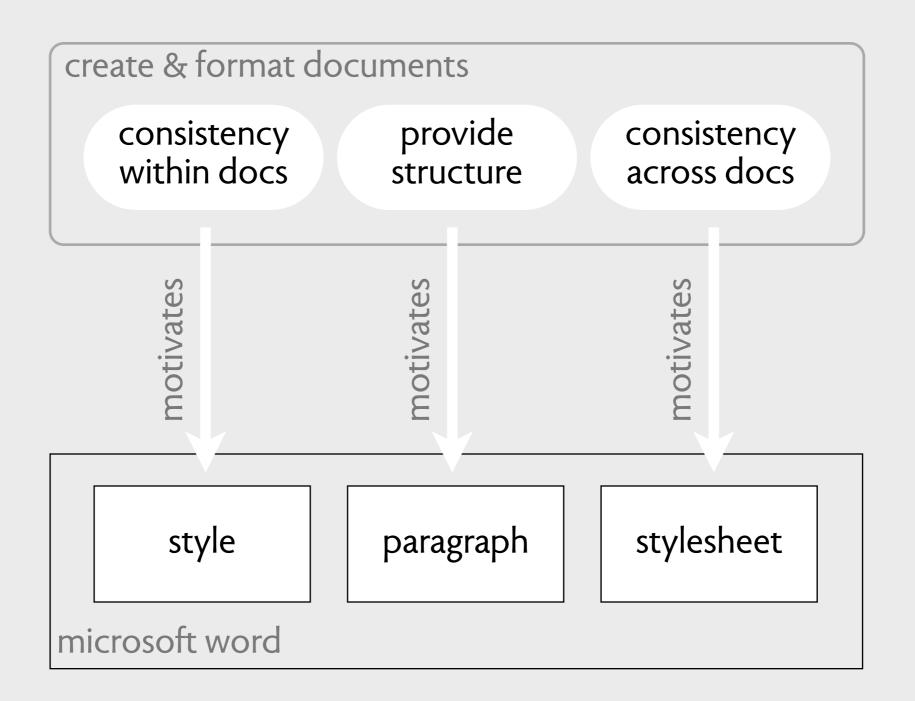
create & format documents

 style
 paragraph
 stylesheet

 microsoft word
 stylesheet







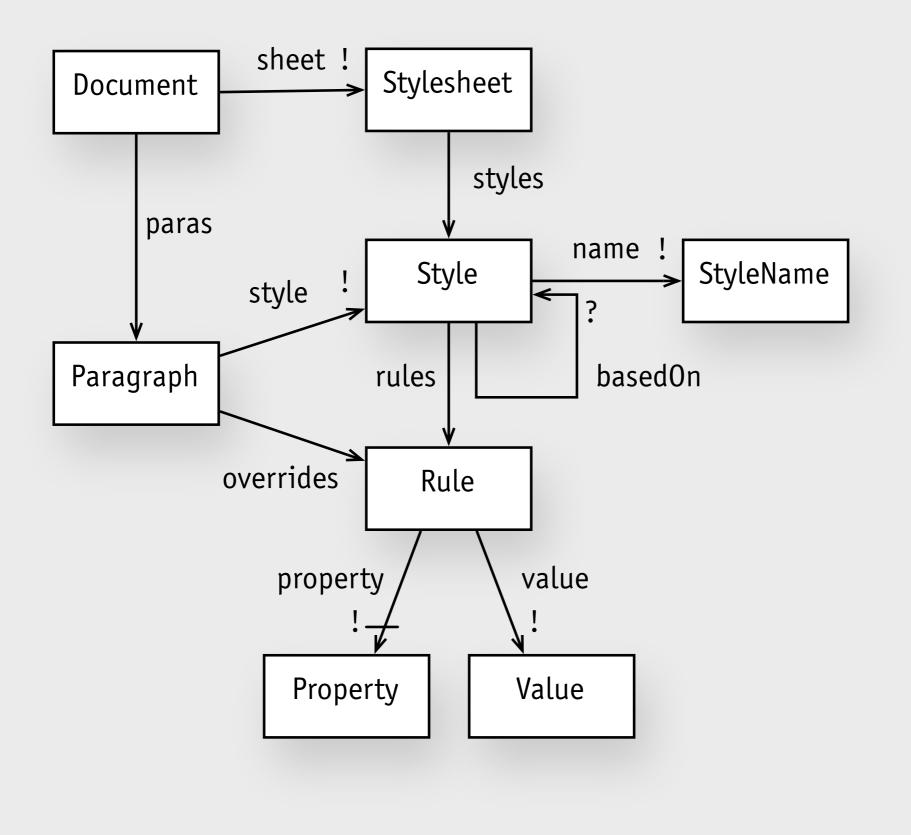
concepts are machines

example word styles

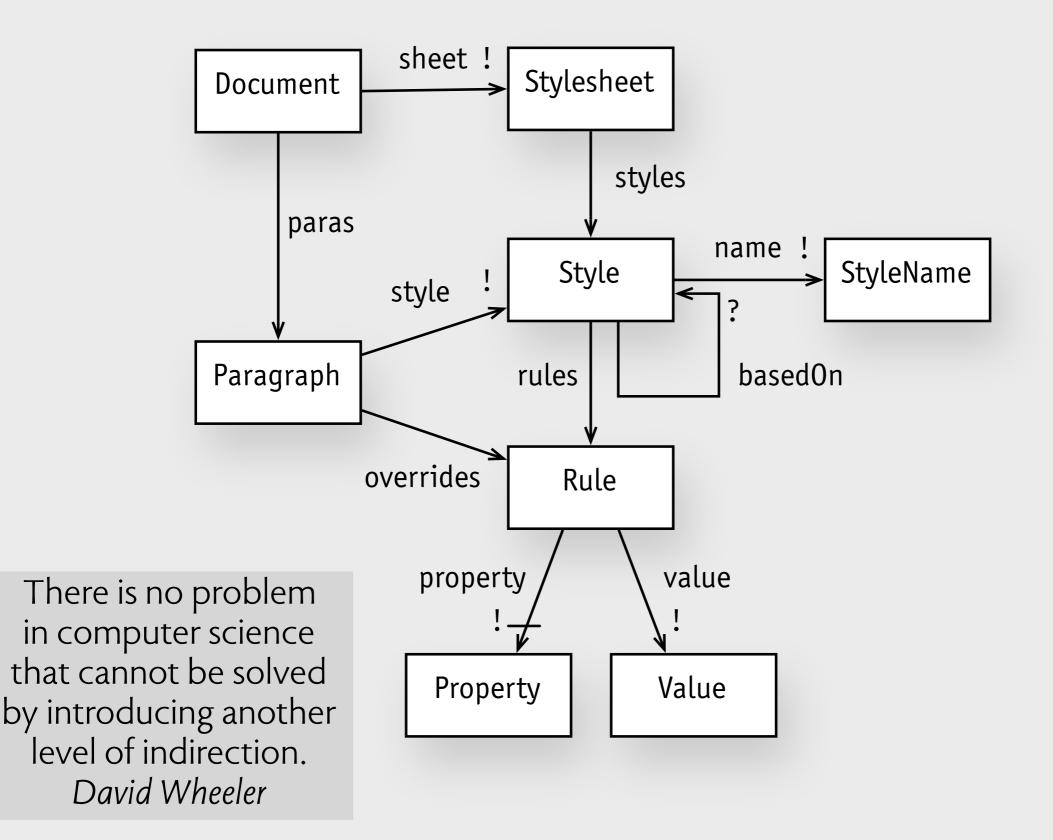
| tyles: | |
|--------------------------|---|
| | Paragraph preview |
| a Default Paragraph Font | Terrine Stage & Terline Stage & |
| No List | Parine Kangadi berlan Kangadi barkan Kangadi barkan Kangadi berlan Kangadi berlan Kangadi. Parine Kangadi berlan Kangadi berlan Kangadi berlan Kangadi. Parine Kangadi berlan di berlan kangadi berlan berlan berlan di berlan beran di berlan beran di berlan da |
| Table Normal | Hale Han a Malersky R na popla Malersky R n |
| | National parts and parts and a second s |
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| | Character preview |
| | |
| | Hello there 12 pt |
| | |
| ist: | Description |
| Styles in Use | + Fact (Default) - Theme Bady, 12 at 1 of 1 line |
| | |
| | Font:(Default) +Theme Body, 12 pt, Left, Line spacing: single, Widow/Orphan control, Style: |
| | spacing: single, Widow/Orphan control, Style: Quick Style |
| | spacing: single, Widow/Orphan control, Style: |
| Organizer | spacing: single, Widow/Orphan control, Style: |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style New Modify Delete |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style New Modify Delete |
| Organizer | spacing: single, Widow/Orphan control, Style: Quick Style New Modify Delete |

| Modify Style | | | | | |
|--|---------------|--|--|--|--|
| Properties | | | | | |
| Name: | Normal | | | | |
| Style type: | Paragraph ‡ | | | | |
| Style based on: | (no style) \$ | | | | |
| Style for following paragraph: | ¶ Normal ‡ | | | | |
| Formatting | | | | | |
| Cambria (Body) * 12 * | B I U A · | | | | |
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| Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Provisan Paragraph Paragraph Pallison og Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pallison og Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pollowing Paragraph Pallison og Paragraph Pollowing Paragraph Pollowing Paragraph Pallison og Paragraph Pallison og Paragraph Pollowing Paragraph Pallison og Paragraph | | | | | |
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| Add to template Add to Quick Style list Format Cancel OK | | | | | |

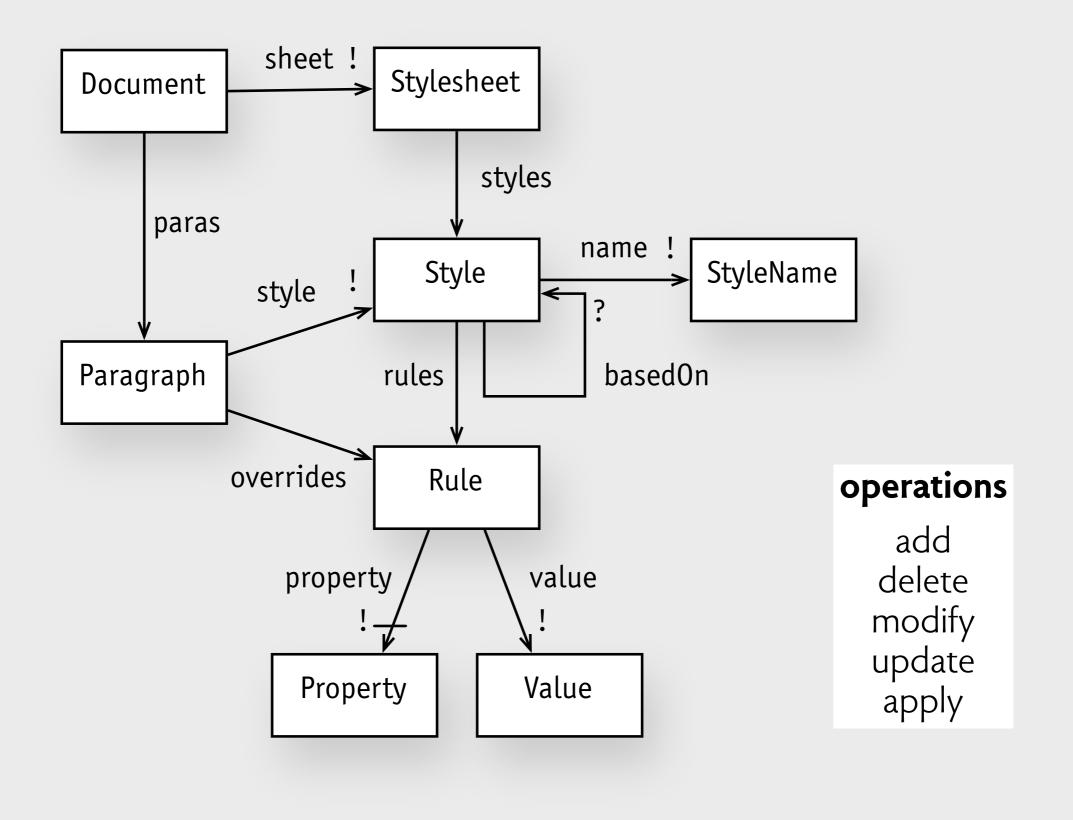
concept model word styles



concept model word styles



concept model word styles



concept characteristics

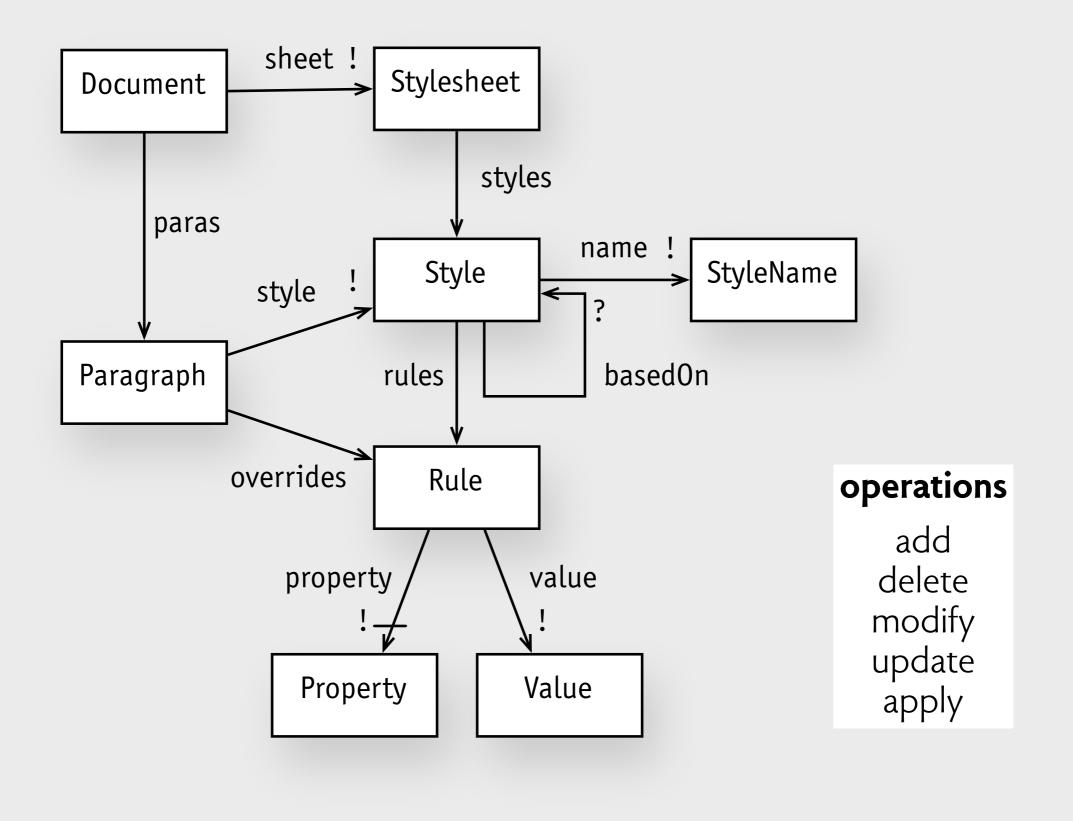
concept characteristics

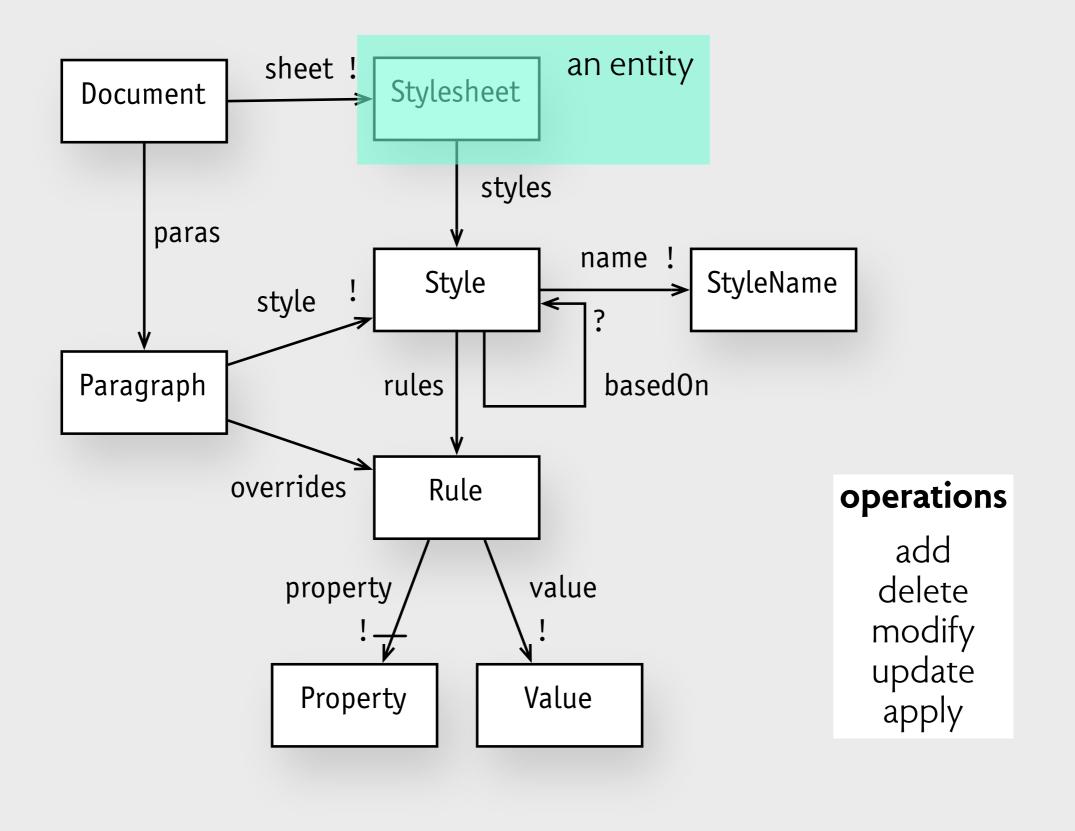
concepts are closed state & all relevant operations

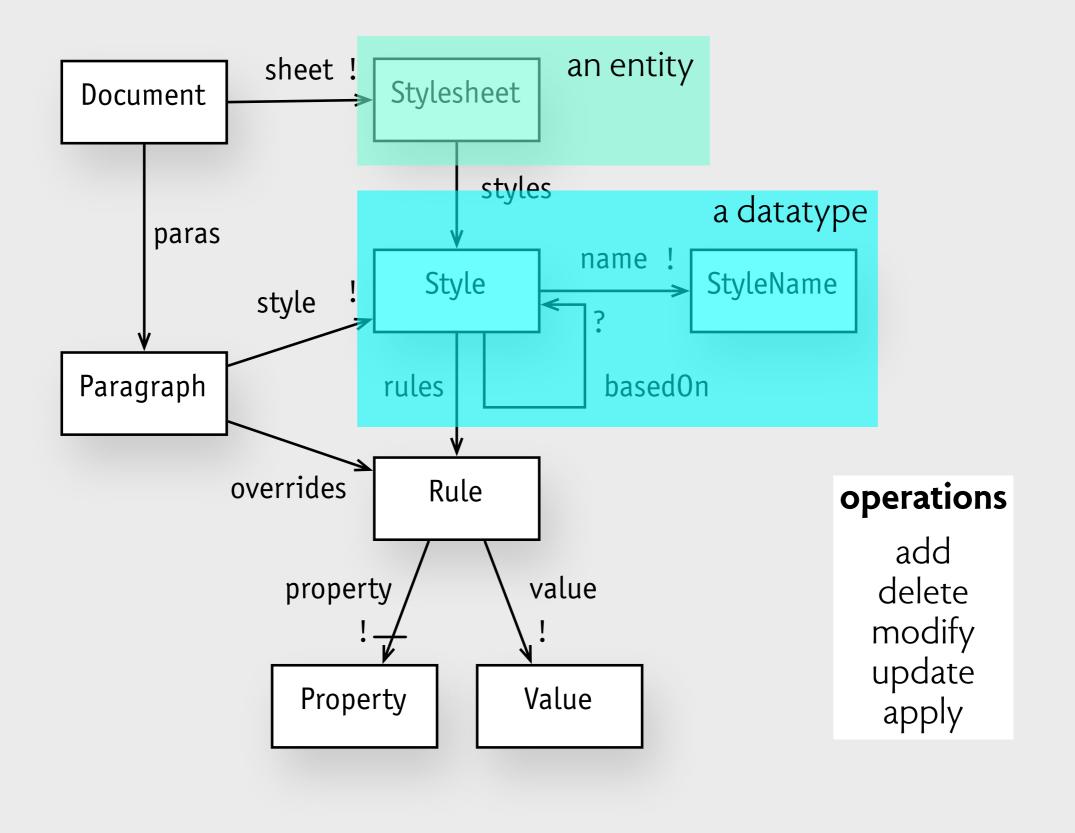
concept characteristics

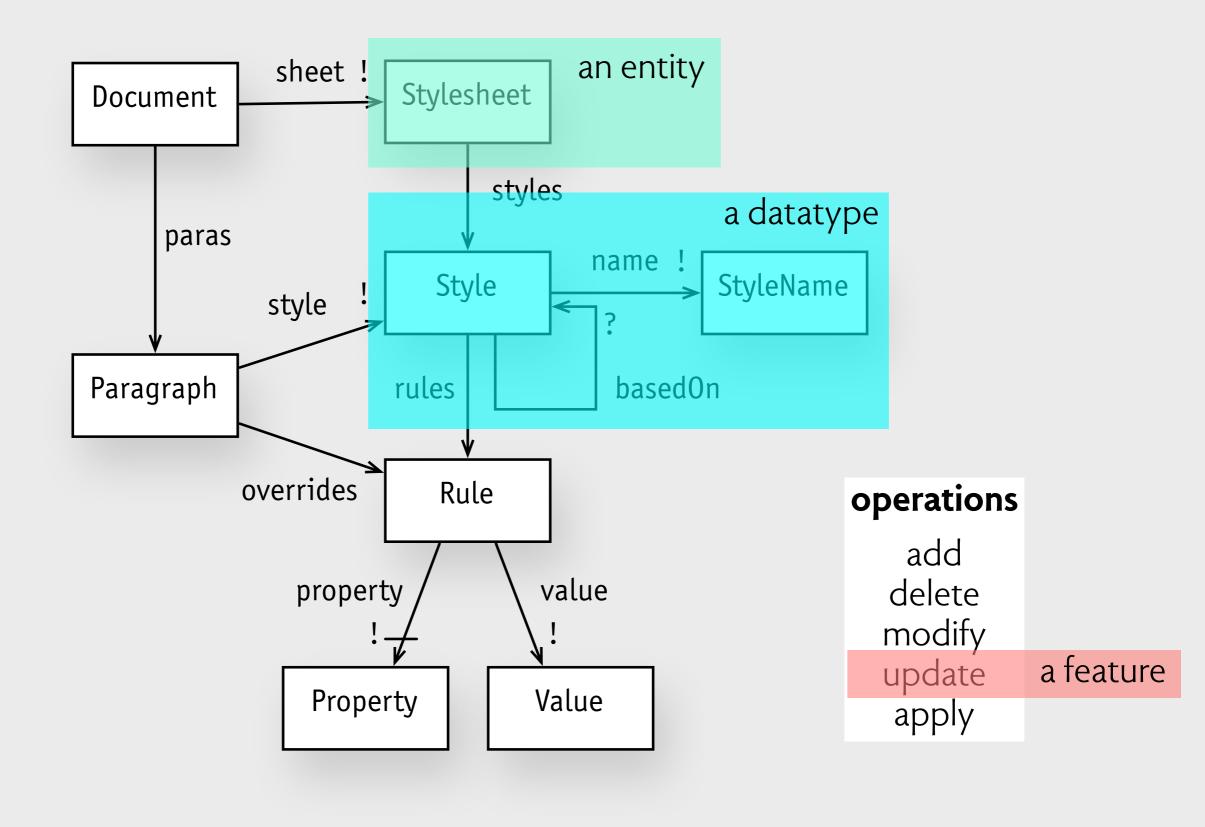
concepts are closed state & all relevant operations

concepts are situated not awaiting composition









OPs vs user stories

connects to purpose so OP for trash must include restore

connects to purpose so OP for trash must include restore

has sufficient span

so OP for secure trash must go up to data recovery

connects to purpose so OP for trash must include restore

has sufficient span

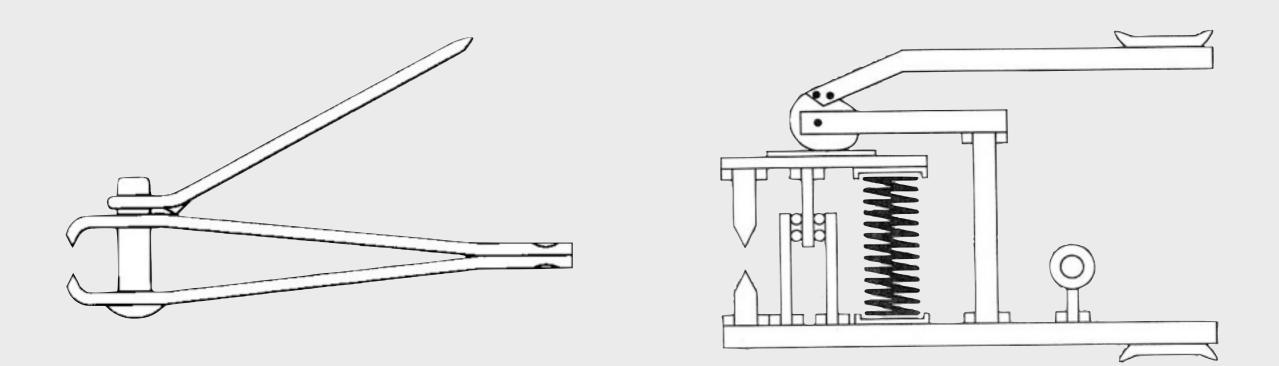
so OP for secure trash must go up to data recovery

separates essential from accidental

so OP for trash doesn't say files disappear when eject disk

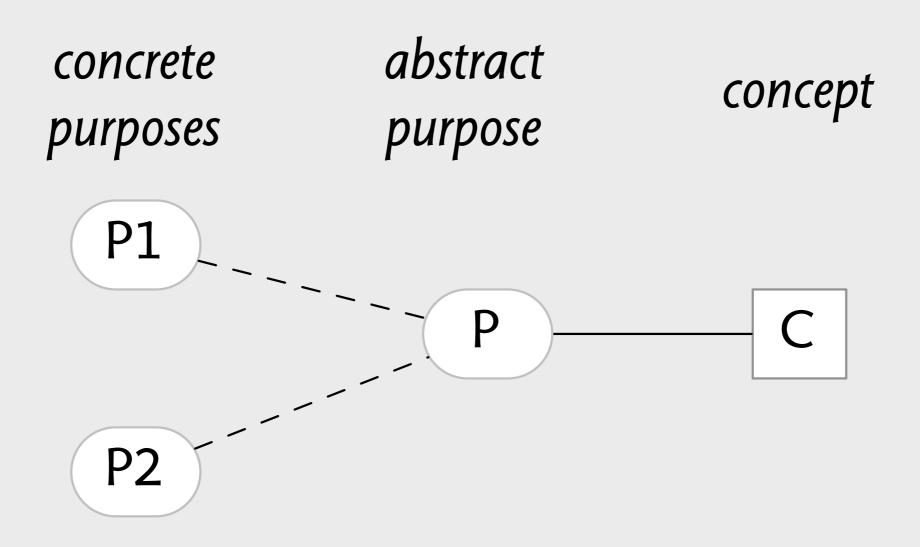
efficiency in design

sharing: the essence of good design?

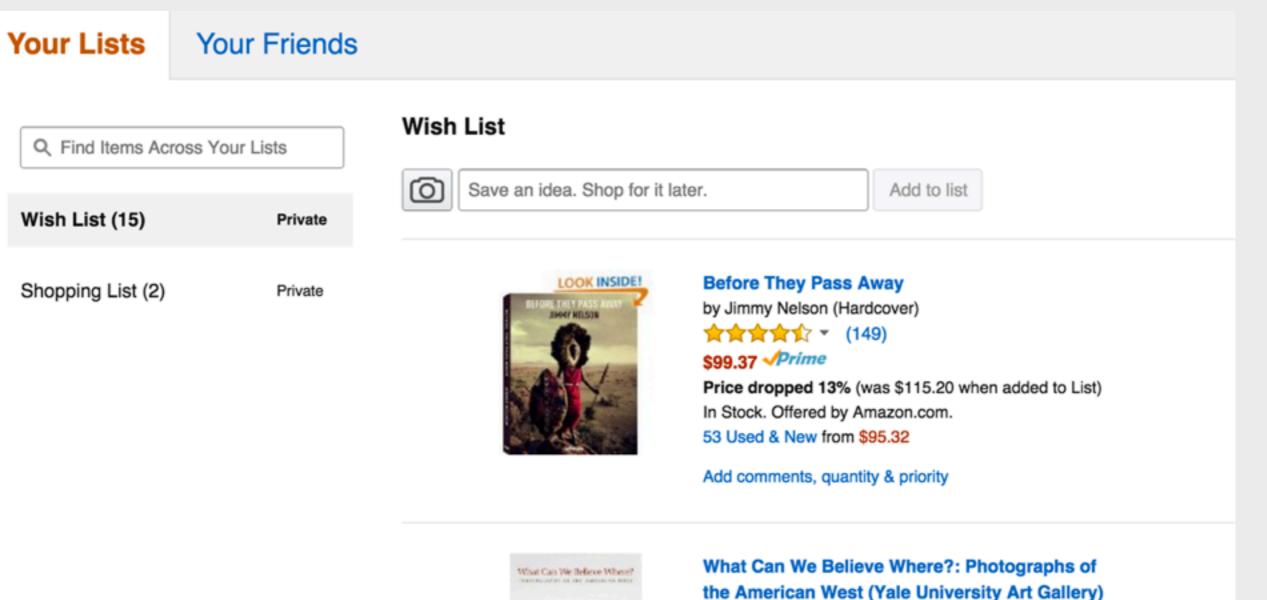


from Karl Ulrich, *Computation and Pre-Parametric Design* (1988) thanks to Yishai Feldman

when overloading is acceptable

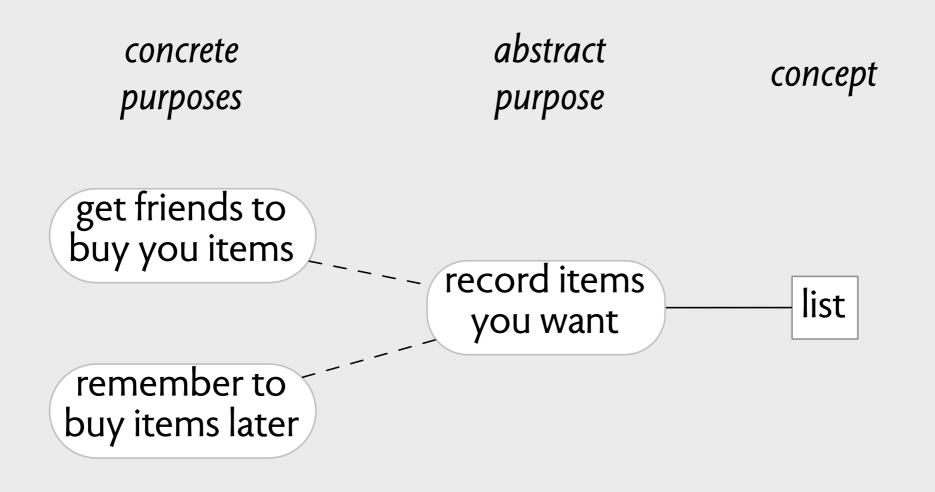


shared concept amazon lists

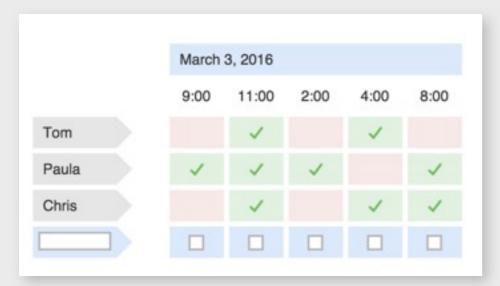


Add comments, quantity & priority

abstract purpose amazon lists



shared concept doodle poll



concrete purpose: schedule a meeting

| 3 participants | Lindt | Callebaut | Valrhona |
|----------------|-------|-----------|----------|
| Alice | | | ~ |
| 9 Bob | | ~ | |
| Carol | | | 1 |
| Your name | | | |
| | 0 | 1 | 2 |

concrete purpose: vote on a choice

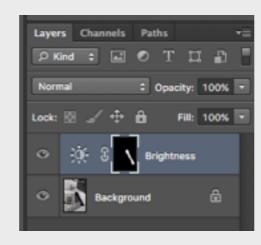
shared concept grayscale image in Ps



greyscale image



brushing pixels



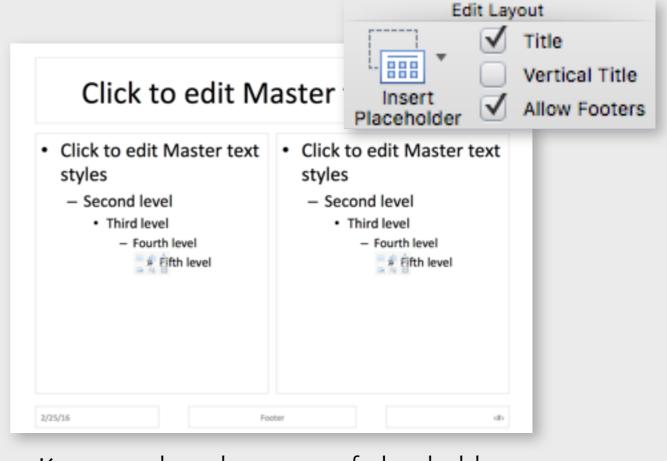


brushing pixels in layer mask

shared concept placeholder

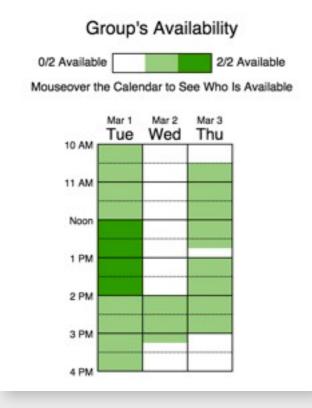
| | Title Text | |
|--------|----------------------------------|---|
| | Body Level One Body Level Two | |
| | Body Level Three | |
| | Body Level Four | |
| | Body Level Flore | |
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| 10.0.1 | | _ |

Keynote: no shared concept for title & body



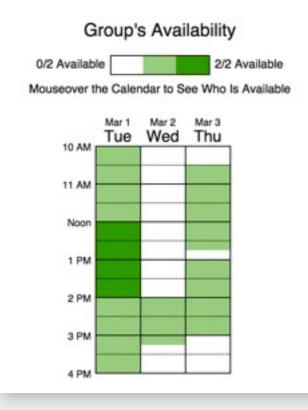
Keynote: shared concept of placeholder

limited functionality for concrete purpose



Doodle doesn't offer some scheduling specific functionality that when2meet offers

limited functionality for concrete purpose



Doodle doesn't offer some scheduling specific functionality that when2meet offers

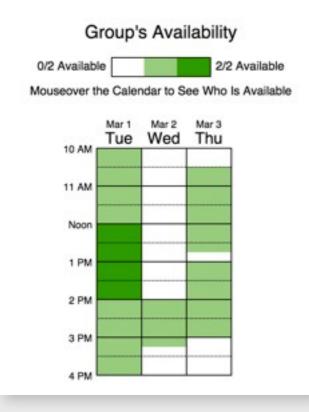
security & safety oversights



Amazon wishlists privacy risk

http://www.dailymail.co.uk/news/article-2984542

limited functionality for concrete purpose



Doodle doesn't offer some scheduling specific functionality that when2meet offers

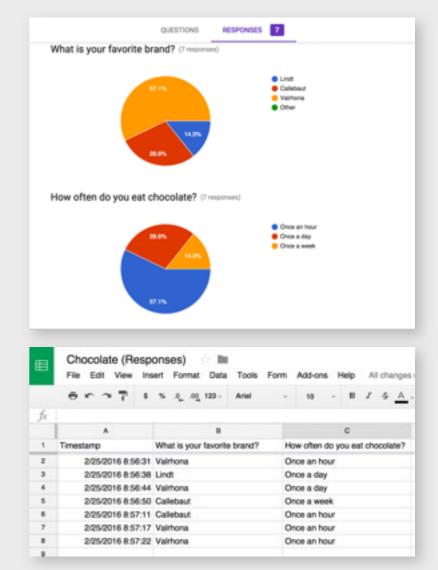
security & safety oversights



Amazon wishlists privacy risk

http://www.dailymail.co.uk/news/article-2984542

unexpected couplings



Google forms: spreadsheet not synced with responses

the root of the problem



Edsger Dijkstra EWD952

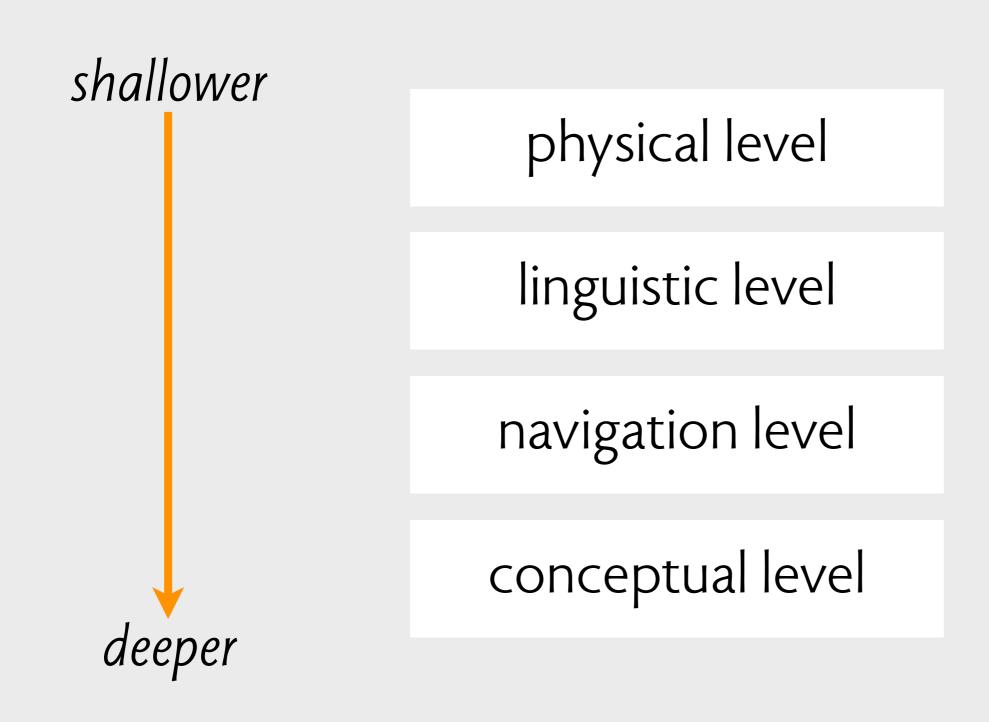
the root of the problem

The rôle of a formal functional specification is simply to act as a logical firewall between two completely different concerns... The **pleasantness problem** concerns the question whether a system... would satisfy our needs... The correctness problem concerns the question whether a given design meets such-and-such a formal functional specification. The logical firewall ... isolates computing science's well-carved niche from the pleasantness problem to which science has little to contribute. Please note that I did not say that the one problem is more important than the other; after all, no chain is stronger than its weakest link.



Edsger Dijkstra EWD952

user interface levels



concept distinctions

banking app

overdraft protection loan

automatic bill payment

available funds balance

instrumental: invented for app banking app

overdraft protection loan

automatic bill payment

available funds balance

instrumental: invented for app given: preexisted in

domain

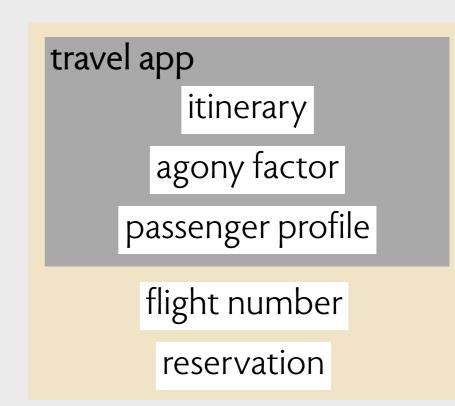
instrumental: invented for app

given: preexisted in domain banking app

overdraft protection loan

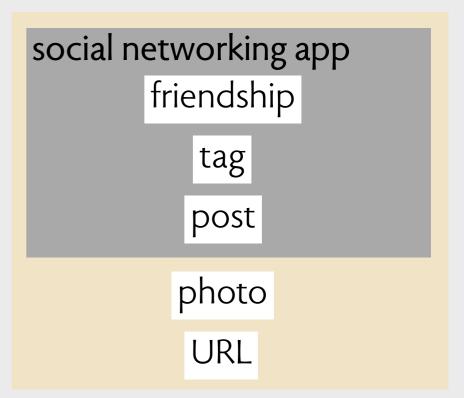
automatic bill payment

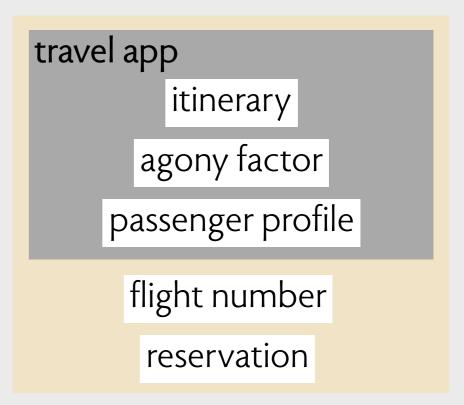
available funds balance



instrumental: invented for app

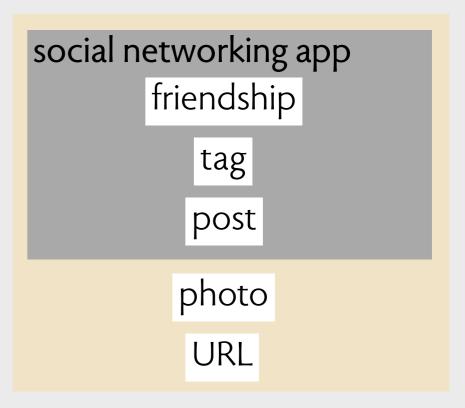
given: preexisted in domain banking app
overdraft protection loan
automatic bill payment
available funds balance

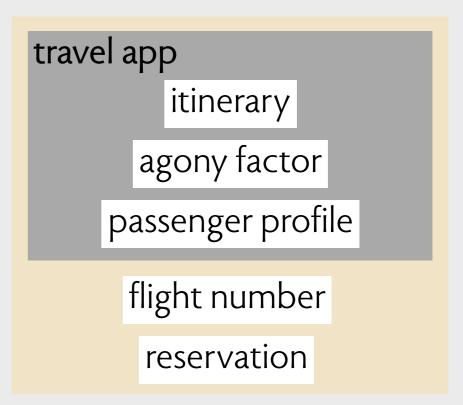




instrumental:
invented for appbanking app
overdraft protection loan
automatic bill paymentgiven:
preexisted in
domainbanking app
overdraft protection loan
automatic bill paymentgiven:
available funds balanceaccount balance

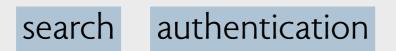
note that all concepts, even given concepts are a means to an end

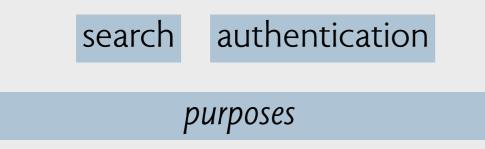


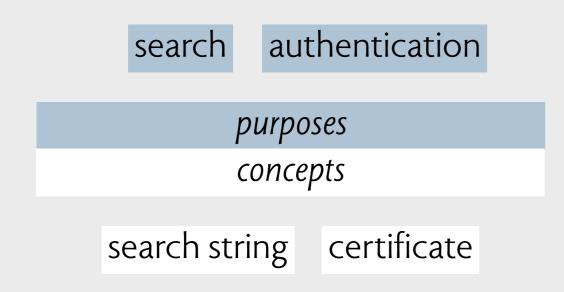


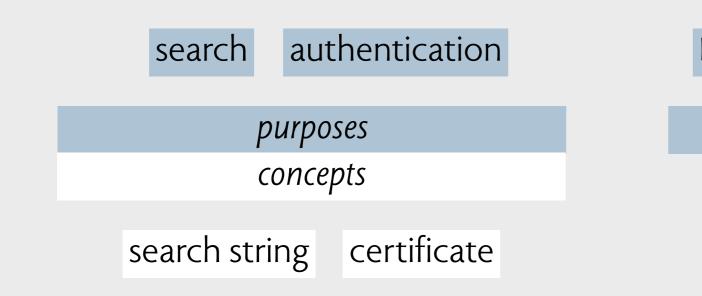
these are not concepts...

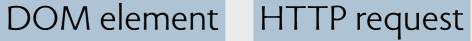
these are not concepts...



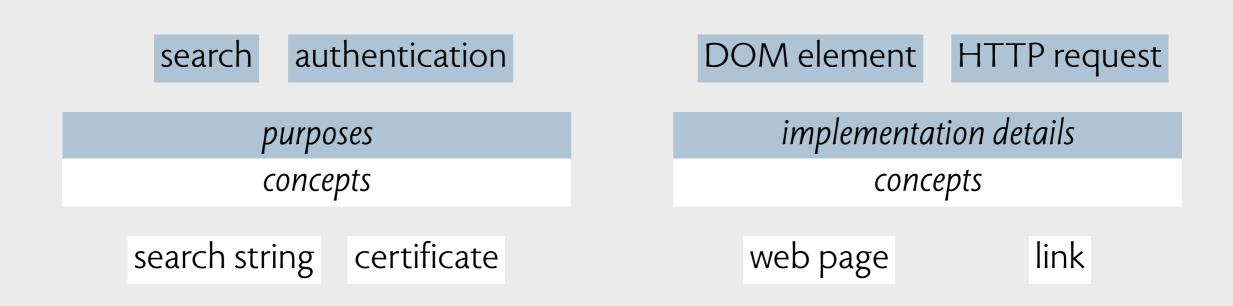








implementation details

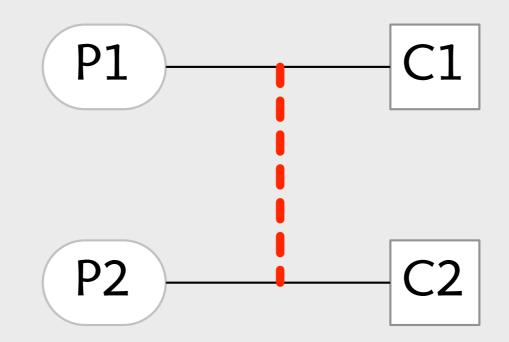


but this is a concept for a user of the jQuery API (vs. a user of Chrome)

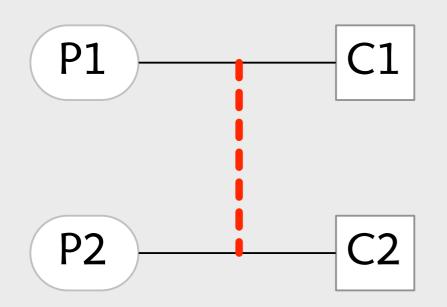
| search authentication | DOM element HTTP request |
|---------------------------|--------------------------|
| purposes | implementation details |
| concepts | concepts |
| search string certificate | web page link |

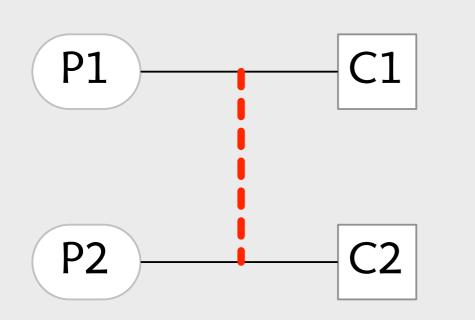
orthogonality & uniformity

orthogonality

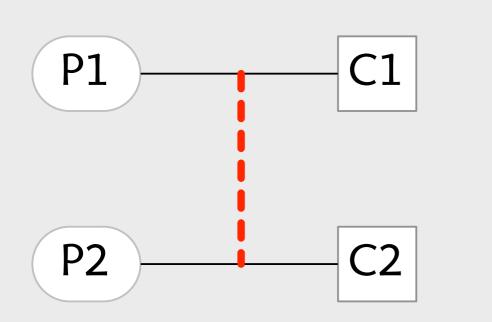


orthogonality is violated when one concept's fitness for purpose is undermined by another concept



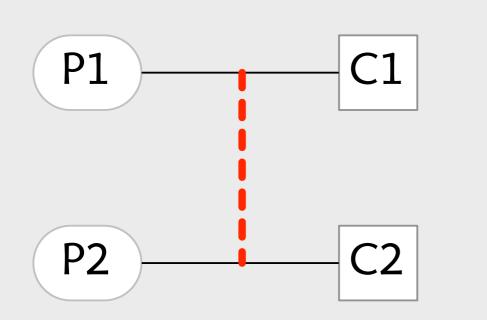


origin, space, exclusion (CSS) 4 position values for 2×3×2 options



origin, space, exclusion (CSS) 4 position values for 2×3×2 options

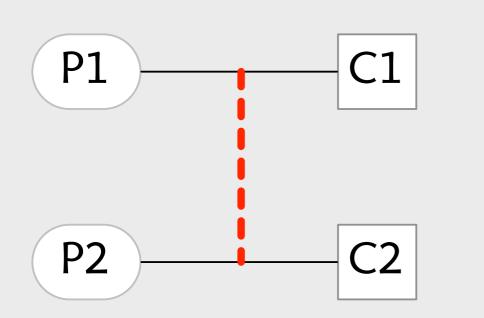
conversation & label (Gmail) same subject, get same label



origin, space, exclusion (CSS) 4 position values for 2×3×2 options

conversation & label (Gmail) same subject, get same label

listserv & bcc (SMTP) modified subject reveals target

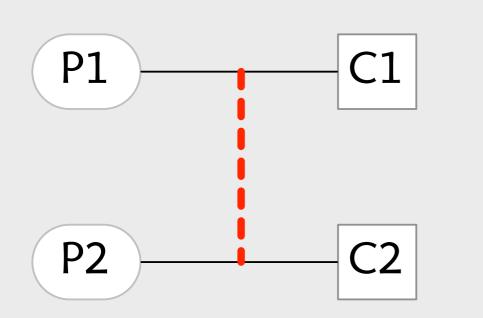


origin, space, exclusion (CSS) 4 position values for 2×3×2 options

conversation & label (Gmail) same subject, get same label

listserv & bcc (SMTP) modified subject reveals target

title & reply (Tumblr) adding ? to title enables replies (!)



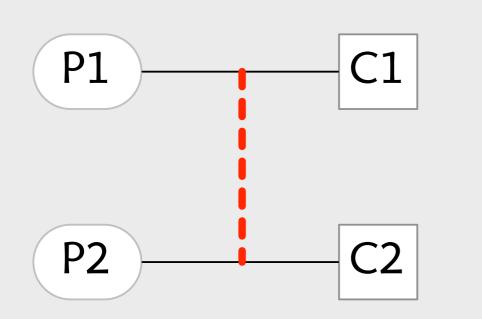
origin, space, exclusion (CSS) 4 position values for 2×3×2 options

conversation & label (Gmail) same subject, get same label

listserv & bcc (SMTP) modified subject reveals target

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group & selection (many old apps) can't select object in a group



origin, space, exclusion (CSS) 4 position values for 2×3×2 options

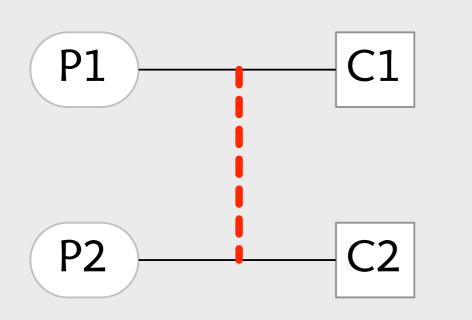
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group & connector (Keynote 5.3) can't select box if connected





Shriram Krishnamurthi BCC example

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group & selection (many old apps) can't select object in a group

group & connector (Keynote 5.3) can't select box if connected

non-orthogonal concepts gmail from Eunsuk Kang

Eunsuk Kang <eskang@csail.mit.edu> To: Daniel Jackson <dnj@MIT.EDU>, Santiago Perez De Rosso <sperezde@csail.mit.edu> an example of bad coupling in gmail? December 11, 2014 2:27 AM Hide Details Conceptual Design -

Hi Daniel, Santiago,

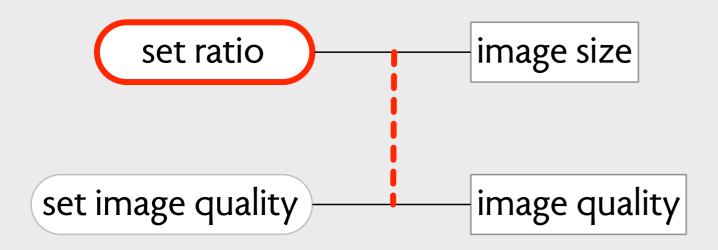
I am not sure whether this falls into one of the conceptual design issues that you have been analyzing, but here's a little annoyance that I just ran into using labels in Gmail.

This evening, I made two separate reservations with Enterprise (one in Phoenix and another one in Vegas), and the company sent me a confirmation e-mail for each one of them. Usually, I tag travel-related e-mails using a label (e.g. "Vegas Trip 2014") so that I can easily find all the relevant e-mails for a particular trip. Now, the problem is that Gmail automatically grouped the two Enterprise emails into a single conversation. It turns out that in Gmail, a label applied to an e-mail in a conversation is applied to every other e-mail in the same conversation. This means I can't assign separate labels to the two car rentals! Uggh!

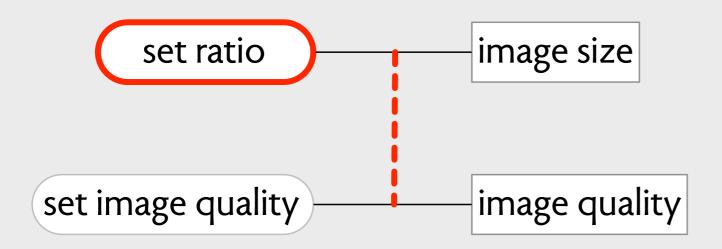
(By the way, is it possible to take an e-mail out of a conversation? Either this is impossible or the Gmail UI does not make this easy).

Eunsuk

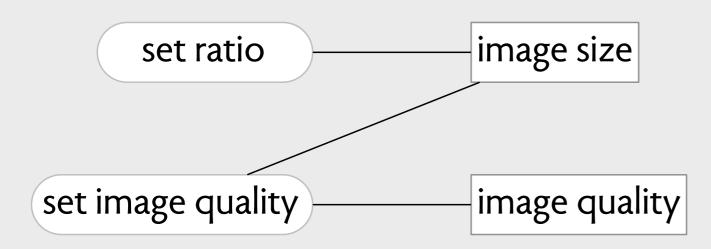
conversations interfere with labels



an orthogonality violation

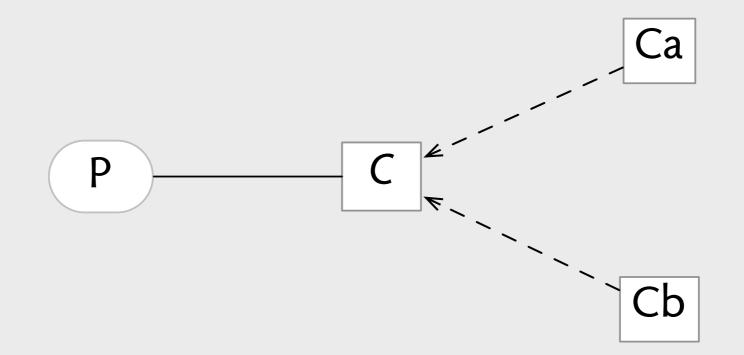


an orthogonality violation

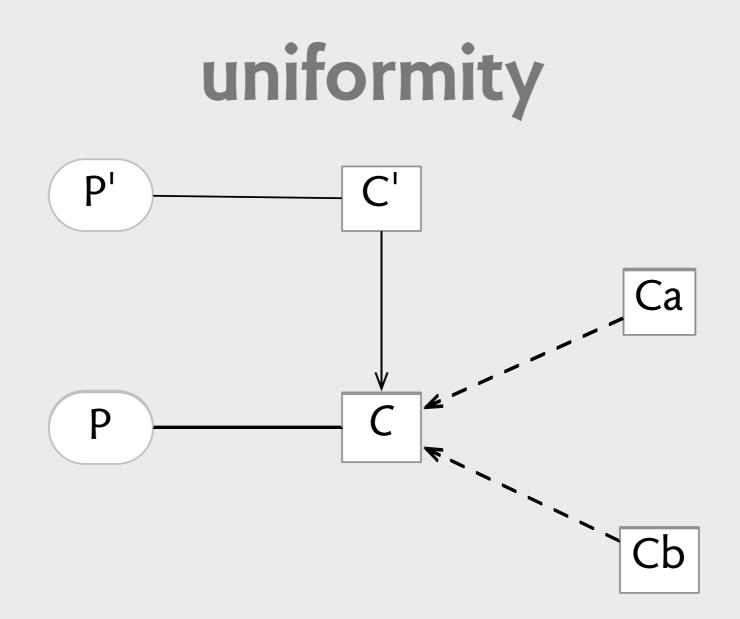


overloaded concept too

uniformity



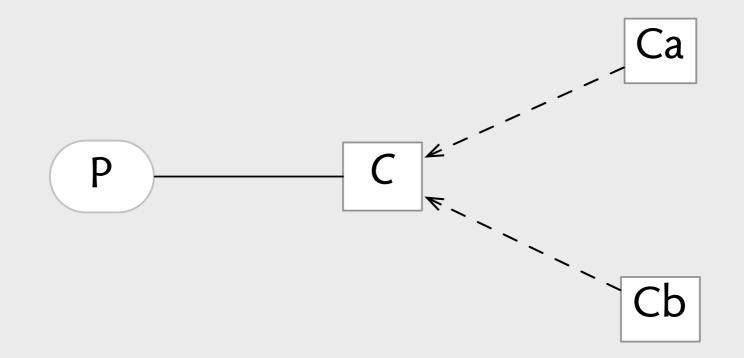
uniformity is violated when instantiations differ with respect to fulfillment of purpose



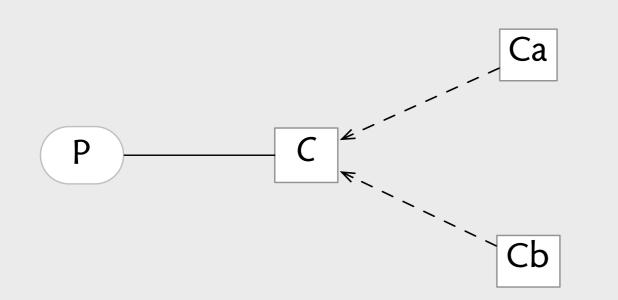
uniformity is violated when instantiations differ with respect to fulfillment of purpose

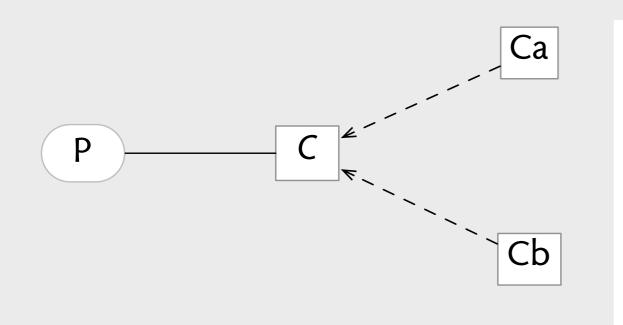
... directly or indirectly

uniformity

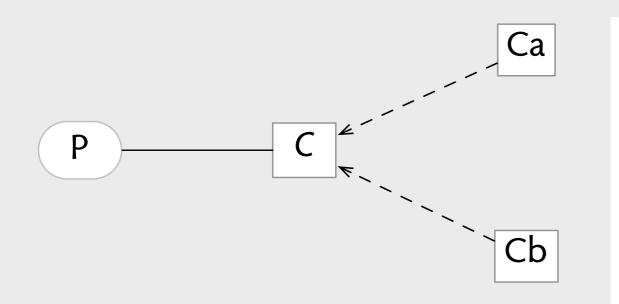


uniformity is violated when a concept has different versions or instantiations that behave differently for no good reason



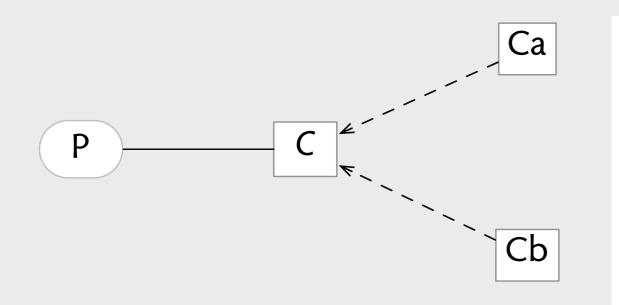


deposits by check (banking) funds arrive before clearing



deposits by check (banking) funds arrive before clearing

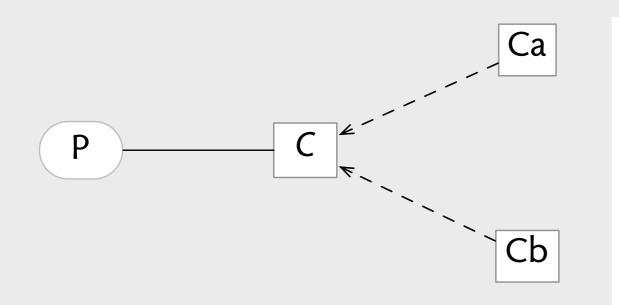
primitive type (Java) not like a class type



deposits by check (banking) funds arrive before clearing

primitive type (Java) not like a class type

direct flight (Official Airline Guides) 1 flight number, but >1 stop

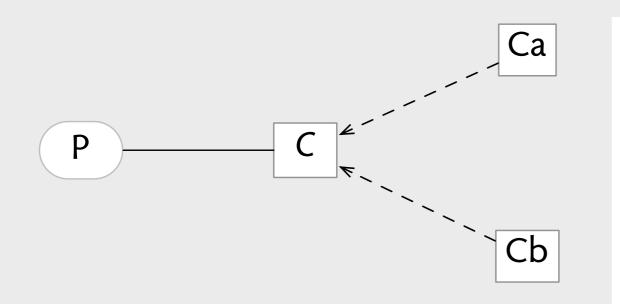


deposits by check (banking) funds arrive before clearing

primitive type (Java) not like a class type

direct flight (Official Airline Guides) 1 flight number, but >1 stop

alerts (Apple iCal) can't select email alerts for default



deposits by check (banking) funds arrive before clearing

primitive type (Java) not like a class type

direct flight (Official Airline Guides) 1 flight number, but >1 stop

alerts (Apple iCal) can't select email alerts for default

custom settings (Fuji x100s) only some settings selectable

conceptual acrobatics

Field Trip Permission Form

Dear Parents:

Ms. Frizzle will again be taking her second grade class on an exciting field trip. Please sign and return the permission slip below.

Thank you!

Yes, I give permission for my child to go on the second grade "Touch and Feel" trip on Friday February 13th to the NastyCo Nuclear Dump. I understood that my child may encounter the normal risks of childhood play, including grazed knees, hurt feelings and exposure to toxic waste.

Parents signature

Field Trip Permission Form

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Count Ola

Parents signature

Date

Field Trip Permission Form

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Thank you!

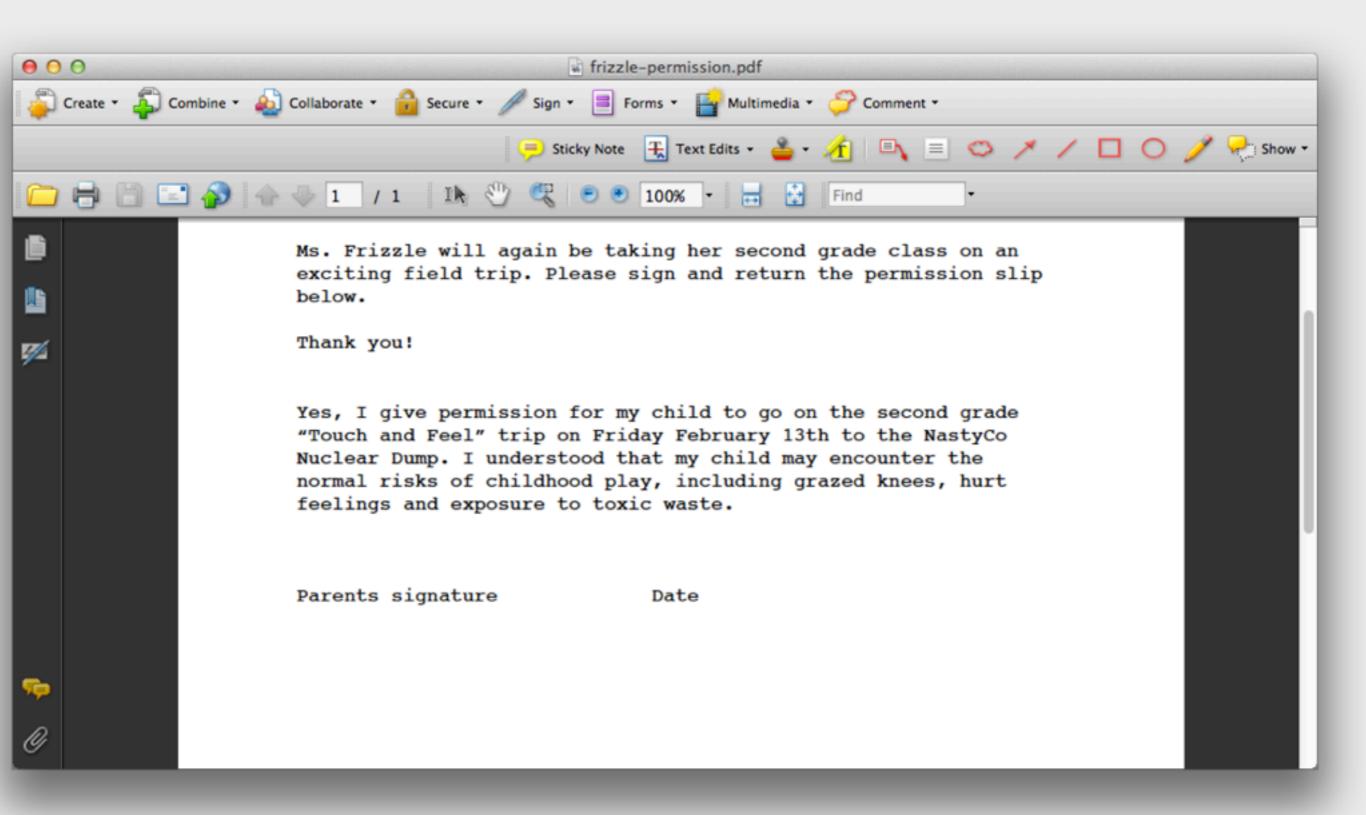
Yes, I give permission for my child to go on the second grade "Touch and Feel" trip on Friday February 13th to the NastyCo Nuclear Dump. I understood that my child may encounter the normal risks of childhood play, including grazed knees, hurt feelings and exposure to toxic waste.

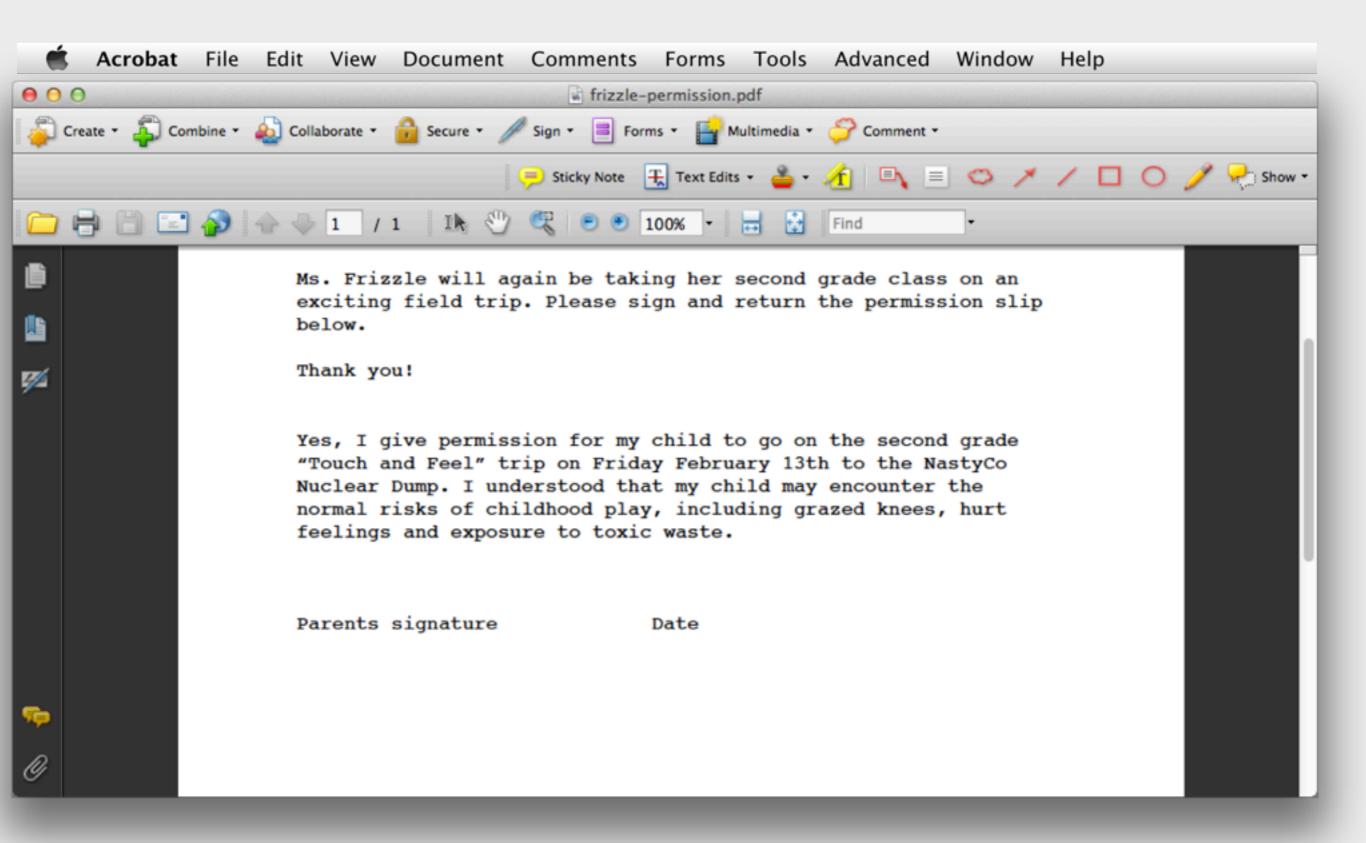
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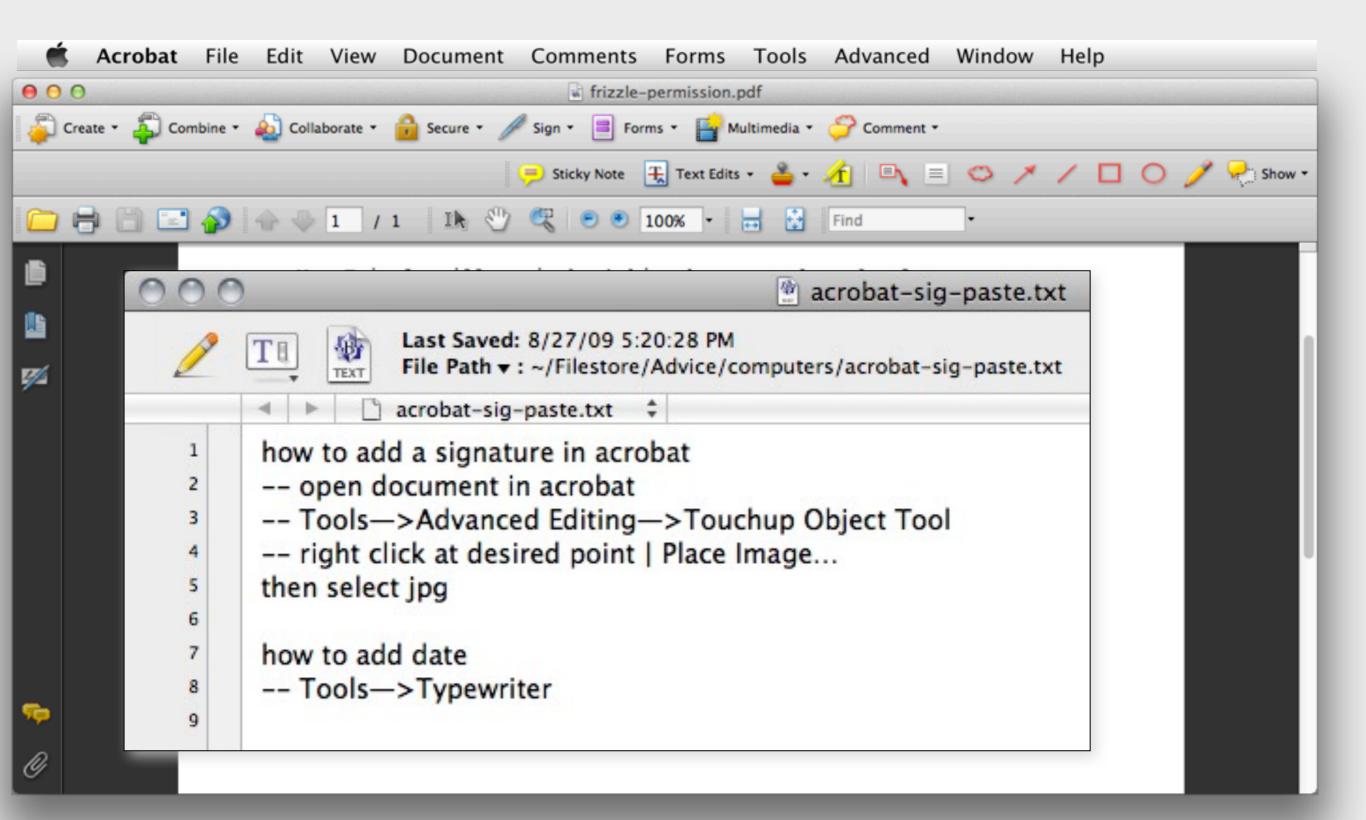
February 11, 2013

Parents signature

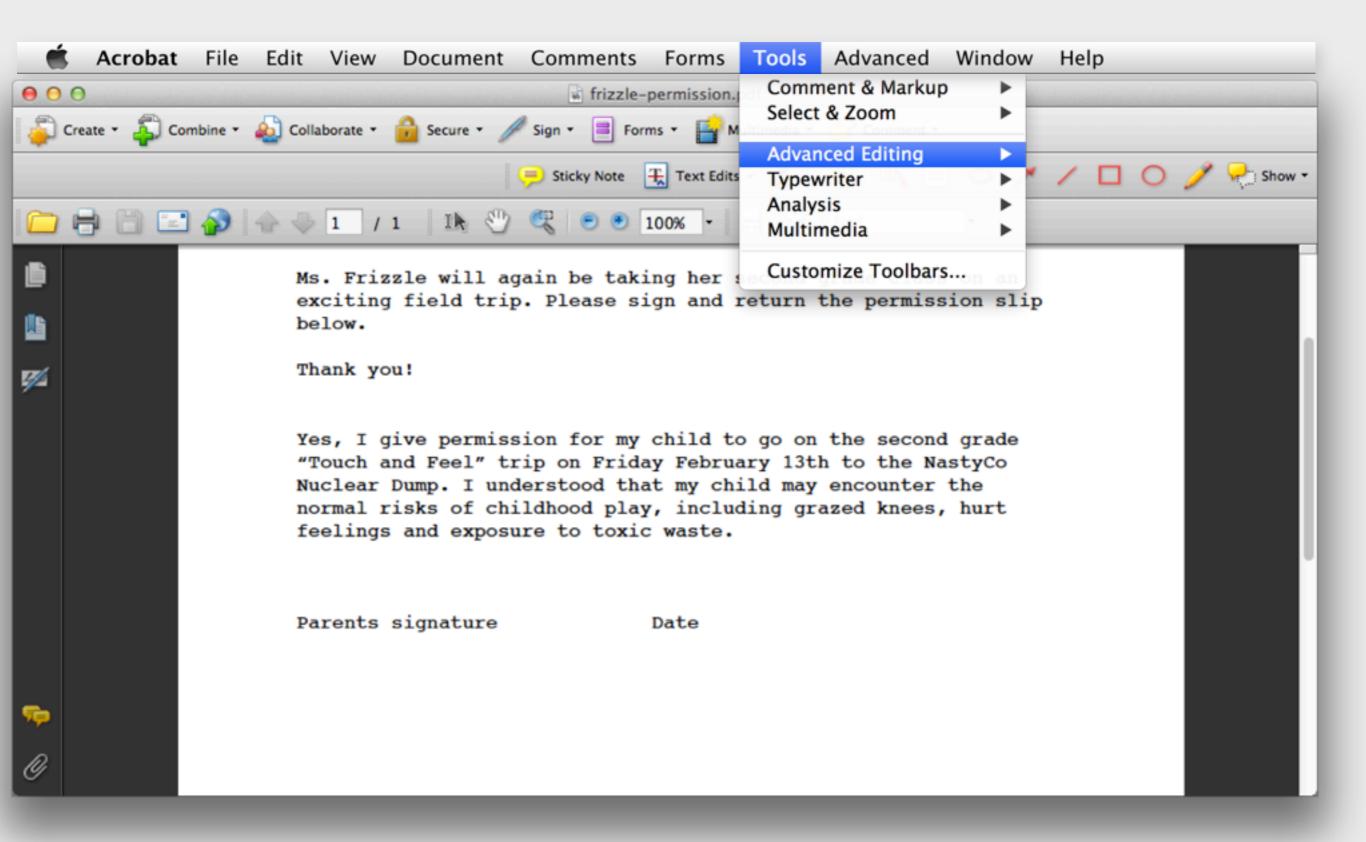
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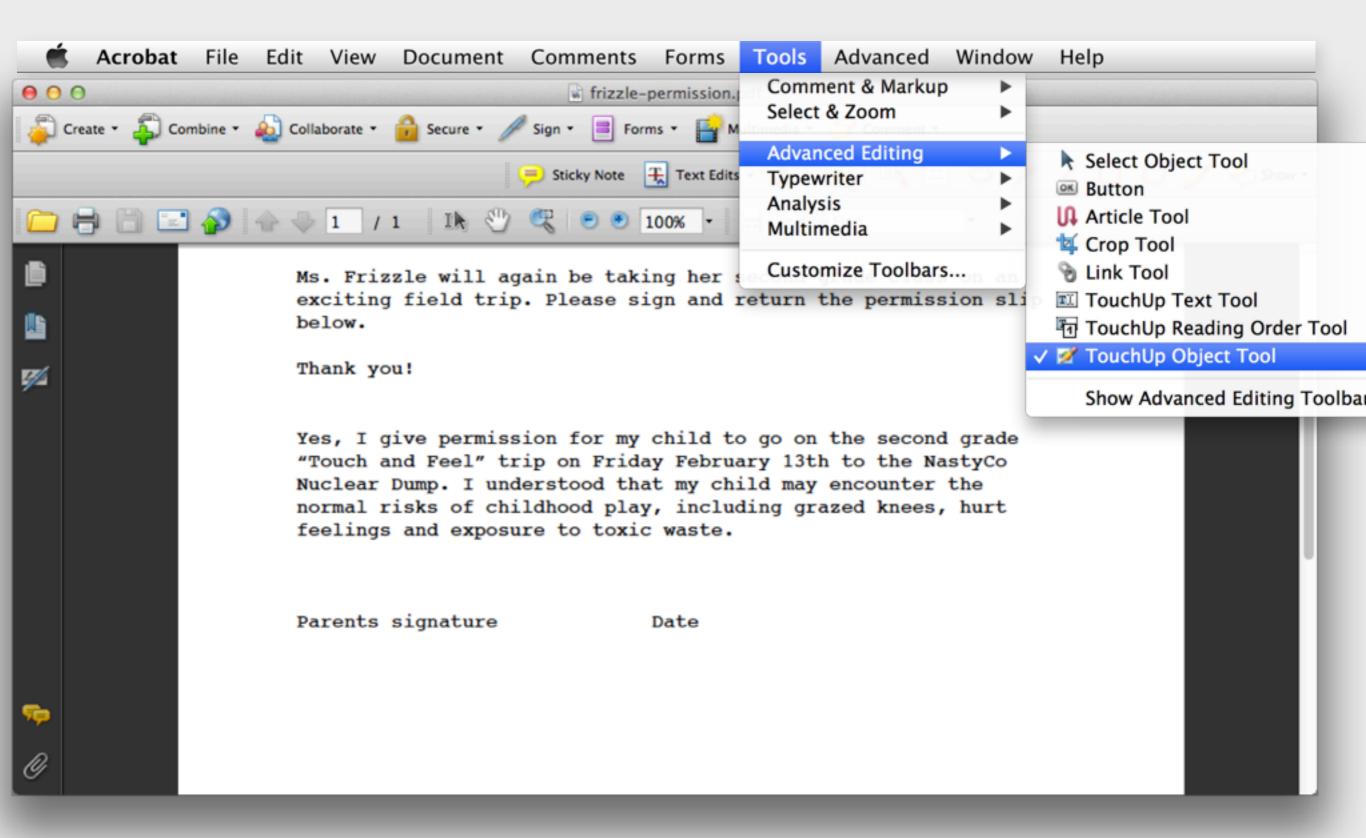




acrobat to the rescue



acrobat to the rescue



acrobat to the rescue

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from http://amplicate.com





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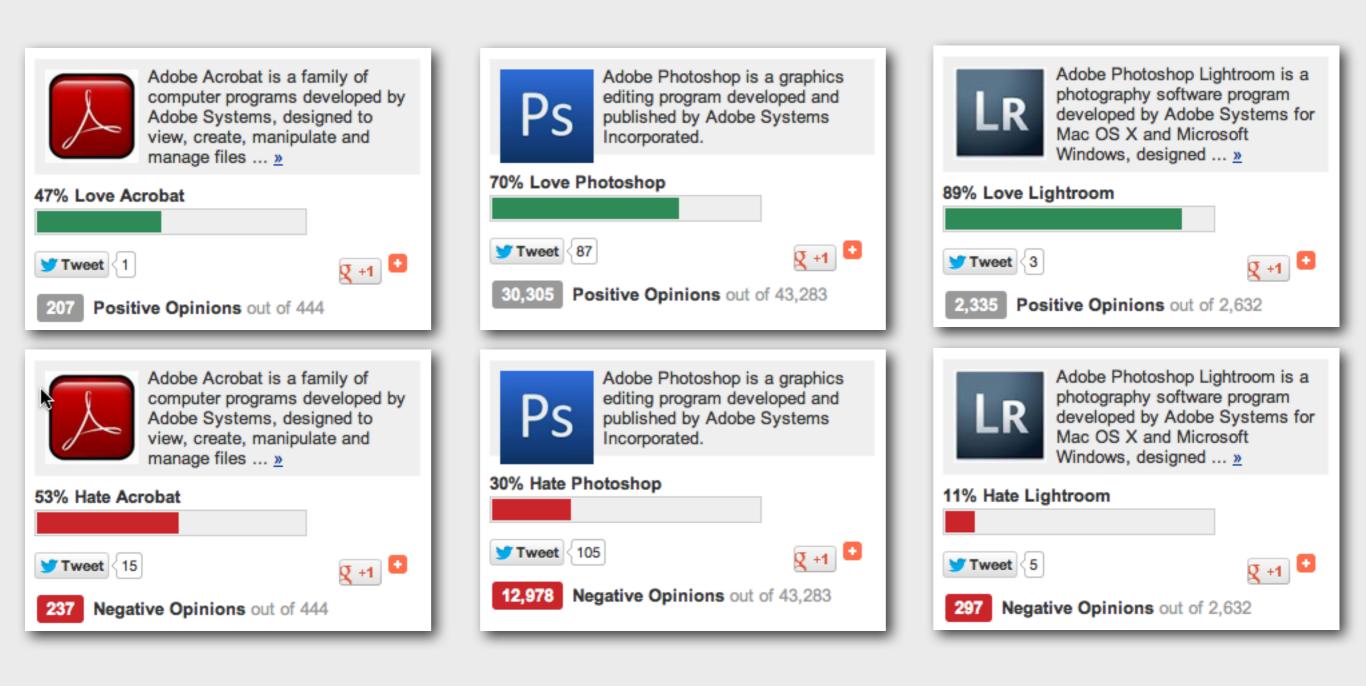
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from http://amplicate.com

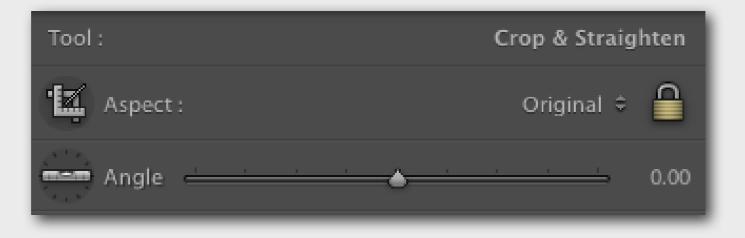
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cropping in adobe lightroom

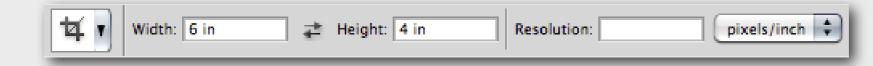
cropping in adobe lightroom





cropping photoshop

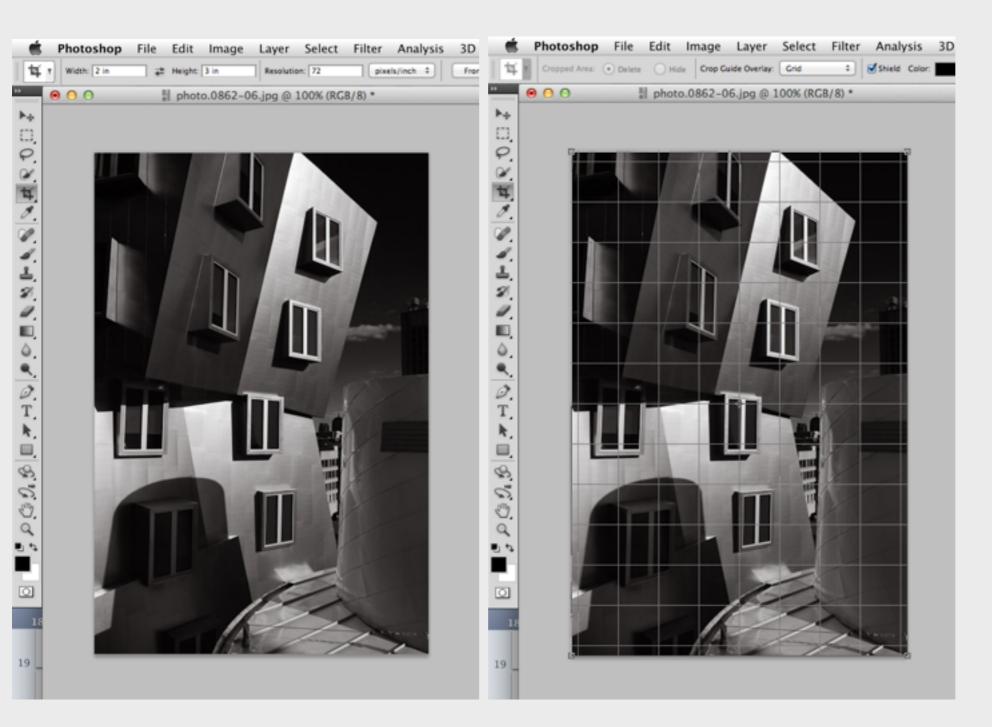
cropping photoshop

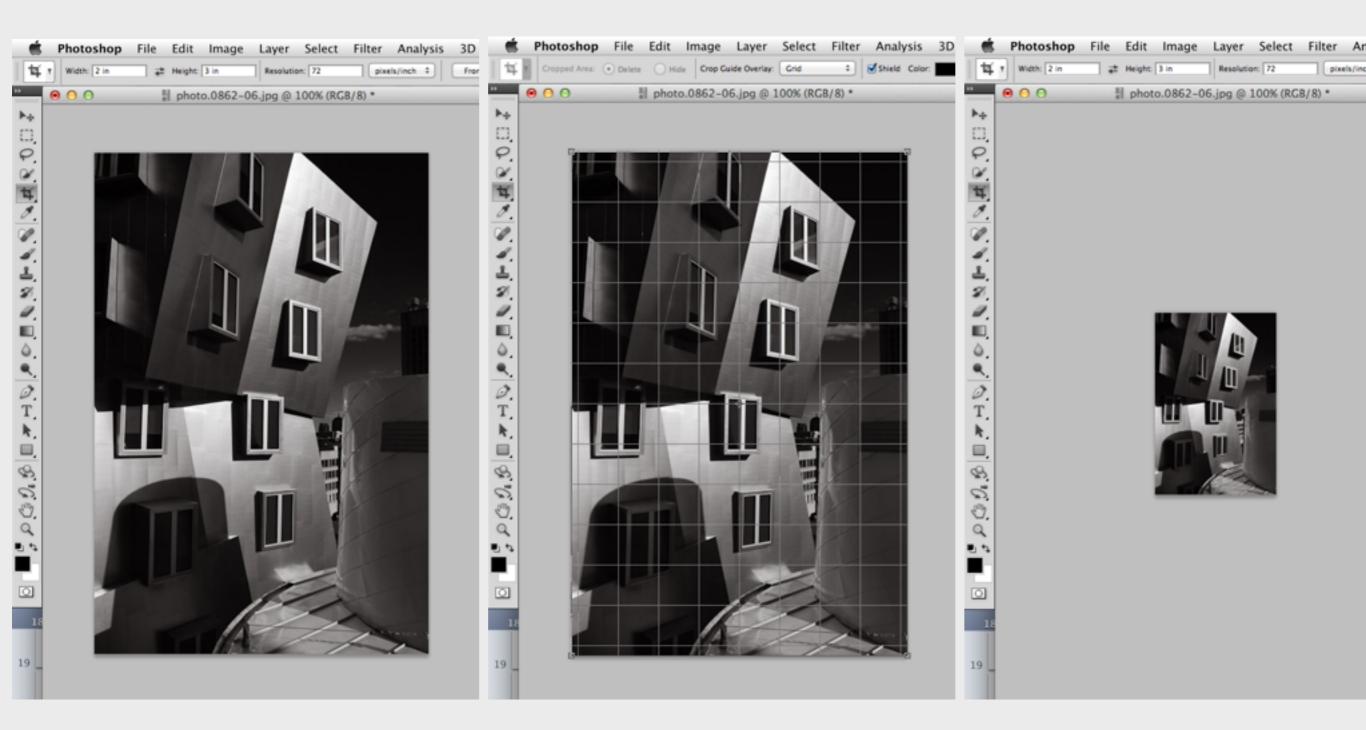


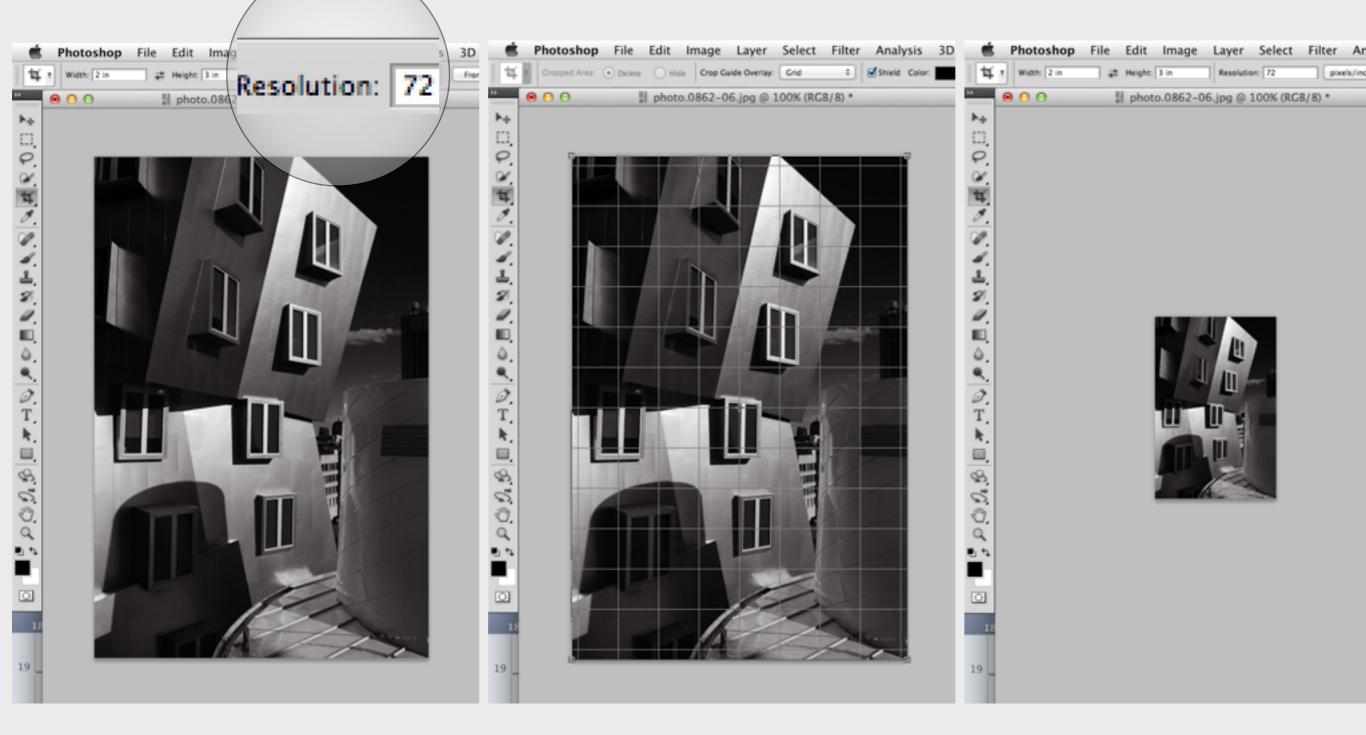




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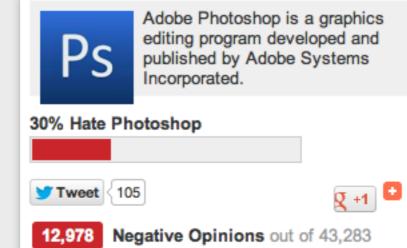




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53% Hate Acrobat

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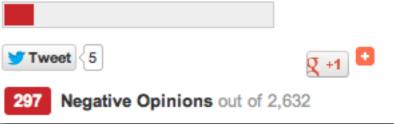




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Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... »

11% Hate Lightroom



Acrobat text box object document text **Lightroom** action treatment effect



Adobe Acrobat is a family of computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... »

53% Hate Acrobat

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Adobe Photoshop is a graphics editing program developed and published by Adobe Systems Incorporated.

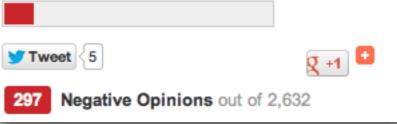
30% Hate Photoshop





Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... »

11% Hate Lightroom



Acrobat text box object document text

incoherent concepts, no clear purpose

Photoshop channel layer mask

Lightroom action treatment effect



computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... »

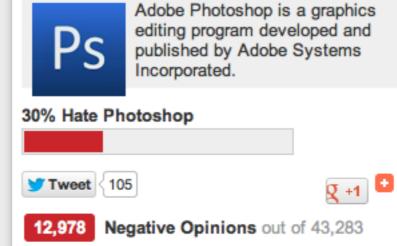
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Acrobat

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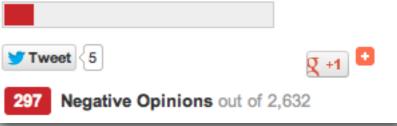
incoherent concepts, no clear purpose

powerful concepts with low level purposes

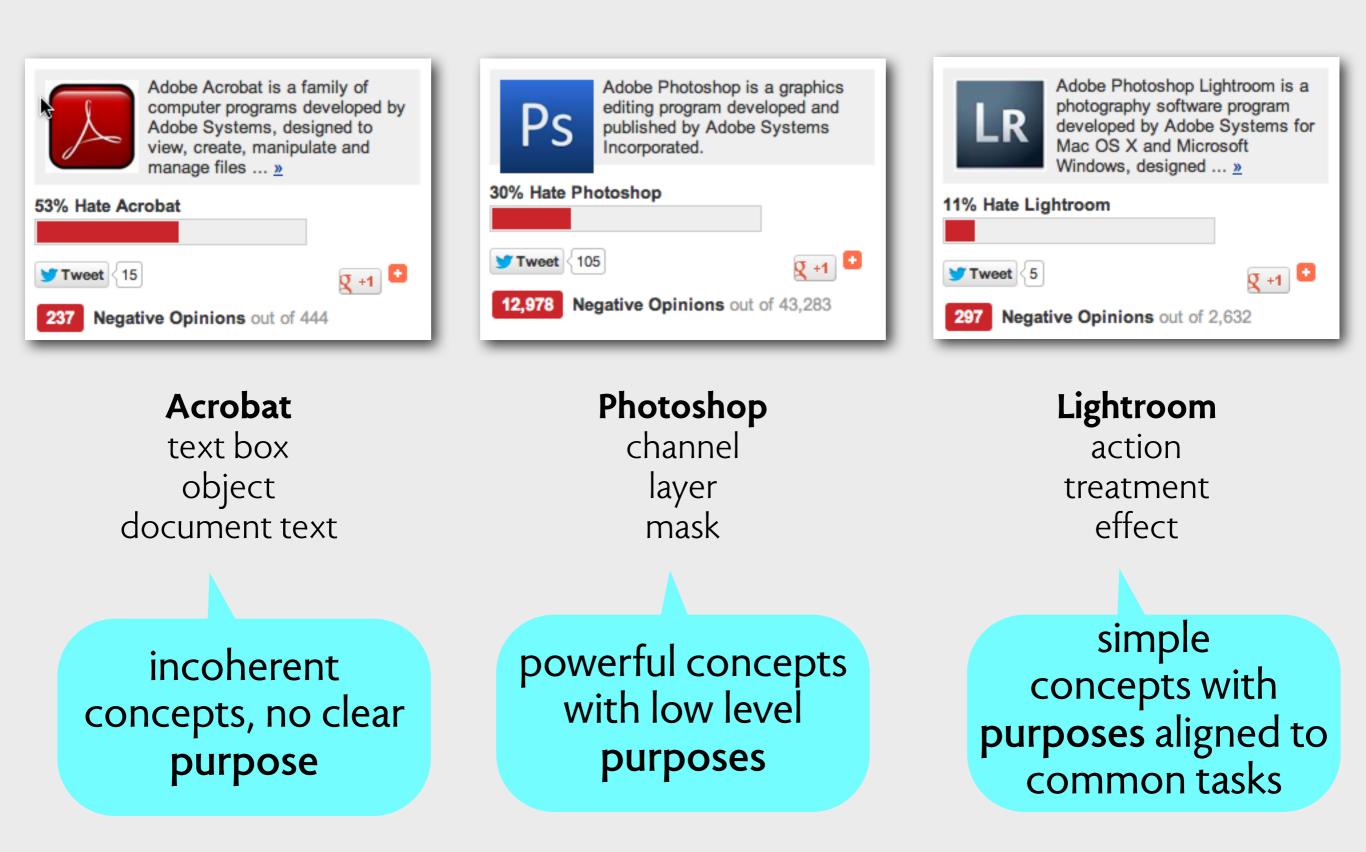


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11% Hate Lightroom



Lightroom action treatment effect



acrobat 9 deeply troubled

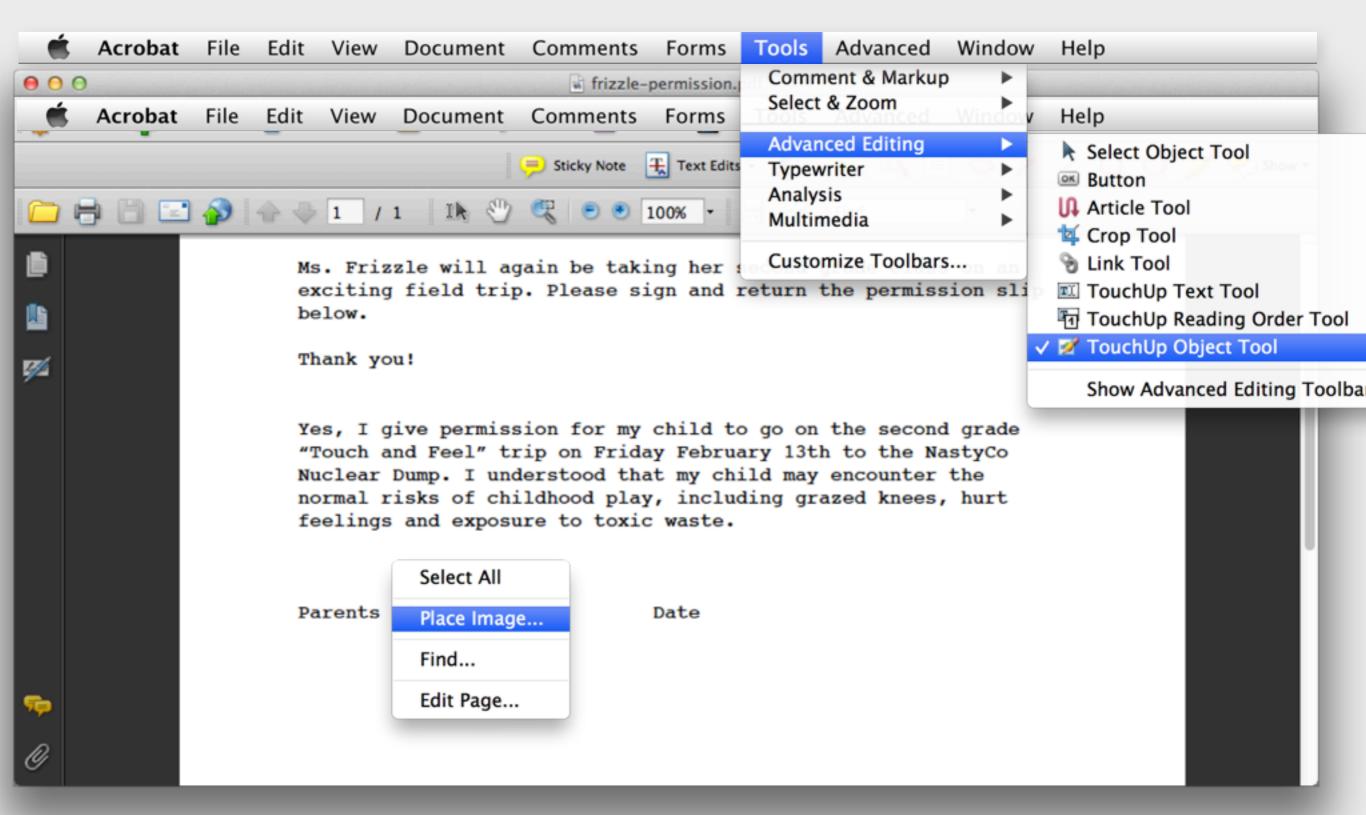
acrobat 9 deeply troubled

acrobat 10 user interface tweaks

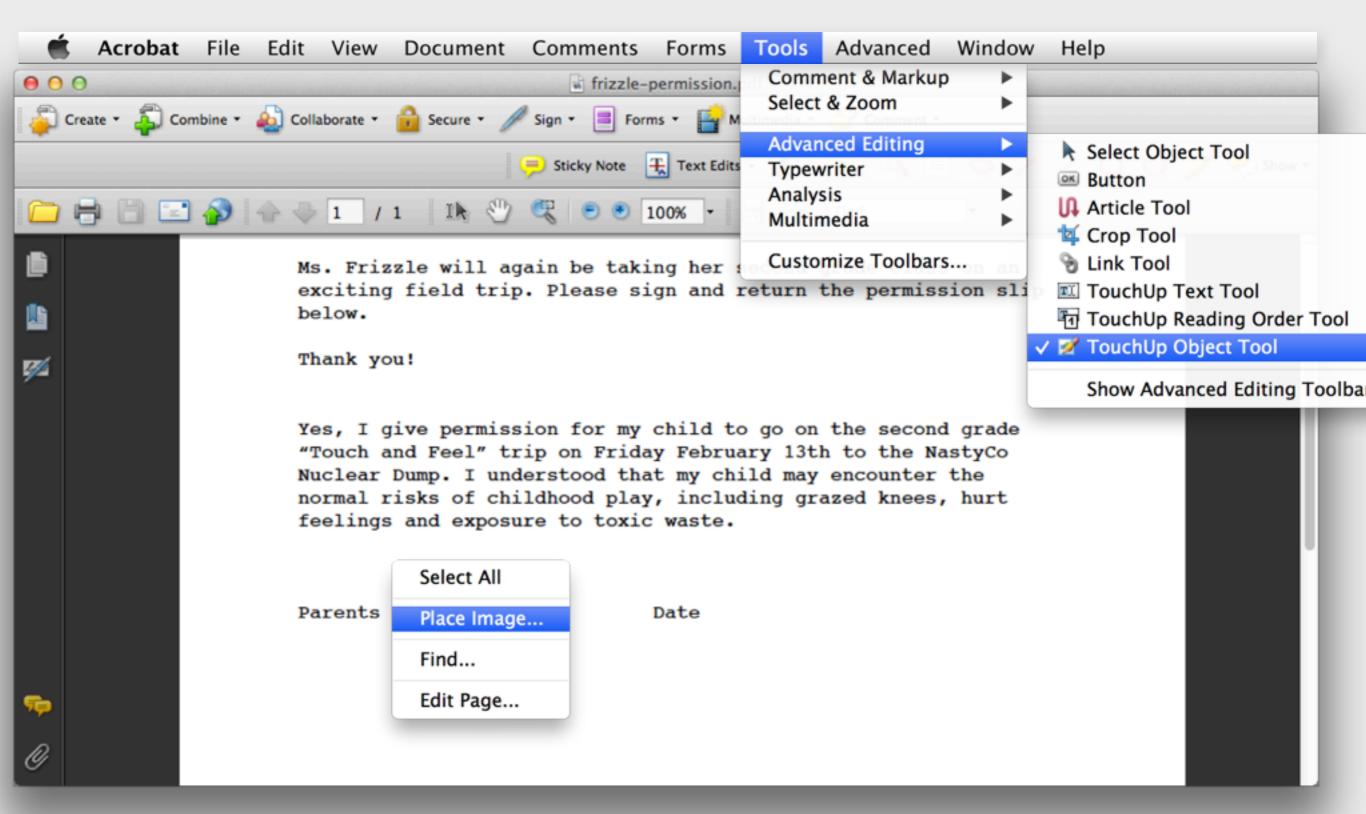
acrobat 9 deeply troubled

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acrobat 11 conceptual reworking



hard to discern any compelling concepts



hard to discern any compelling concepts

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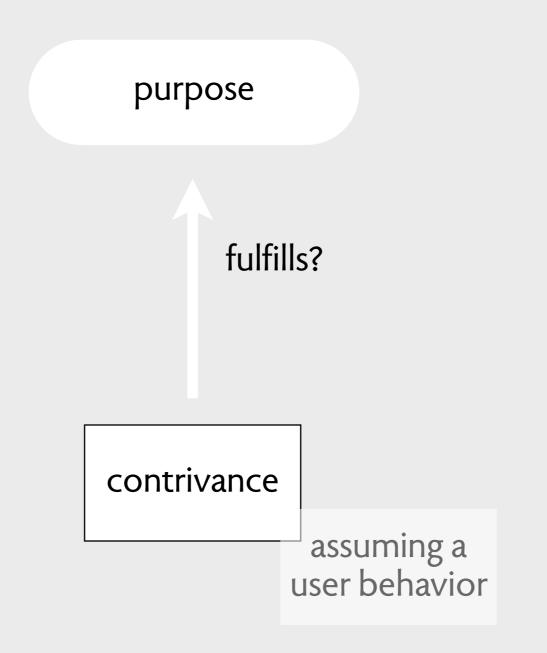
user interface has been reworked but still *text, text box, object*

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conceptual reworking: now just *text*

designing the user

designing the user too



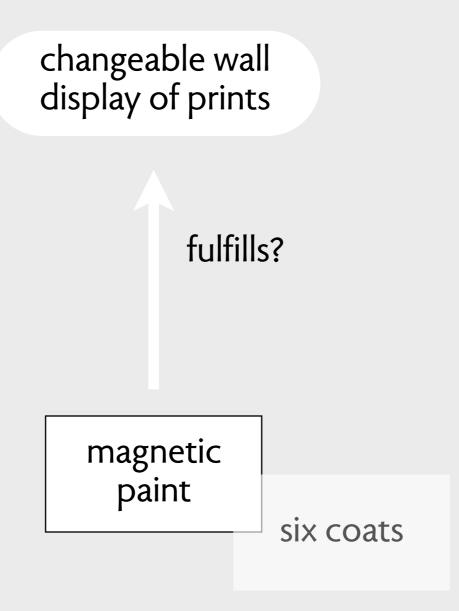
example: magnetic paint

changeable wall display of prints

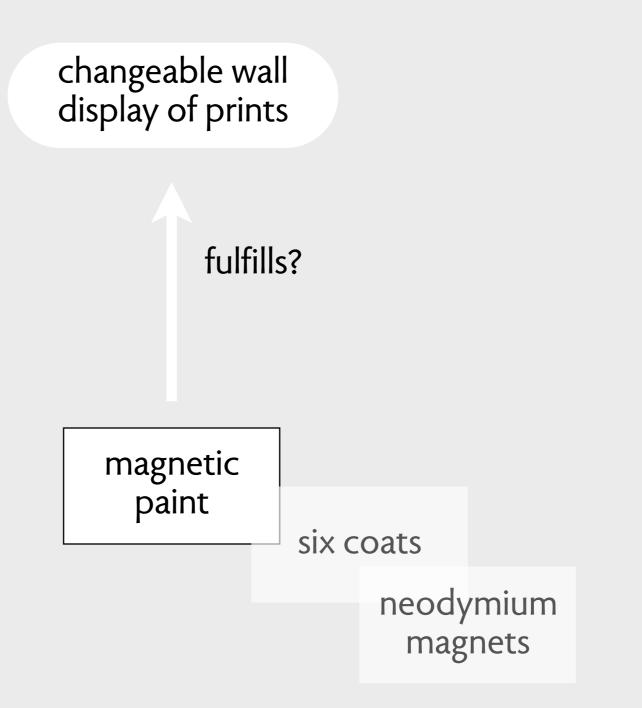
fulfills?

magnetic paint

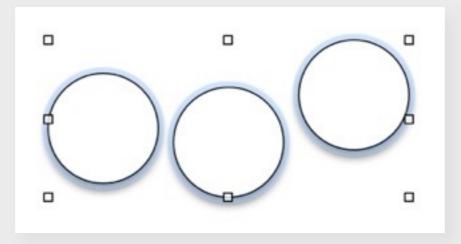
example: magnetic paint



example: magnetic paint

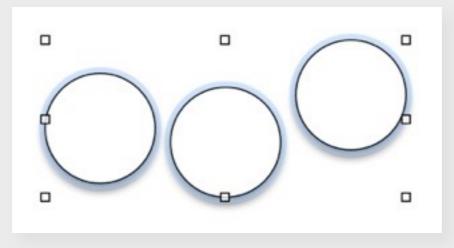


example: aligning elements



purpose: help align objects

example: aligning elements



purpose: help align objects

Align Left Edges

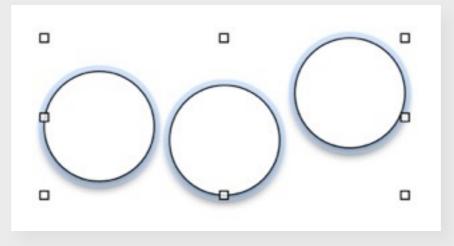
Align Right Edges Align Top Edges Align Bottom Edges

Align Vertical Centers Align Horizontal Centers

Make Centered Row Make Centered Column

a contrivance: autoalign

example: aligning elements



purpose: help align objects

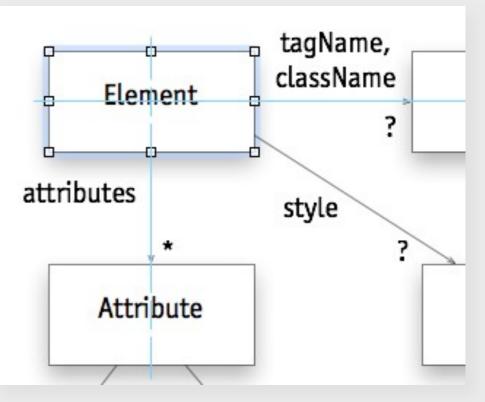
Align Left Edges

Align Right Edges Align Top Edges Align Bottom Edges

Align Vertical Centers Align Horizontal Centers

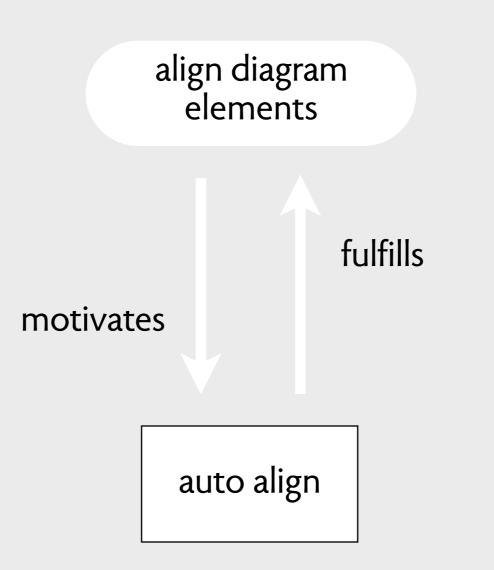
Make Centered Row Make Centered Column

a contrivance: autoalign

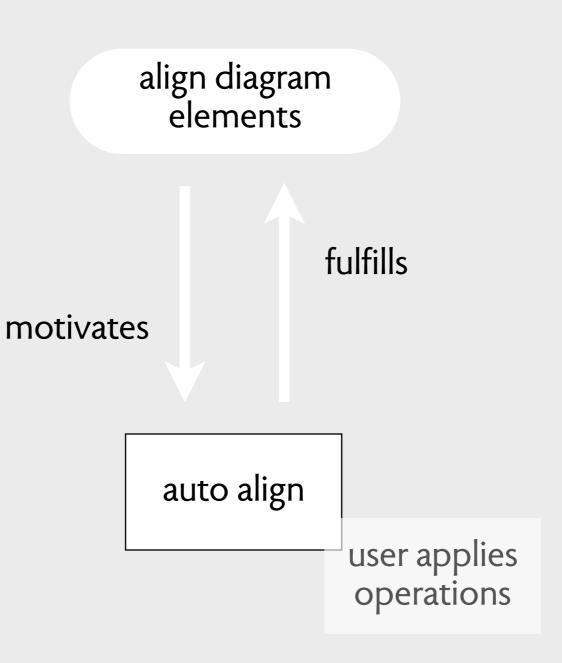


a better contrivance: snap align

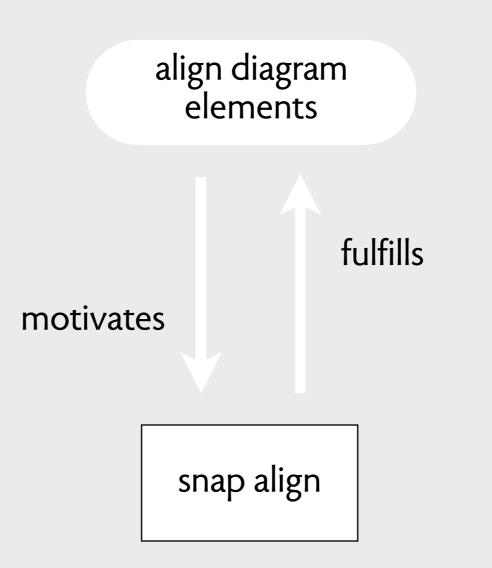
example: auto align



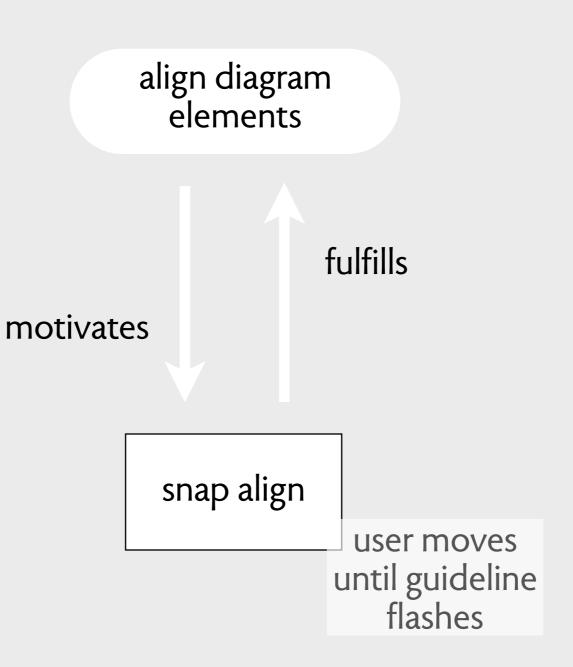
example: auto align



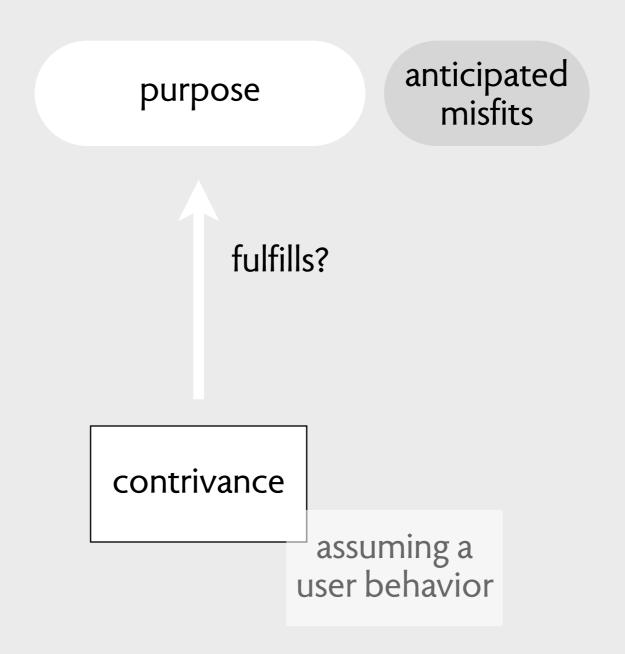
example: snap align



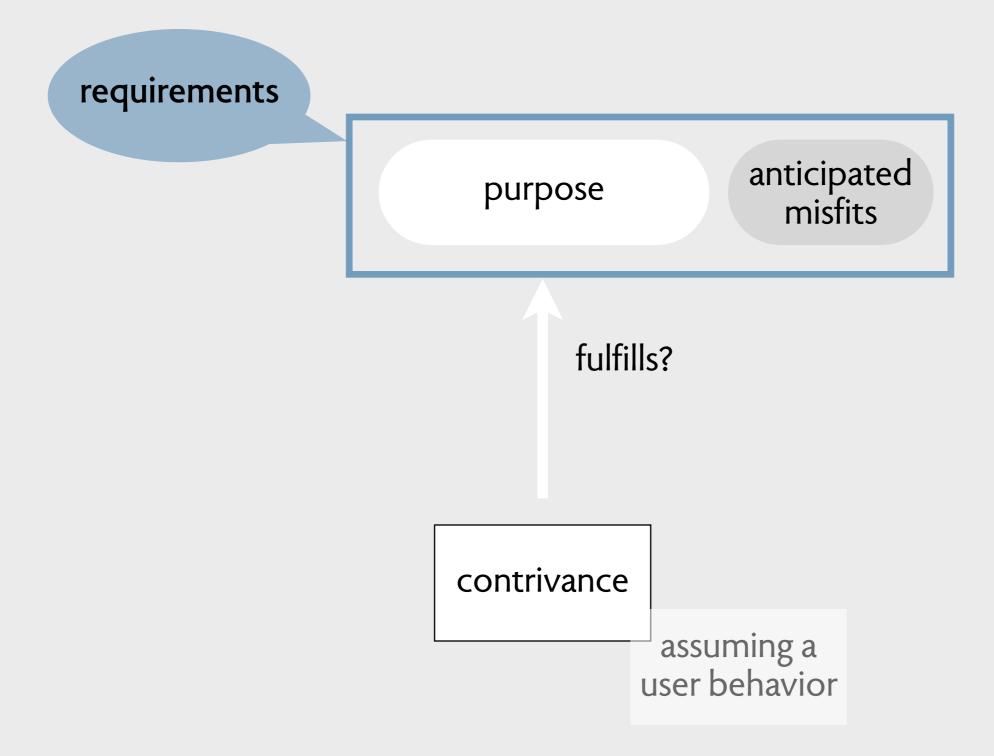
example: snap align



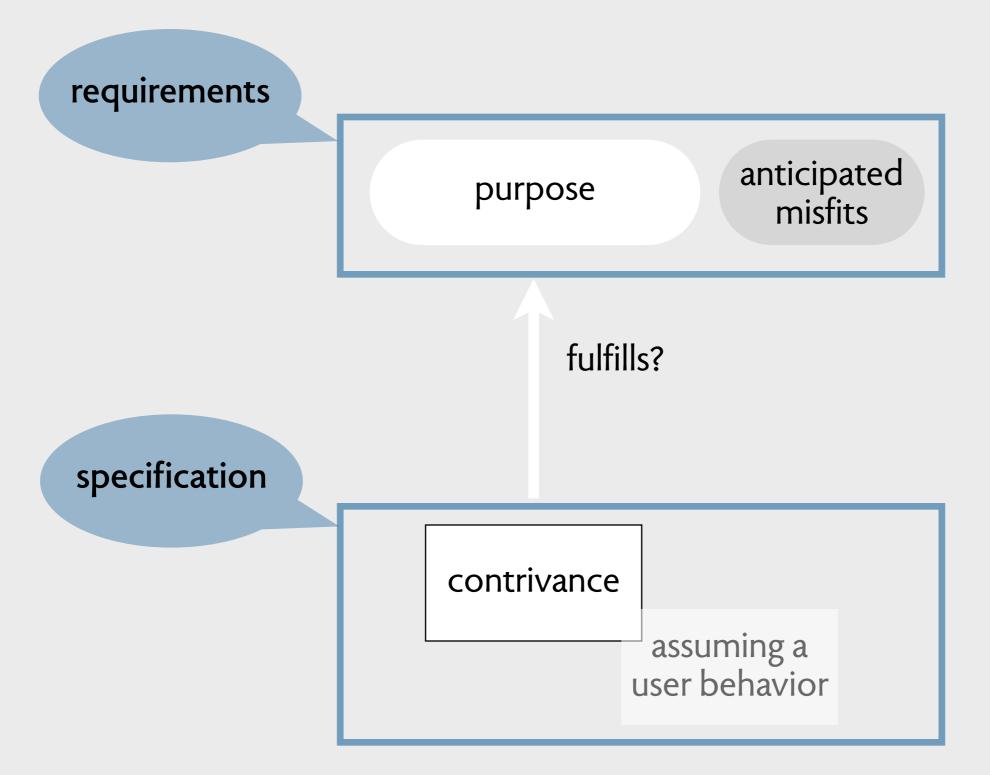
in conventional software terms



in conventional software terms

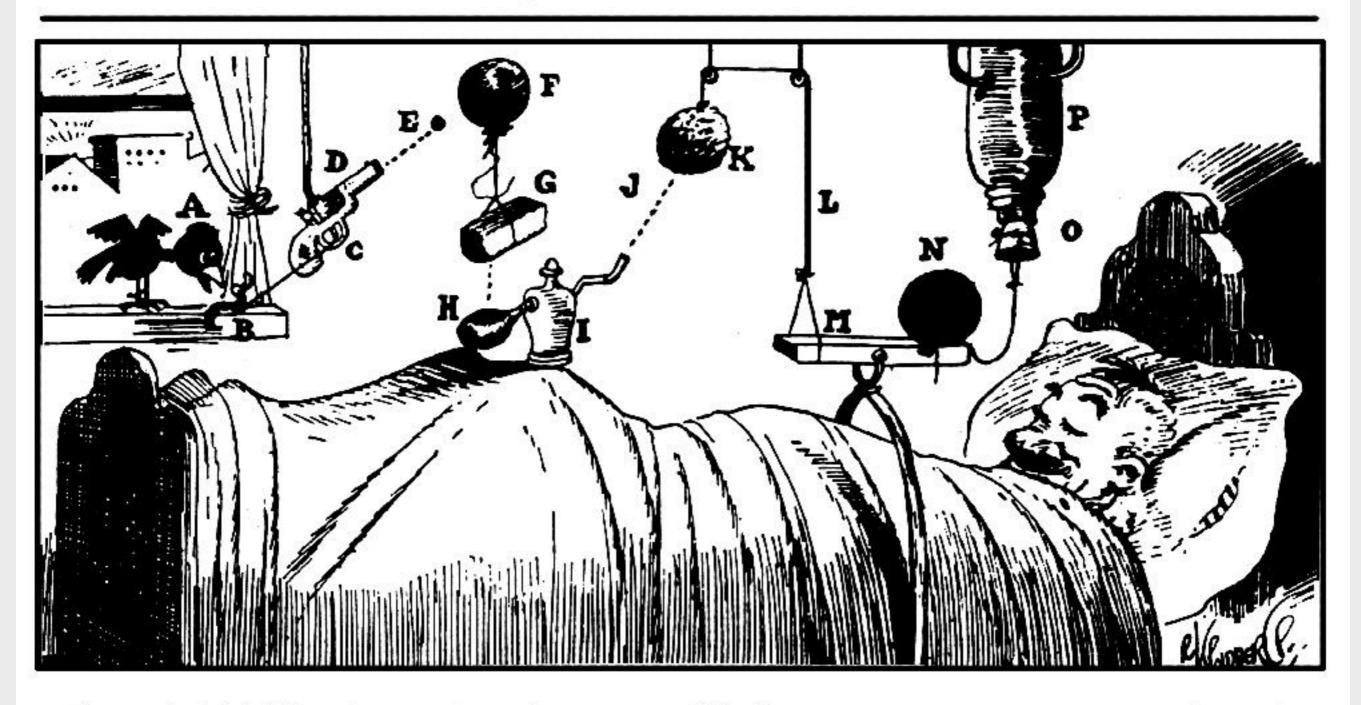


in conventional software terms



abstract affordances

Simple Alarm Clock



The early bird (A) arrives and catches worm (B), pulling string (C) and shooting off pistol (D). Bullet (E) busts balloon (F), dropping brick (G) on bulb (H) of atomizer (I) and shooting perfume (J) on sponge (K)-As sponge gains in weight, it lowers itself and pulls string (L), raising end of board (M)-Cannon ball (N) drops on nose of sleeping gentleman-String tied to cannon ball releases cork (O) of vacuum bottle (P) and ice water falls on sleeper's face to assist the cannon ball in its good work.

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| 🖲 🖯 New Alarm |
|-------------------------------|
| Time Alarm |
| Alarm Time: 6:00 AM 🗘 🂢 |
| Alarm Date: |
| • One time alarm |
| 4/16/2013 🗘 🏢 |
| O Repeating alarm |
| Sun Mon Tue Wed Thu Fri Sat |
| |
| |
| |
| Enable Alarm Delete Cancel OK |

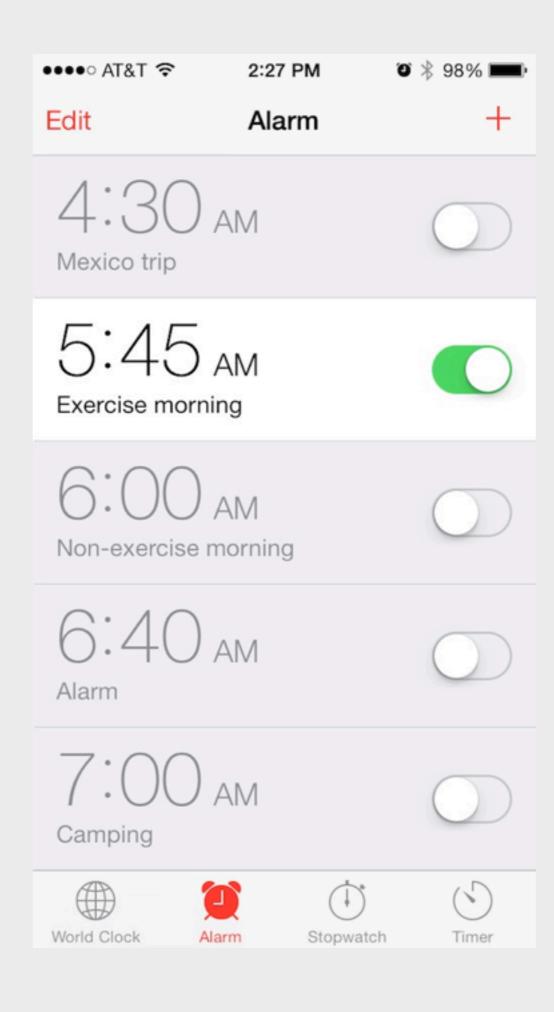
| ⊙ O New Alarm |
|--|
| Invalid alarm time Please select a date and time in the future. |
| Alarm Date: |
| • One time alarm |
| 4/16/2013 🗘 🏢 |
| O Repeating alarm |
| Sun Mon Tue Wed Thu Fri Sat |
| |
| |
| |
| Enable Alarm Delete Cancel OK |

| 🖲 🖯 New Alarm |
|-------------------------------|
| Time Alarm |
| Alarm Time: 6:00 AM 🗘 🂢 |
| Alarm Date: |
| • One time alarm |
| 4/17/2013 🗘 🏢 |
| O Repeating alarm |
| Sun Mon Tue Wed Thu Fri Sat |
| |
| |
| |
| Enable Alarm Delete Cancel OK |

| Time Alarm | |
|-----------------------------|----------------------------------|
| Alarm Time: 6:00 AM 🗘 🂢 | ✓ 06:00 AM Tomorrow |
| Alarm Date: | New Alarm |
| • One time alarm | New Timer |
| 4/17/2013 🗘 🏢 | New Stopwatch |
| Repeating alarm | About Alarm Clock 2 |
| Sun Mon Tue Wed Thu Fri Sat | Check for updates Preferences |
| | Quit |
| | |
| Enable Alarm Delete Cancel | DK |



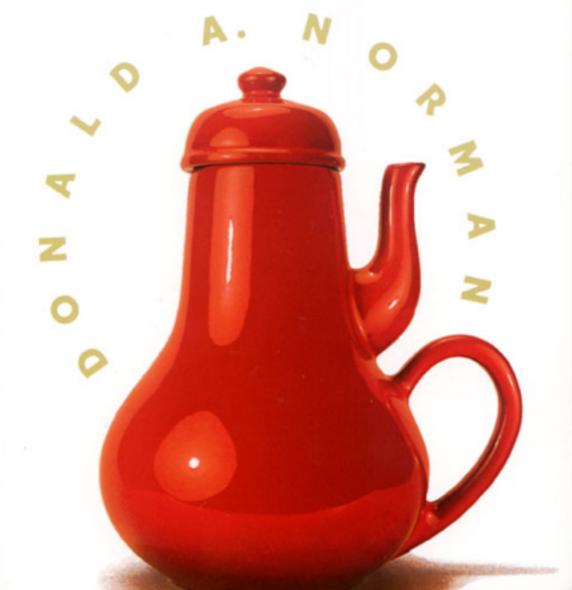






Donald Norman







Donald Norman

James Gibson (1977): "action possibilities" latent in environment



James Gibson (1977): "action possibilities" latent in environment

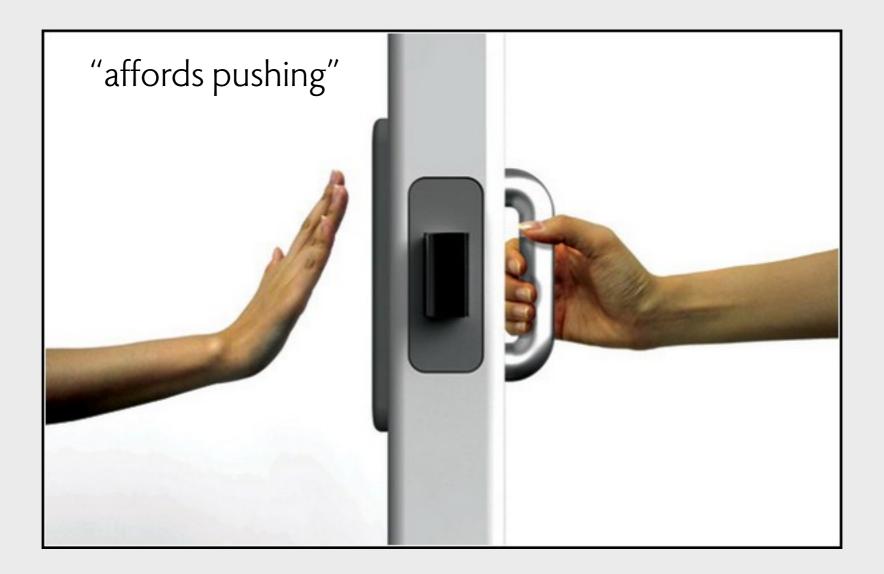
Donald Norman (1988): action possibilities that are perceivable



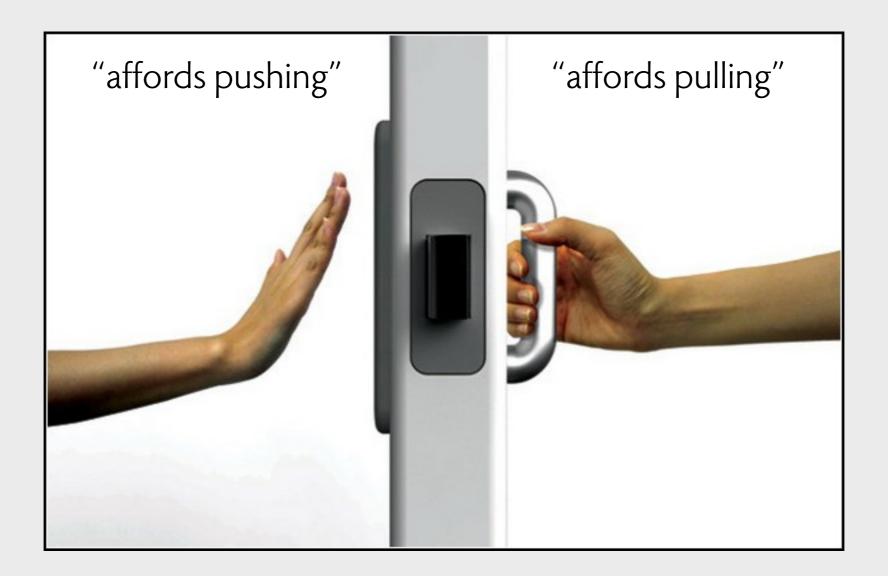
a door with good affordances



a door with good affordances



a door with good affordances





push or pull?



push or pull?



door with user manual



push or pull?



door with user manual



conflicting instructions



facebook

Q

🔙 Daniel Jackson Home 🔐 🛠

Who Is in These Photos?

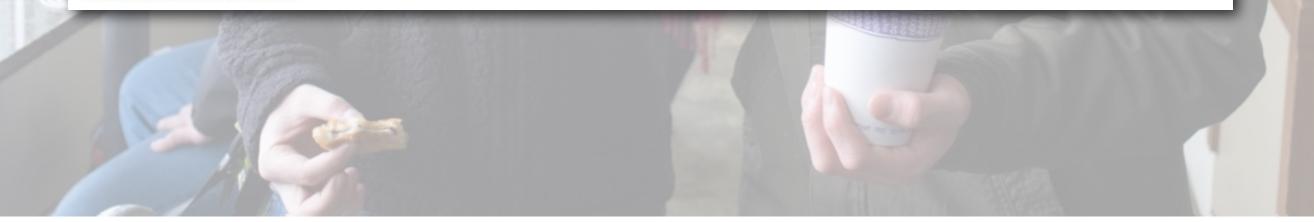
To tag your friends, review the suggested names and click Save Tags at the bottom of this page. If a name is missing or incorrect, list a new name and press Enter.

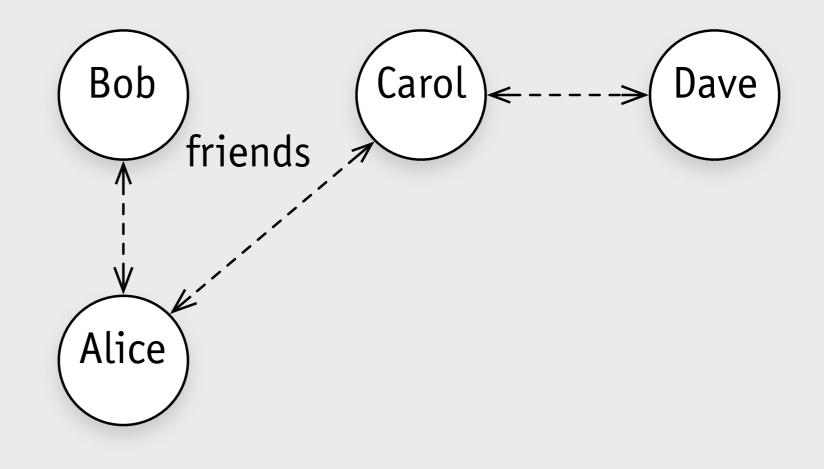
Remember: If someone doesn't like a photo, they can untag themselves or ask you to take it down.

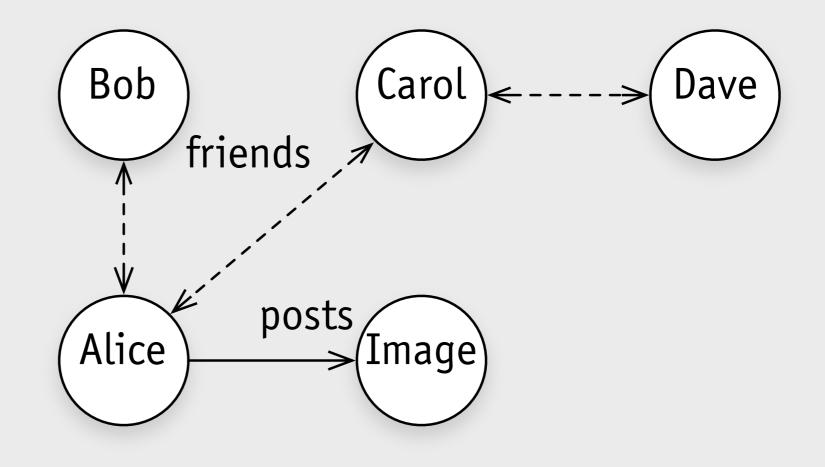
| Charles and the | - 1/5-1 | |
|-----------------|--------------|--|
| | | |
| Who is this? | Who is this? | |

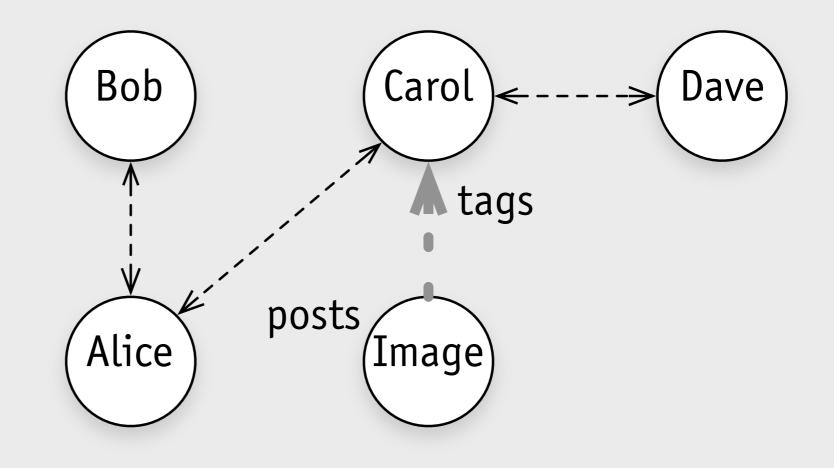
Create an Ad Create a Page Developers Careers Privacy Cookies Terms Help About

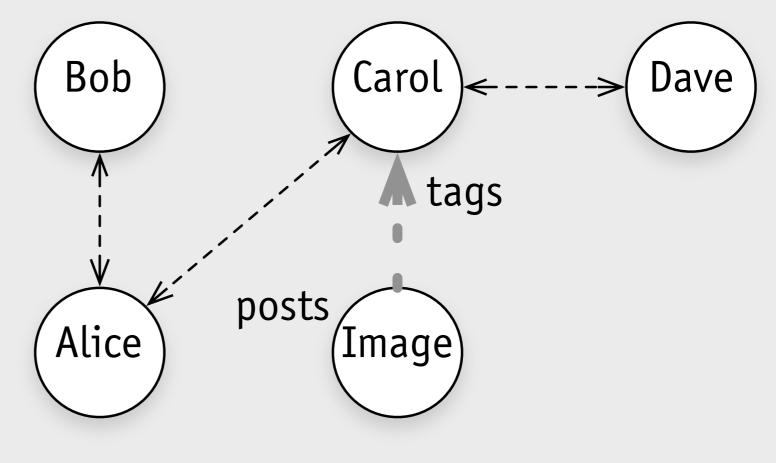
Facebook @ 2013 · English (US)



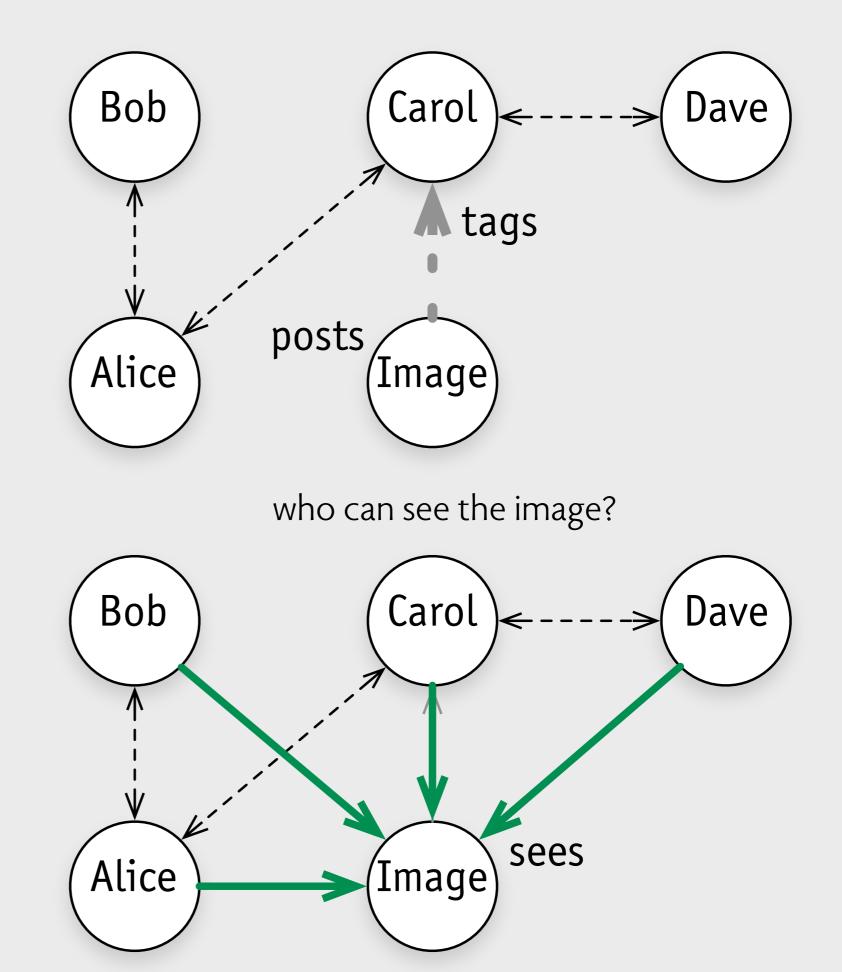


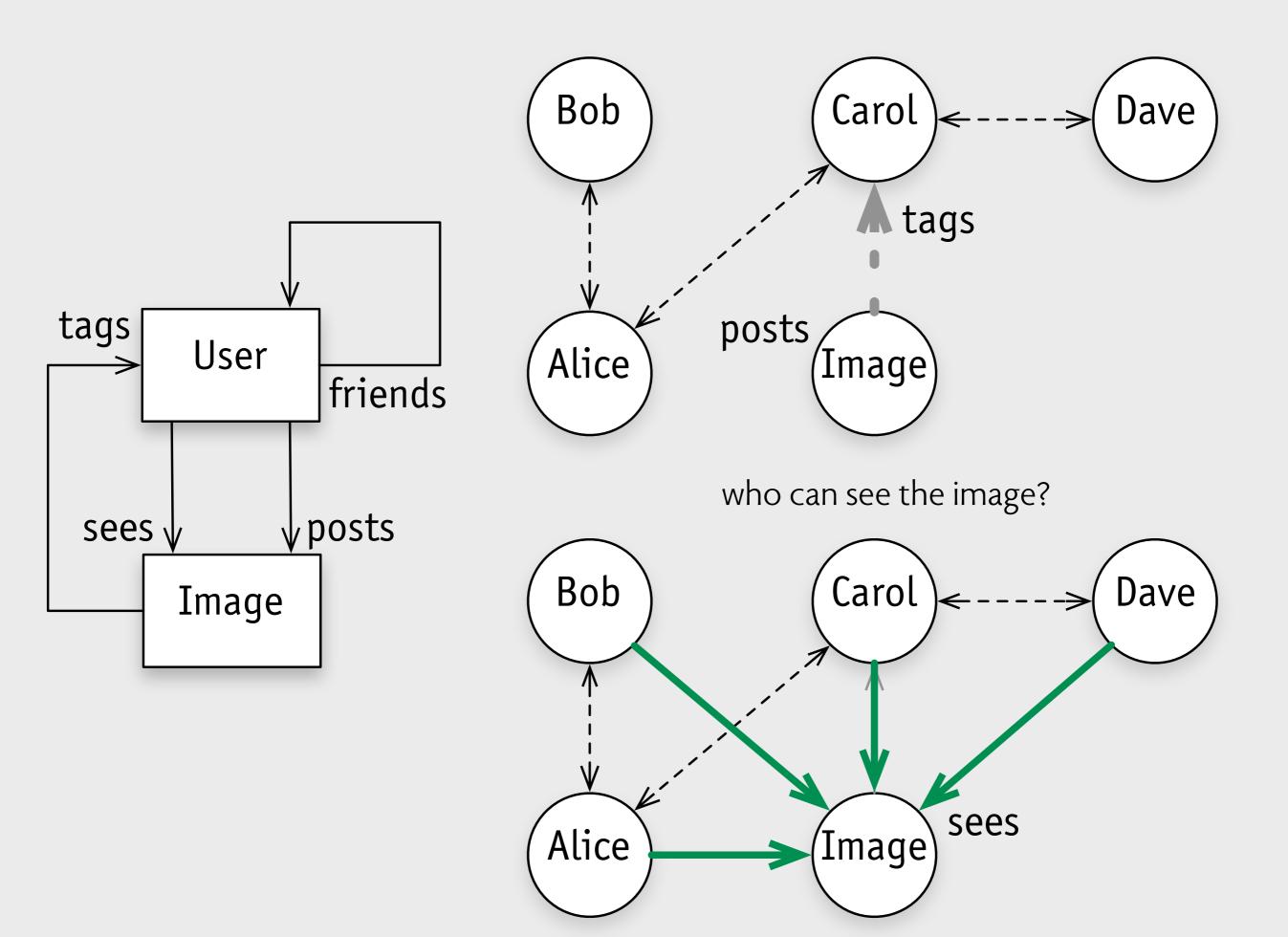






who can see the image?





what facebook says

When someone adds a tag to a photo or other post I shared, who can see it?

When someone adds a tag to something you shared, it's visible to:

- The audience you chose for the post or photo
- The person tagged in the post and their friends

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as a textual constraint in Alloy: all i: Image | sees.i = (posts.i).friends + (i.tags).friends

what facebook should say

When a psychopathic stranger takes a photo of me at a party and tags me, who can see it?

When someone adds a tag to something you didn't share, it's visible to:
 All of their friends and fellow psychopaths

All of your future employers, boyfriends, girlfriends and in-laws

for physical designs effects are clear, if hard to predict affordances connect actions to effects

for physical designs effects are clear, if hard to predict affordances connect actions to effects

for software designs effects are often not clear affordances become 'abstract'

for physical designs effects are clear, if hard to predict affordances connect actions to effects

for software designs

effects are often not clear affordances become 'abstract'

so we need to

convey to users effects of actions challenge: effects are indirect

design thinking









optimize organization & task structure Taylor (1880s), Toyota JIT (1980s), CMM (1990s), agile (2000s)



brainstorming



brainstorming



user studies



brainstorming





user studies

prototypes



Dieter Rams, 1958 pocket transistor radio T3



Dieter Rams, 1958 pocket transistor radio T3



Henry Hobson Richardson, 1877 Trinity Church, Boston



Dieter Rams, 1958 pocket transistor radio T3



Henry Hobson Richardson, 1877 Trinity Church, Boston



Leica, 1953 M3 rangefinder camera



Dieter Rams, 1958 pocket transistor radio T3



Alfonso Bialetti, 1933 La Moka coffee maker



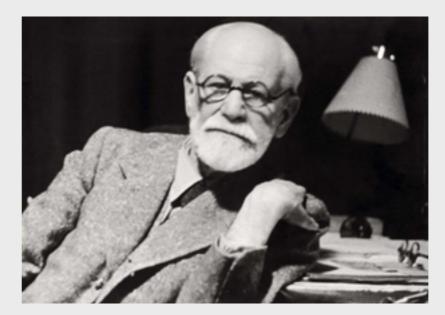
Henry Hobson Richardson, 1877 Trinity Church, Boston



Leica, 1953 M3 rangefinder camera

broadening

broadening

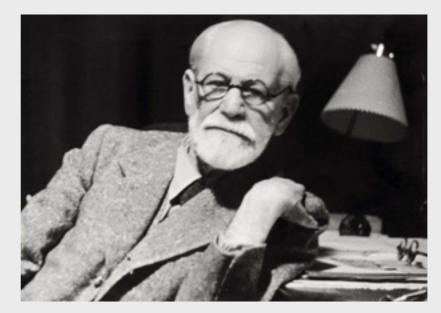


psychology



anthropology

broadening

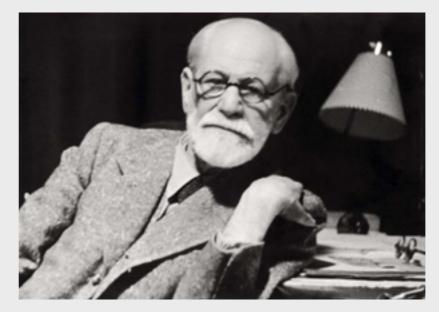


psychology

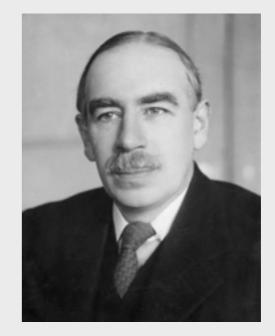


anthropology

broadening



psychology

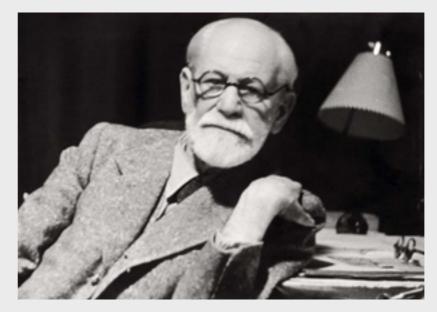


economics

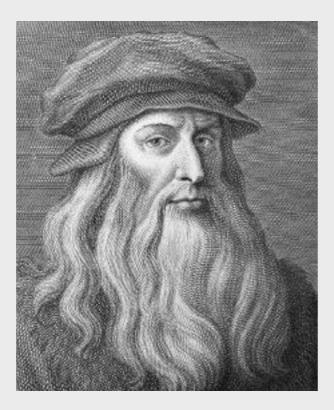


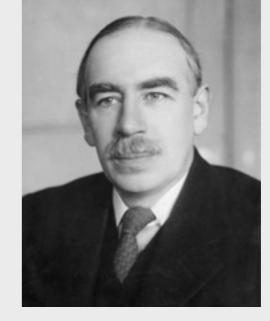
anthropology

broadening



psychology





economics

nature of software design

[T]o see what rate of progress one can expect in software technology, let us examine the difficulties of that technology. Following Aristotle, I divide them into **essence**, the difficulties inherent in the nature of software, and **accidents**, those difficulties that today attend its production but are not inherent.

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The **essence of a software entity is a construct of interlocking concepts**: data sets, relationships among data items, algorithms, and invocations of functions. This essence is abstract in that such a conceptual construct is the same under many different representations. It is nonetheless highly precise and richly detailed.

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The **essence of a software entity is a construct of interlocking concepts**: data sets, relationships among data items, algorithms, and invocations of functions. This essence is abstract in that such a conceptual construct is the same under many different representations. It is nonetheless highly precise and richly detailed.

I believe **the hard part** of building software to be the specification, design, and testing of **this conceptual construct**, **not the labor of representing it** and testing the fidelity of the representation. We still make syntax errors, to be sure; but they are fuzz compared with the conceptual errors in most systems.

mental models