

CSE 510: Advanced Topics in HCI

HCI as Design I

James Fogarty
Daniel Epstein

Tuesday/Thursday
10:30 to 12:00

CSE 403

“Do the Work” vs “Understand It”

HCI practice includes both

CSE 440 teaches an intense project sequence

Interjects higher-level understanding

Today will focus on conceptual material

Thursday will focus on a typical design process

Highly abridged presentation of this material

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Ideation Rules

Defer judgement.

Encourage wild ideas.

Build on the ideas of others.

Stay focused on the topic.

One conversation at a time.

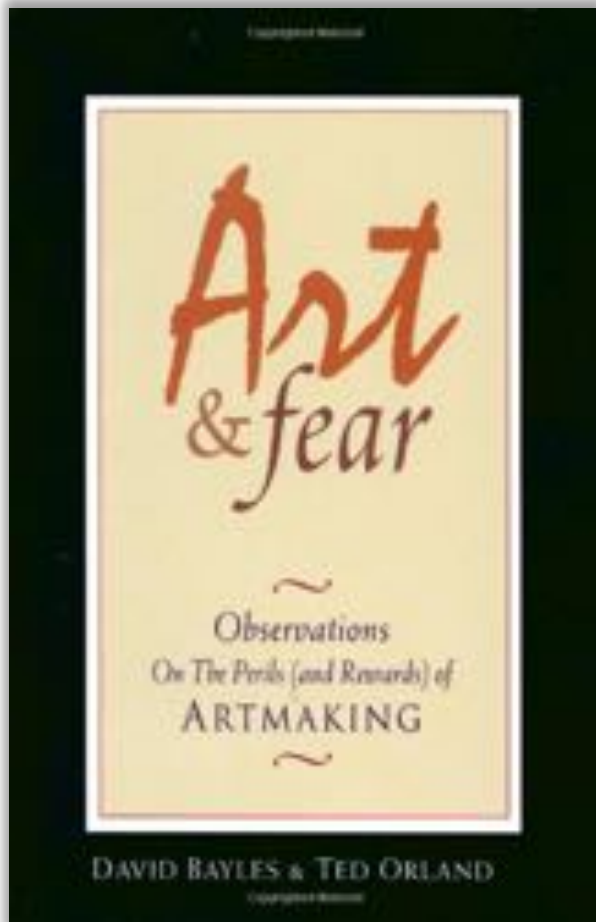
Be visual.

Go for quantity.

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Quantity versus Quality



One class told they will be graded on quality, another on quantity



Quantity versus Quality

The quantity class produces better pots. Why?

“While the quantity group was busily churning out piles of work—and learning from their mistakes—the quality group had sat theorizing about perfection, and in the end had little more to show for their efforts than grandiose theories and a pile of dead clay”

Sketching User Experiences



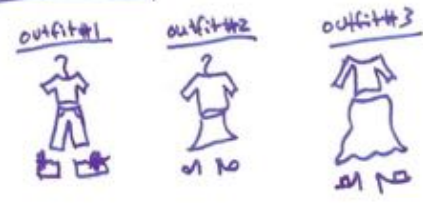
Sketching



STORE FOR THE STYLE-CHALLENGED



As it should be...

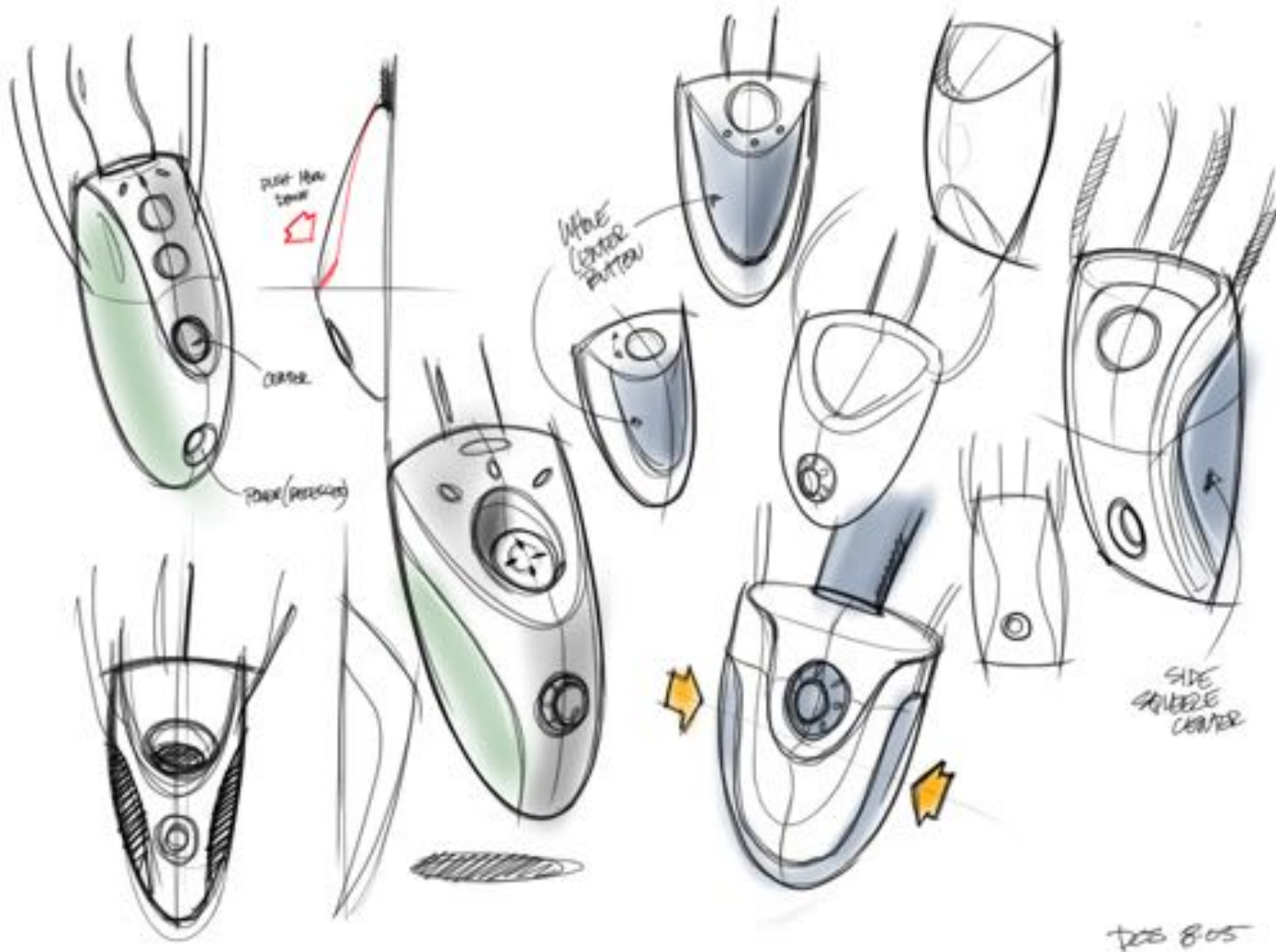


(pre-selected to match so you don't have to choose.)

Sketching

A **process** that enables you to think through ideas and convey design ideas to others very early in the design phase

Quintessential Activity of Design



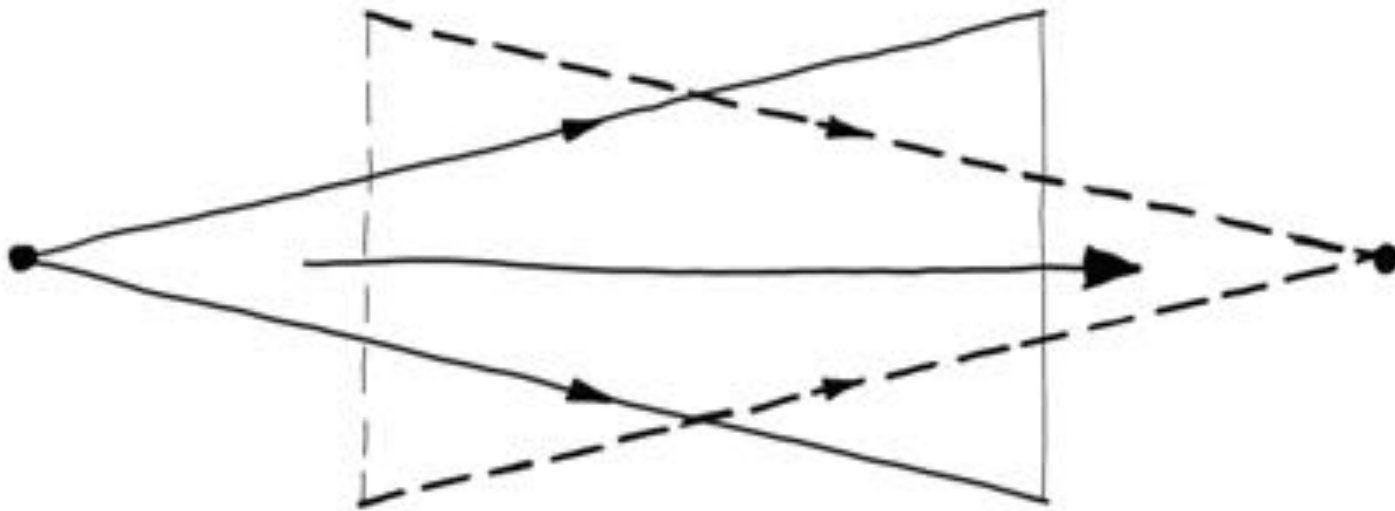
Design as Choice

Elaboration

palette of choices

Reduction

heuristics to choose



Design as Choice

Two openings for creativity

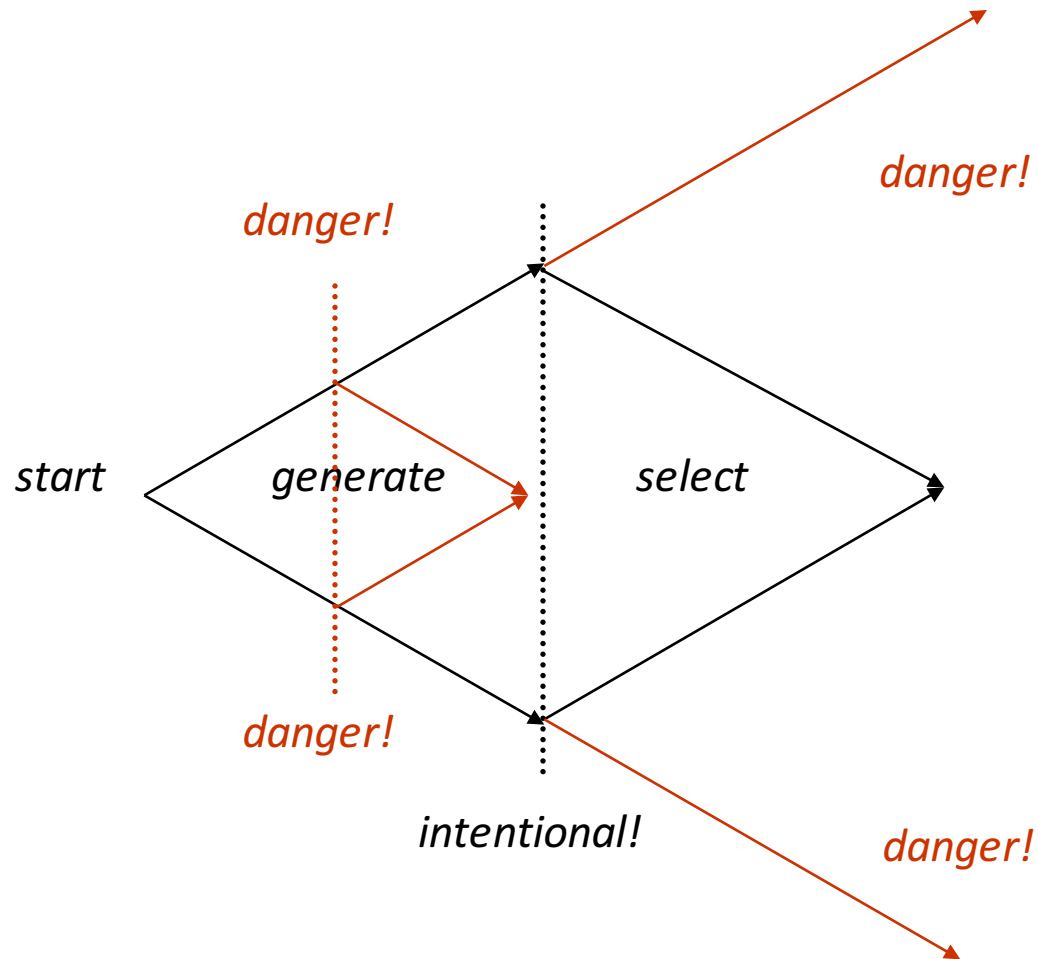
Palette of choices

Heuristics used to choose

Why is your contextual inquiry so important?

What you learn directly informs both of these, shaping everything you do this entire quarter

The Design Diamond



Properties of Sketches

Quick

Timely

Inexpensive

Disposable

Plentiful

Clear Vocabulary

Distinct Gesture

Minimal Detail

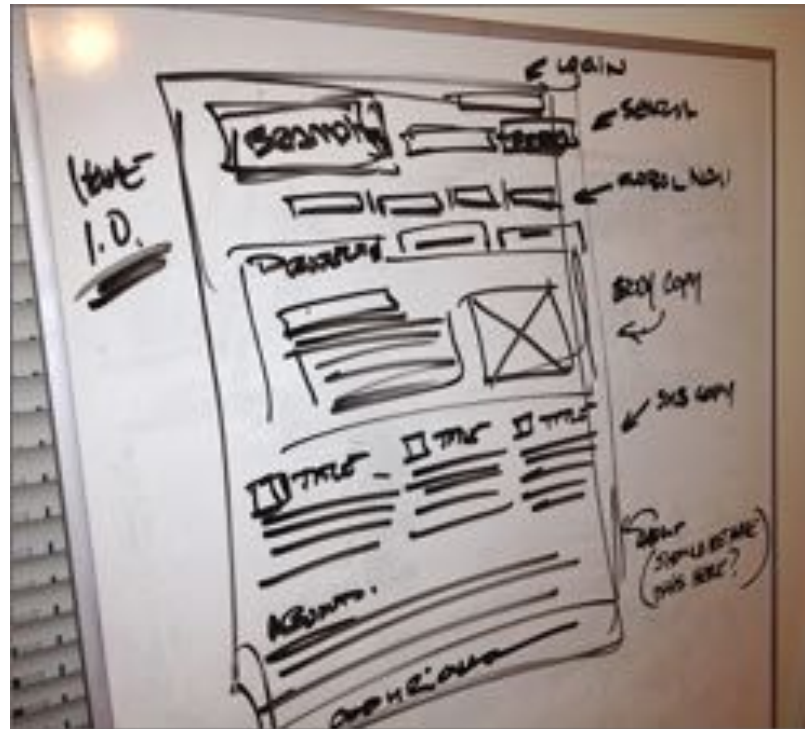
Appropriate Refinement

Suggest and Explore

Ambiguous

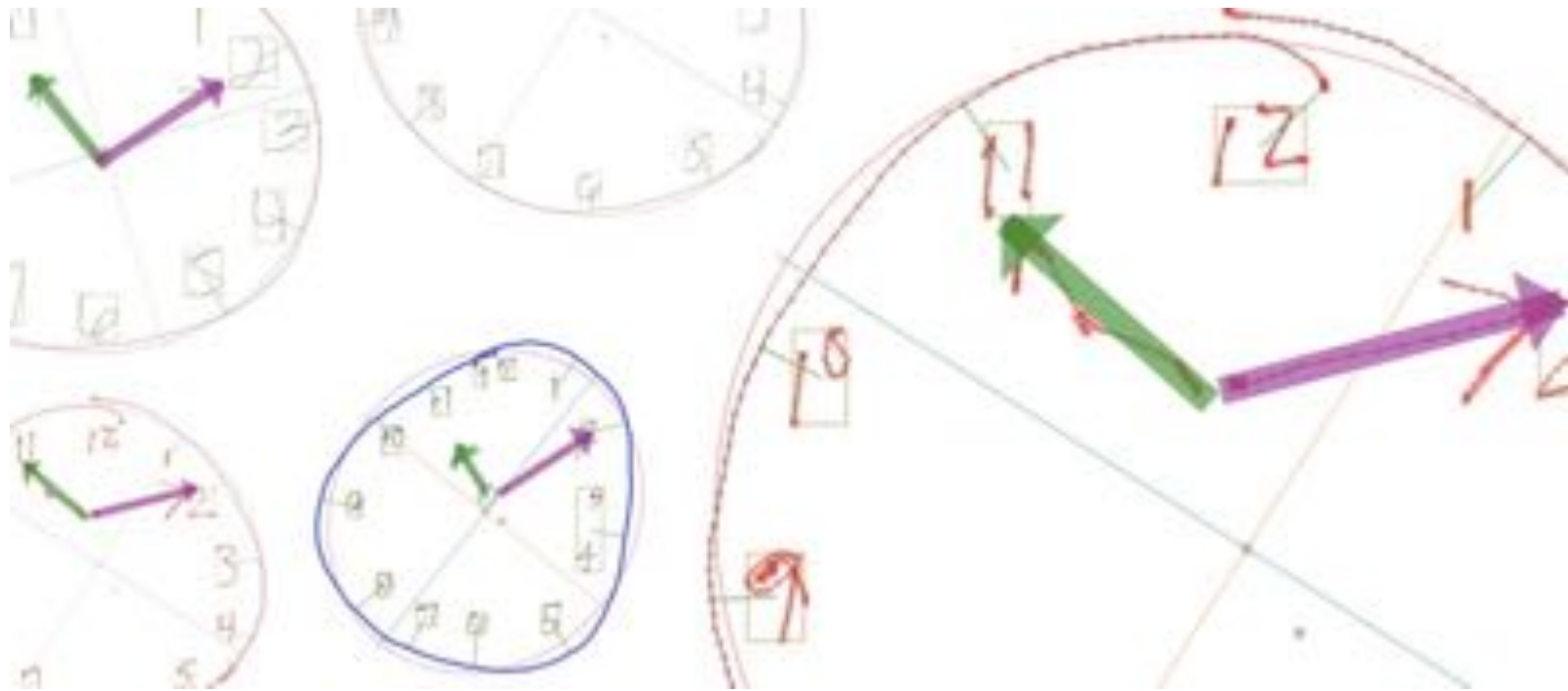
Quick

A sketch is quick to make,
or at least gives that impression



Timely

A sketch can be provided when needed



Inexpensive

Cost must not inhibit the ability to explore a concept, especially early in design



Disposable

If you cannot afford to throw it away,
then it is not a sketch

Investment is in the process,
not the physical sketch

But they are not "worthless"



Plentiful

Sketches do not
exist in isolation

Meaning and relevance
is in the context of a
collection or series

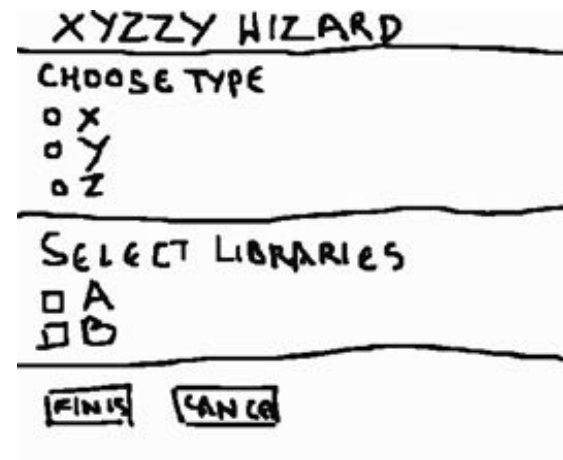


Clear Vocabulary

The way it is rendered makes it distinctive that it is a sketch (e.g., style, form, signals)

Could be how a line extends through endpoints

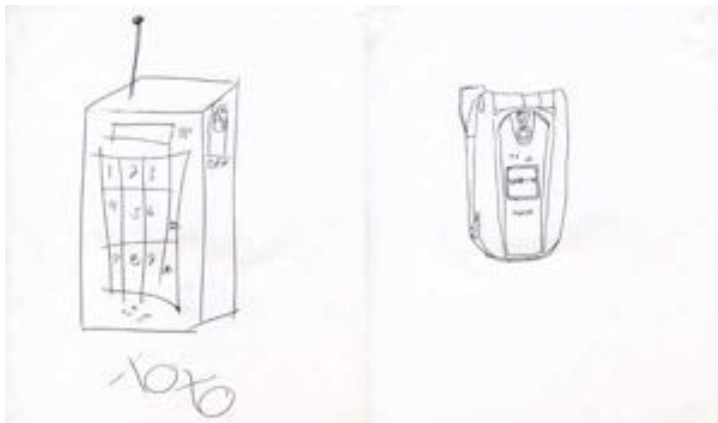
Physical sketches have their own vocabulary



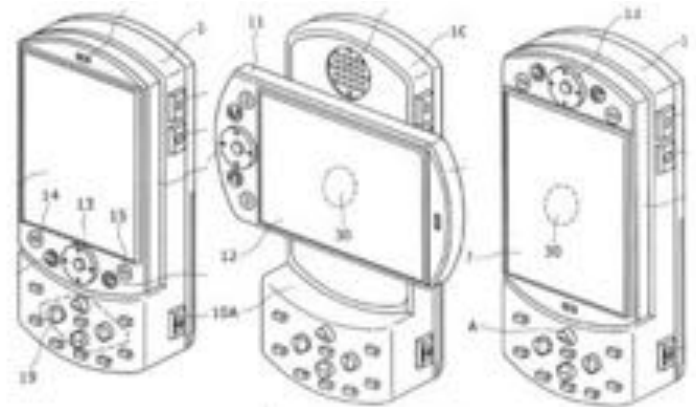
Distinct Gesture

Fluidity of sketches gives them
a sense of openness and freedom

Opposite of engineering drawing,
which is tight and precise



vs.



Minimal Detail

Include only what is required to render the intended purpose or concept



Create JSP for this page

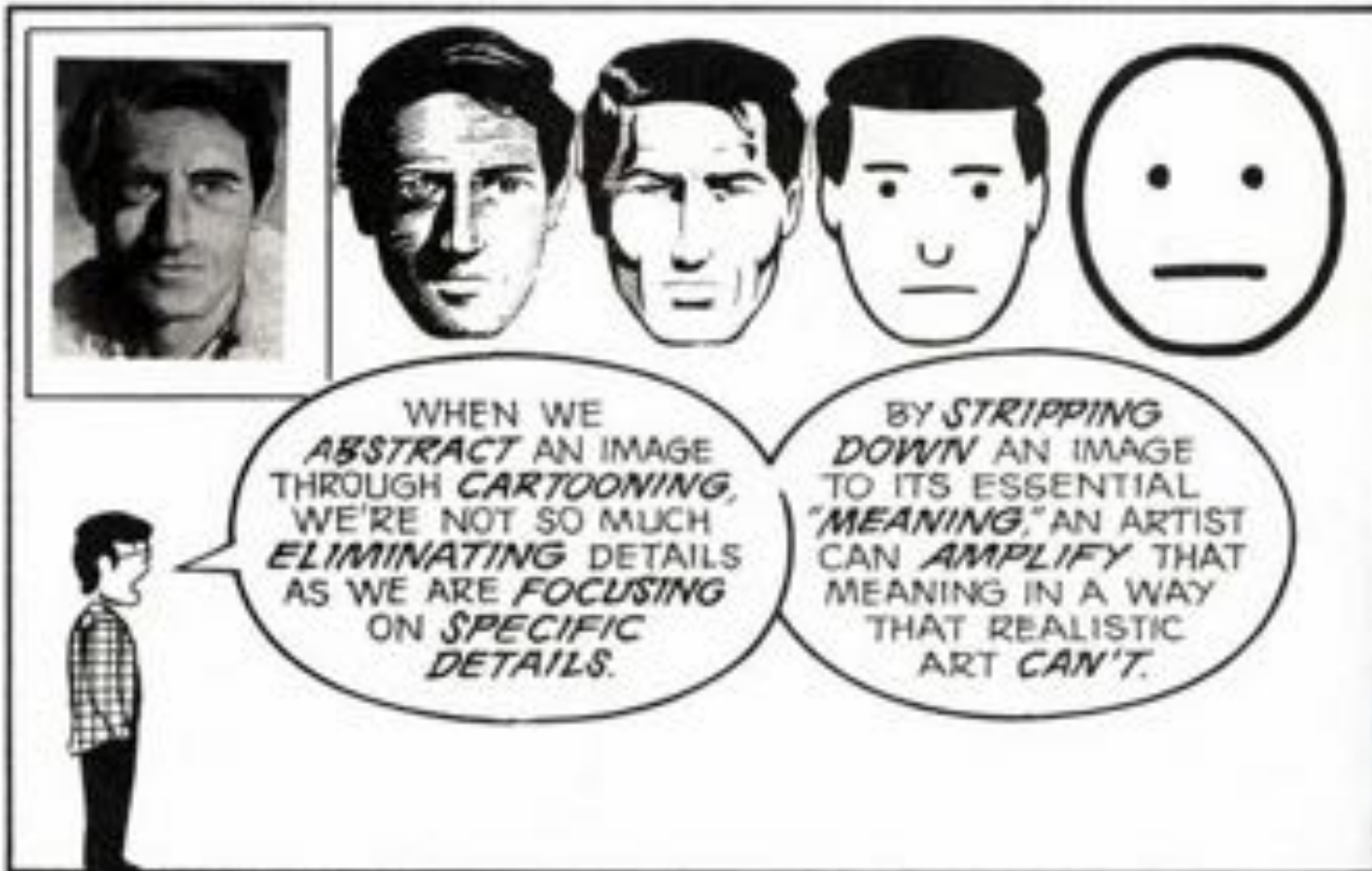
Name:

Number:

Category:

Price Range: to

Minimal Detail

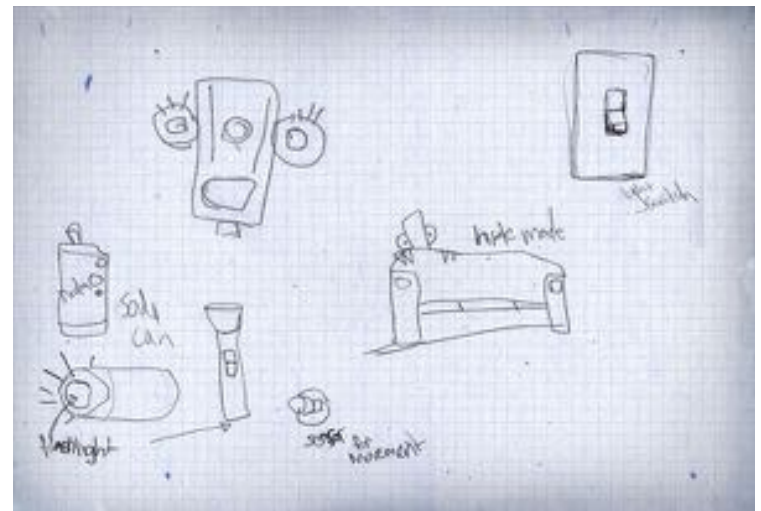


Appropriate Degree of Refinement

Make the sketch as refined as the idea

If you have a solid idea,
make the sketch look
more defined

If you have a hazy idea,
make the sketch look
rougher and less defined



Suggest and Explore Rather than Confirm

Sketch should act as a catalyst
to the desired and appropriate behaviors,
conversations, and interactions



Ambiguity

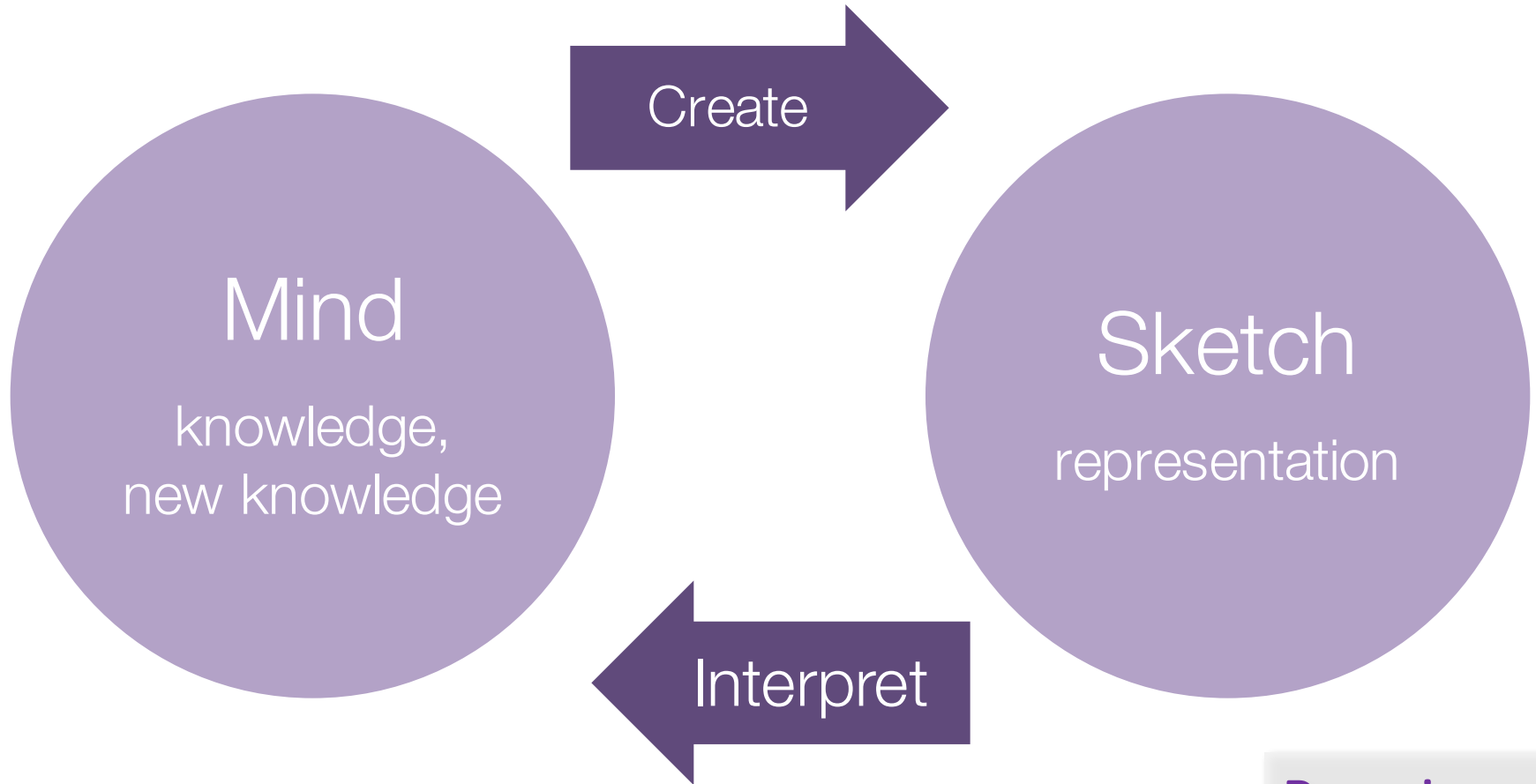
Intentionally ambiguous

Value comes from being able to be interpreted in different ways, even by the person who created them

Sketches have holes



Sketching as Conversation



Requires
ambiguity

Sketch vs. Prototype

Sketch	Prototype
Invite	Attend
Suggest	Describe
Explore	Refine
Question	Answer
Propose	Test
Provoke	Resolve
Tentative, non committal	Specific Depiction

The primary differences are in the intent

Sketching the Mouse



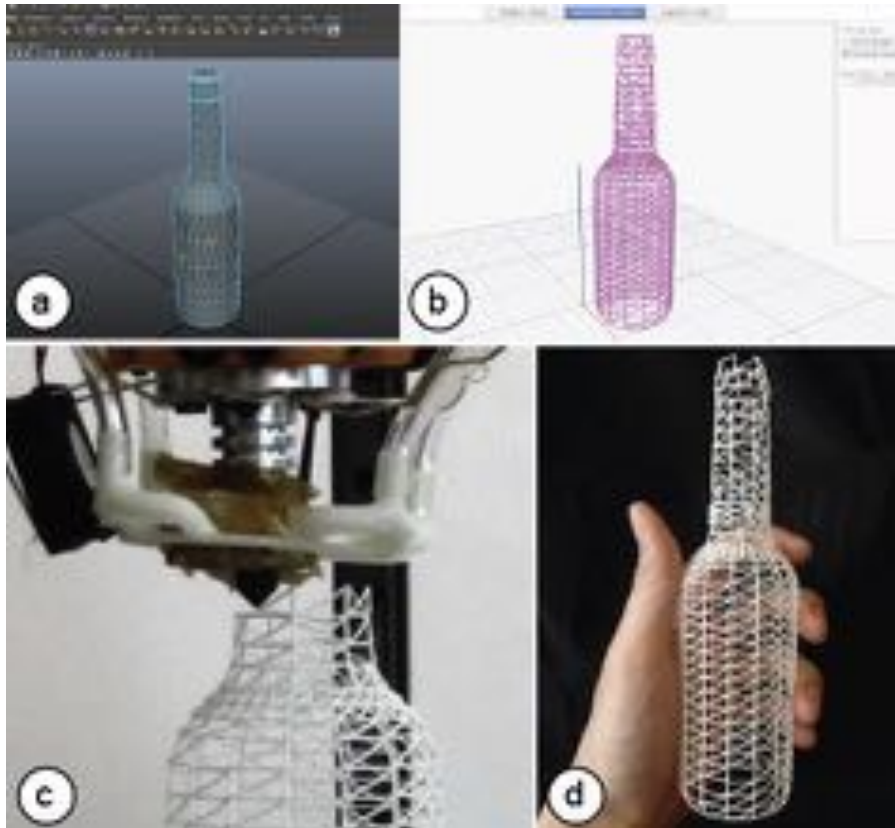
Sketching the Mouse



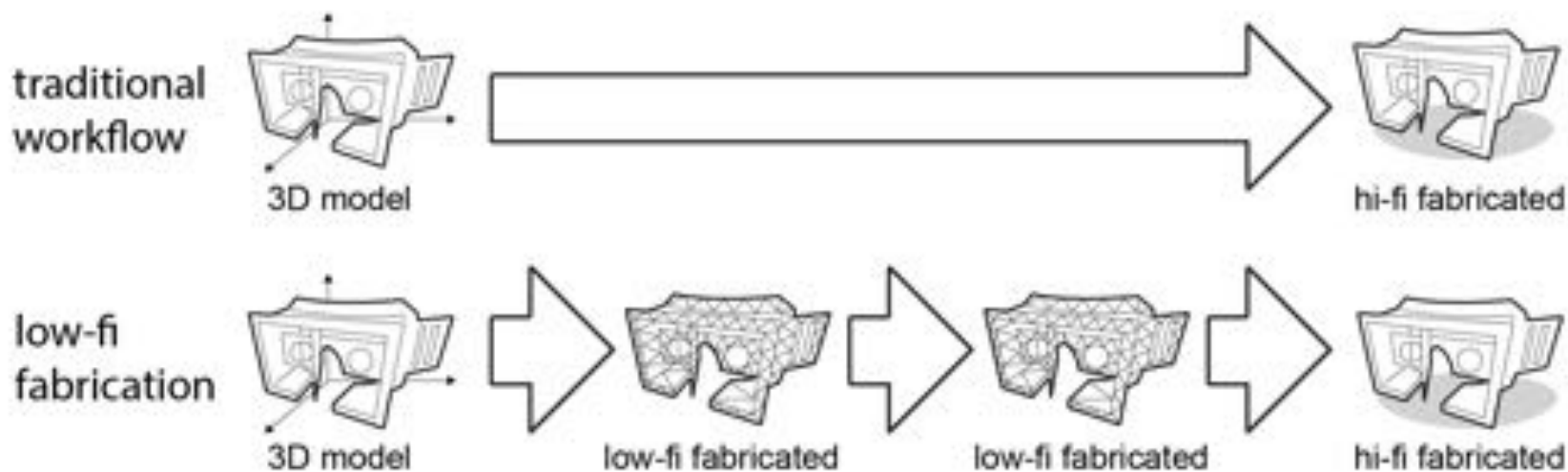
Physical Sketching



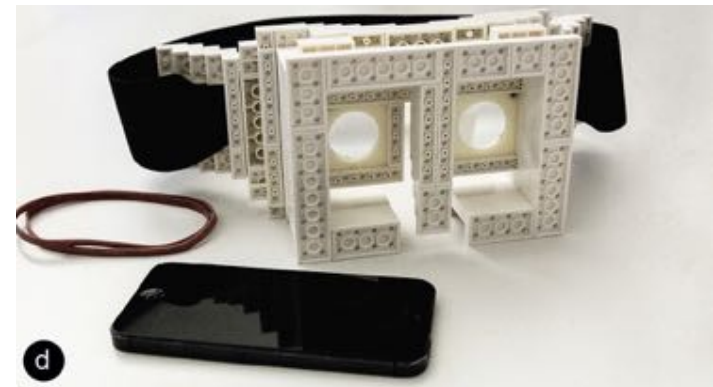
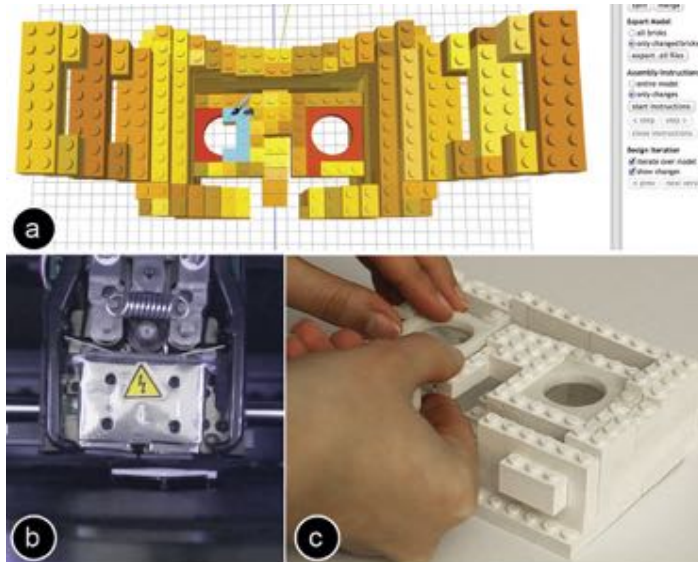
Physical Sketching



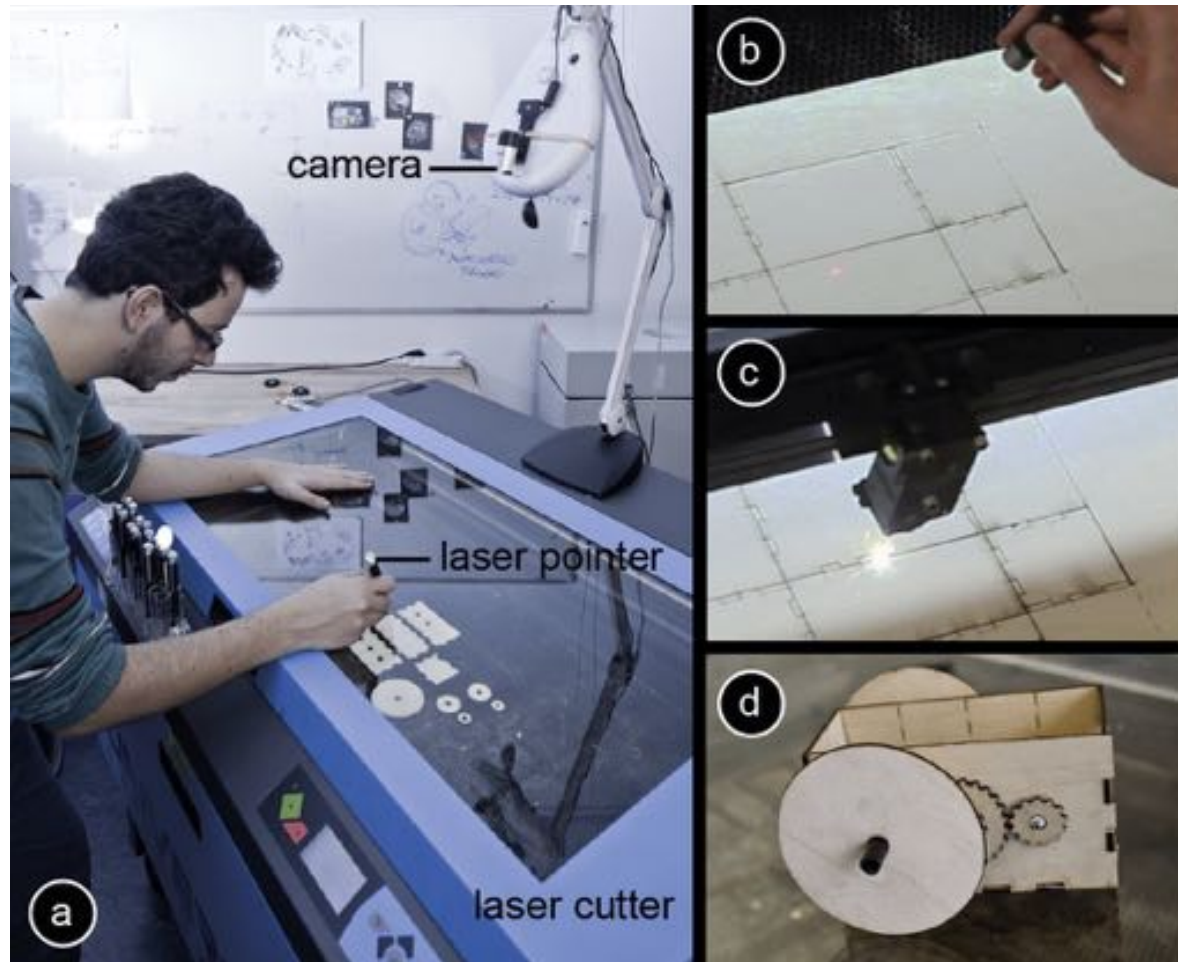
Physical Sketching



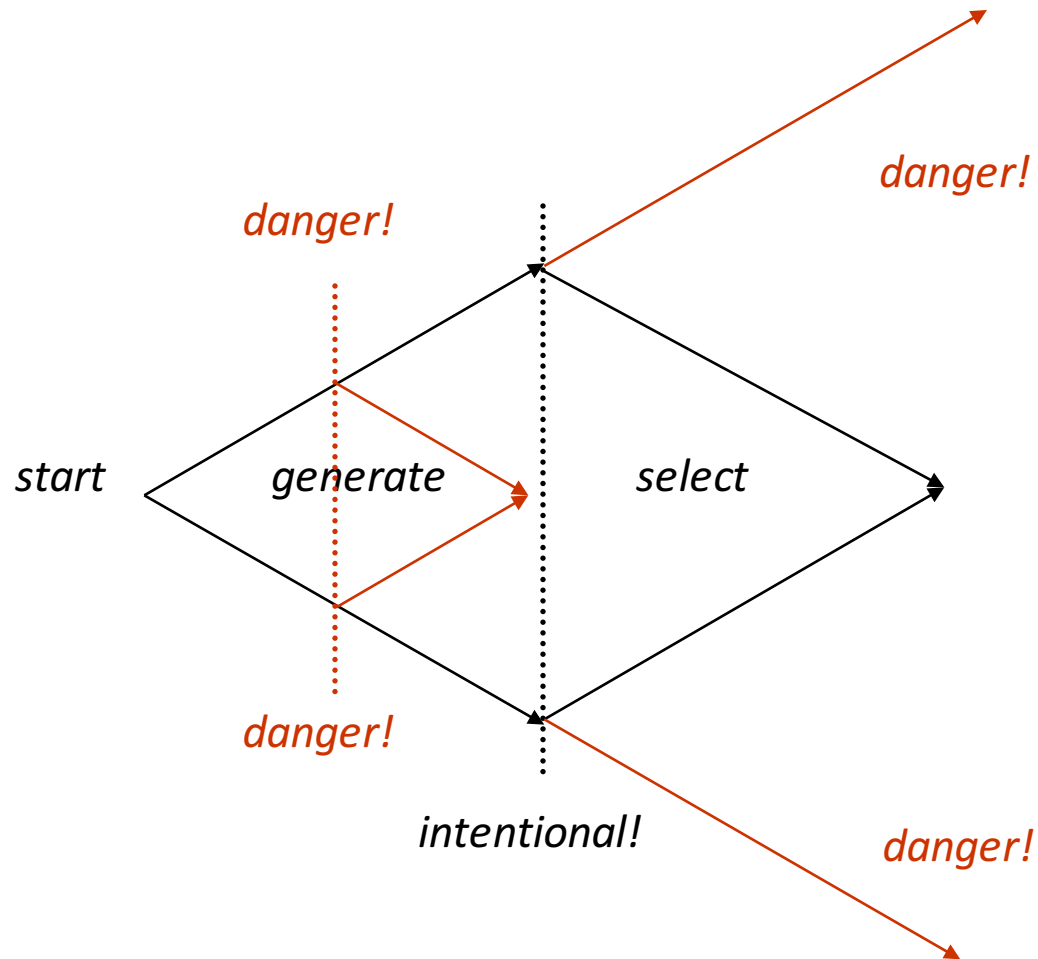
Physical Sketching



Physical Sketching



Idea Oscillation



Critiquing Sketches is Important

Ideas are both good and bad

Both are useful in design

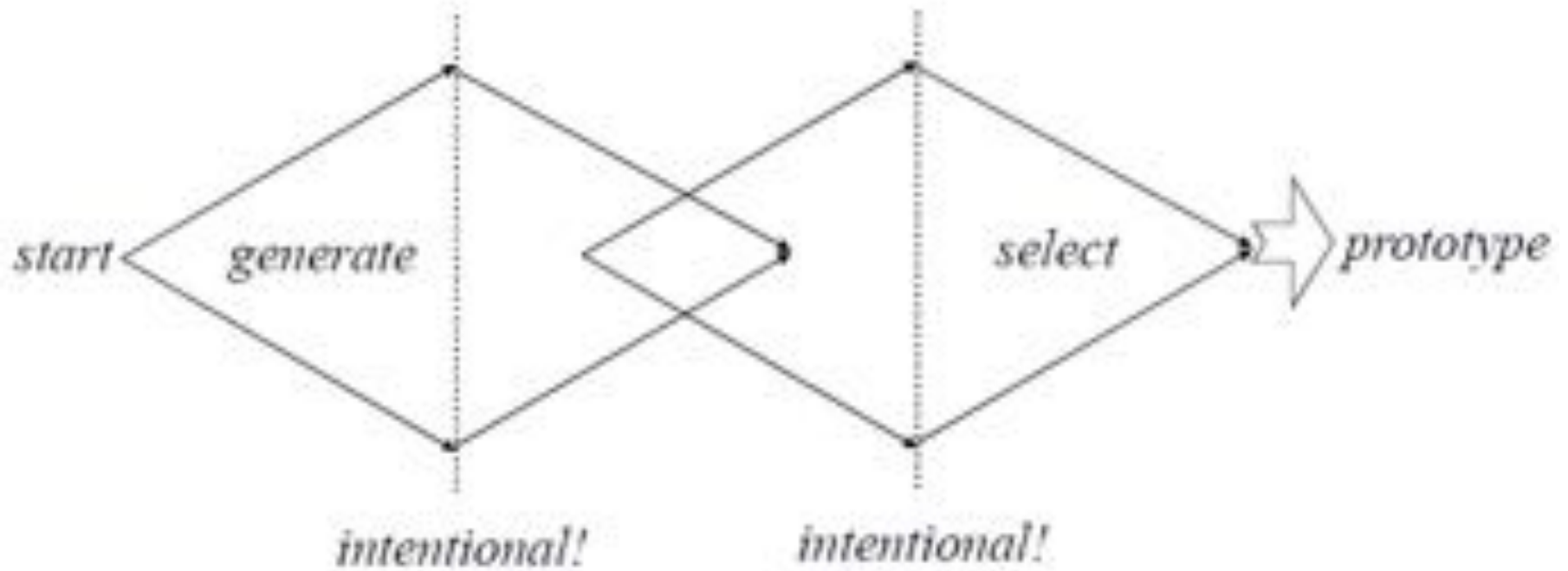
By making clear what is a bad design,
we can avoid actually implementing it

Bad ideas help you justify your good ideas

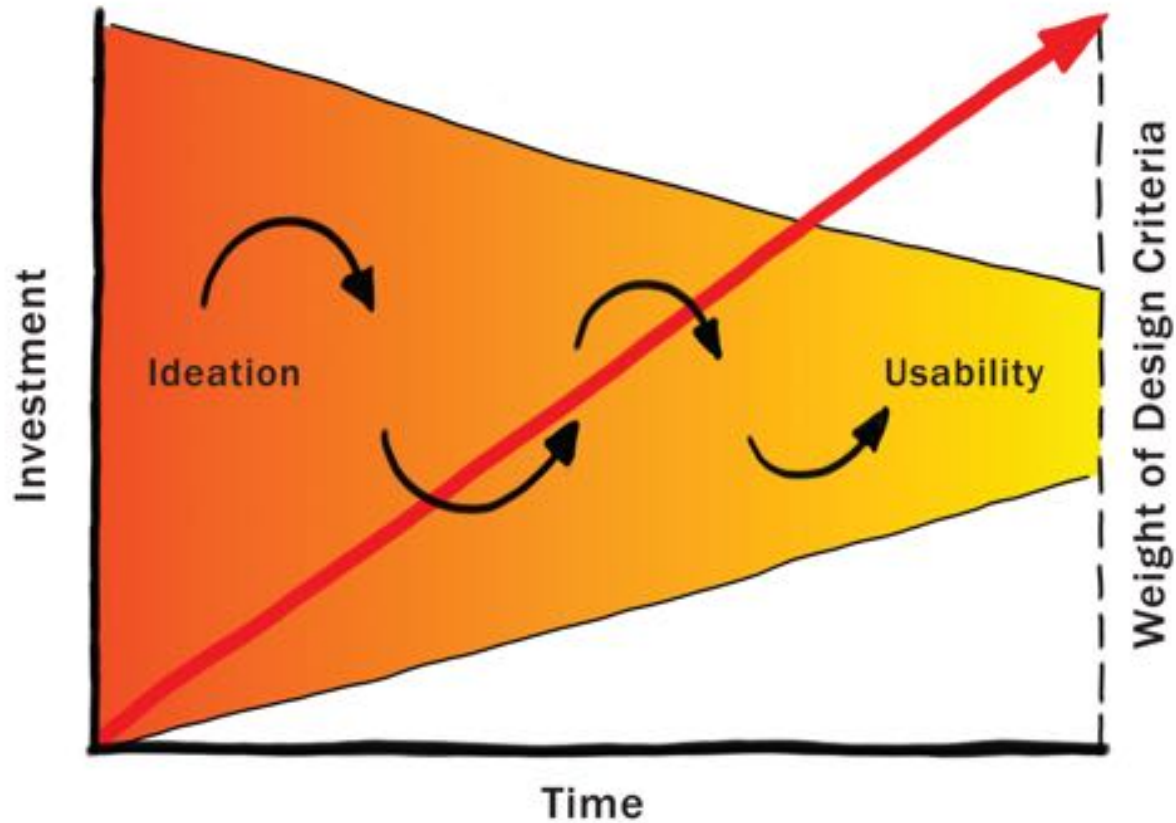
Feedback can turn a good idea into a great idea

Sketching generates too many ideas to implement

Idea Oscillation

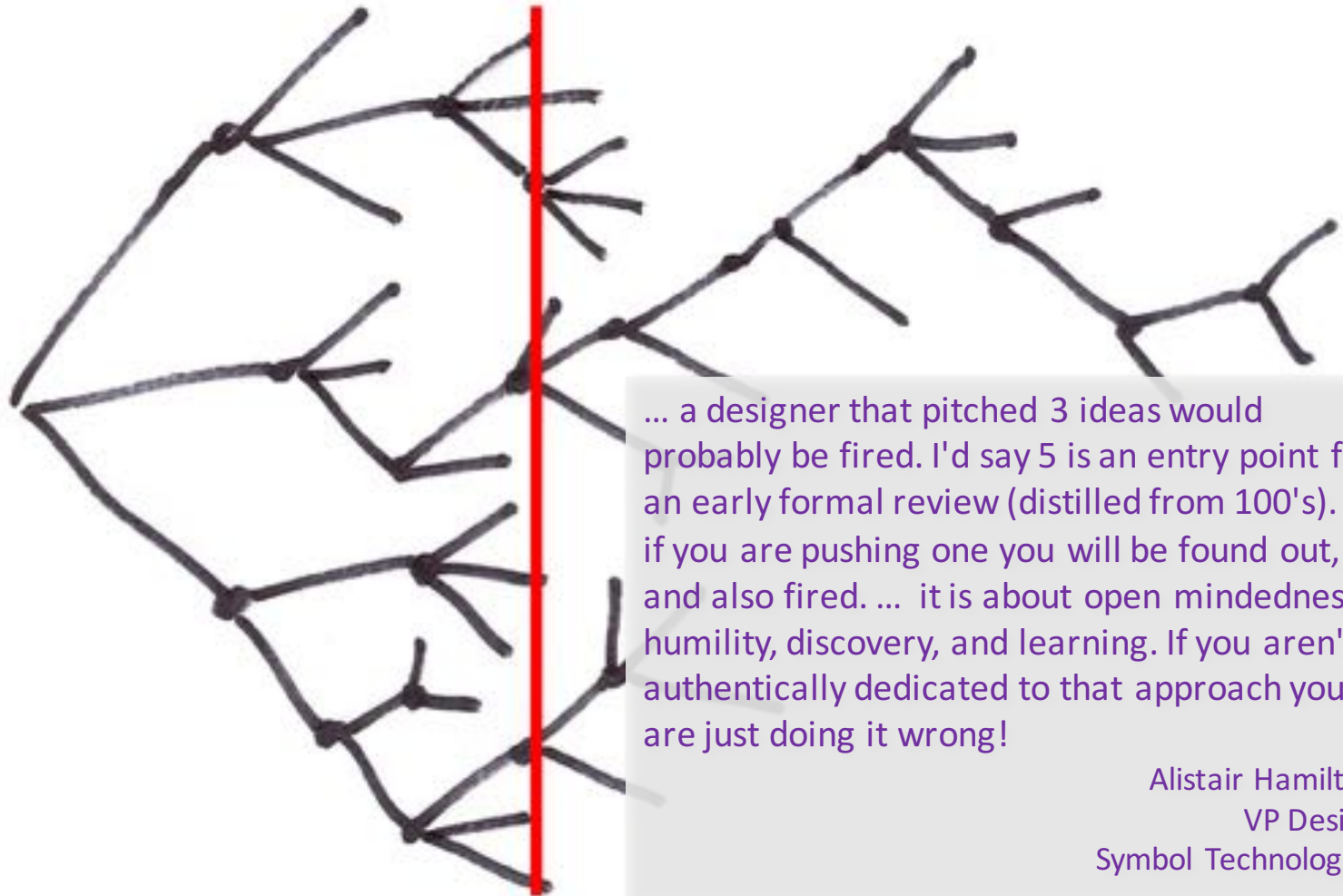


Iteration Toward a Design



- Sketch
- Prototype

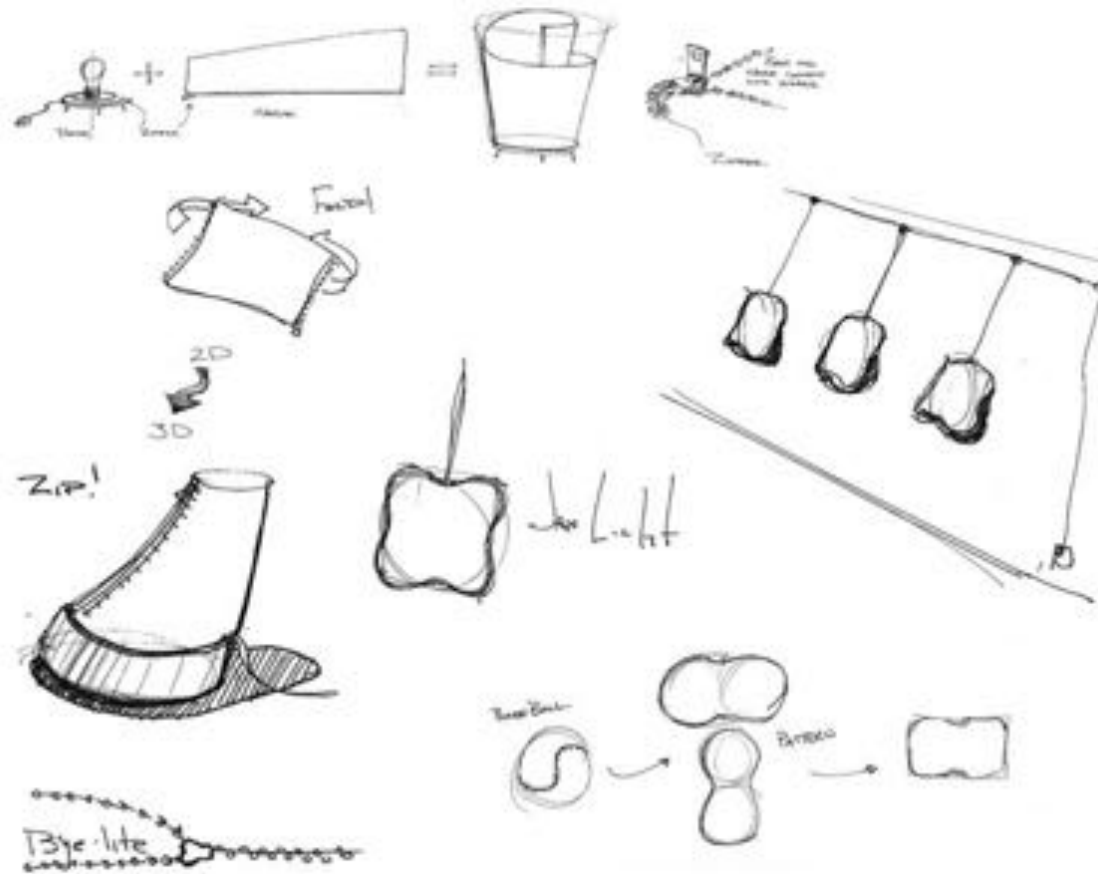
Exploration of Alternatives



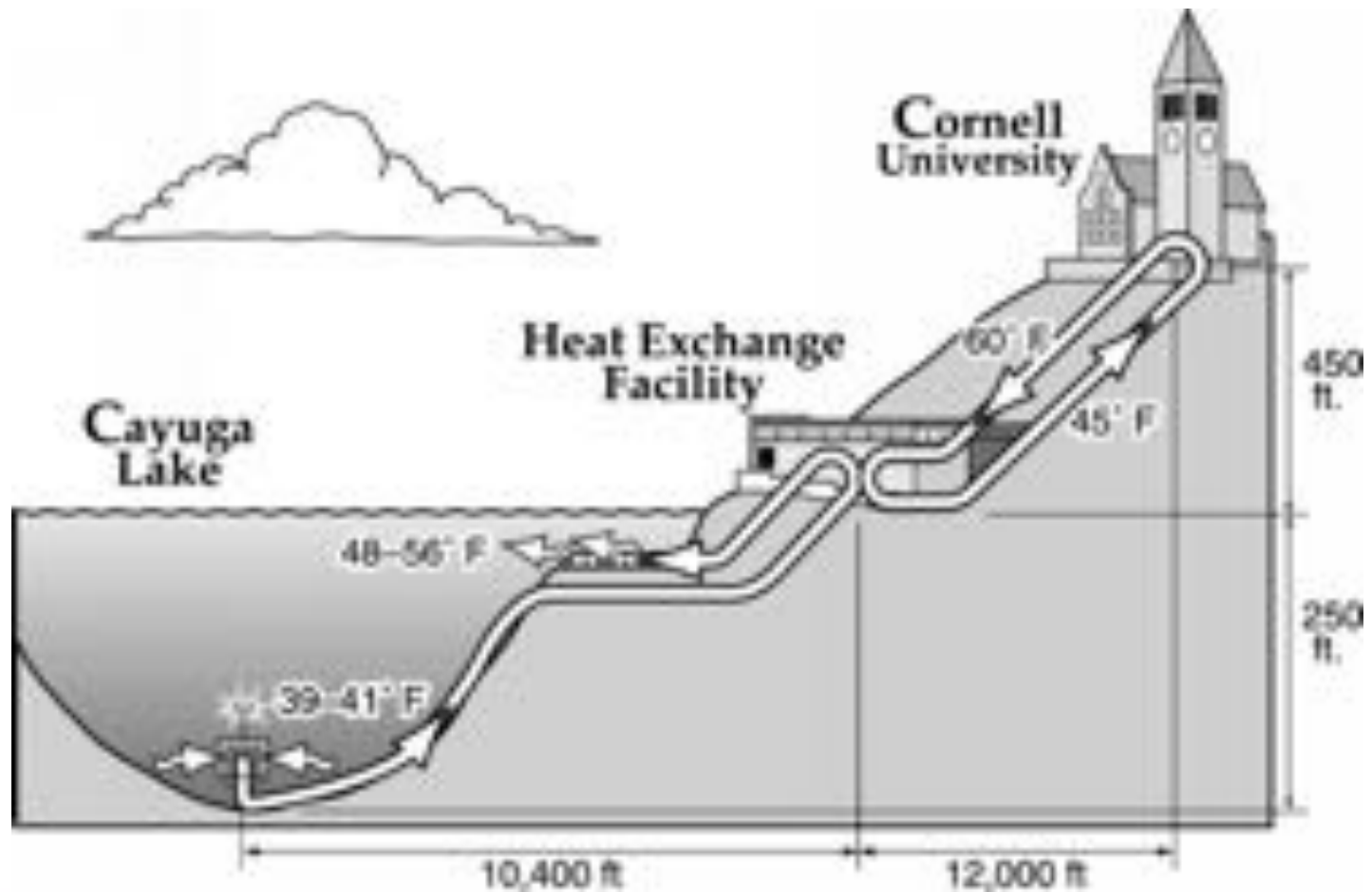
... a designer that pitched 3 ideas would probably be fired. I'd say 5 is an entry point for an early formal review (distilled from 100's). ... if you are pushing one you will be found out, and also fired. ... it is about open mindedness, humility, discovery, and learning. If you aren't authentically dedicated to that approach you are just doing it wrong!

Alistair Hamilton
VP Design
Symbol Technologies

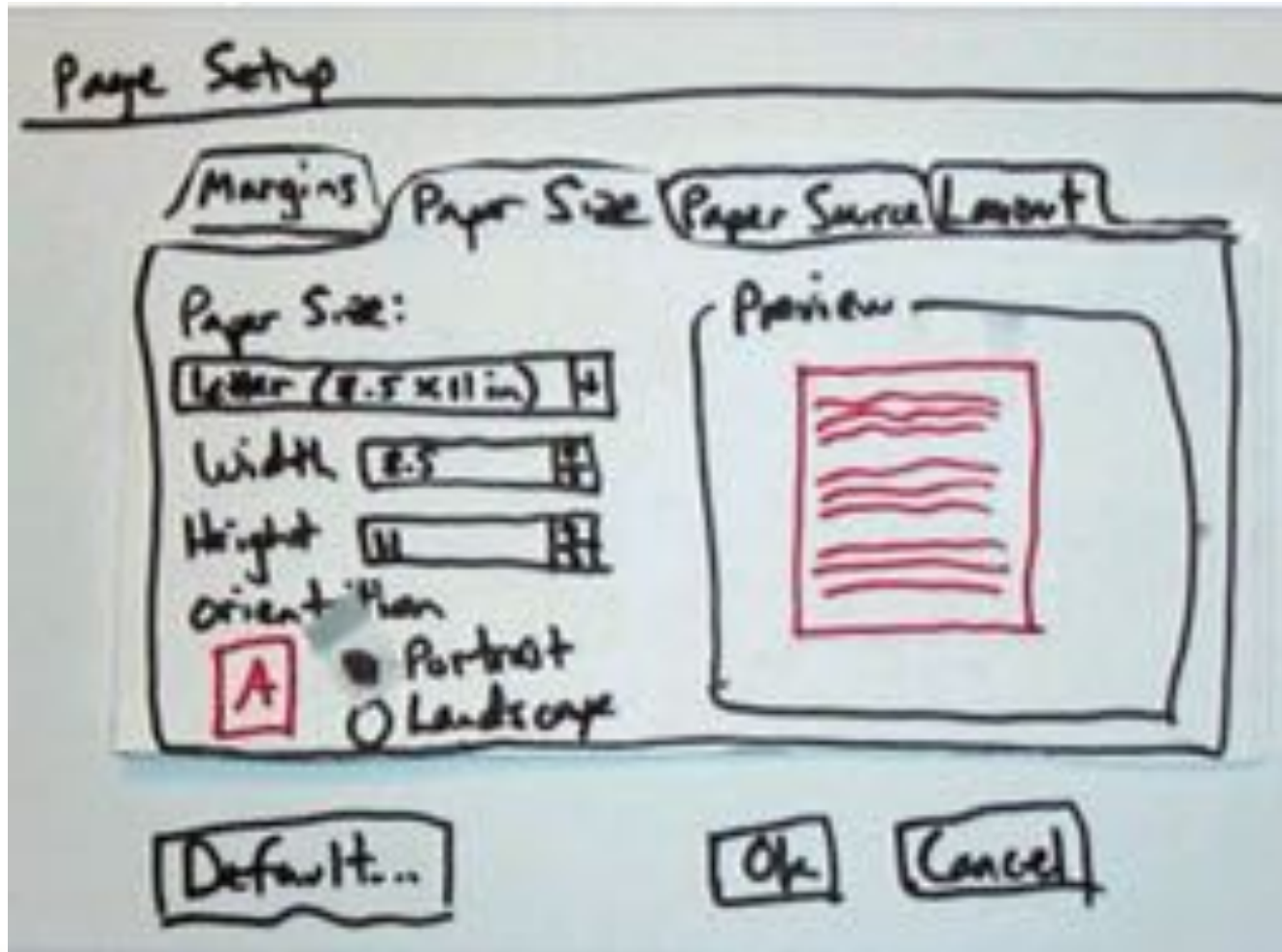
Is this a sketch? Why or why not?



Is this a sketch? Why or why not?



Is this a sketch? Why or why not?



Is this a sketch? Why or why not?



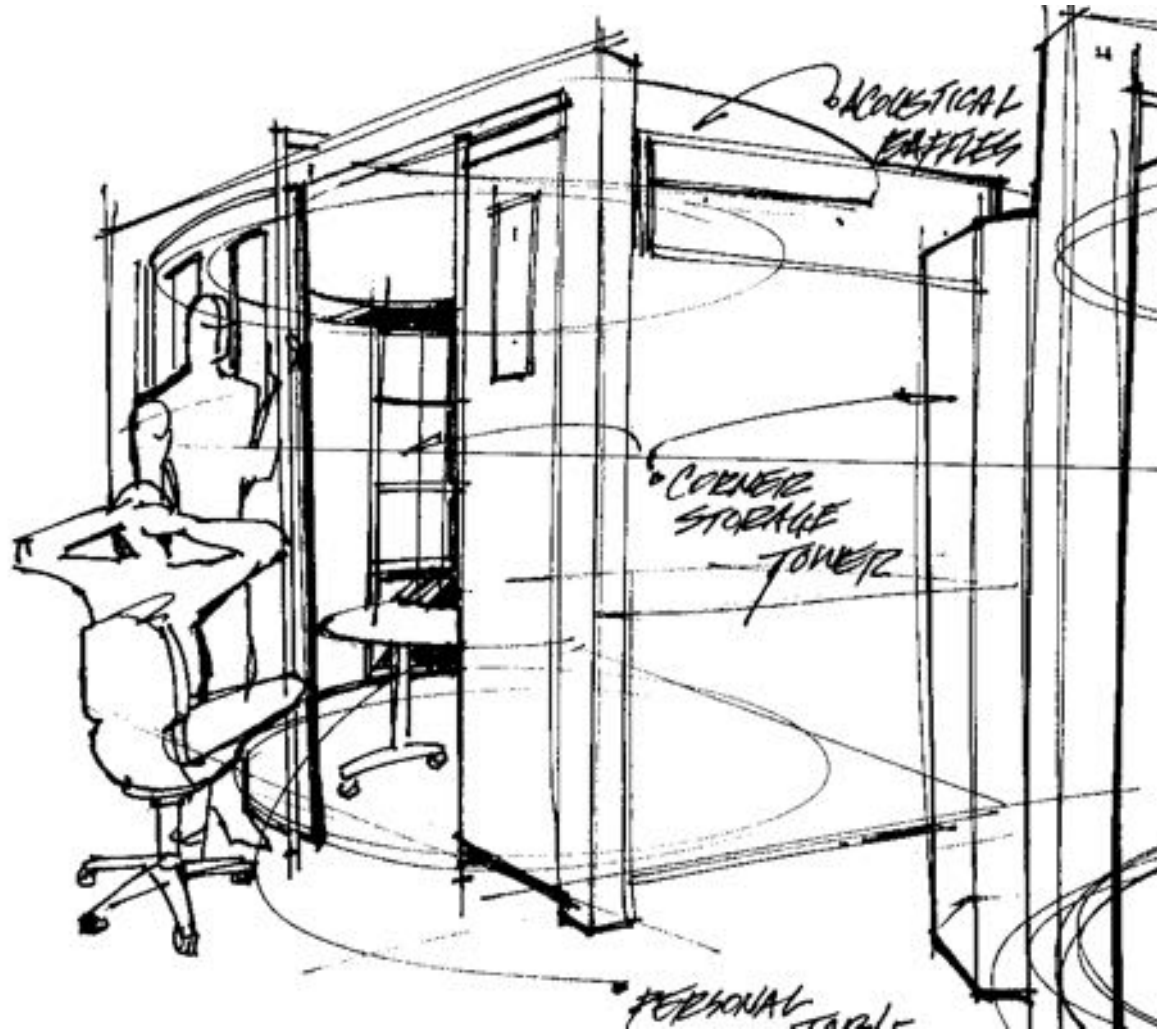
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Is this a sketch? Why or why not?



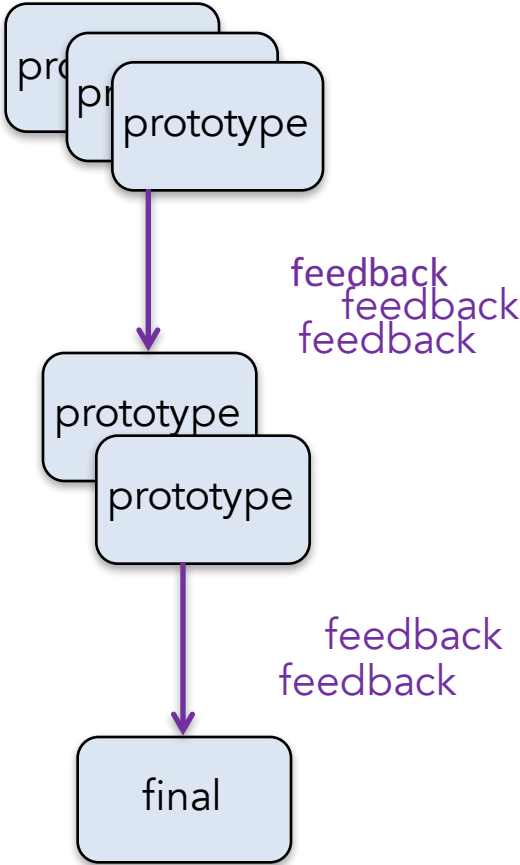
Some Evidence

Task:

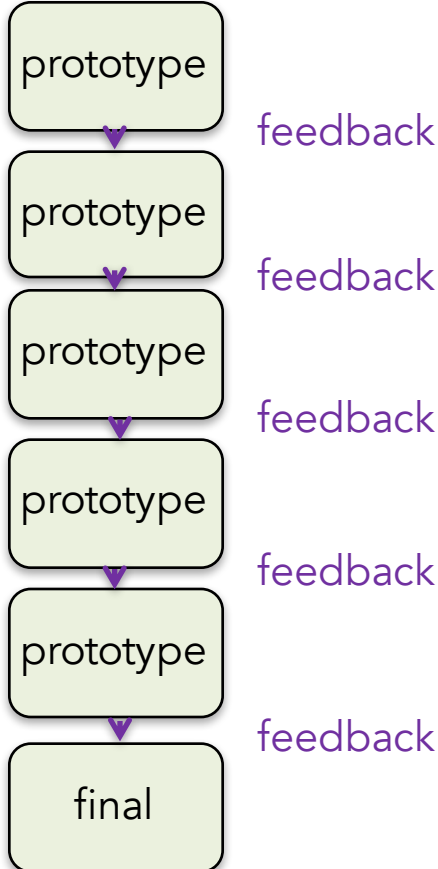
Create a web banner ad for Ambidextrous magazine.



Feedback in Parallel or Serial



Parallel condition



Serial condition

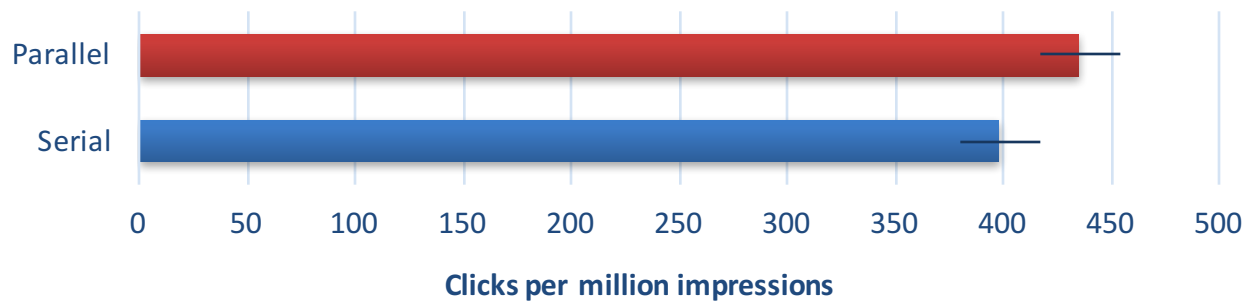
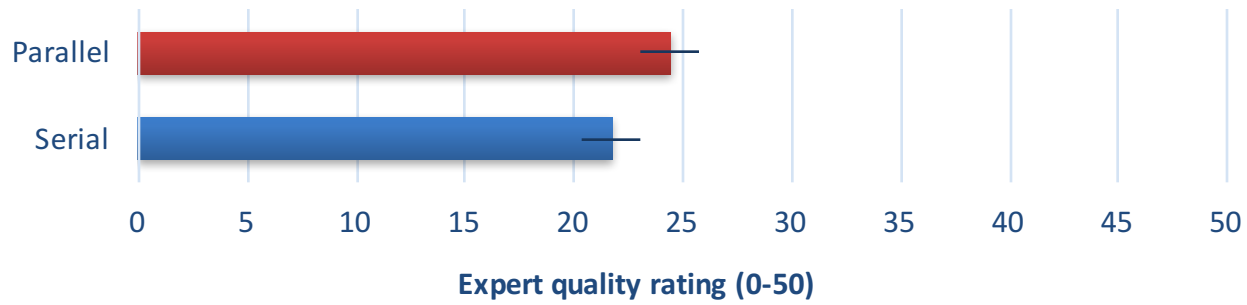
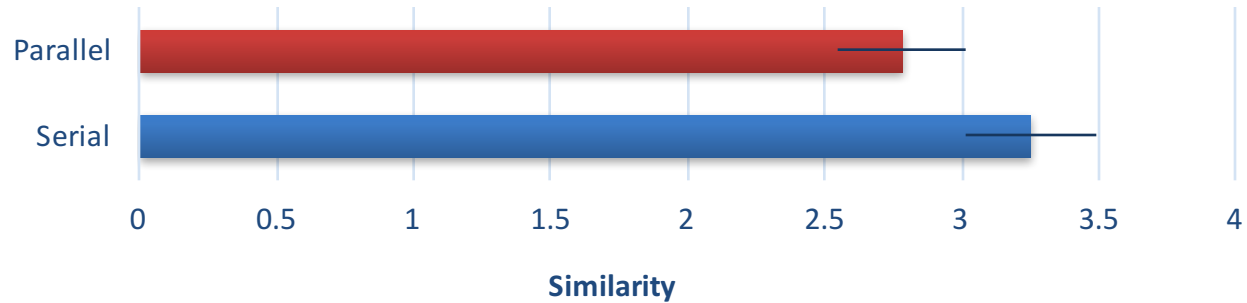
Procedure

serial
prototyping
condition

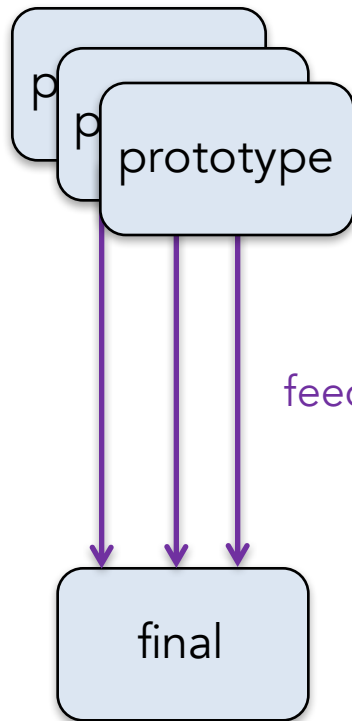
parallel
prototyping
condition



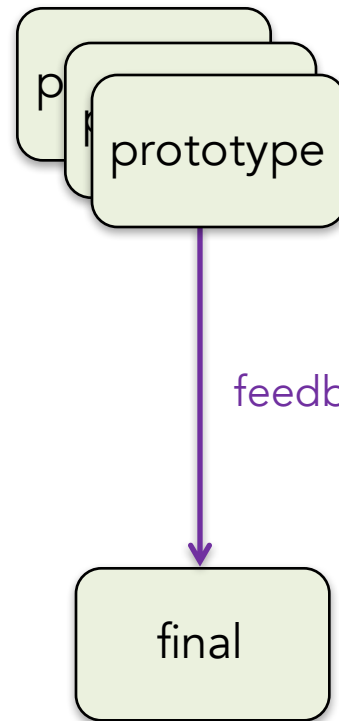
Parallel: more diverse, better, more clicks



Share one or share your best?



Share multiple
condition

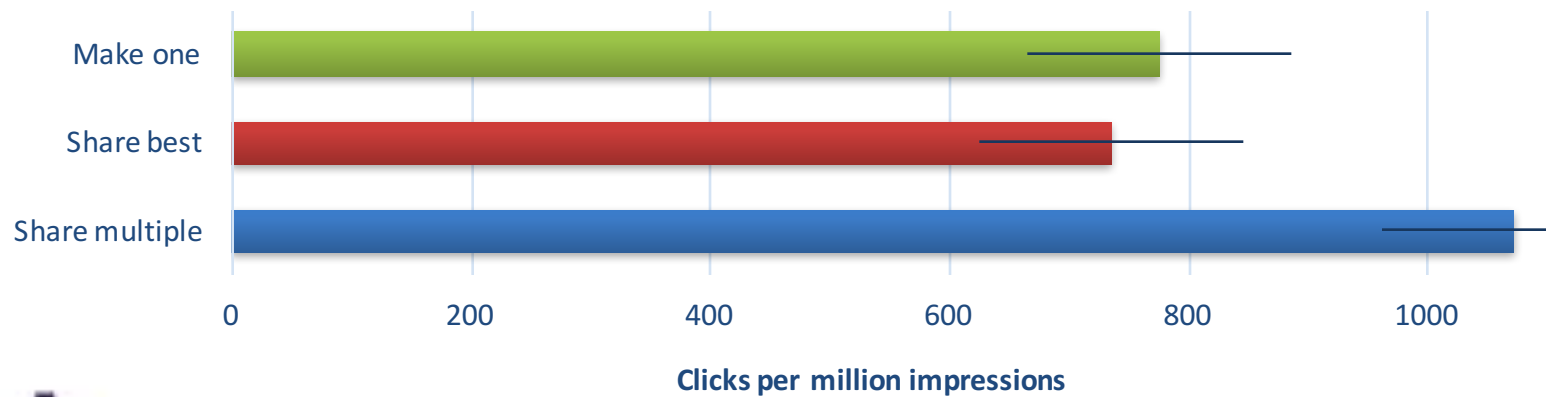
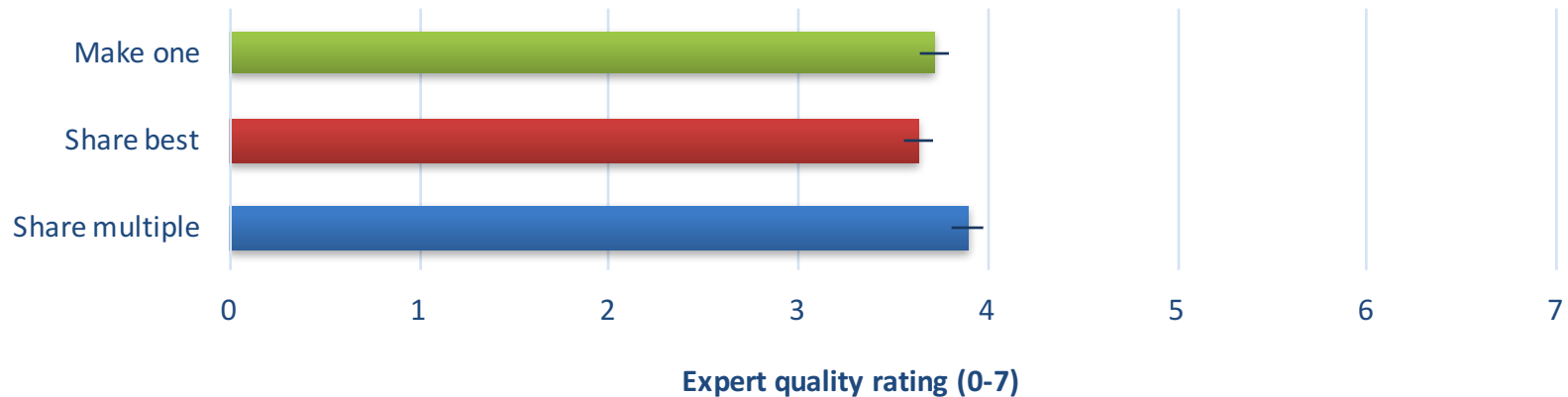


Share best
condition



Make one
condition

Share Multiple: better, more clicks



Some Evidence

Greater divergence in designs

Prevents sticking with the first idea

Allows mashing ideas together

Alternatives facilitate feedback

Enable comparison

Can improve tone of critique

Sketching and the Design Diamond

The design diamond is fundamental to understanding effective iteration in design

Much of your education, including in CSE, has taught you to focus on having the right answer

Here it matters what you do long before the end

Most ideas get thrown out, including yours

Better ideas are great criticism, and frequently would never have come about otherwise

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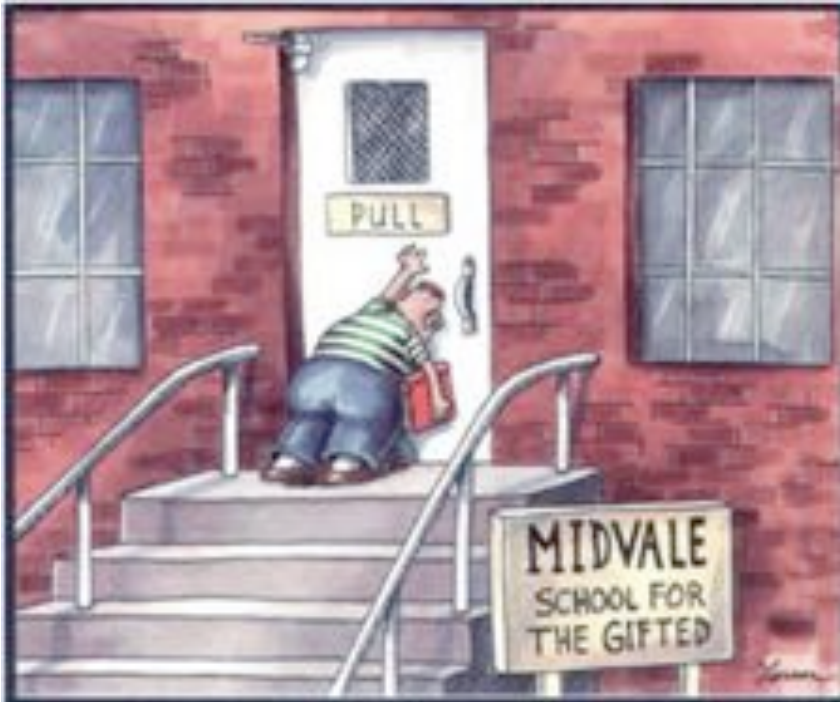
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What Is This Course?

Time for a Door Quiz:

Say out loud what action you use to open the door



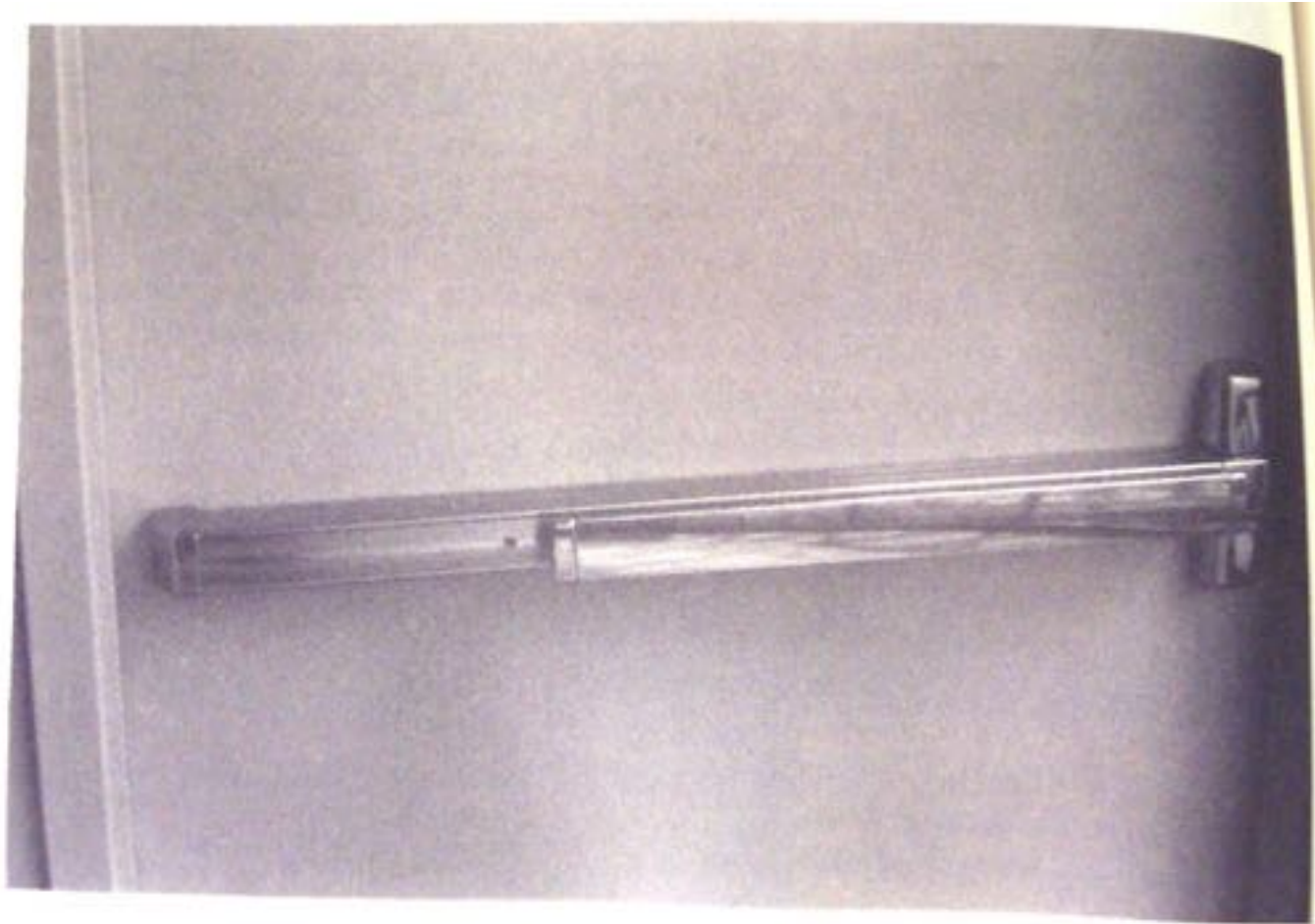
Push

Pull

Door Quiz



Door Quiz



Door Quiz



Door Quiz



Door Quiz



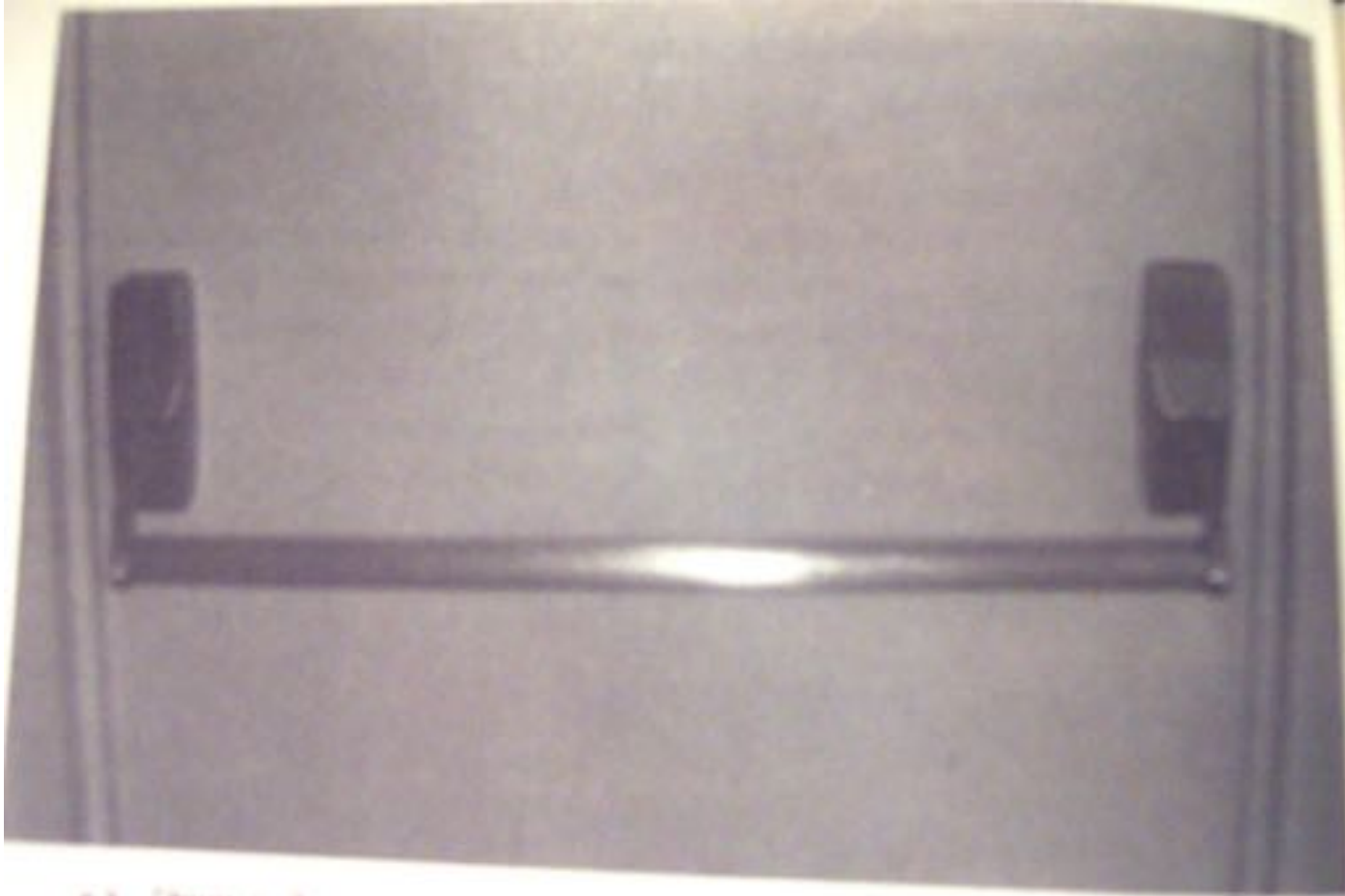
Door Quiz



Door Quiz



Door Quiz



Door Quiz



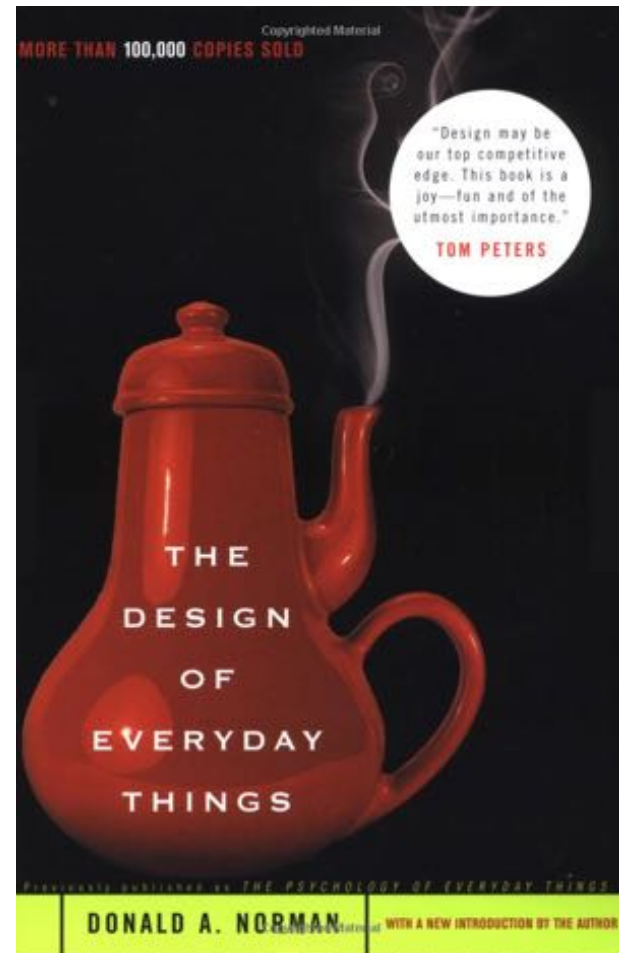
What is so Special about Computers?

Nothing! It is about good designs and bad designs

We all make push/pull decisions many times per day

We all encounter doors that do this badly

We all see signs that do not change what we do



What is so Special about Computers?

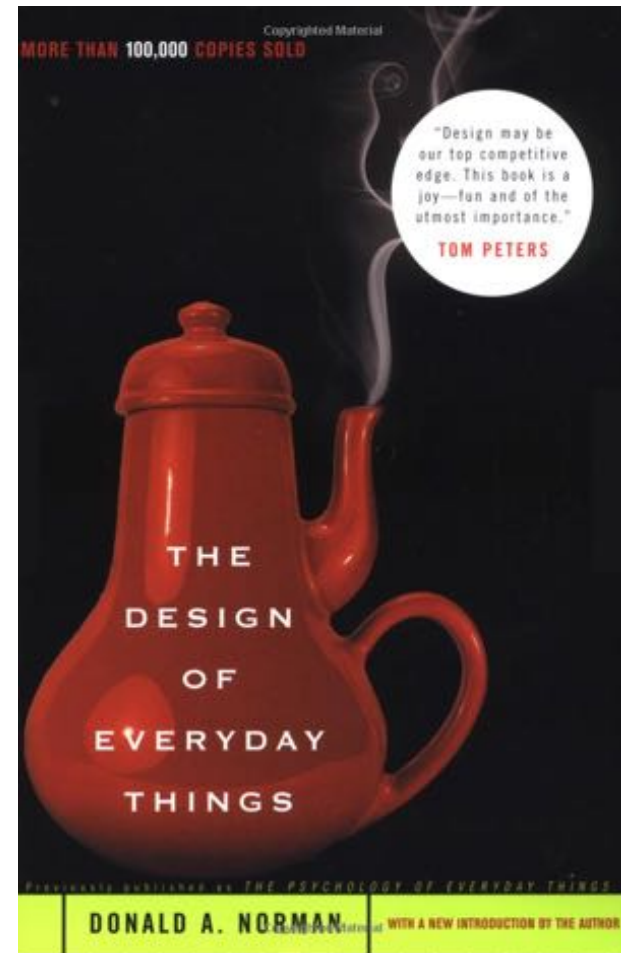
Yet we blame ourselves

Absolutely everything we encounter in the made world was designed

Too often poorly designed

Read this book

Be warned you cannot unread it, you become angry



Norman's Execution-Evaluation Cycle

1. Establish the goal.
2. Form the intention.
3. Specify the action sequence.
4. Execute the action sequence.
5. Perceive the system state.
6. Interpret the system state.
7. Evaluate the system state with respect to the goals and intentions.



Revise
Goals

Turning on the Light

1. Establish the goal

Increase light in the room

2. Form the intention

To turn on the lamp

3. Specify the action sequence

Walk to the lamp, reach for the knob, twist the knob

4. Execute the action sequence

[walk, reach, twist]

5. Perceive the system state

[hear “click” sound, see light from lamp]

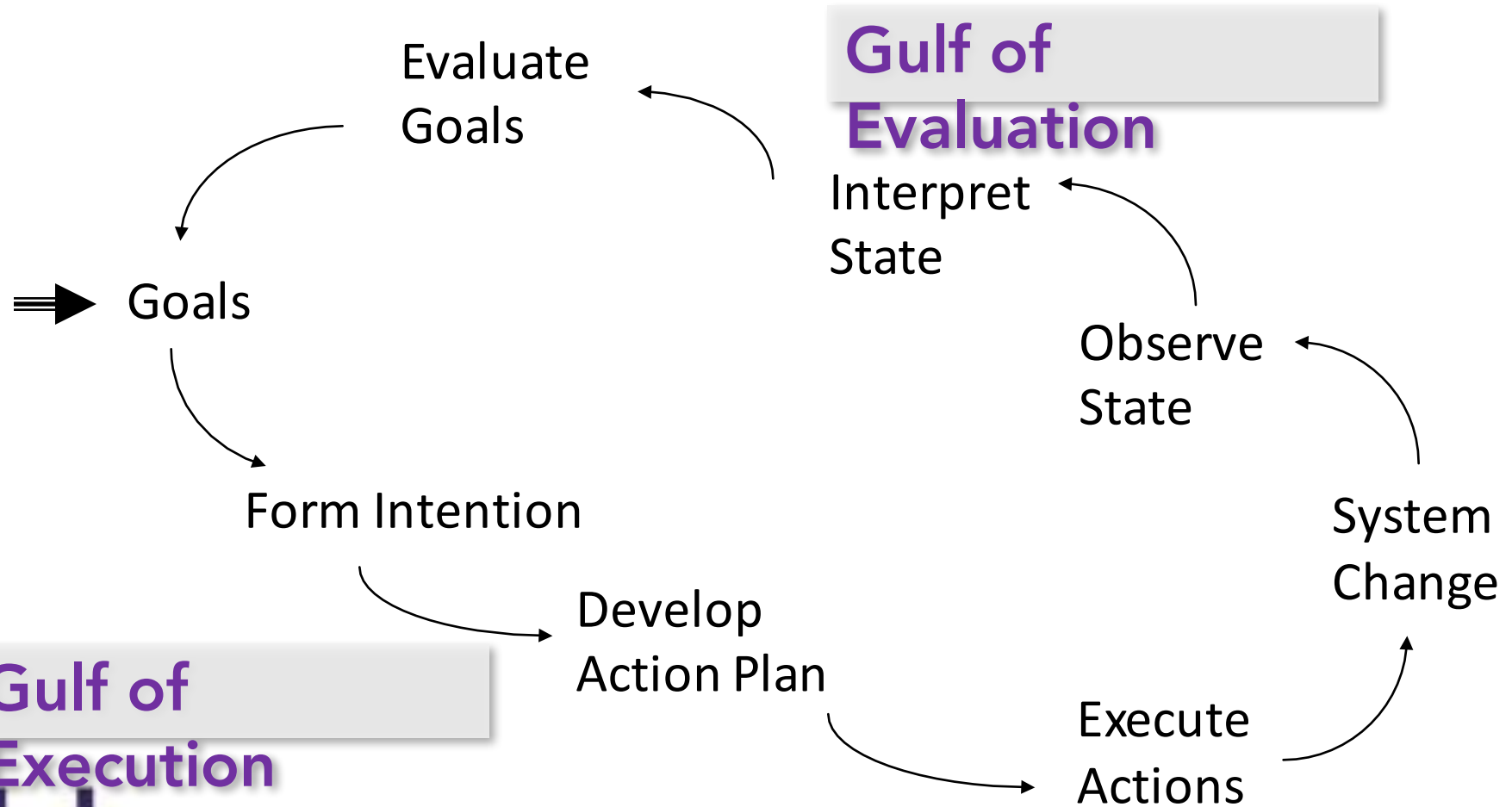
6. Interpret the system state

The knob rotated. The lamp is emitting light. The lamp seems to work

7. Evaluate the system state with respect to the goals and intentions

The lamp did indeed increase the light in the room [goal satisfied]

Norman's Execution-Evaluation Cycle



Gulf of Execution

Gulf of Evaluation

Bridging the Gulfs

Gulf of Execution: “How do I do it?”

Commands and mechanisms need to match the goals, thoughts, and expectations of a person

Gulf of Evaluation: “What does it mean?”

Output needs to present a view of the system that is readily perceived, interpreted, and evaluated

People build mental models to anticipate and interpret system response to their actions

What can I do?

How do I do it?

What result will it have?

What is it telling me?

Cooper's Mental Model Terminology



Implementation Model

How it works

(aka Design Model, Designer's Conceptual Model)



Manifest Model

How it presents itself

(aka System Image)



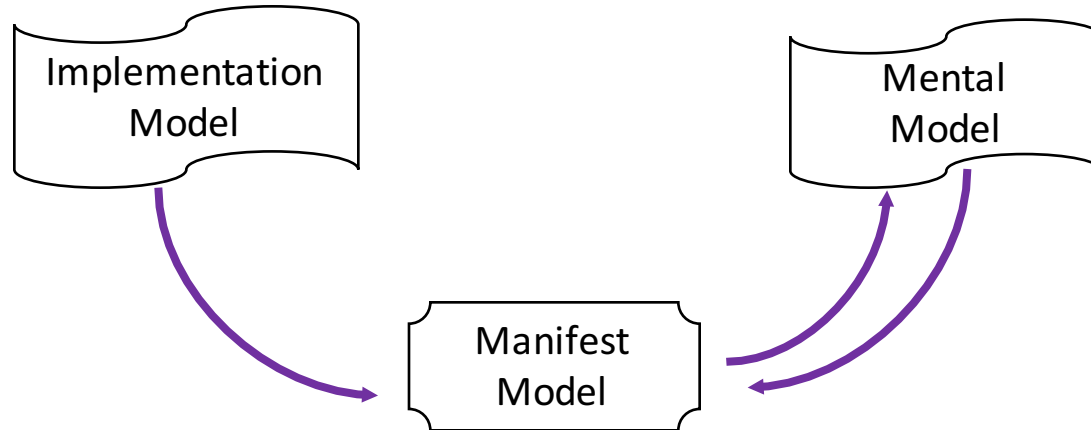
Mental Model

How a person thinks it works

(aka User Model, User's Conceptual Model)

These terms
are sloppy and
ambiguous
out in the
world

Manifest and Mental Models



Designer projects their model into an artifact

Person forms their model based on interaction

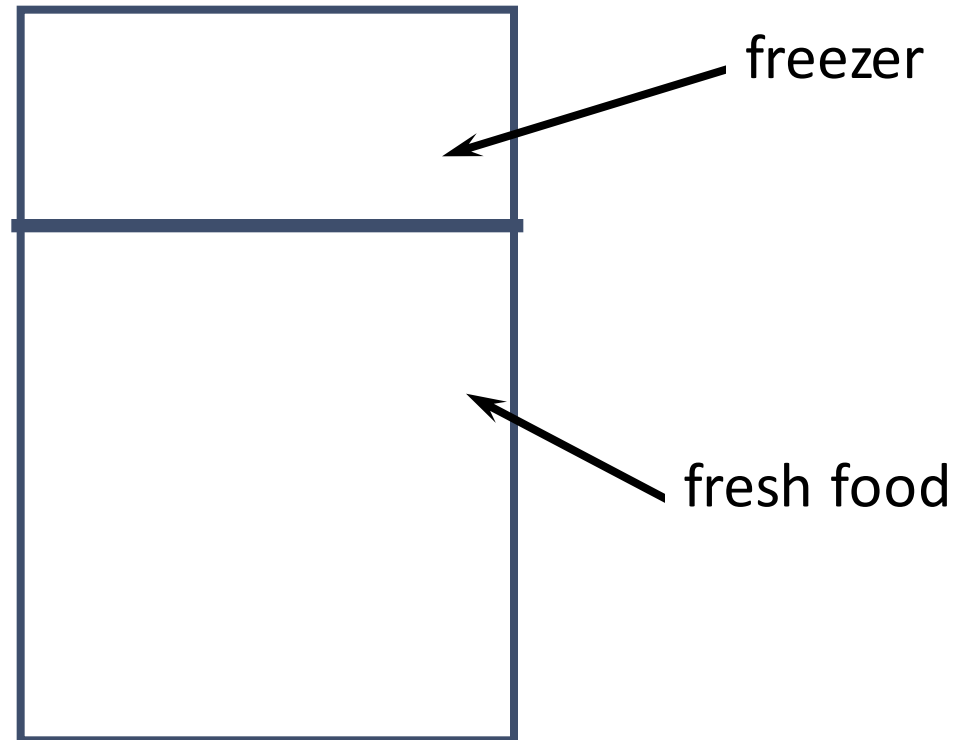
People struggle until model matches manifest model

Update mental model in response to breakdowns

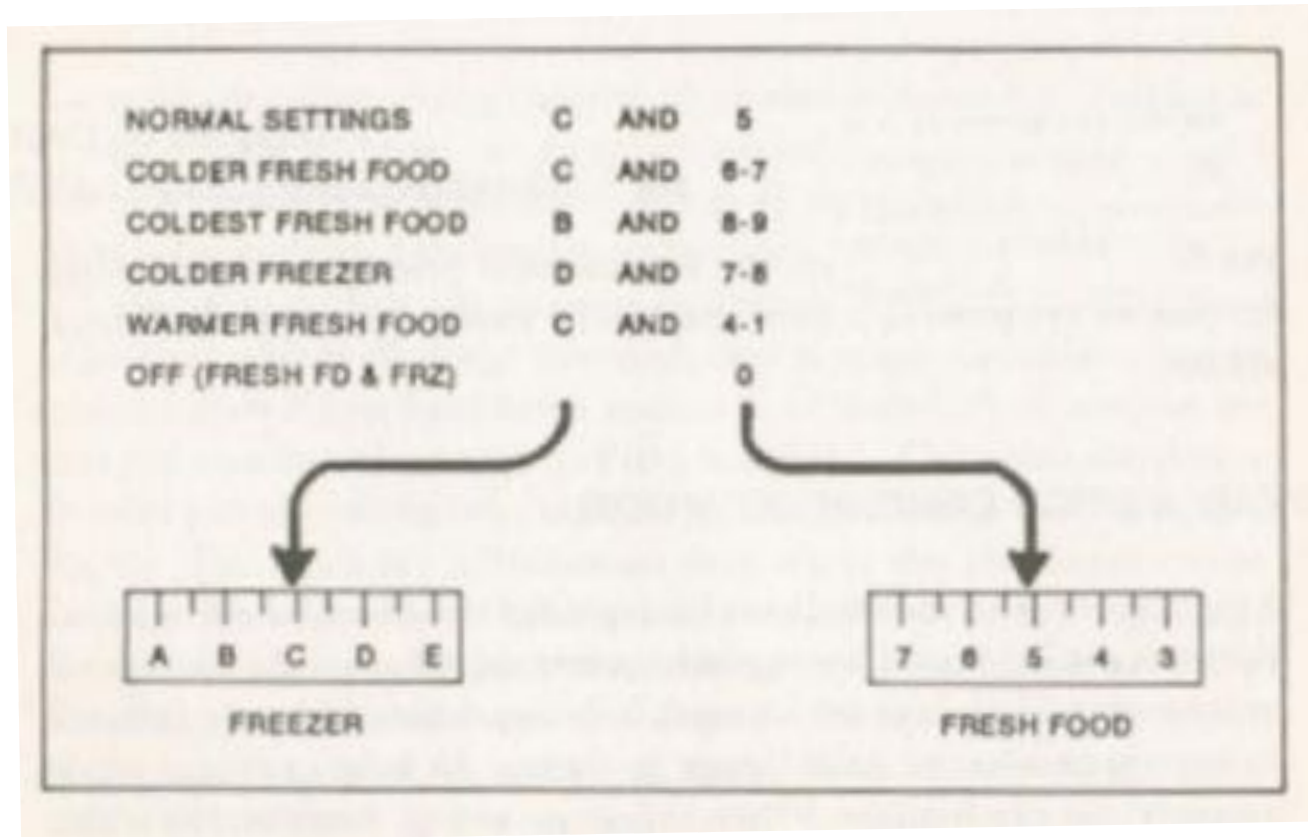
Not necessarily matching the implementation model

Mental Models

Problem: freezer too cold, fresh food just right

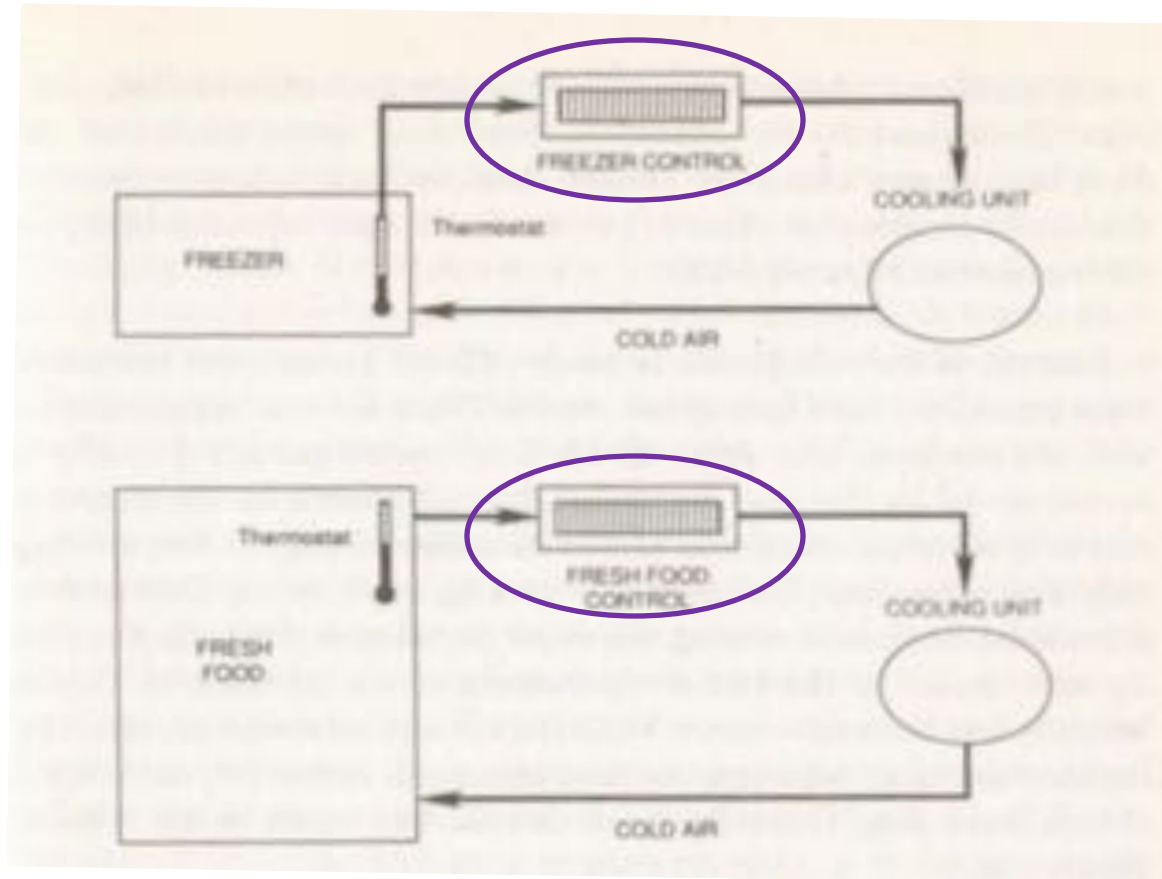


Manifest Model



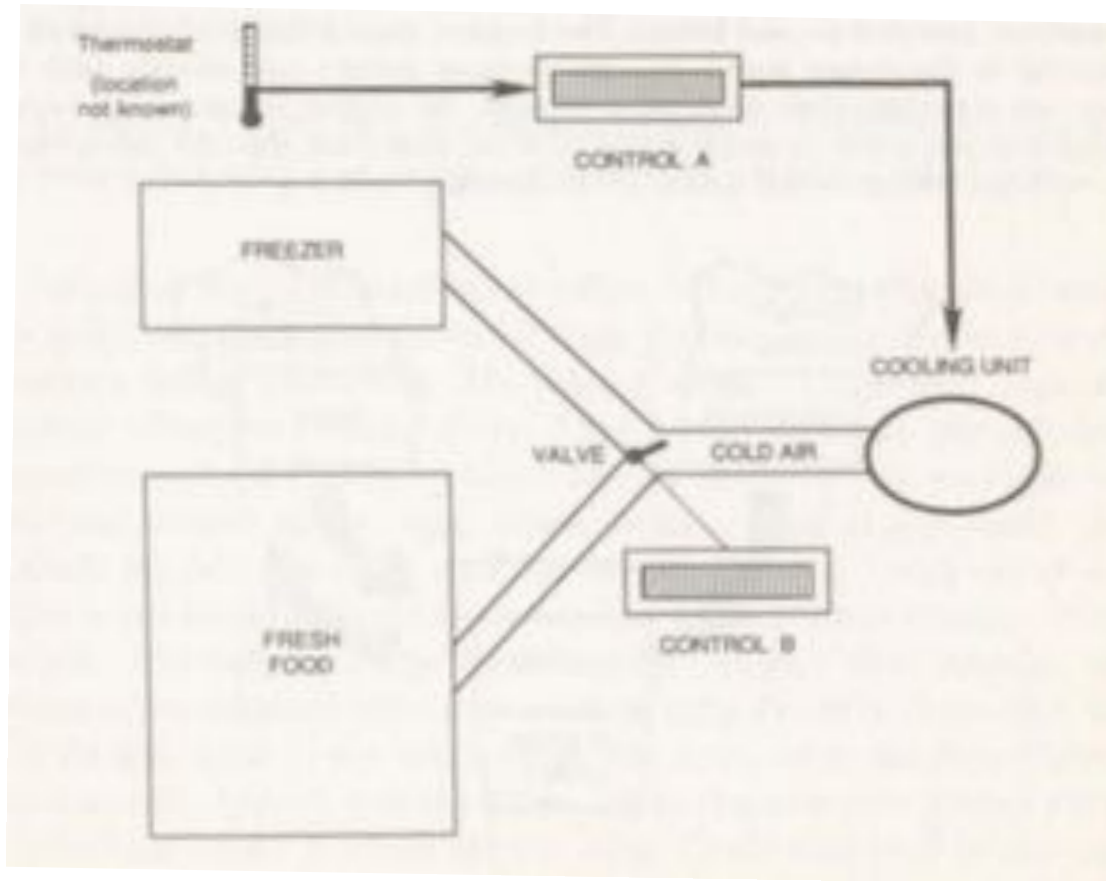
What if I want to make just the freezer warmer?

A Sensible Mental Model

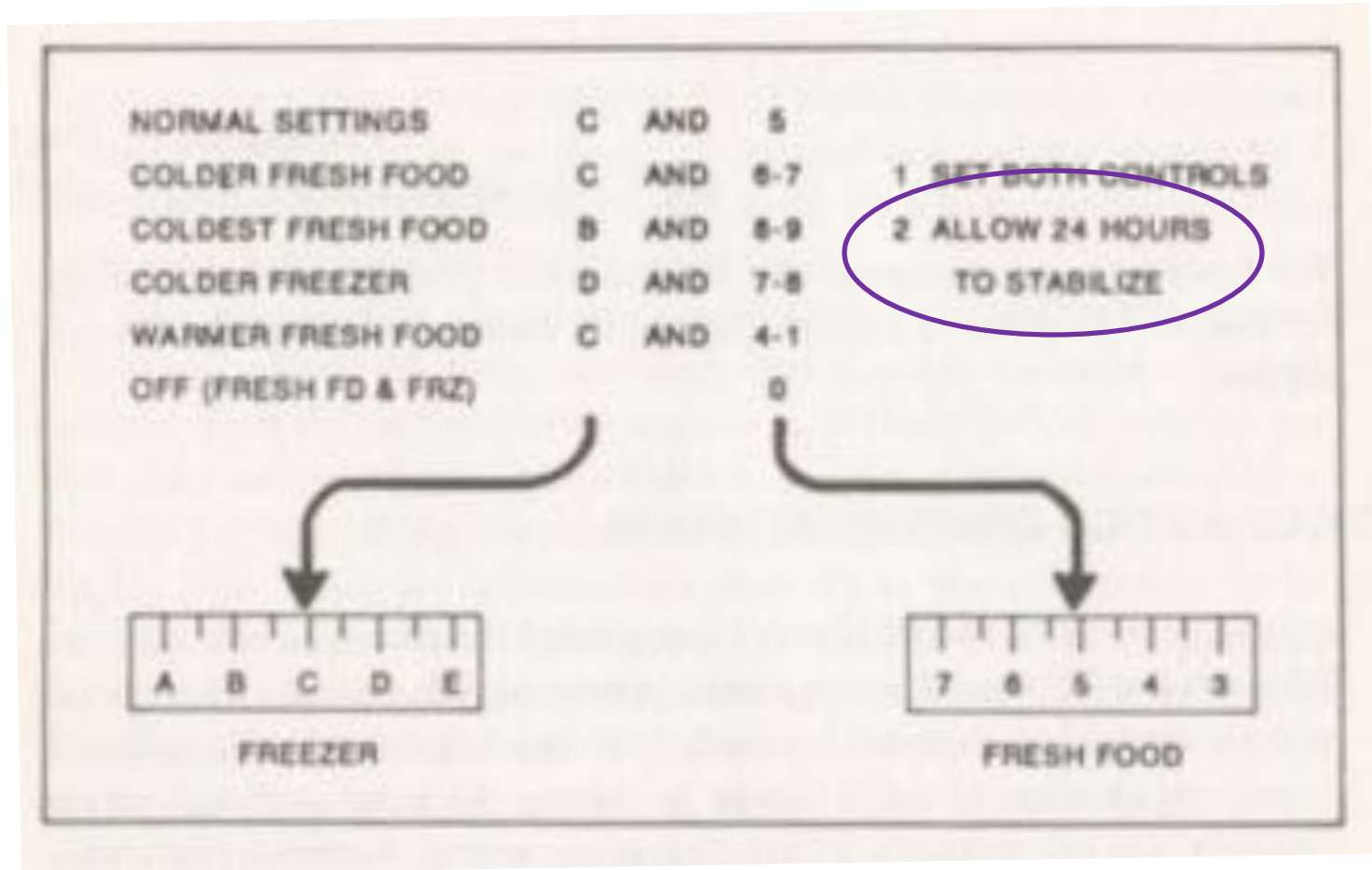


“The Freezer Control controls the freezer temperature and the Fresh Food Control controls the fresh food temperature”

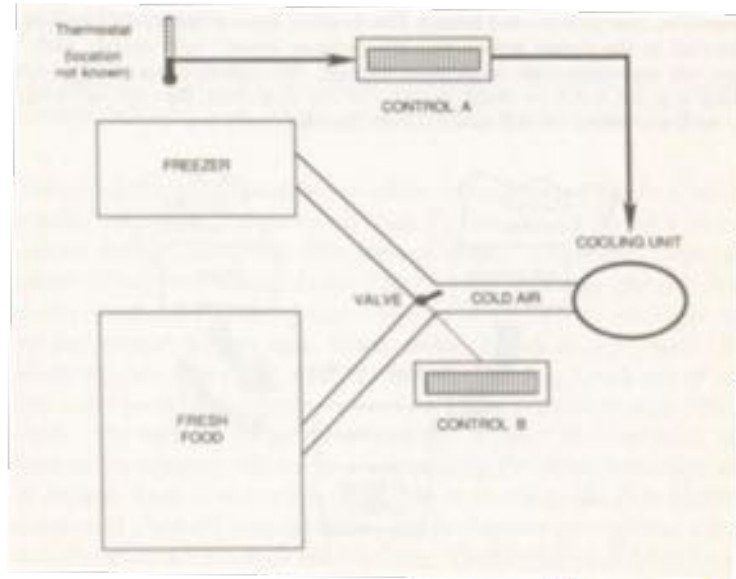
The Implementation Model



A Problem with Feedback



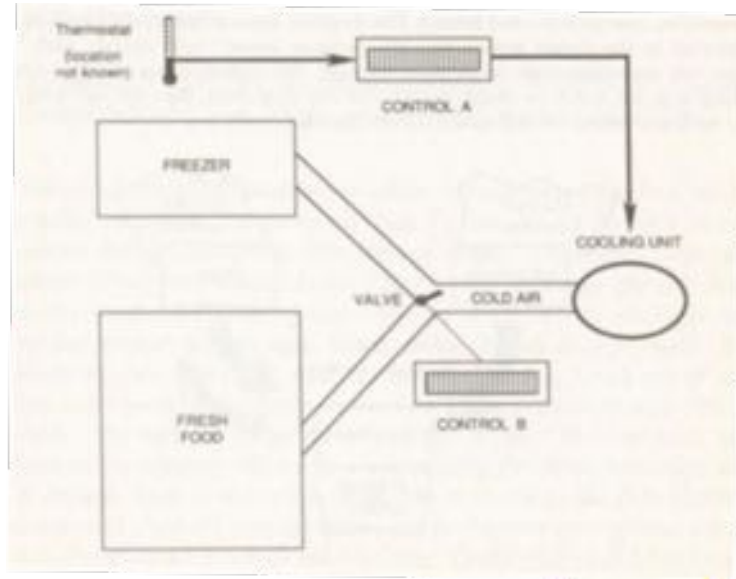
The Implementation Model



Why do we have a problem?

Can you fix the problem?

The Implementation Model



Why do we have a problem?

Cost constraints

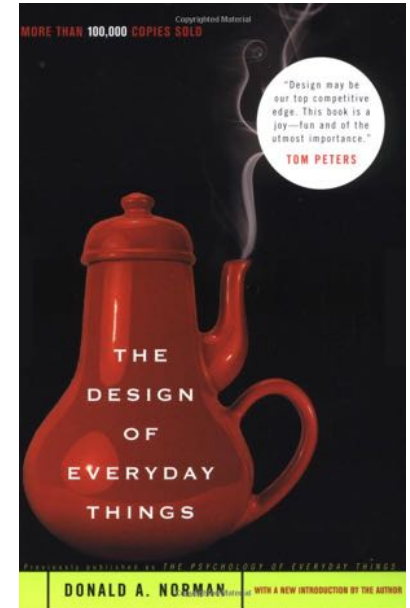
Can you fix the problem?

Make controls correspond to a person's mental model

Make controls correspond to the implementation model

Building the Right Model

Having the right model helps people bridge the Gulf of Execution and the Gulf of Evaluation



How can we help people build the right models:

Affordances

Visibility

Constraints

Consistency

Metaphors

Knowledge in the World

Mapping

Modes

Affordances

Visual clue to interaction

knobs afford turning

levers afford moving

buttons afford pushing



Affordances

“The affordances of the environment are what it offers animals, what it provides or furnishes, for good or ill.”

Gibson, part of an ecological approach to psychology

“The term ‘affordance’ refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used.”

Norman

What's the Affordance?



Affordances



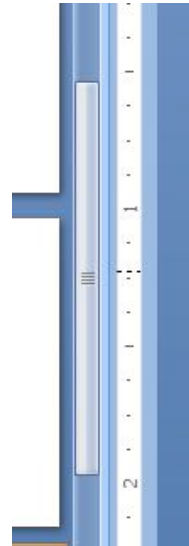
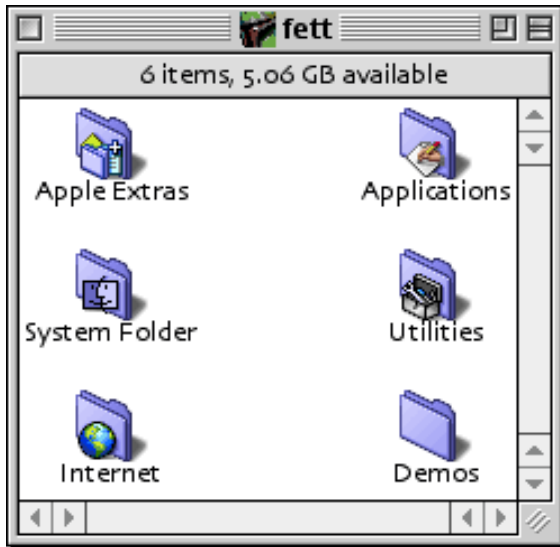
Affordances

Technology affordances are often based in affordances from the physical world



Affordances

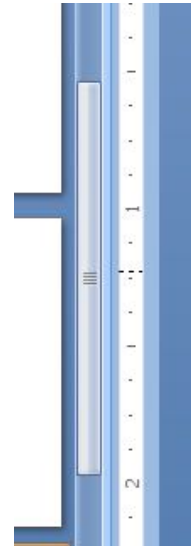
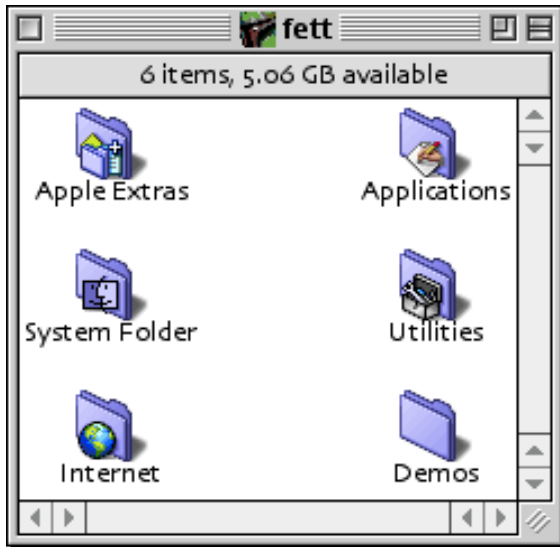
What is the affordance here?



Where does it come from?

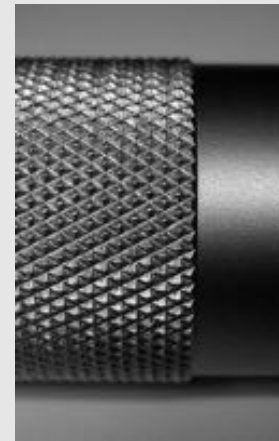
Affordances

What is the affordance here?



Where does it come from?

Knurling



Sequential Affordance

Acting on a perceptible affordance leads to information indicating new affordances

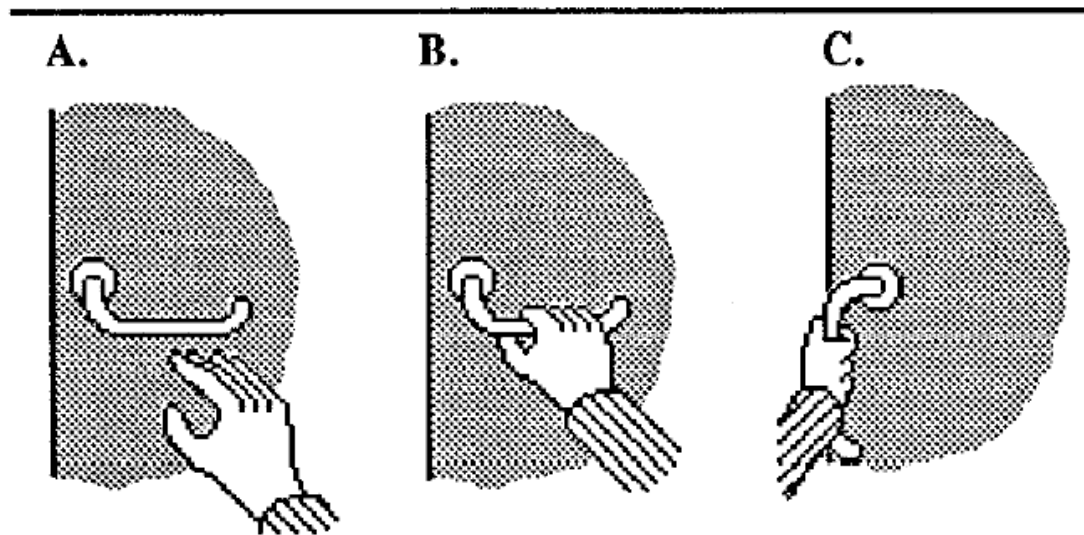


Figure 4. Sequential affordances: one affordance leads to another. Visual information indicates grasping (A & B); tactile information indicates turning (B & C).

Sequential Affordance

Acting on a perceptible affordance leads to information indicating new affordances

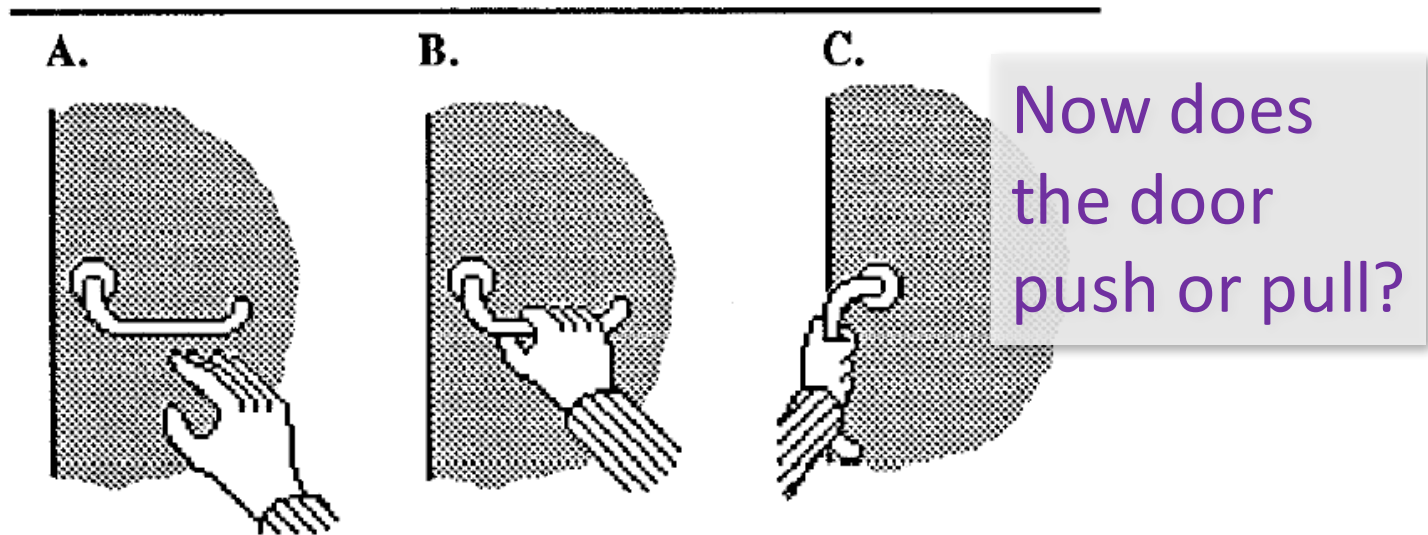
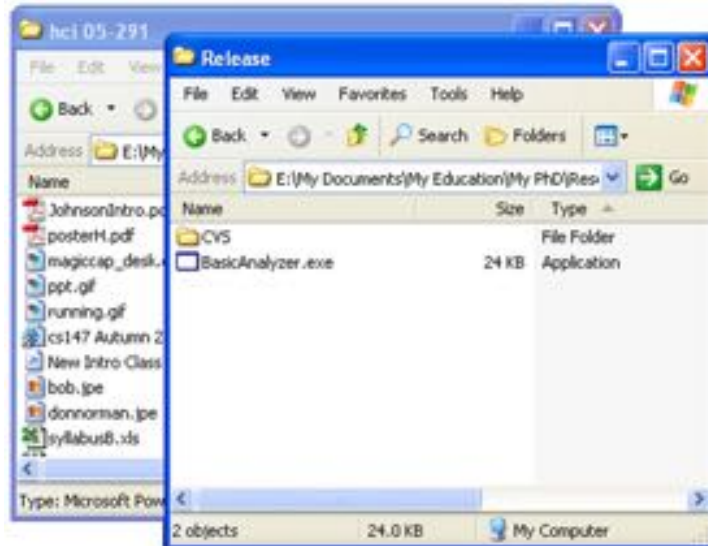


Figure 4. Sequential affordances: one affordance leads to another. Visual information indicates grasping (A & B); tactile information indicates turning (B & C).

Nested Affordances

Affordances due to spatial relationships revealing what actions can be done

Proximate to, contained in, part of



Copies:

In Other Words

An affordance is what a thing communicates about how it can be used, often by its appearance

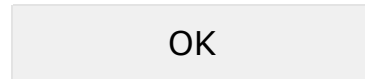
“In general, when the apparent affordances of an artifact matches its intended use, the artifact is easy to operate. When apparent affordances suggest different actions than those for which the object is designed, errors are common.”

Gaver

Challenges arise if there is a mismatch between implied use versus intended use

False Affordances

When there is perceptual information suggesting an implied use that does not exist



(Just an image of a button, not one that responds)

False Affordances



False Affordances



False Affordances



False Affordances



Hidden Affordances

When there is no perceptual information suggesting an actual intended use



Hidden Affordances



Hidden Affordances



Logos linking to home is a convention, but not afforded by the page

Confusion of the Term

“Note also that affordances are not intrinsic, but depend on the background and culture of users. Most computer-literate user will click on an icon. This is not because they go around pushing pictures in art galleries, but because they have learned that this is an affordance of such objects in a computer domain...”

Dix

Disagree. Icons do not afford “pushability” or “clickability” by their attributes. They do not give an indication of their intended use, except by convention.

Clarification on Convention

“Designers sometimes will say that when they put an icon, cursor, or other target on the screen, they have added an ‘affordance’ to the system. This is a misuse of the concept. ... It is wrong to claim that the design of a graphical object on the screen ‘affords clicking.’ ... Yes, the object provides a target and it helps the user know where to click and maybe even what to expect in return, but those aren’t affordances, those are conventions, and feedback, and the like. ... **Don’t confuse affordances with conventions.**”

Norman

Metaphors

Suggest an existing mental model

“horseless carriages”, “iron horses”, “wireless”

Desktop metaphor

Not an attempt to simulate a real desktop

Leverages knowledge of files, folders, trash

Explains why some windows seem hidden

Metaphors

Suggest an existing mental model

“horseless carriages”, “iron horses”, “wireless”

Desktop metaphor

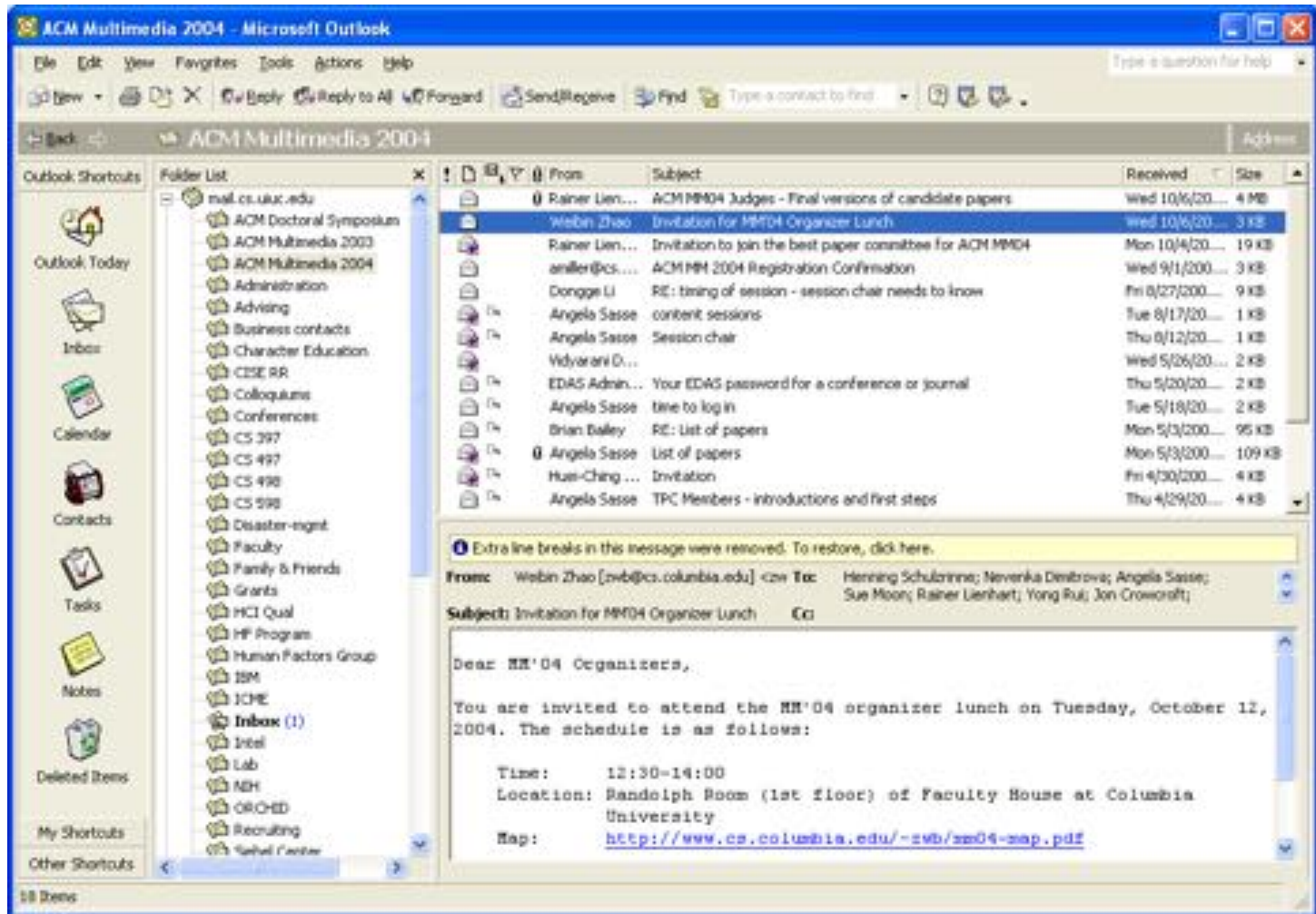
Not an attempt to simulate a real desktop

Leverages knowledge of files, folders, trash

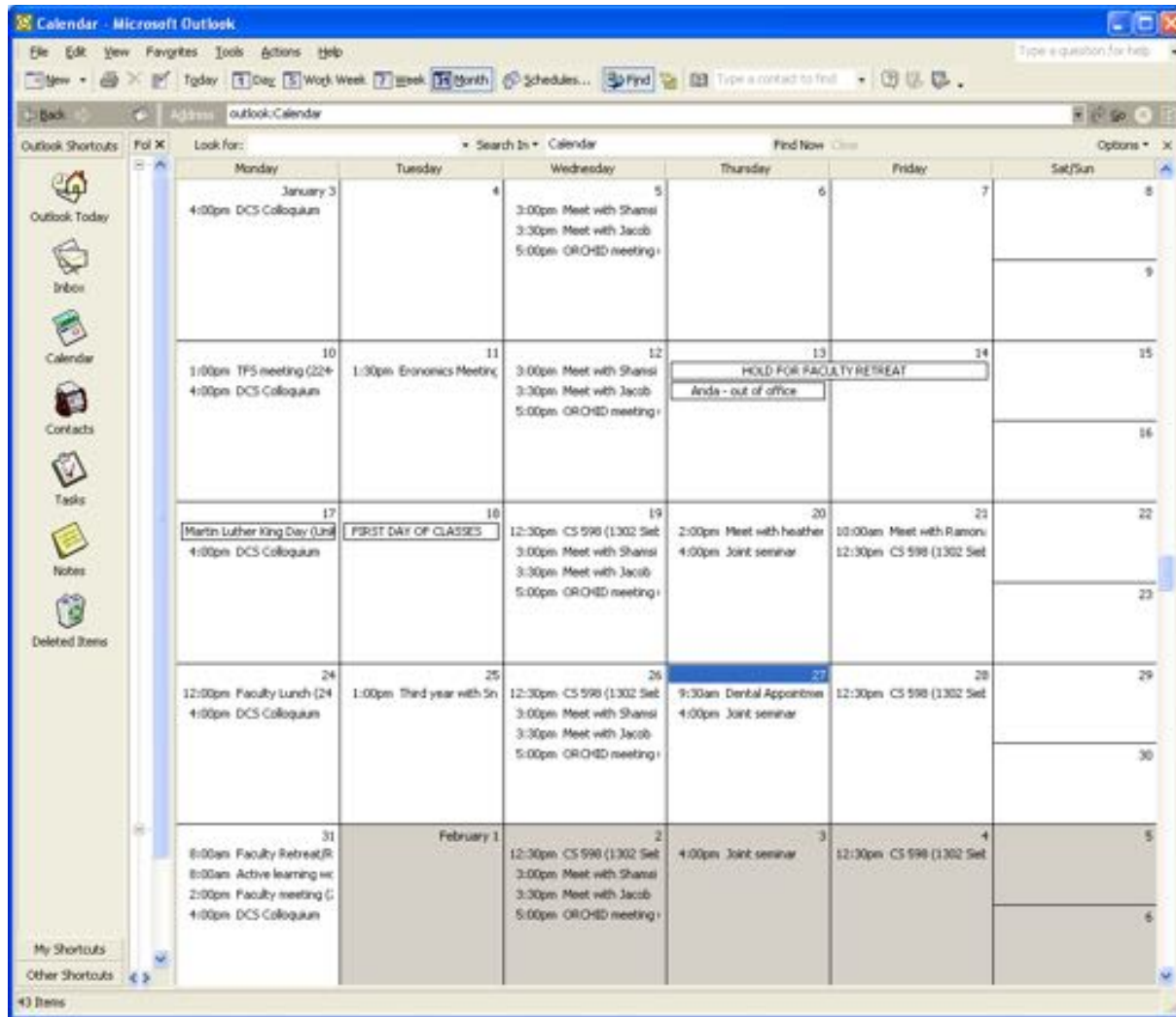
Explains why



Mail Metaphor



Calendar Metaphor



Health Metaphor



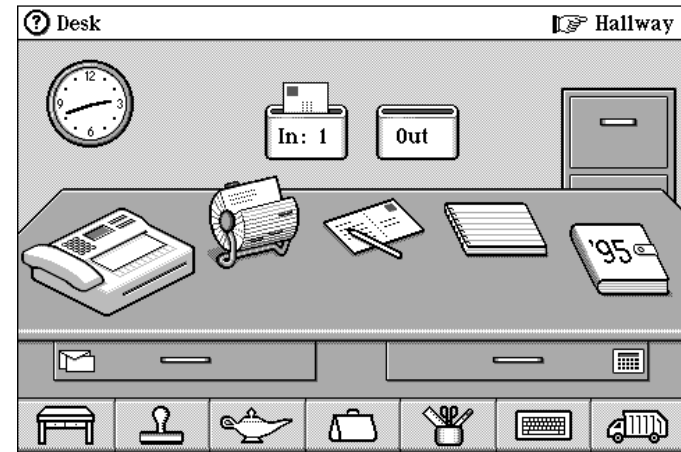
Shallow or Inappropriate Metaphors

Informs a small range of possibilities, or none at all



It is just a menu and a dialog box?

What does the living room add?



Magic Cap



Microsoft Bob

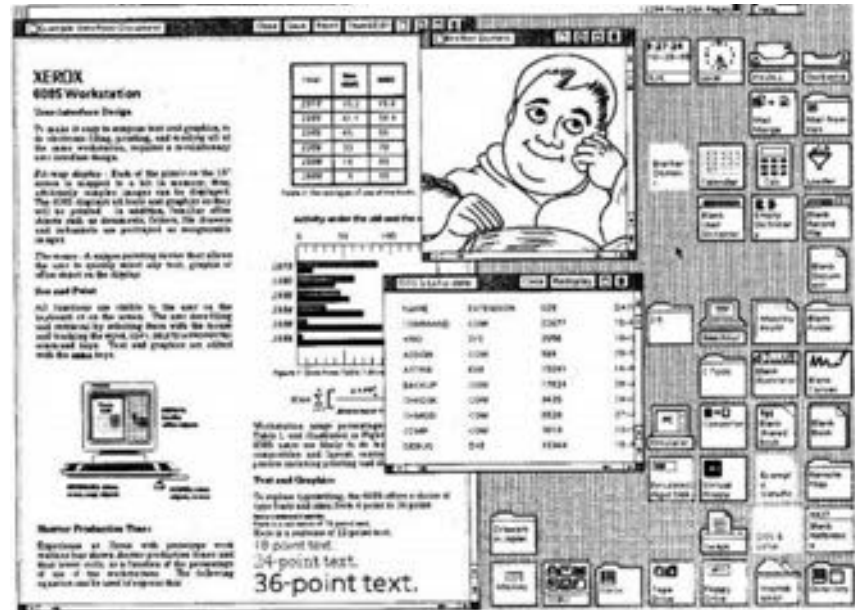
Mixed Metaphors

Two or more different metaphors coexist with some supposed relation

The desktop metaphor
Windows into content

Good? Bad?

Neither? Both?

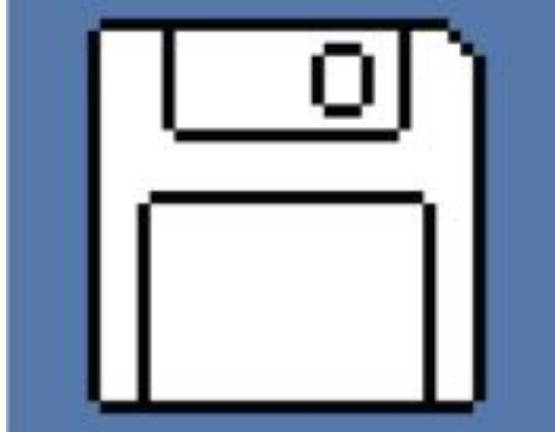


Windows are views into larger content regions

No desktop has windows

Broken Metaphors

Are not consistent, do not operate in every circumstance, or do not uphold things consistent with what the metaphor would suggest



Mechanical-Age Metaphors

Operate as their mechanical-age counterparts did, not taking advantage of the digital domain to escape the limitations of the original



Dead Metaphors

Lost the original imagery of their meaning

- Milk
- Butter
- Cheese

-
- Water
 - Beer
 - Wine

Metaphors versus Idioms

Idioms

rely on shared experience or custom

are learned, often early in life

are supported or revealed by context

become conventions

do not rely on metaphors

Idiomatic widgets
(e.g., screen splitter,
dragable title bar)

Single click
to select,
double click
to open

Hyperlinks

Metaphors and Affordances

Affordances “jump start” a model for interaction

Metaphors “jump start” a model of a system

But if designed poorly, both can be damaging

- Lead to an incorrect model, undermining interaction

- Can limit designer creativity

- Can reduce the advantages of software

- Can be “cute” at the expense of functional

Visibility

Phones

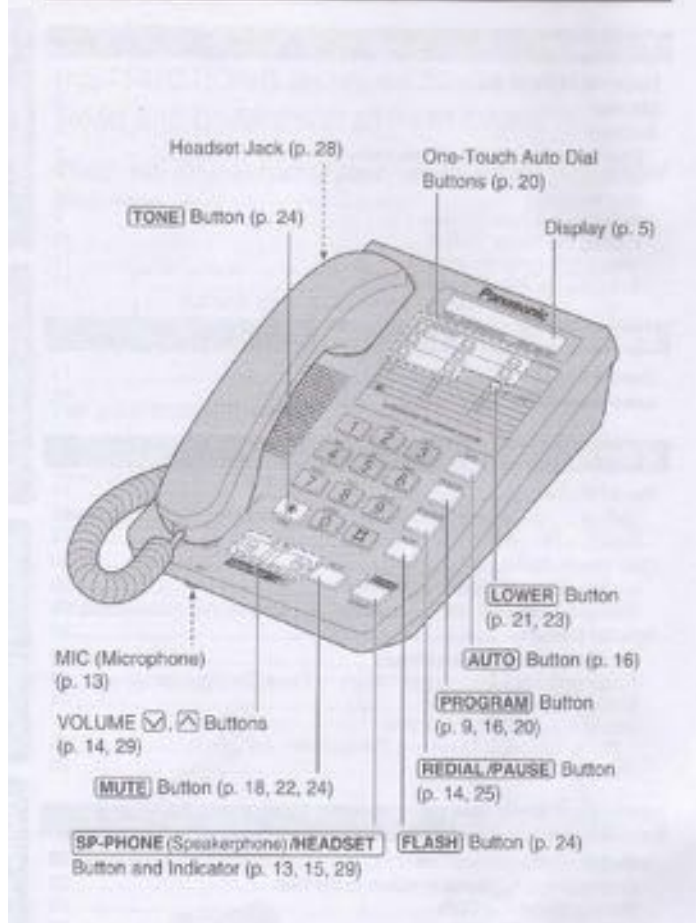
How do you

put somebody on hold
change volume



Visibility

Location of Controls



Display



(This display shows all of the possible configurations.)

- 0 15-30 During a conversation, the call duration is displayed. (Example: 15 minutes, 30 seconds)
- The unit is in the programming mode (p. 9, 16, 20).
 - The AUTO button was pressed while dialing or storing phone numbers for the Speed Dialer (p. 16, 19).
 - ⌞ The LOWER button was pressed (p. 21, 23).
 - 🔕 The ringer is set to OFF (p. 10).
 - 🔇 The MUTE button was pressed during a conversation (p. 24).
 - 🔒 The dial lock mode is set. To cancel the mode, see page 27.
 - ⚡ The FLASH button was pressed while storing phone numbers.
 - ⏸ The PAUSE button was pressed while dialing or storing phone numbers.
 - ⌞ You pressed * while dialing or storing phone numbers in the TONE mode.
 - # You pressed # while dialing or storing phone numbers in the TONE mode.
 - ☐ While storing a phone number in an UPPER memory location for the One-Touch Dialer, "U" will appear when you press a one-touch auto dial button (p. 20).
 - ☐ While storing a phone number in a LOWER memory location for the One-Touch Dialer, "L" will appear when you press a one-touch auto dial button (p. 21).
 - ⌞-⌞ The MUTE button was pressed as a secret button while storing phone numbers (p. 18, 22).
 - ⌞ While programming function items, such as the dialing mode, "u" will flash as a cursor.

Preparation

Visibility

Changing Ringer Volume

Press “Program”

Press “6”

Set Volume

Low - Press “1”

Medium - Press “2”

High - Press “3”

Press “Program”

Visibility

Controls available on watch with 3 buttons?

Too many and they are not visible

Compare to controls on simple car radio

Number of controls \approx Number of functions

Controls are labeled and grouped together



Knowledge in the World



Constraints

Prevent some actions while allowing others

Form1

Date:

Month Day Year

May 22 1997
Month Day Year

May 22 1997

Appointment

General Attendees Notes Planner

When

Start: 8:30AM Wed 5 /14 /97

End: 4:30PM Wed 5 /14 /97 All day

Description:

Smart Technology Sen

Where:

May 1997

S	M	T	W	T	F	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Prevent errors before they can happen

Disruptive error messages are a last resort

Constraints



Constraints



Constraints



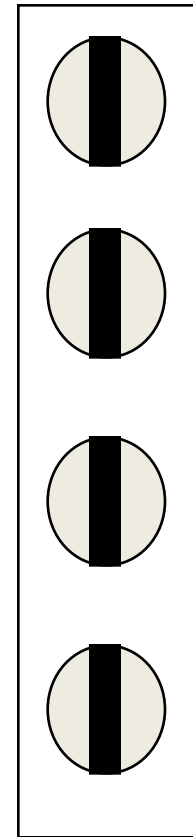
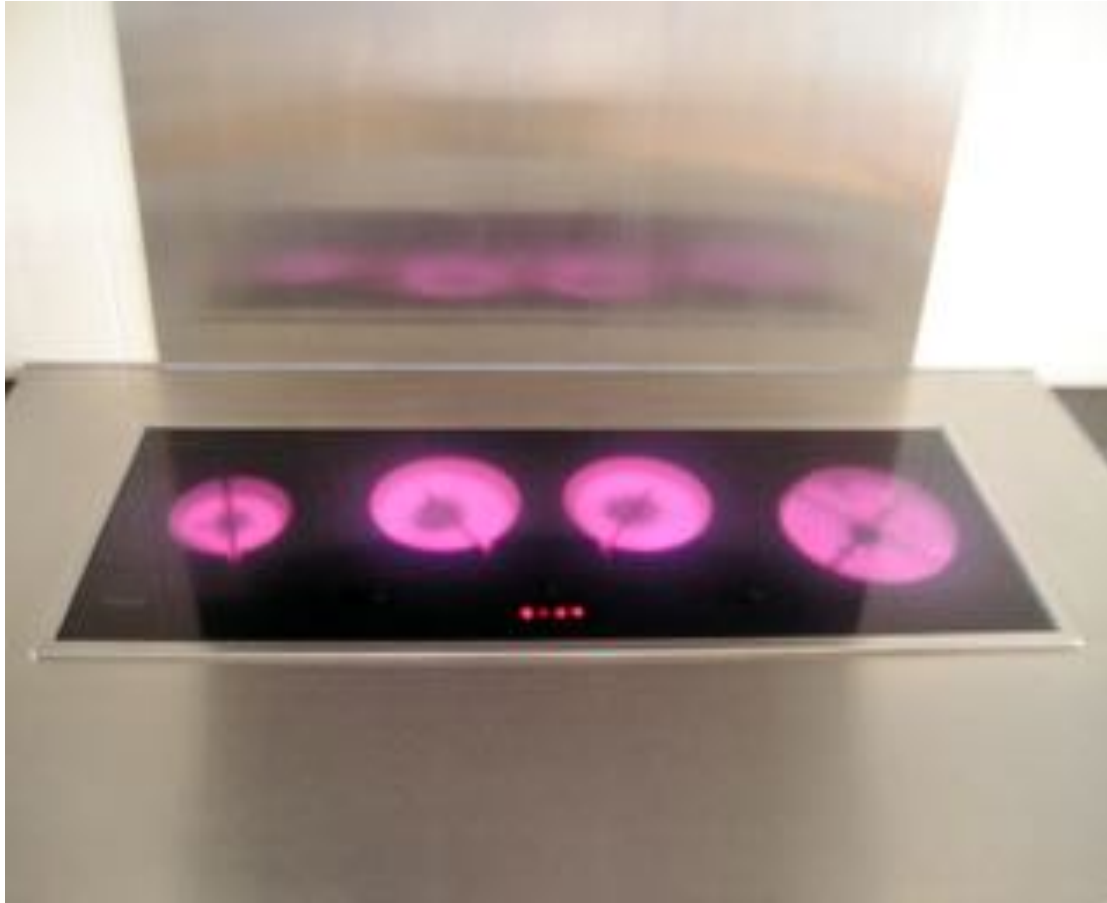
Mapping

Correspondence between an interface and the corresponding action in 'the world'

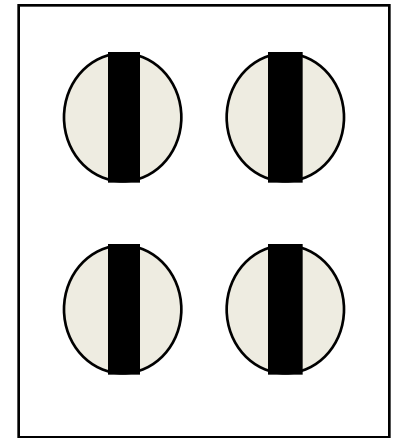
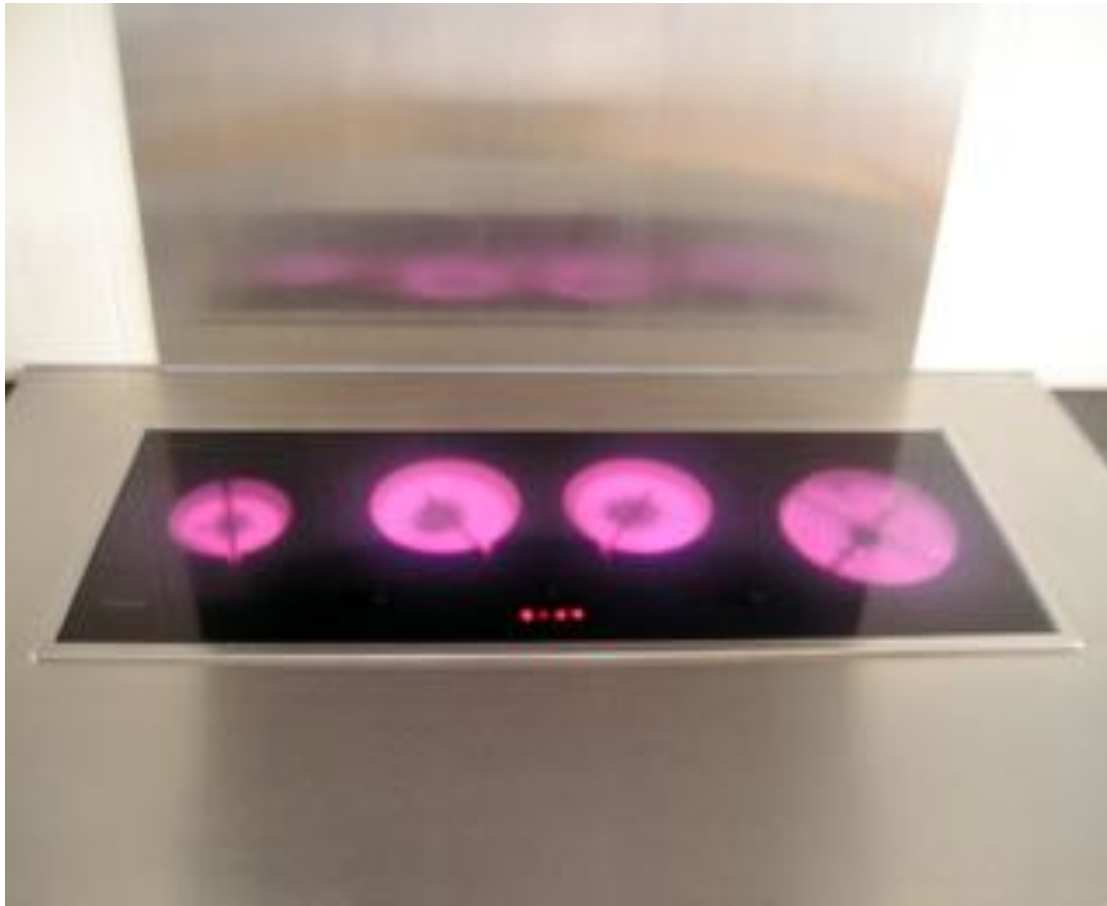
Minimize cognitive steps to transform action into effect, or perception into comprehension (i.e., execution and evaluation)



Very Bad Mapping



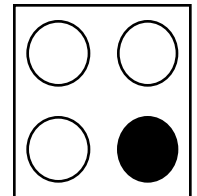
Slightly Better Mapping



Good Mapping



Not this Stove



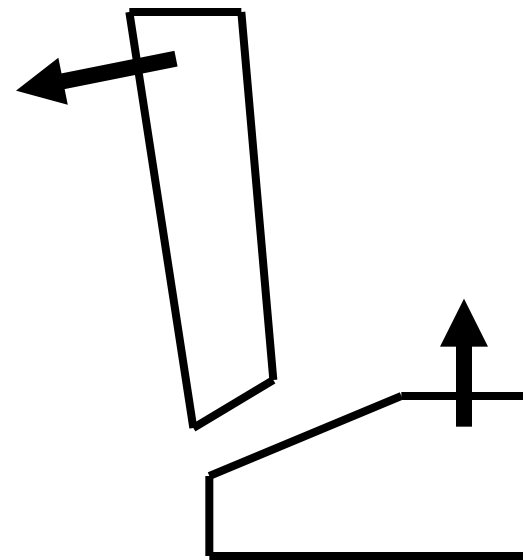
Great Mapping



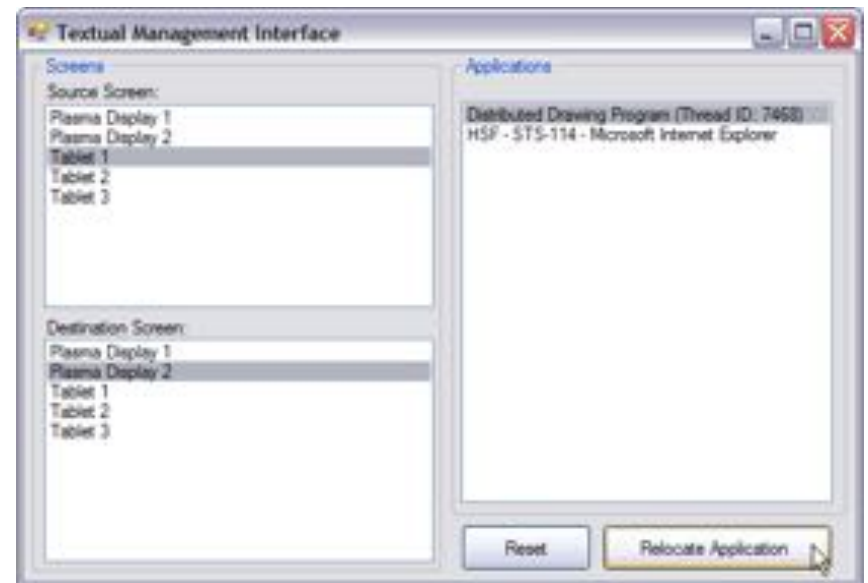
Mapping



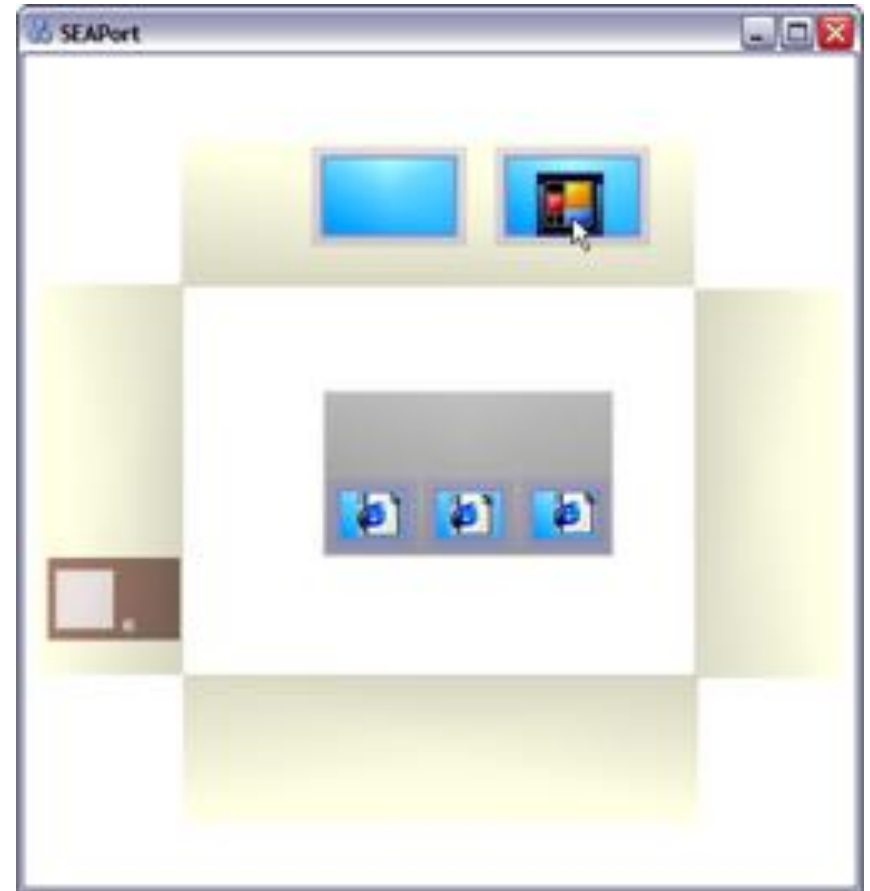
Mapping



Mapping



Mapping



Consistency

Interfaces should be consistent in meaningful ways

Ubiquitous use of same keys for cut/copy/ paste

Types of consistency

Internal (i.e., within itself)

e.g., same terminology and layout throughout

External (i.e., with other applications)

e.g., common widget appearance

e.g., design patterns common across applications

Is Consistent Always Better?

Should “new” & “delete” be in the same place?



Is Consistent Always Better?

Should “new” & “delete” be in the same place?



New is common, delete is not

Is Consistent Always Better?

Event Details ⓘ

Time: 12:00 pm - 1:00 pm

Date: Thu 6/24/99

Alarm:

Repeat:

None Day **Week** Month Year

Every: ... 1 week(s)

End on: ▼ No End Date

Repeat on: S M T W **T** F S

Private:

OK Cancel Delete... Note

Event Details ⓘ

Time: 12:00 pm - 1:00 pm

Date: Thu 6/24/99

Alarm:

Repeat: None

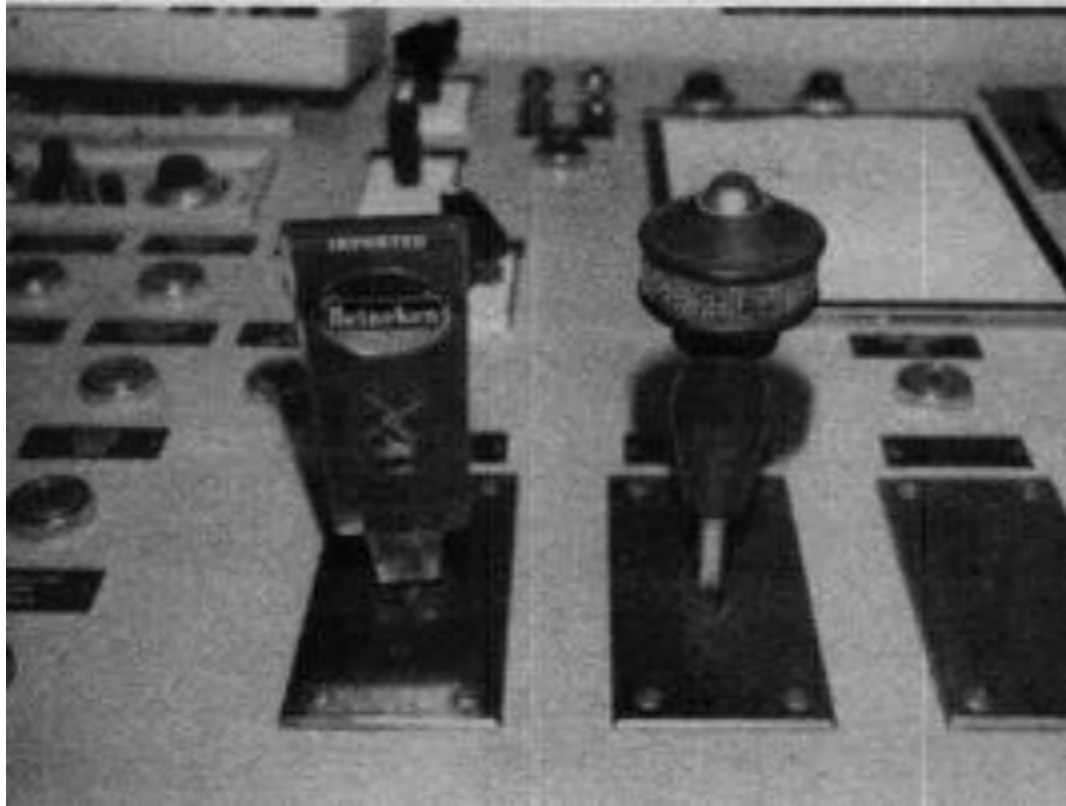
Private:

OK Cancel Delete... Note

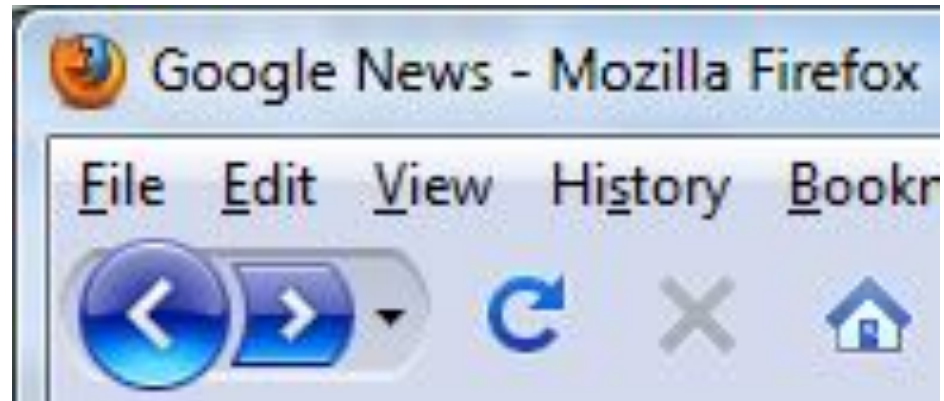
Is Consistency Always Better?



Is Consistency Always Better?

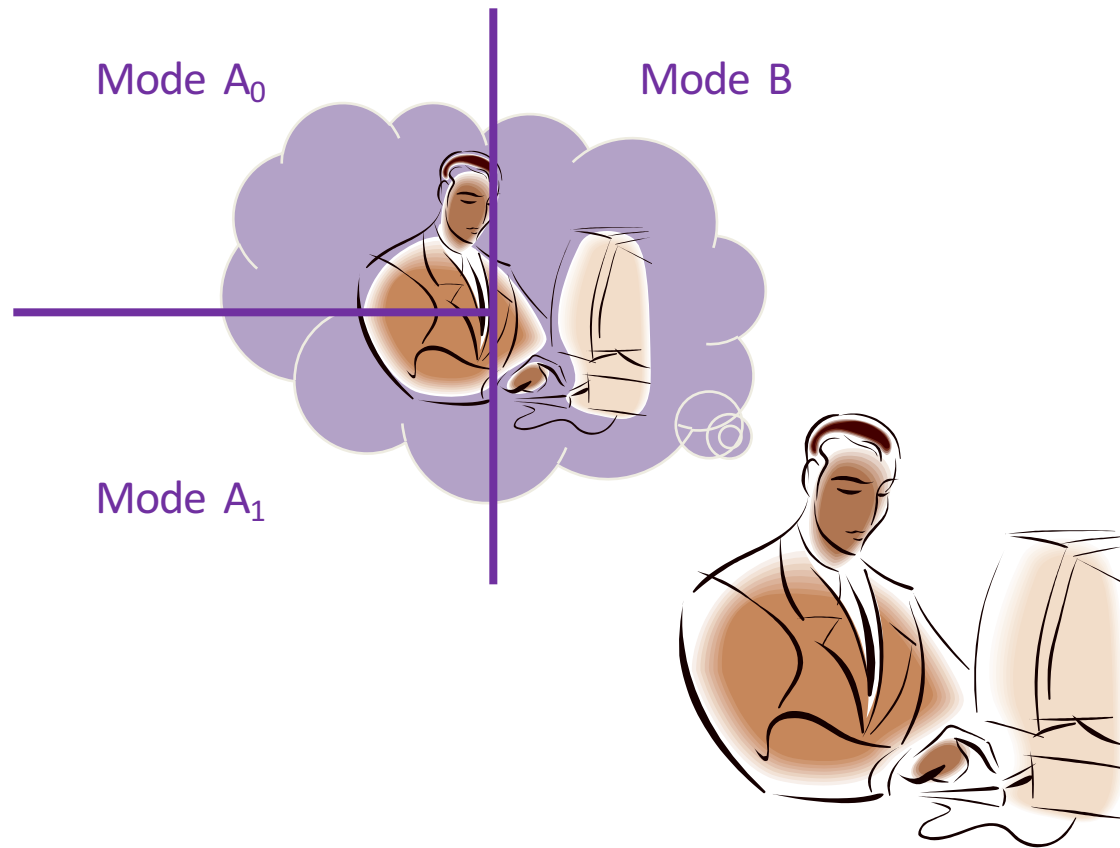


Is Consistency Always Better?



Modes

Modes force people to divide their model



Active versus Passive Modes

Active modes require constant action to maintain

Once that action has retired, so does the mode

e.g., Shift

Passive modes require action to set, and a separate action to unset, or to set again

e.g., CAPS LOCK

Active modes are generally preferred

Standardization

If all else fails, standardize

Fewer things to memorize

Reduced learning time

Adapt to new situations faster

e.g., keyboard layout not optimal, but standard

Norman's Seven Principles for Design

Use knowledge in the head and in the world

Simplify the structure of tasks

Making things visible

Get the mappings right

Exploit the power of constraints

Design for error

When all else fails, standardize

dub

University of
Washington

dub

University of
Washington

Limitations of Testing

Drives hill-climbing, but not overall design

A design may be better, but is it good?

Impossible for new designs to compete

Can be difficult to scale to many features

Design Equals Solutions

Design is about finding solutions

Designers often reinvent

Hard to know how things were done before

Why things were done a certain way

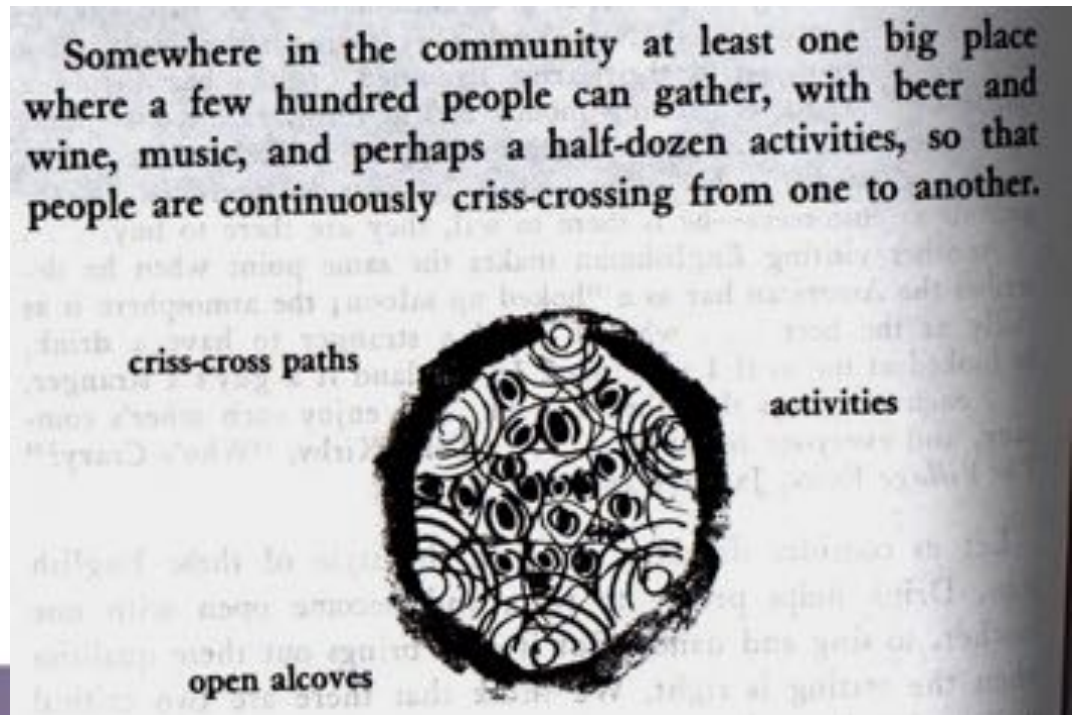
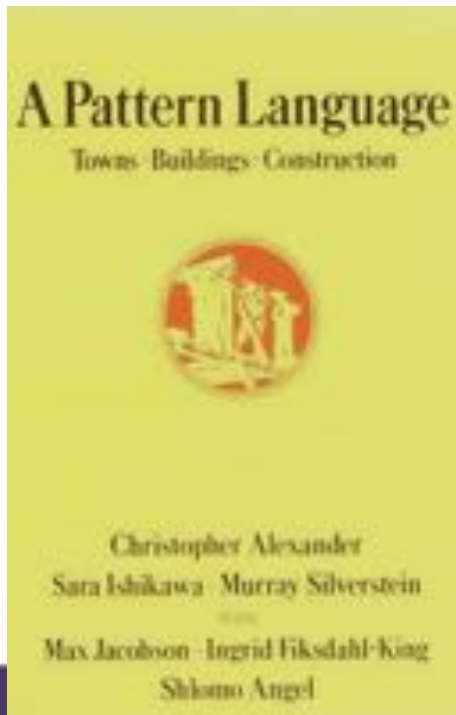
How to reuse solutions

Design Patterns

Design patterns communicate common design problems and solutions

First used in architecture [Alexander]

How to create a beer hall where people socialize?



Using Design Patterns

Not too general and not too specific

use a solution “a million times over, without ever doing it the same way twice”

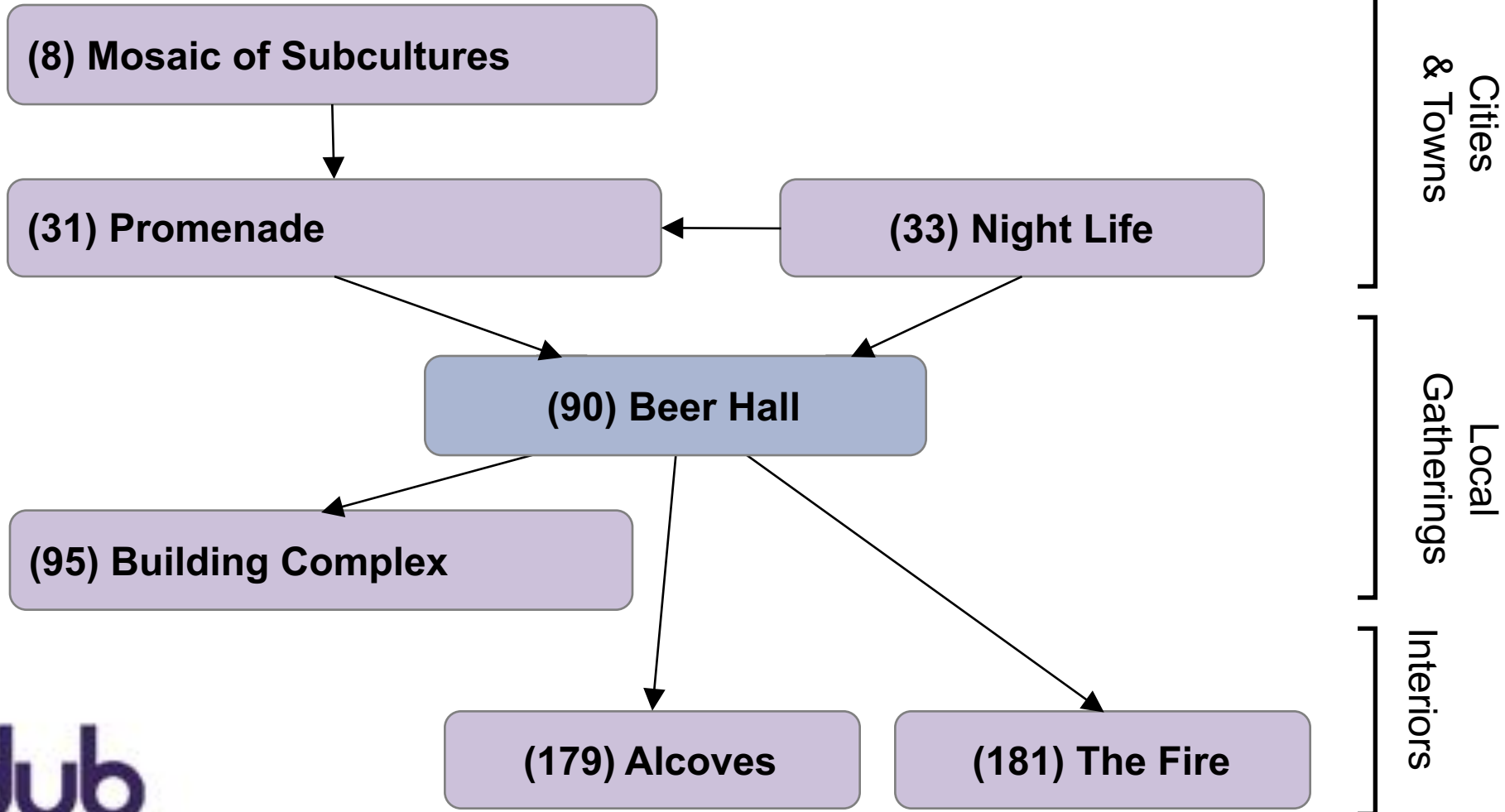
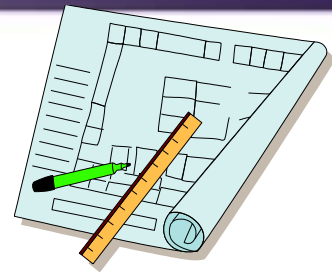
Design patterns are a shared language

for “building and planning towns, neighborhoods, houses, gardens, and rooms”

Beer hall is part of a center for public life

Beer hall needs spaces for groups to be alone ALCOVES

A Web of Design Patterns



Web Design Patterns

Communicate design
problems & solutions

how to create navigation bars
for finding relevant content

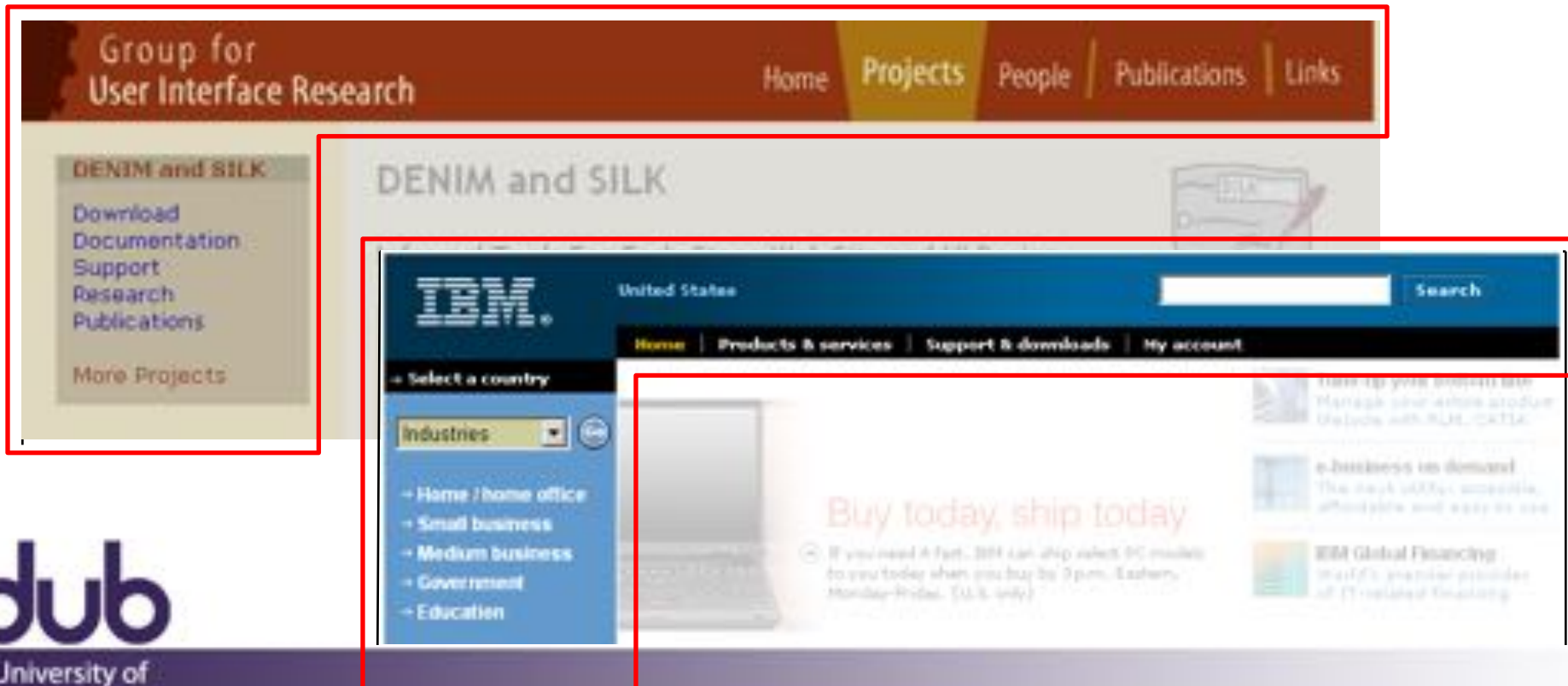
how to create a shopping cart
that supports check out

how to make e-commerce sites
where people return & buy



NAVIGATION BAR (K2)

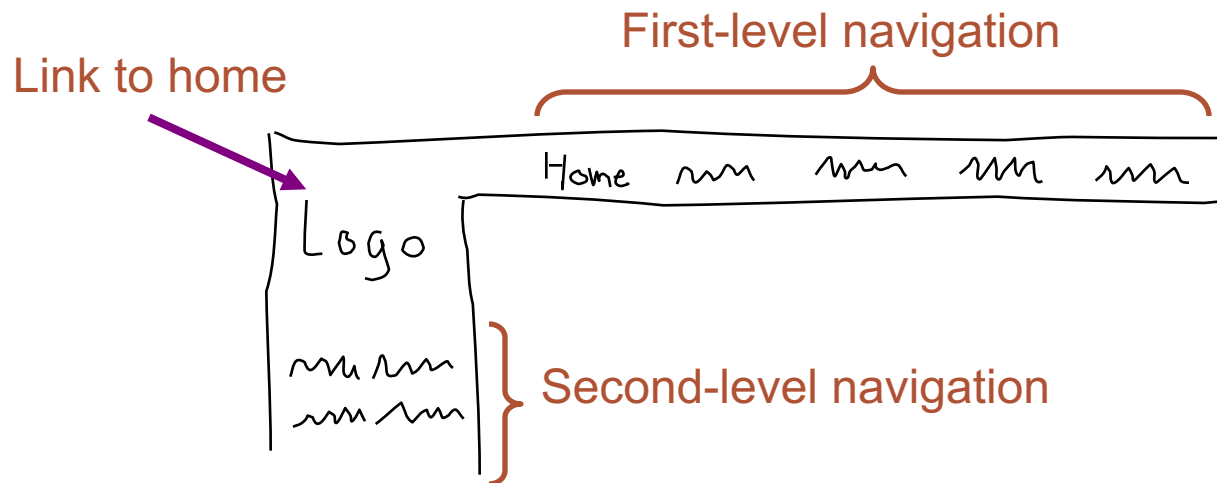
Problem: Customers need a structured, organized way of finding the most important parts of your Web site



NAVIGATION BAR (K2)

Solution diagram

Captures essence on how to solve problem



Pattern Groups

Patterns organized by group

- A** Site genres
- B** Navigational framework
- C** Home page
- D** Content management
- E** Trust and credibility
- F** Basic ecommerce
- G** Advanced ecommerce
- H** Completing tasks
- I** Page layouts
- J** Search
- K** Page-level navigation
- L** Speed
- M** The mobile web

PROCESS FUNNEL (H1)

Problem:

Need a way to help people complete highly specific stepwise tasks

Ex. Create a new account

Ex. Fill out survey forms

Ex. Check out

PROCESS FUNNEL (H1)

The screenshot displays the Half.com website interface. At the top, there is a navigation bar with the Half.com logo, a search bar, and various category links. Below the navigation bar, there are several promotional banners and a main content area. The main content area is divided into several sections: a sidebar with product recommendations, a central shopping cart section, and a bottom section for gift certificates and coupons.

Navigation and Search:

- Half.com by eBay logo
- NEW: Counting Down: Mac of Candy \$11.99 Save 32%
- my account cart help
- Home Books Music DVD/ Movies Video Games Computers & Software Electronics Everything Else...
- Gift Certificates Wish List Pre-Orders Sell Your Stuff New Users
- Search: All Categories

Product Recommendations (Left Sidebar):

- People with similar tastes also enjoyed...
- Weezer (1994)** (CD, 1994) Weezer **\$5.00** (Save \$6.97)
- Pinkerton** (CD, 1996) Weezer **\$6.00** (Save \$10.95)
- All Killer No Filler [ECD]** (CD, 2001)

Shopping Cart Section:

- Redeeming a Gift Certificate or Coupon?**
- Proceed to Checkout** (with Speedy Checkout button)
- Shopping Cart**
- Weezer (2001)** Weezer, Weezer (Music)
CD, Release Year: 2001
Seller: nastia@hotmail.com (35)
Condition: Like New • Notes: Perfect condition
- Item: \$8.30
Media Mail: \$2.45
(Change Shipping Method)
- More to Wishlist • Remove from Cart • Find another one
- TOTAL: \$10.75**

Gift Certificates and Coupons Section:

- Gift Certificates and Coupons**
- Redeeming your Half.com Gift Certificate or Coupon is easy. Just enter your Claim Code in the box to the right and click "Redeem".
- Proceed to Checkout** (with Speedy Checkout button)

PROCESS F

- **What's different?**

- No tab rows
- No impulse buys
- Only navigation on page takes you to next step

The screenshot shows the checkout process on half.com. At the top, there's a navigation bar with 'Checkout' and a progress indicator showing '1 Shipping', '2 Billing', and '3 Place Order'. Below this, the page title is 'Step 1 - Choose Shipping Address'. The main content area is titled 'Ship my order to:' and contains a box with the following address: 'Jason Hong, 387 Soda Hall Computer Science UC Berkeley, Berkeley, CA 94720'. To the right of this address is a red button labeled 'Use This Address'. Below this, there's an 'OR' separator and a section titled 'Enter a new shipping address:'. This section contains several input fields: 'Name', 'Street address', 'City', 'State' (with a dropdown menu), 'ZIP code', and 'Country' (pre-filled with 'USA'). There are also instructions for U.S. Military users. A red 'Save Changes' button is located at the bottom right of the form.

- **What's the same?**

- Logo, layout, color, fonts

PROCESS FUNNEL (H1)

Problem:

What if users need extra help?

PROCESS FUNNEL (H1)

The screenshot displays the Dell website's product page for a 'Featured Dimension 4100' system. The page layout includes a top navigation bar with links for 'About Dell', 'Contact', 'Search', and 'Support', along with 'Order Status' and 'My Cart'. Below this is a secondary navigation bar with categories like 'Computers', 'Software & Accessories', 'Service & Support', and 'Learning Center'. A yellow banner on the left encourages users to 'Buy Online or Call 1-800-915-3355'. A sidebar on the left provides 'Purchase Assistance' links for 'Payment Methods', 'Tax & Shipping Info', 'Return Shipping Insurance', and 'Privacy Policy', along with a 'Recommended Systems' section. The main content area features a 'FEATURED SYSTEM' heading and a 'Featured Dimension 4100' sub-heading. A product image shows the computer system. Text describes the system as offering 'amazing power and flexibility at a price that won't break your budget'. A list of specifications includes: 'Intel® Pentium® III processor at 800MHz', '40GB Hard Drive', '128MB SDRAM', and '32MB Nvidia GeForce2 MX 400 Graphic Card'. A promotional offer for 'Free Ground (3-5-day) Shipping' is also present. Below the main description, there are sections for 'Dimension 4100' specifications, a 'Customize It' button, and a '3-Year On-Site Service' add-on. A table at the bottom lists components like 'Processor', 'Keyboard', and 'Hard Drive' with their respective specifications and prices.

FEATURED SYSTEM

Featured Dimension 4100

The Dimension 4100 desktop offers you amazing power and flexibility at a price that won't break your budget.

- Intel® Pentium® III processor at 800MHz
- 40GB Hard Drive
- 128MB SDRAM
- 32MB Nvidia GeForce2 MX 400 Graphic Card

Free Ground (3-5-day) Shipping with purchase of any new Dell desktop System. Offer ends 4/23/01. [Click Here for Details.](#)

Dimension 4100

Intel® Pentium® III processor at 800MHz

\$1,199

As low as \$104.99 plus
No payment for 60 days
(Click or scroll for details)

[Customize It](#)

3-Year On-Site Service Add \$201

Epson Stylus Color 900 Add \$149

Processor	Intel® Pentium® III processor at 800MHz
Keyboard	Quantum® Keyboard
Hard Drive	40GB Ultra ATA-66 Hard Drive (7200 RPM)

CONTEXT-SENSITIVE HELP (H8)

Keyboards - Netscape

LEARN MORE Close

Keyboards
Great Keyboard Choices to Suit Your Needs:

- Choose from standard-size and "space-saver" designs
- Ergonomic design for added comfort
- Hot Keys provide quick, one-touch access to frequently used programs and Web sites
- USB ports allow for quick and easy access to USB peripherals, such as digital cameras, scanners and joysticks

Dell™ Enhanced Performance Keyboard

DELL GLOSSARY
Need a definition?
Click on a term.

Keyboard Type	Dell™ QuietKey	Microsoft® Internet Keyboard, Dell Edition	Dell™ Enhanced QuietKey	Dell™ Enhanced Performance
ZOOM! For a closer look.				
Benefits	<ul style="list-style-type: none"> • Quiet key response • Soft "rubberdome" touch 	<ul style="list-style-type: none"> • 10 Hot Keys for easy access to your internet and e-mail • E-mail Hotkey 	<ul style="list-style-type: none"> • 3 programmable keys • Soft "rubberdome" 	<ul style="list-style-type: none"> • 7 programmable keys • Built-in 2 port USB HUB

FLOATING WINDOWS (H6)



The screenshot shows the Netflix interface with a red header and navigation tabs. The 'Recommendations' tab is active, displaying 'NEW RECOMMENDATIONS'. Two movie cards are visible: 'Gladiator: Extended Edition' and 'Samurai Champloo (7-...)'. A tooltip window is overlaid on the 'Gladiator' card, providing detailed information about the movie.

NETFLIX Arthine van Duyn ▾ | Your Account

Browse Recommendations Friends Queue Buy DVDs Movies, act

Get Recommendations (636) Rate Movies Movies You've Rated (210)

Recommendations

Movie suggestions based on your ra

NEW RECOMMENDATIONS



Gladiator: Extended Edition
(2000)

★★★★★
Not Interested

Fans of Gladiator's original theatrical release will appreciate this extended version of the epic Ridley Scott film, packed with 17 extra minutes of action footage and gripping dialogue. Featuring a strong supporting cast and an Oscar-winning performance from actor Russell Crowe as the dauntless Roman general Maximus, this big-budget Best Picture winner became an instant classic -- and helped elevate its leading man to icon status.

Starring: Russell Crowe, Joaquin Phoenix
Director: Ridley Scott
Genre: Action & Adventure
MPAA: R

★ Recommended based on 1 rating

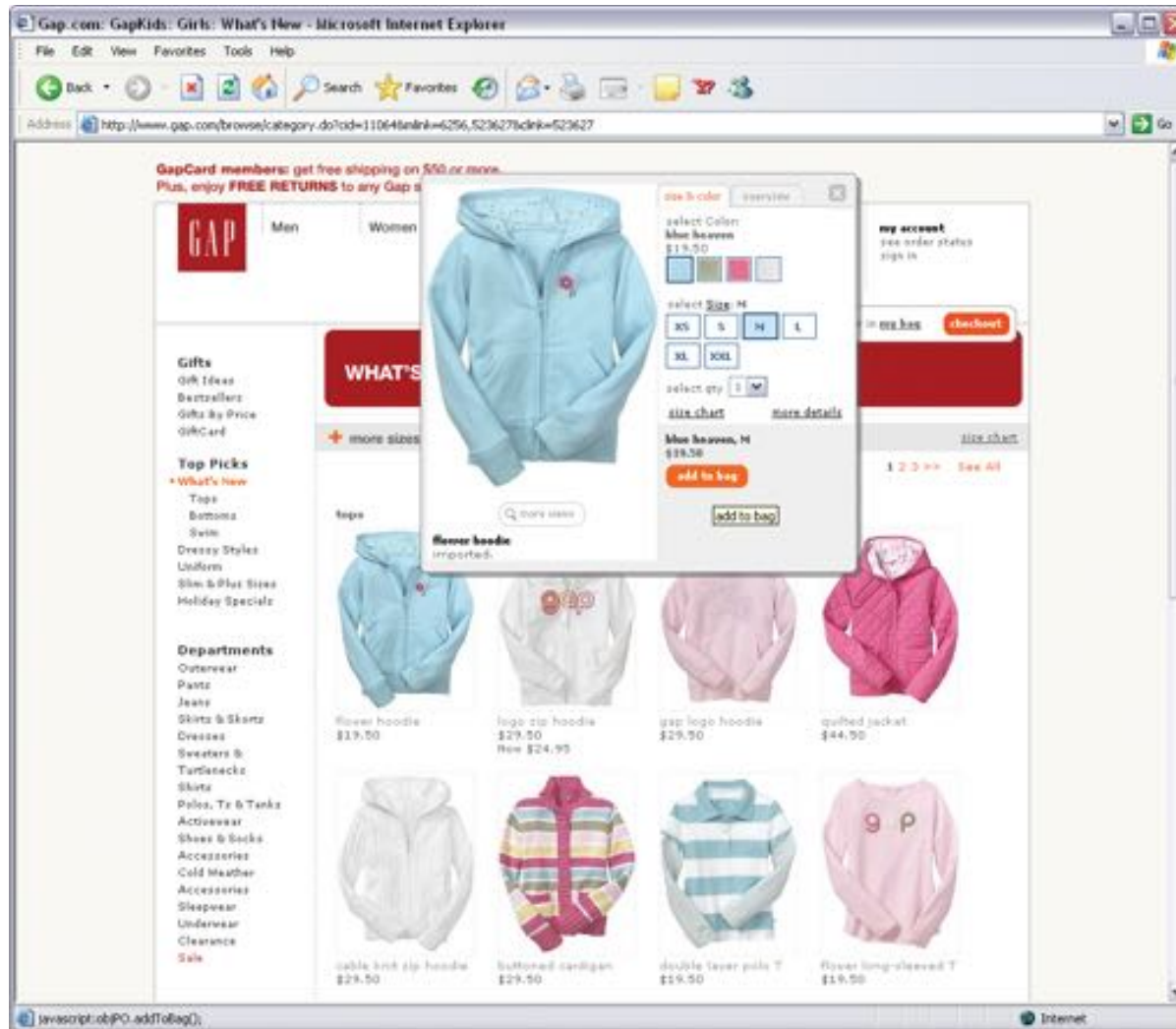


Samurai Champloo (7-...)

★★★★★
Not Interested

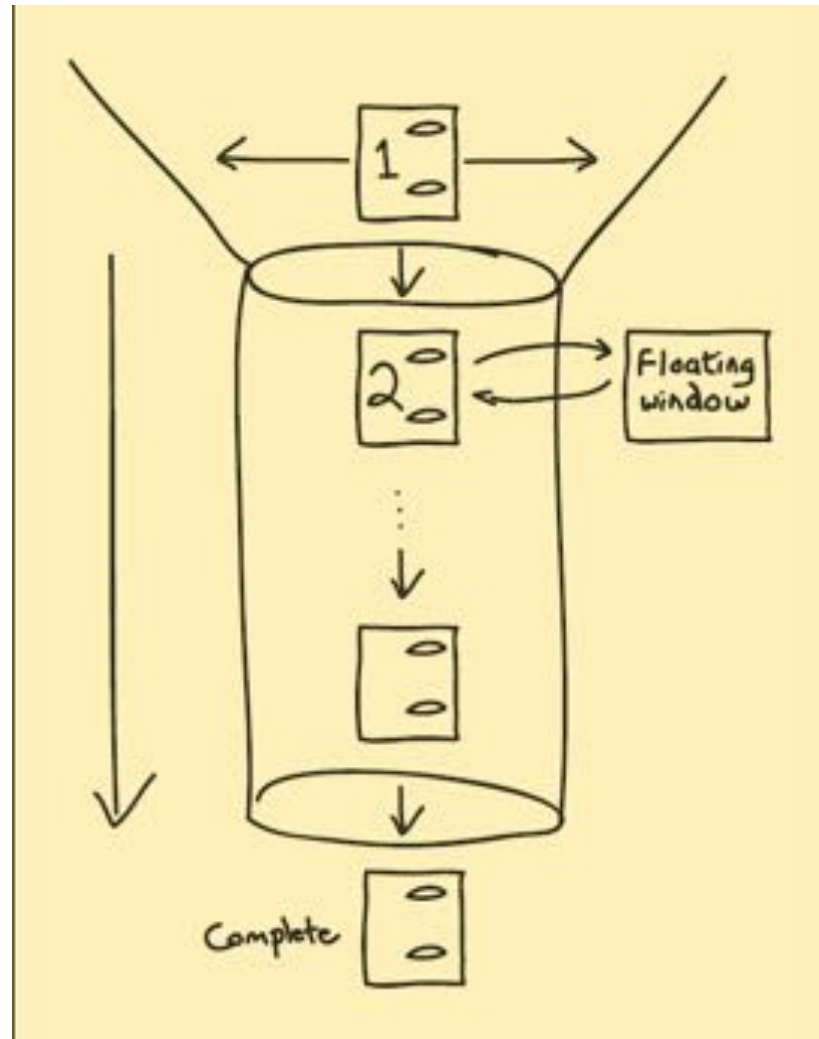
Director Shinichiro Watanabe mixes a maturity rarely found in anime with a historical Japanese setting and a funky hip-hop soundtrack. Fuu is a spacey waitress at a teahouse where a sword fight breaks out between Mugen, a wild warrior, and Jin, a ... [Read More](#)

FLOATING WINDOWS (H6)

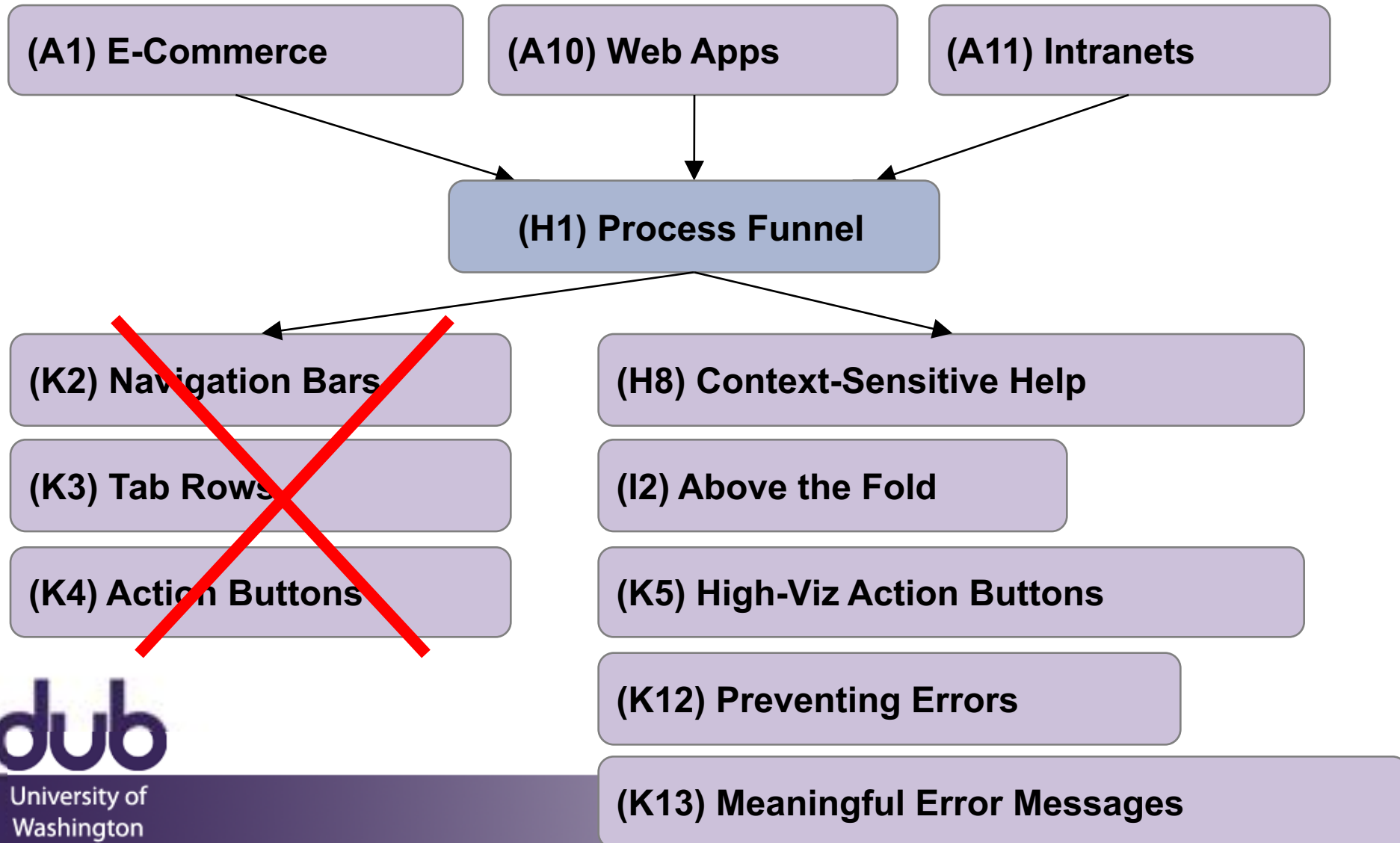


PROCESS FUNNEL (H1)

Solution Diagram



Related Patterns



Patterns Support Creativity

Patterns come from successful examples

sites that are so successful that lots of people are familiar with their paradigms

interaction techniques/metaphors that work well across many sites (e.g., shopping carts)

Not too general and not too specific

you need to specialize to your needs

Patterns let you focus on the hard, unique problems of your design situation

Principles, Guidelines, Templates

Patterns help design without over-constraining

unlike principles, patterns are not too general


unlike guidelines, patterns discuss tradeoffs, show good examples, and tie to other patterns

unlike style guides, patterns not too specific, can be specialized to a design

unlike templates, patterns illustrate flows and relationships among different pages

Web Design Patterns

Pattern Name and Number → **PROCES FUNNEL #1**



Exemplar

Forces & Solution

Background

Problem Statement

PROCES FUNNEL #1

Figure #1.1
Dell uses a process funnel consisting of several logical steps that guide customers to quickly configure and purchase a personal computer. Information in a pop-up window shows additional details but keeps customers in the funnel so that they can continue to completion.

Remove Unnecessary Links and Content While Reinforcing the Brand
Removing links and content unrelated to the task at hand will reduce the time it takes to complete the task, making it more likely that your customers will return. Remove all navigation bars (N2), tabs (T1), search boxes (S1), and content areas (C1), navigation actions (N4) that help visitors reach their goals. Reinforce the Web site brand to minimize any disorientation customers might feel from sudden changes in navigation options. Use the same logo, color scheme, and logo throughout the Web site so that no one is confused and people know they're still on the same site.

*** BACKGROUND**
All Web applications that lead visitors through stepped tasks—PERSONAL E-COMMERCE (A1), SELF-SERVICE GOVERNANCE (A4), WEB APPS THAT WORK (A10), and ENABLING INSTANCES (A11)—need ways to help people succeed at completing the tasks.

*** PROBLEM**
Customers often need to complete highly specific tasks on Web sites, but pages with tangential links and many questions can prevent them from carrying out these tasks successfully.
People enjoy completing the tasks they start. Yet all kinds of distractions—including links that lead off the critical path, extra steps, and extra

PROCES FUNNEL #2

PROCES FUNNEL #2

PROCES FUNNEL #2

Web Design Patterns

III PROCESS FUNNEL

Use Pop-Up Windows to Provide Extra Information, without Leading Visitors Out of the Process Funnel • Sometimes customers need additional information that you have not provided on a page, such as extra help or product details. Provide a link to a **POP-UP WINDOW (B6)** containing **CLARIFY PRODUCT DETAILS (E2)** (see Figure III.1), **CONTEXT-SENSITIVE HELP (B8)**, or information from the **FREQUENTLY ASKED QUESTIONS (H7)** page, to make the extra information less intrusive. Your challenge is to implement this extra content without detracting from the main purpose.

Make Sure the Back Button Always Works • Customers often use the **Back** button on browsers to modify answers they have typed in on previous pages. However, if the Web site is not implemented correctly, the information they have already entered may be lost when they hit the **Back** button, forcing them to type everything again. In the worst case, people get a cryptic error message saying that the posted information was lost. You can address this annoying problem by temporarily storing the information they type in on each page, redisplaying this information if customers hit the **Back** button, and then overriding the temporarily stored information on the page if it is changed.

Always Make It Clear How to Proceed to the Next Step • Some Web pages are longer than can be displayed on a customer's Web browser. The problem is that people sometimes get lost if the critical action button (K4), the one that takes them to the next step, is hidden below the fold. Place **IMPORTANT ACTION BUTTONS (K5)** both high and low on the page, ensuring that at least one of the critical action buttons is visible without scrolling.

Prevent Errors Where Possible, and Prevent Errors That Do Occur • People will always make errors. You can provide good customer and simple input to help prevent errors and provide **MEANINGFUL ERROR MESSAGES (K1)**.

✧ SOLUTION

Minimize the number of steps required to complete a task, keeping them between two and eight. Remove unnecessary and potentially confusing links and content from each page, while reinforcing the brand to maintain a sense of place. Use pop-up windows to provide extra information, without leading people out of the process funnel. Make sure the **Back** button always works so that customers can correct errors. Make it clear how to proceed to the next step.

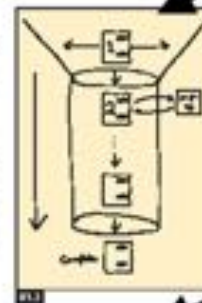
III Patterns Helping Customers Complete Tasks

Bus Stops



Figure III.3

A process funnel lets people complete their goals by breaking down complicated tasks into a small number of steps, using pop-up windows for detailed information, and reducing the number of links to only the vital ones, so that people are never distracted.



Solution Diagram

Related Patterns

✧ CONSIDER THESE OTHER PATTERNS

Many kinds of Web sites use process funnels, including sites for personal e-commerce (A1), self-service government (A4), Web apps that work (A10), and ensuring usability (A11). Customers use process funnels when they finalize purchases through **CHECK-OUT CHECKOUT (F1)**, when they create new accounts through **WIS-ECRIVE ACCOUNT (H2)**, and when they post new messages to a **DISCUSSIONBOARD COMMENT (G4)**, to name some examples.

Remove **SAMBACTION BARS (K2)**, **BAR BROWS (K3)**, **IRRELEVANT ACTION BUTTONS (K4)**, **LOCATION BREAK CRISMS (K6)**, and **STRIPPED LINKS (K7)** to ensure that customers stay on their paths. However, keep strong site branding (E1) so that customers will know where they are.

Design process funnels to **PREVENT ERRORS (K12)**, and provide **MEANINGFUL ERROR MESSAGES (K13)** when errors do occur.

Track your customers through **PERSISTENT CUSTOMER SESSIONS (B5)** to avoid problems with the **Back** button, and to save customer-entered information.

Move **CRUCIAL CONTENT**, such as **CONTEXT-SENSITIVE HELP (B8)** and **FREQUENTLY ASKED QUESTIONS (H7)**, to **POP-UP WINDOWS (B6)** to keep the main task page on the screen. Make the **next** action visible by keeping it **ABOVE THE FOLD (E2)** and by using **HIGH-VISIBILITY ACTION BUTTONS (K5)**.

- A1
- A4
- A10
- A11
- B5
- B6
- B8
- E1
- E2
- F1
- G4
- H2
- H7
- K1
- K12
- K13
- K2
- K3
- K4
- K5
- K6
- K7

III Patterns Helping Customers Complete Tasks

Patterns

When you see advice, consider its depth

Result of an individual study

Pre-pattern based on some meta-analysis

Established pattern

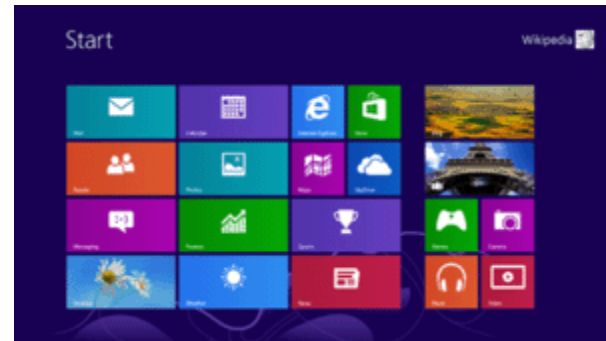
Be aware of misapplying patterns

And be aware of anti-patterns

Touch and Microsoft Windows



2004



2012

Consistency vs. Specialization

Beware of simply copying a design language

Consistency is your friend until it is not your friend

Not limited to platform-level decisions

One “look” for your app

Or targeted at each device

Dark Patterns

A Dark Pattern is an interface that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

Disguised Ads

Ads that are disguised as other kinds of content or navigation, in order to get users to click on them

Dark Patterns

A Dark Pattern is an interface that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

Friend Spam

A site or game asks for your credentials, then goes on to publish content or send out bulk messages

Dark Patterns

The screenshot shows a web browser window with the URL www.fastcodesign.com/7051906/fast-code/after-lawsuit-settlement-linkedin-dishonest-design-is-now-a-13-million-problem?utm_source=facebook. The article title is "After Lawsuit Settlement, LinkedIn's Dishonest Design Is Now A \$13 Million Problem". Below the title is a sub-headline: "HOPEFULLY, THIS WILL BE A LESSON TO OTHER COMPANIES WHO USE DARK UX PATTERNING TO TRICK THEIR USERS." There are social media share counts: 10 KATTS, 5 FB, 108 SL, 853 TW, 1.2K FB, and 1.5K LI. The main text begins: "Anyone who has ever signed up, or even known anyone who has signed up, for LinkedIn has probably found themselves on the receiving end of dozens of follow-up emails, inviting you to 'expand your professional network.' Even worse, they're virtually impossible to opt-out of. It's a scummy use of dark UX patterns by a company that should know better. Now, LinkedIn is going to be paying for it as part of a class-action lawsuit, to the tune of \$13 million." An image of a smartphone displaying the LinkedIn mobile app is shown. Below the image, the text reads: "Presented in San Jose's U.S. District Court, the key issue in Perkins v. LinkedIn is spam. Namely, during the user sign-up process, LinkedIn claims that it 'will not store your password or email anyone without your permission.' Despite this, LinkedIn sends automated follow-up email reminders on a new user's behalf to any contacts harvested from their webmail accounts, which are presented in such a way as to appear as if they came directly from the user." At the bottom, it states: "Under California law, the string judge says has deemed this illegal. Consequently, if you were a member of LinkedIn's 'add connection' program between September 2011 and October 2014, you can submit a claim to get a payout."

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HCI as Design I

James Fogarty
Daniel Epstein

Tuesday/Thursday
10:30 to 12:00

CSE 403

