UI Design

Tuesday, October 16

Announcements

Thursday guest lecture: Dr. Carlos Jensen

Overview of the front-end

Interaction Design Concepts

Usability goals

Heuristic Evaluation

Design principles

Affordance

Visibility, Consistency, Feedback

Design guidelines

Nielsen's usability goals

1. Learnability
2. Efficiency
3. Memorability
4. Errors (safety)
5. Satisfaction

Class exercise

For each goal, write down one software application where:

The usability goal is **very** important

The usability goal is **not very** important

Learnability

Efficiency

Memorability

Errors (safety)

Satisfaction

Learnability

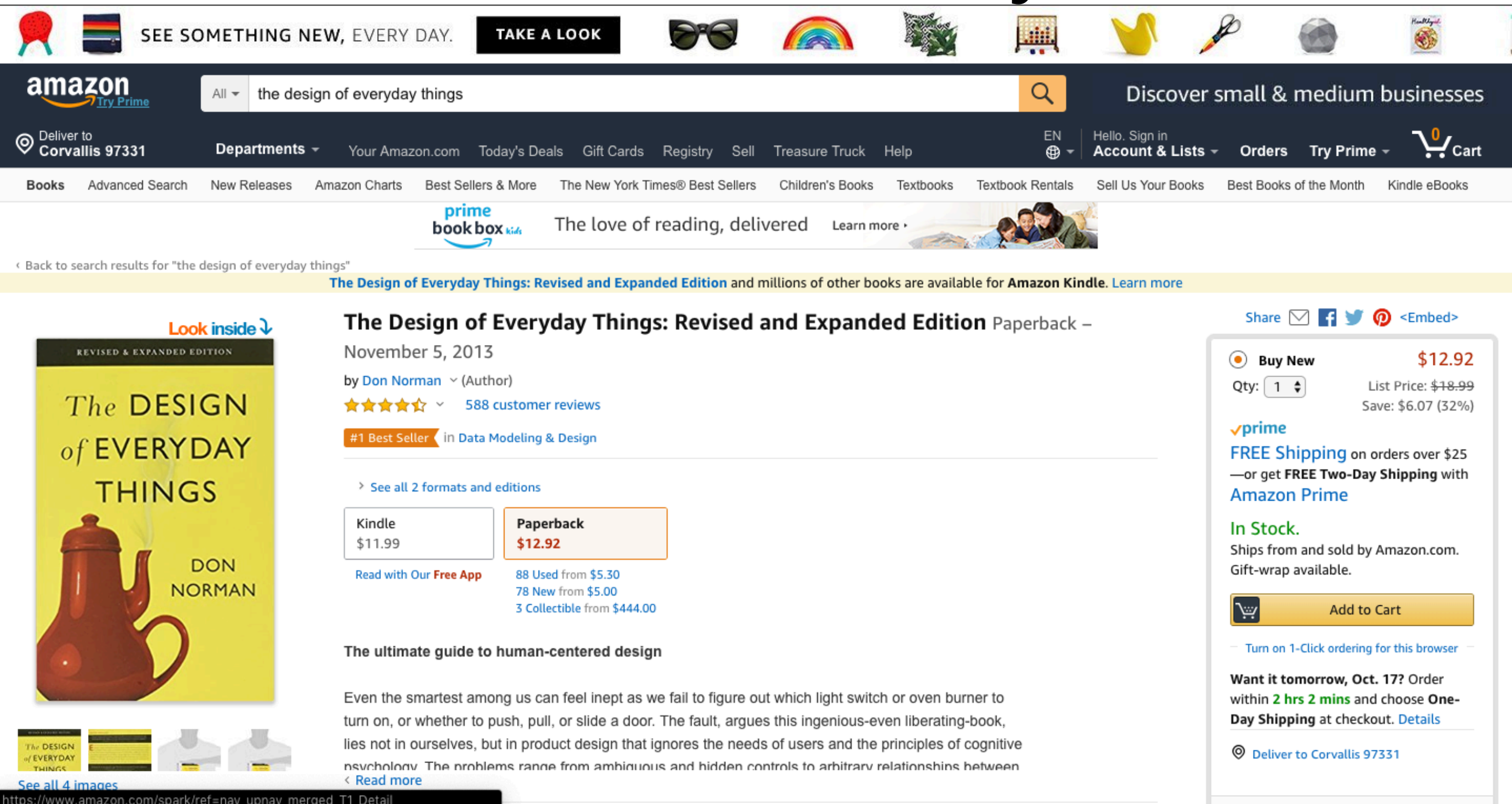
How easy a system is to **learn to use**

Can the user figure out the system by exploring?

How hard will it be to learn the whole set of functionality?

Learnability

Learnability



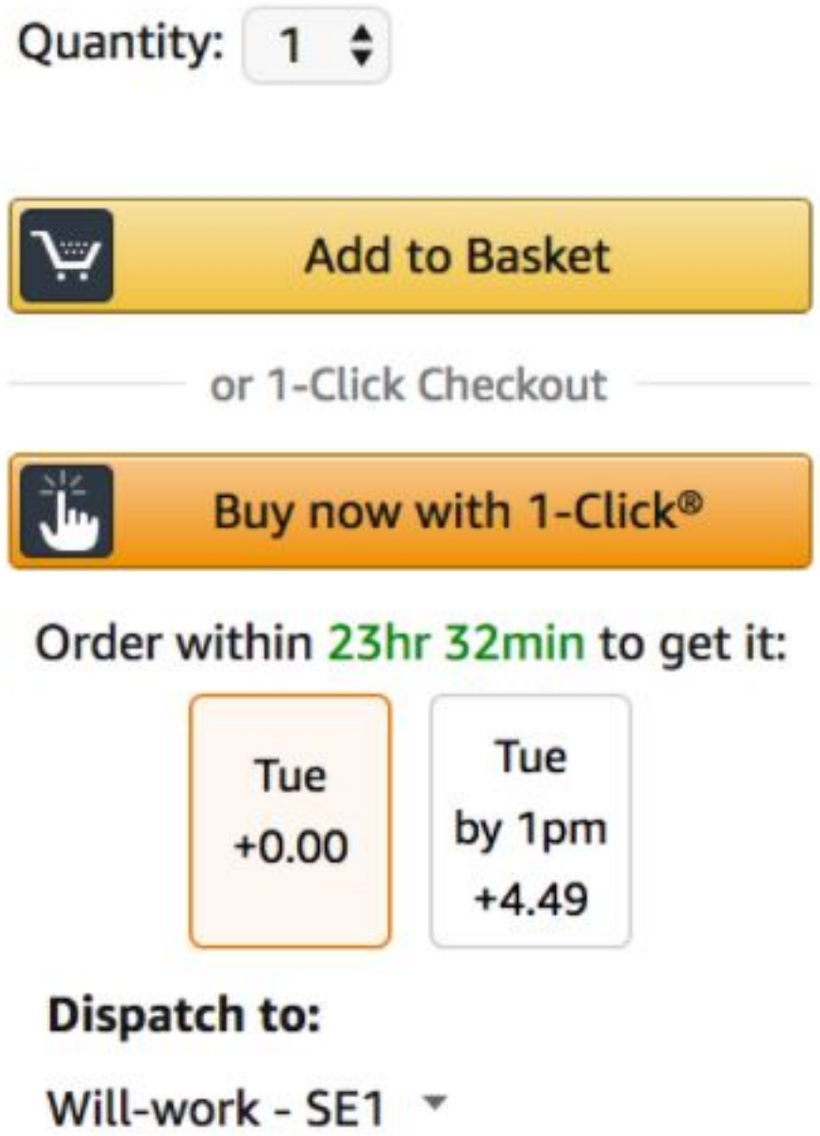
Efficiency

The way a product supports users in carrying out their tasks

Once a user has learned the system can they sustain a high level of productivity?

Efficiency

Efficiency



Memorability

How easy do you remember how to use a product, after learning it?

What kind of interface support has been provided?

Especially important for interactive products that are used infrequently

Memorability

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    Added slides

commit 9ffafaa24d572df35409d8aae3e765d54bb66b39
Author: Caius Brindescu <caius.brindescu@gmail.com>
Date:   Wed Oct 3 16:00:12 2018 -0700

    Fixed typo in sprint 1

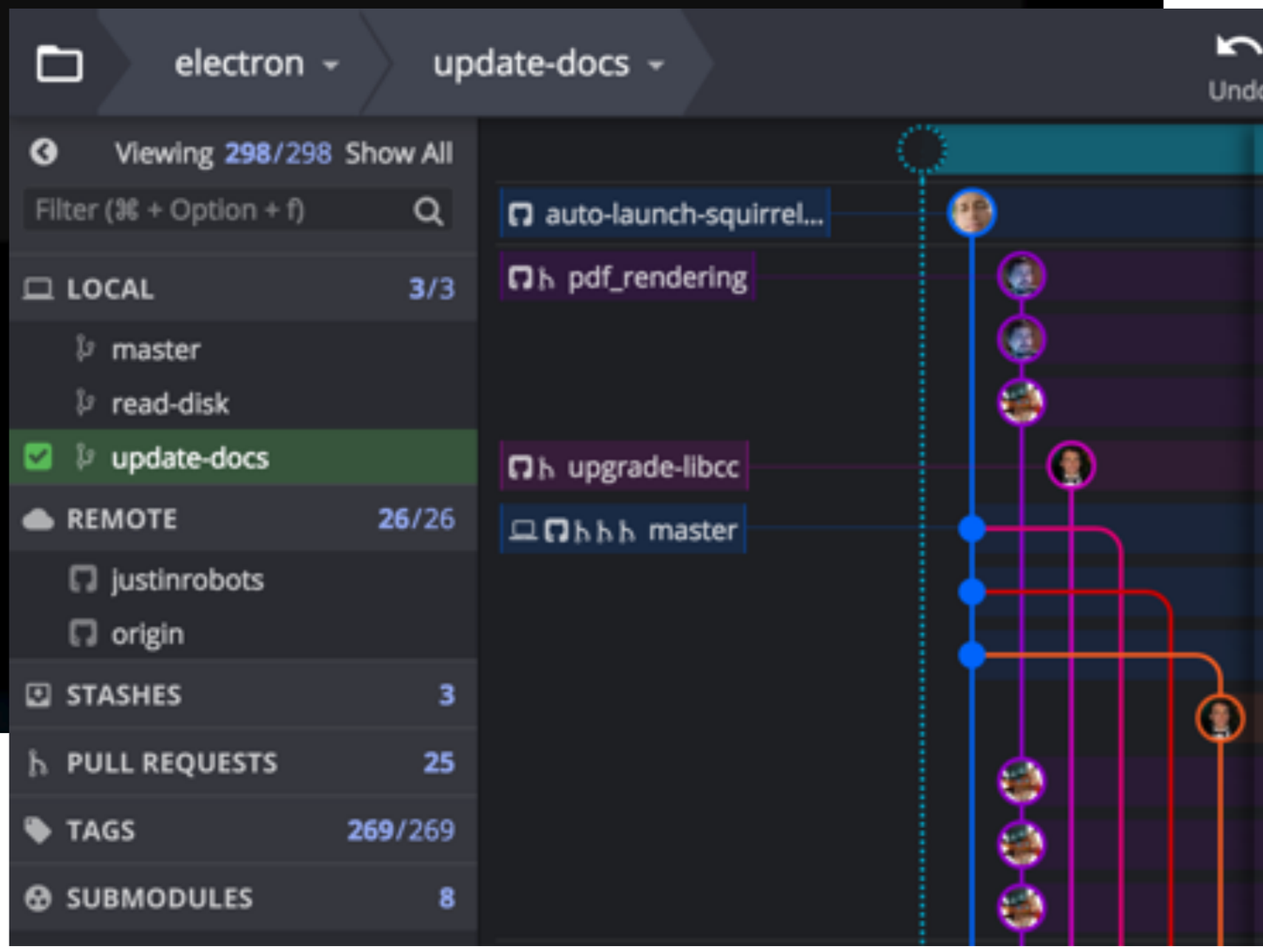
commit 8b6aca59fb892503a167a604d5e1f10a2aea769e
Author: Caius Brindescu <caius.brindescu@gmail.com>
Date:   Wed Oct 3 07:56:58 2018 -0700

    Fixed typos on slides

commit c3e960eba783f64704126d8bc66a3990ab85c372
Author: Caius Brindescu <caius.brindescu@gmail.com>
Date:   Tue Oct 2 12:34:54 2018 -0700

    Added solid reading
Adso:website caius$ git status
On branch sources
Your branch is up to date with 'origin/sources'.

nothing to commit, working tree clean
Adso:website caius$
```



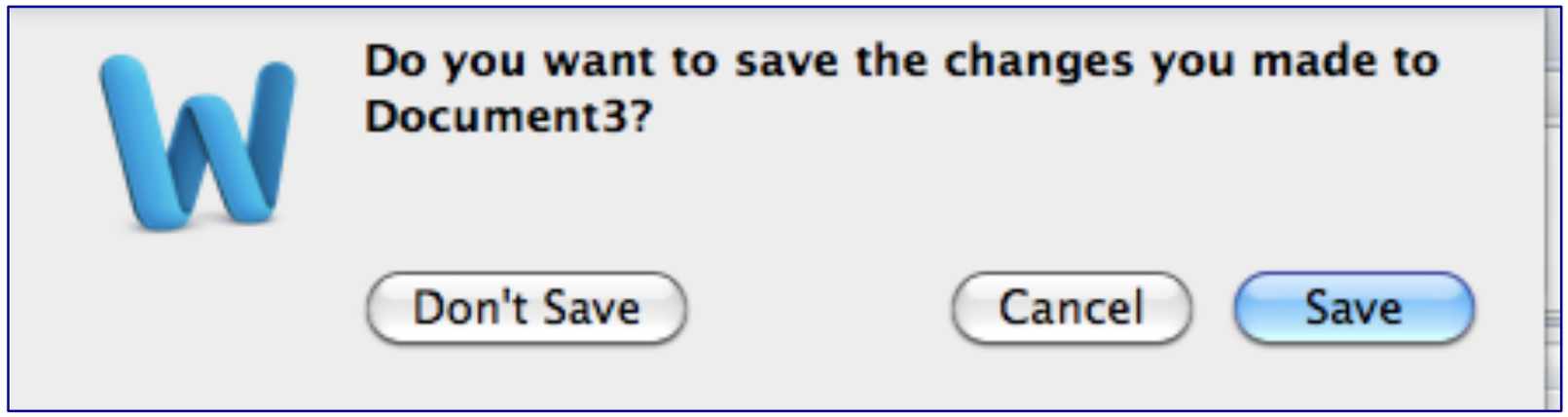
Errors (safety)

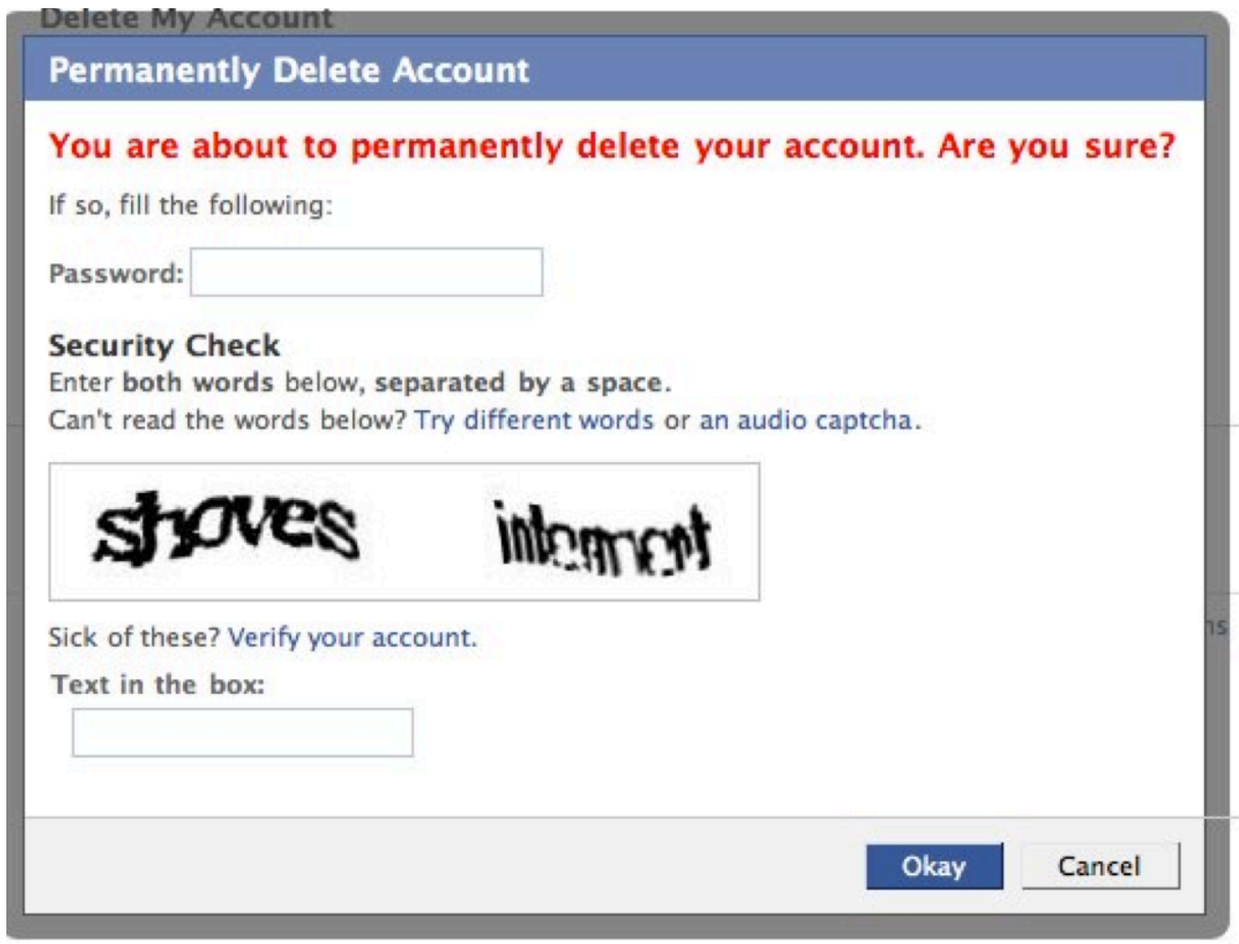
Protecting the user from dangerous conditions and undesirable situations, also from perceived fear

Question:

What is the range of errors possible

What measures to recover easily from them





Satisfaction

Subjective quality of how a system feels to a user

What is the user's response after finishing their task/ interaction

Satisfaction

Satisfaction

Heuristic Evaluation

A simple and structured process for finding usability problems

3-5 evaluators

Can be performed on a working UI, or on sketches (i.e. paper prototypes)

Short set of heuristics

The evaluator can keep all of them in their head

Heuristic Evaluation

1. **Visibility of system status**. Users should always be informed of system operations.

2. **Match between system and the real world**. Designers should endeavor to mirror the language and concepts users would find in the real world based on who their target users are.

3. **User control and freedom**. Offer users a digital space where backward steps are possible, including undoing and redoing actions.

4. **Consistency and standards**. Interface designers should ensure that both the graphic elements and terminology are maintained across similar platforms.

Heuristic Evaluation

5. **Error prevention**. Whenever possible, design systems so that potential errors are kept to a minimum.

6. **Recognition rather than recall.** Minimize cognitive load by maintaining task-relevant information within the display while users explore the interface.

7. **Flexibility and efficiency of use**. With increased use comes the demand for less interactions that allow faster navigation. This can be achieved by using abbreviations, function keys, hidden commands and macro facilities.

Heuristic Evaluation

8. **Aesthetic and minimalist design**. Keep clutter to a minimum. All unnecessary information competes for the user's limited attentional resources.

9. **Help users recognize, diagnose and recover from errors**. Designers should assume users are unable to understand technical terminology, therefore, error messages should almost always be expressed in plain language.

10. **Help and documentation**. When users require help, ensure it is easily located, specific to the task at hand and worded in a way that will guide them through the necessary steps towards a solution to the issue they are facing.

Shopping Cart Contents

Welcome, Ben Bitdiddle.

You have 2 item(s) in your shopping cart.
To remove an item, check "Remove" box & click "Recalculate".
Shipping Calculator below.

There is a problem with your order.

Product	Description	Quantity	UnitPrice	ExtPrice
	323022 Pinnalce Clean Plus Version 4.0 Retail ***(Free 2nd Day)*** ☐ Remove	1	$61.00	$61.00
	80098-21 Corsair VS1GBKIT400 1GB Kit DDR400 PC3200 Value Select Memory Retail (out of stock) Remove Hardware	1	$179.00	$179.00

Subtotal: $240.00

For more information about tax, please click here.

Recalculate | Clear Cart

Shipping Promotion details. Please read.

Check Out

Note: Discount will be applied during check out
Coupon Code: Apply
Ship to Zip Code: Calculate Shipping Charge

Have not made up your mind? Save all the items in your shopping cart!
Cart Title: Save Shopping Cart

Return to old shopping cart:
Cart Name: Load Shopping Cart

Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

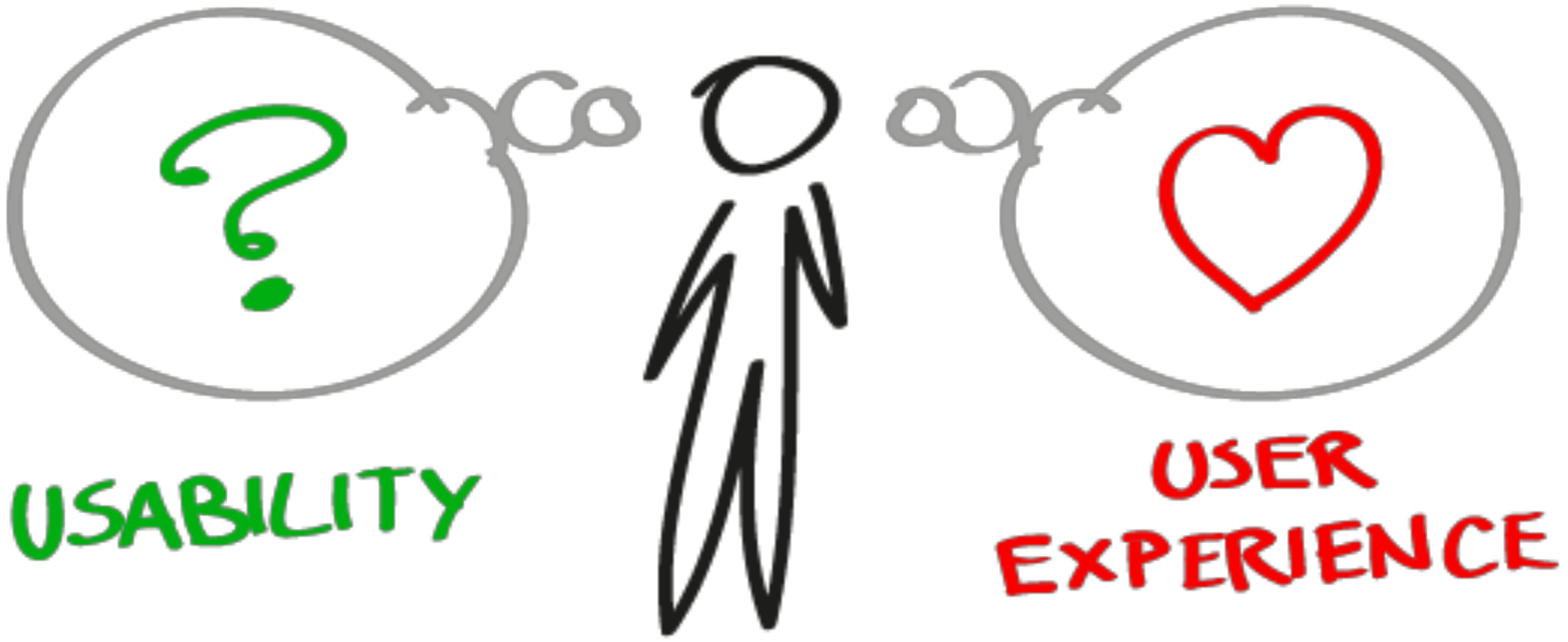
Recognition rather than recall

Flexibility and efficiency of use

Aesthetic and minimalist design

Help users recognize, diagnose and recover from errors

Help and documentation



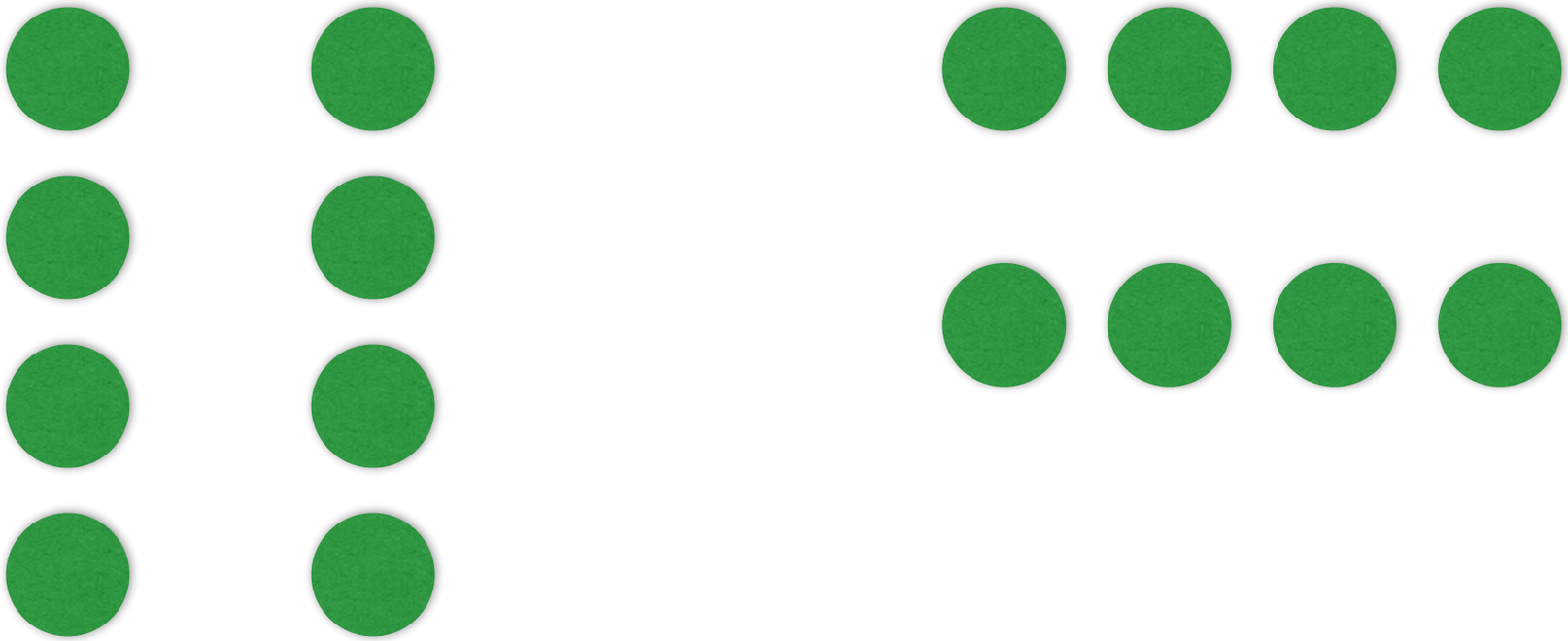
Gestalt principles

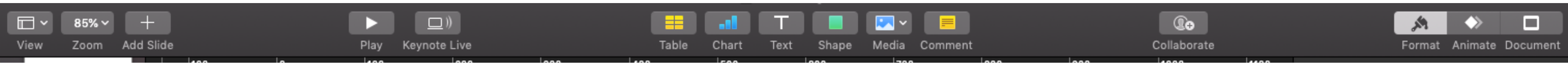
Gestalt = an organized whole that is perceived as more than the sum of its parts.

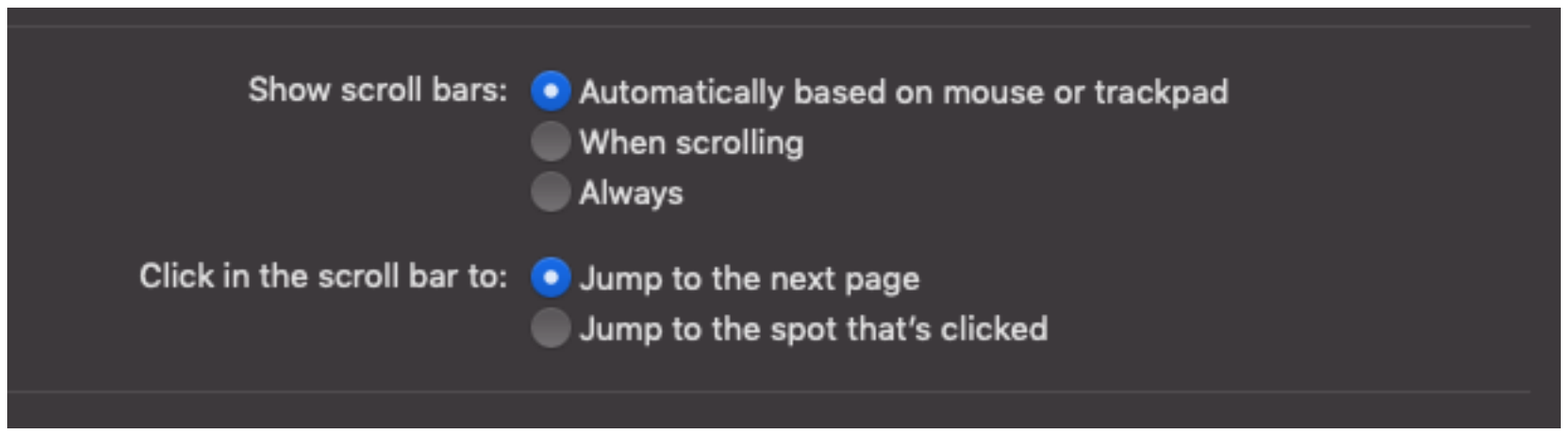
Our way of acquiring and maintaining **perceptions** in a chaotic world

Proximity

When items are close together, they are perceived as a group.





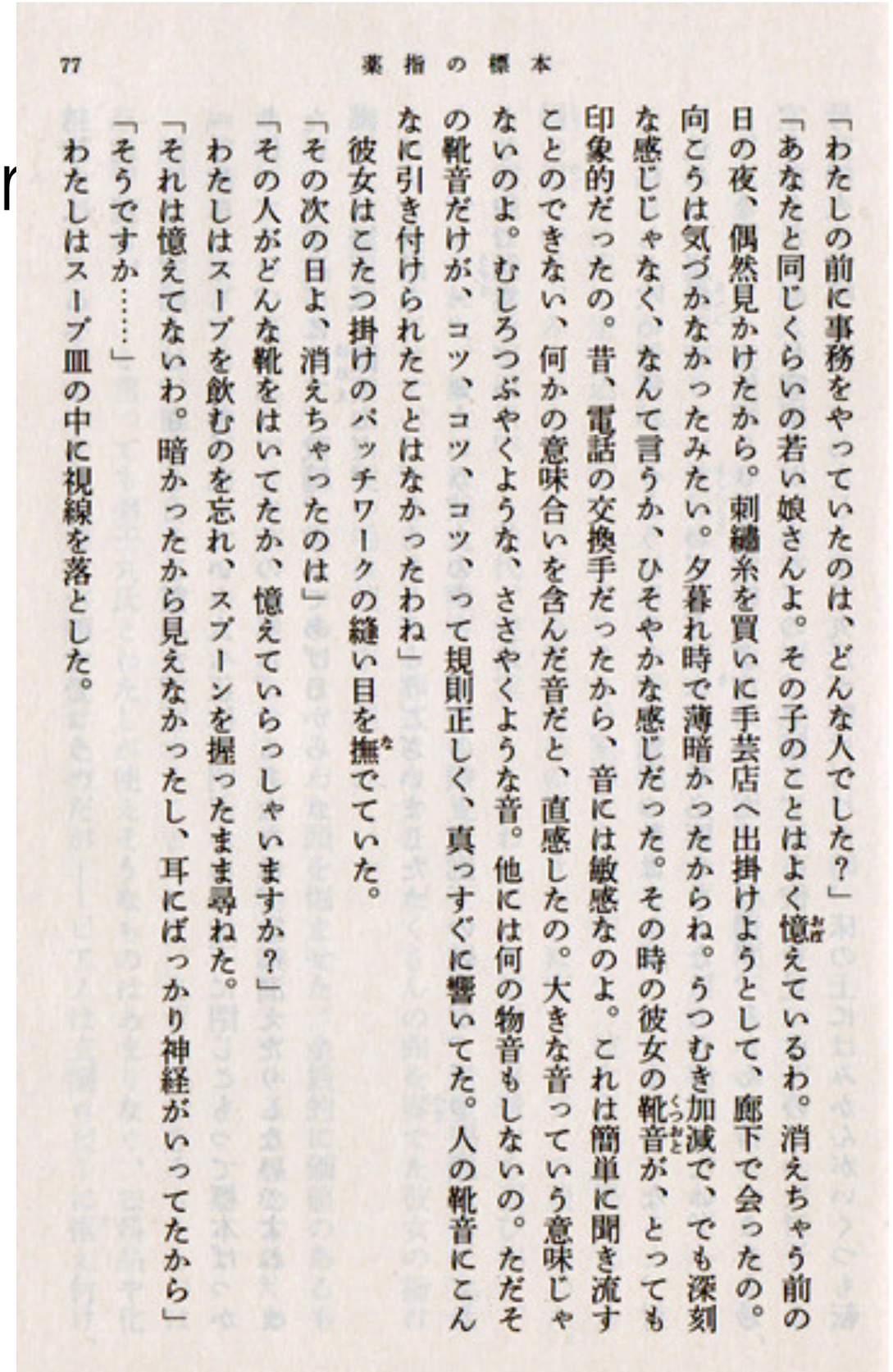


Continuation

Elements arranged in a line or a soft curve are perceived to be more related than those arranged randomly or in a harsh line.

This row is a lot easier to r

t h a n t h



77　薬指の標本

「わたしの前に事務をやっていたのは、どんな人でした？」
「あなたと同じくらいの若い娘さんよ。その子のことはよく憶えているわ。消えちゃう前の日の夜、偶然見かけたから。刺繍糸を買いに手芸店へ出掛けようとして、廊下で会ったの。向こうは気づかなかったみたい。夕暮れ時で薄暗かったからね。うつむき加減で、でも深刻な感じじゃなく、なんて言うか、ひそやかな感じだった。その時の彼女の靴音が、とっても印象的だったの。昔、電話の交換手だったから、音には敏感なのよ。これは簡単に聞き流すことのできない、何かの意味合いを含んだ音だと、直感したの。大きな音っていう意味じゃないのよ。むしろつぶやくような、ささやくような音。他には何の物音もしないの。ただその靴音だけが、コツ、コツ、コツ、って規則正しく、真っすぐに響いてた。人の靴音にこんなに引き付けられたことはなかったわね」
彼女はこたつ掛けのパッチワークの縫い目を撫でていた。
「その次の日よ、消えちゃったのは」
「その人がどんな靴をはいてたか、憶えていらっしゃいますか？」
わたしはスープを飲むのを忘れ、スプーンを握ったまま尋ねた。
「それは憶えてないわ。暗かったから見えなかったし、耳にばっかり神経がいってたから」
「そうですか……」
わたしはスープ皿の中に視線を落とした。

MEN WOMEN BOYS GIRLS CUSTOMIZE

Search

Shorts
Surf & Swimwear
Accessories & Equipment

FILTERS

SHOE TYPE −
- Cleats & Spikes

SURFACE −
- Road
- Track
- Trail

NIKEID −
- Full Customization
- Personalization (Text Only)

BEST FOR −
- Barefoot-like ride
- Neutral Ride
- Stability
- + More

COLLECTIONS −
- Nike Zoom
- Nike Air Max

MEN'S RUNNING SHOES (125)

SORT BY:

6 Colors
Nike Flyknit Racer
Unisex Running Shoe (Men's Sizing)
$150

8 Colors
Nike LunarTempo 2
Men's Running Shoe
$100

CUSTOMIZE IT NIKEiD
Nike LunarTempo 2 iD
Men's Running Shoe
$150

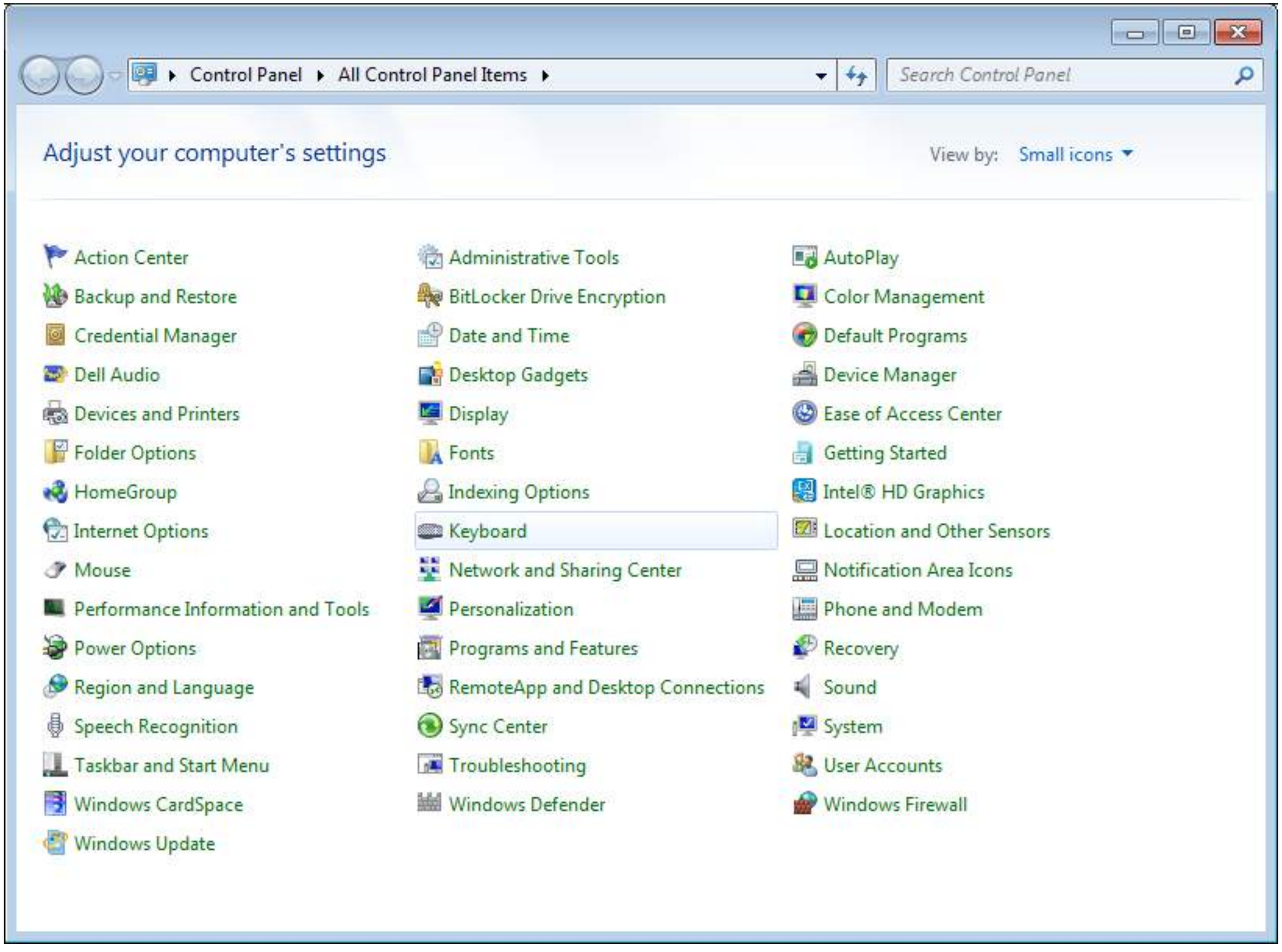
6 Colors
Nike Flyknit Air Max
Men's Running Shoe
$225

2 Colors
Nike Air Max 2016 Print
Men's Running Shoe
$200

2 Colors PERSONALIZE
Nike Air Zoom Pegasus 32 Solstice
Men's Running Shoe
$125

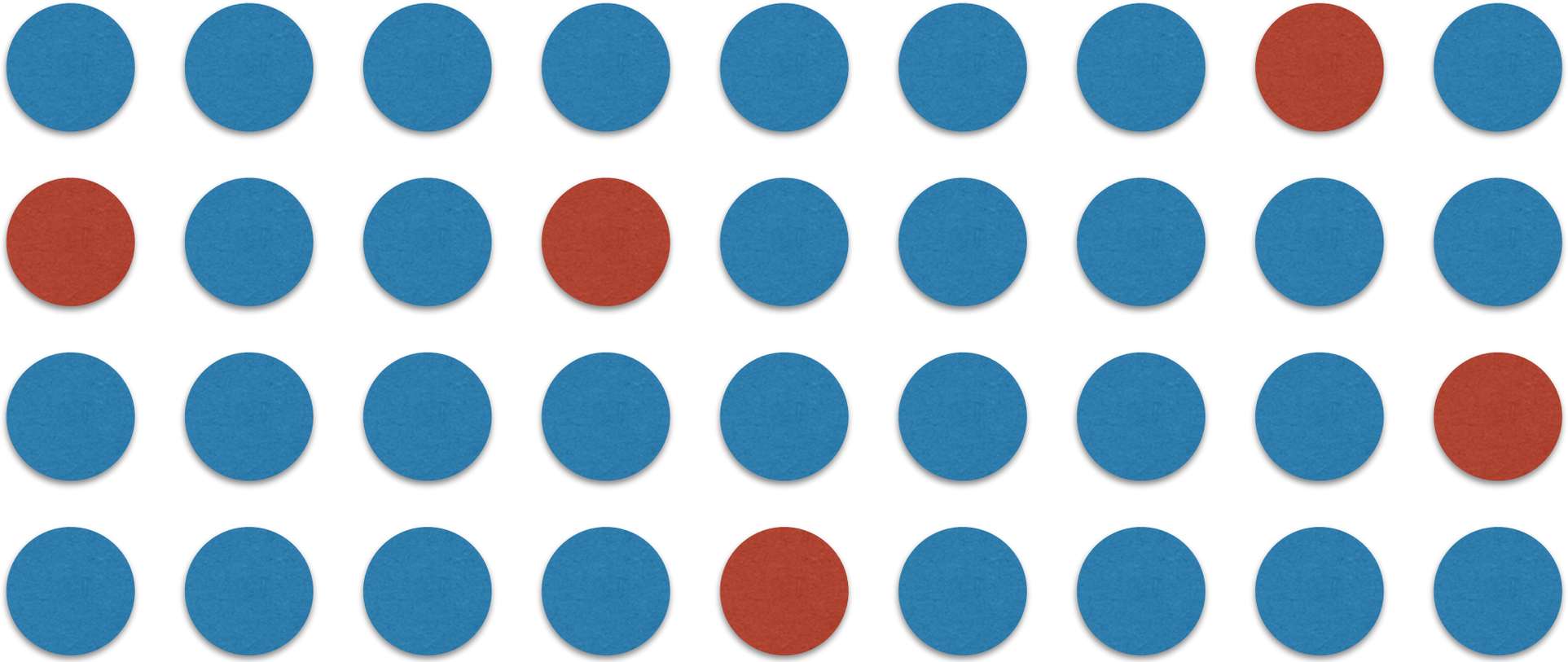
3 Colors
Nike Free RN Distance
Men's Running Shoe
$120

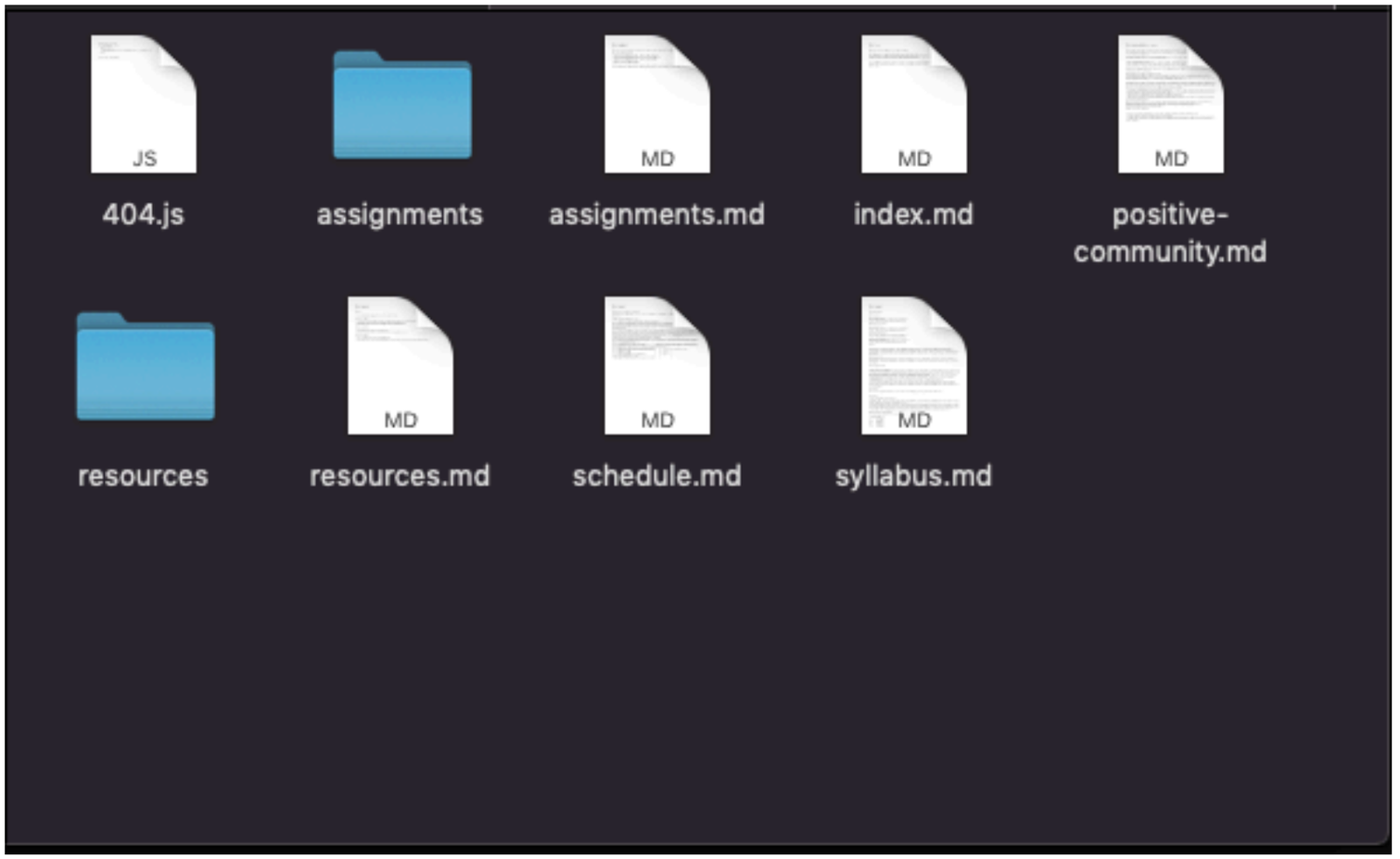
8 Colors
Nike Air Max 2016
Men's Running Shoe
$190



Similarity

Similar elements are visually grouped, regardless of their proximity to each other

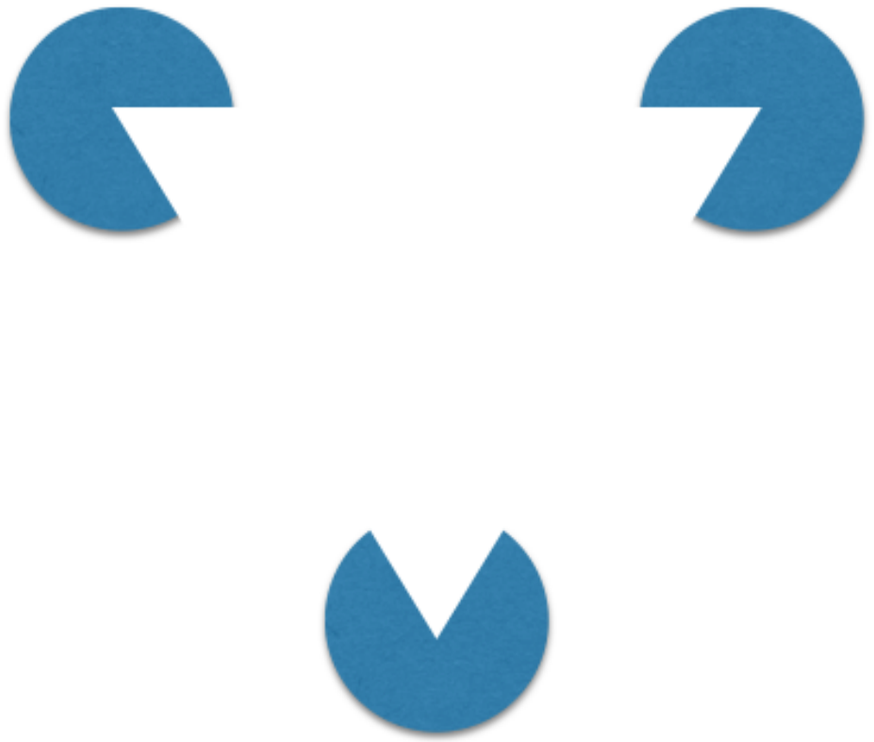




Closure

Closure

Your brain will fill in the missing parts of a design or image to create a whole.



FedEx

Adobe

adidas

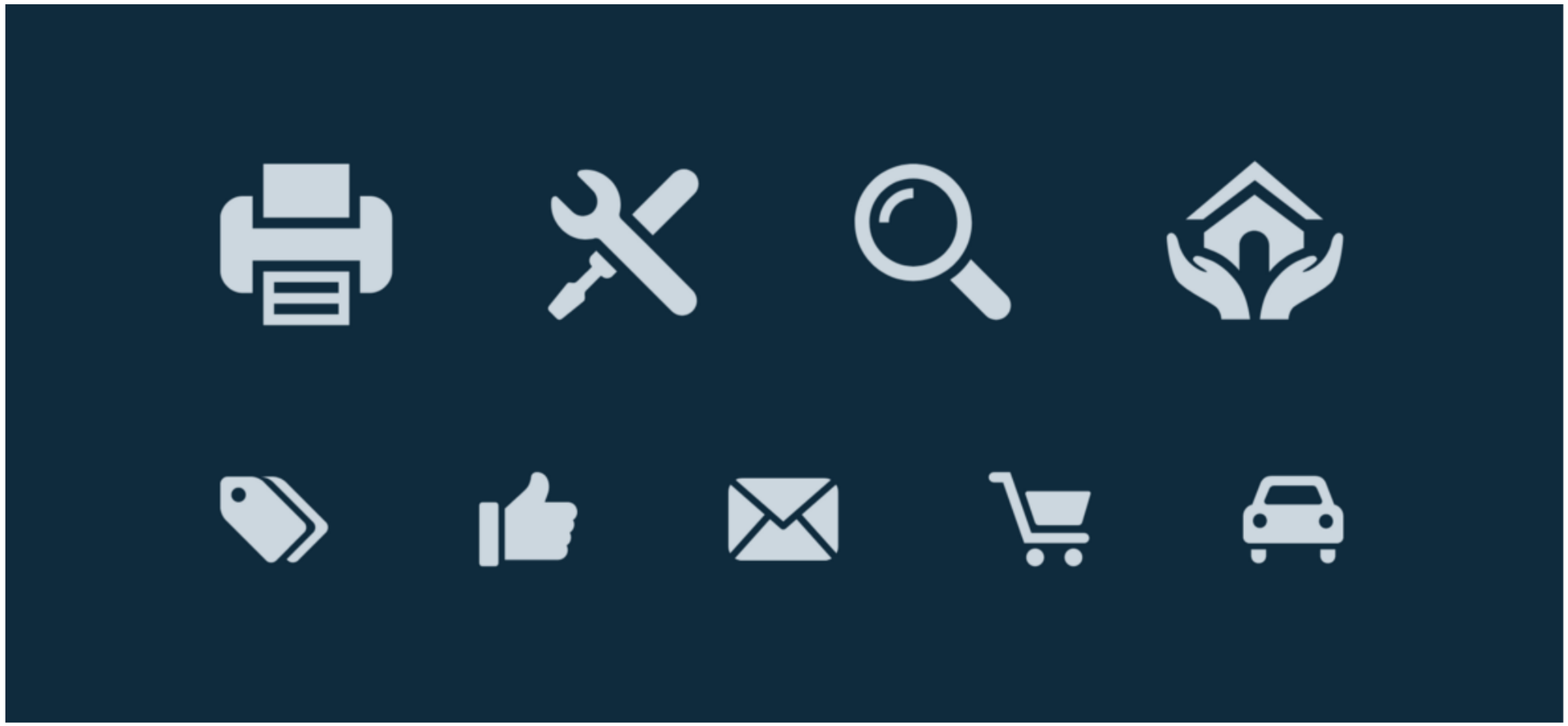


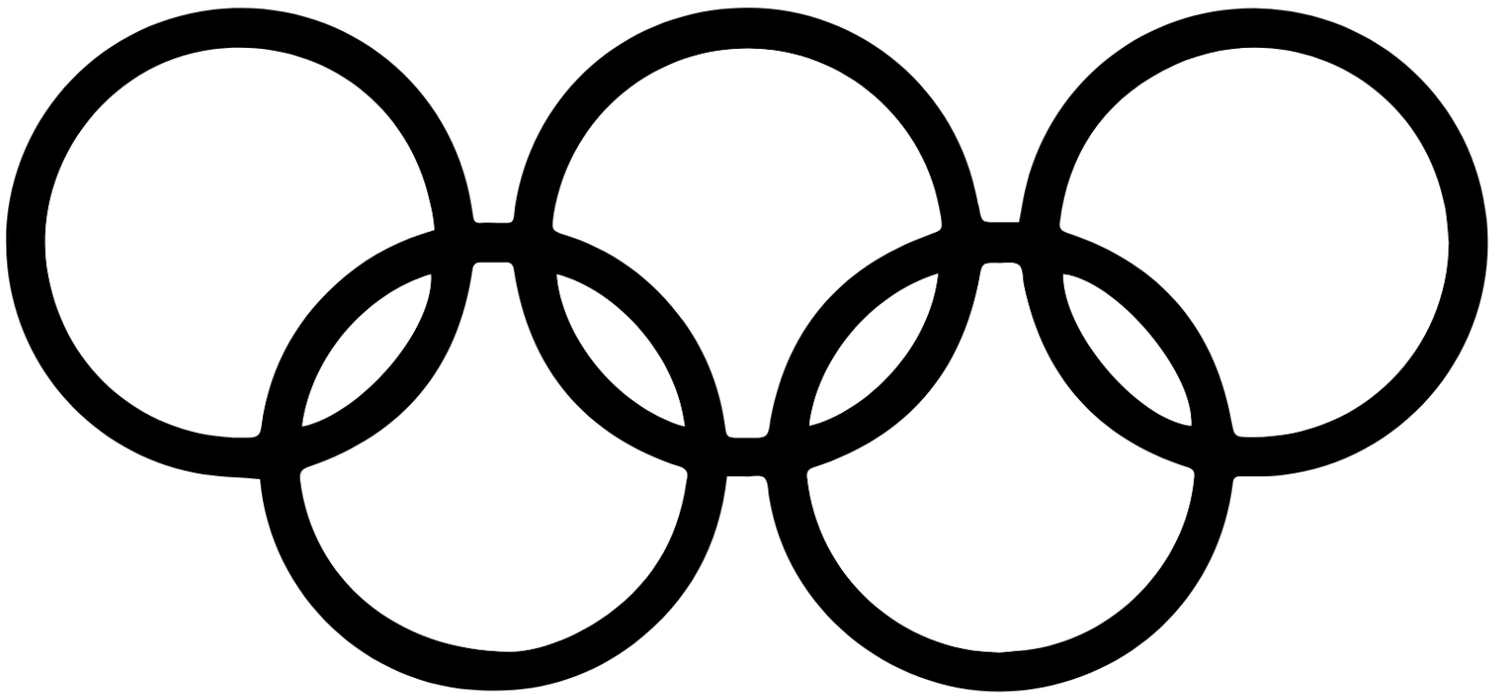
Figure and Ground

Your brain will distinguish between the objects it considers to be in the **foreground** of an image (the figure, or focal point) and the **background** (the area on which the figures rest).

Symmetry and Order

Your brain will perceive ambiguous shapes in as simple a manner as possible.

It also prefers to view images as symmetrical



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Affordance

It should be obvious how a control is used

Affordances

The perceived and actual fundamental properties of the object that determine how it could possibly be used (Gibson 1977)

Some affordances are **obvious**, some **learned**

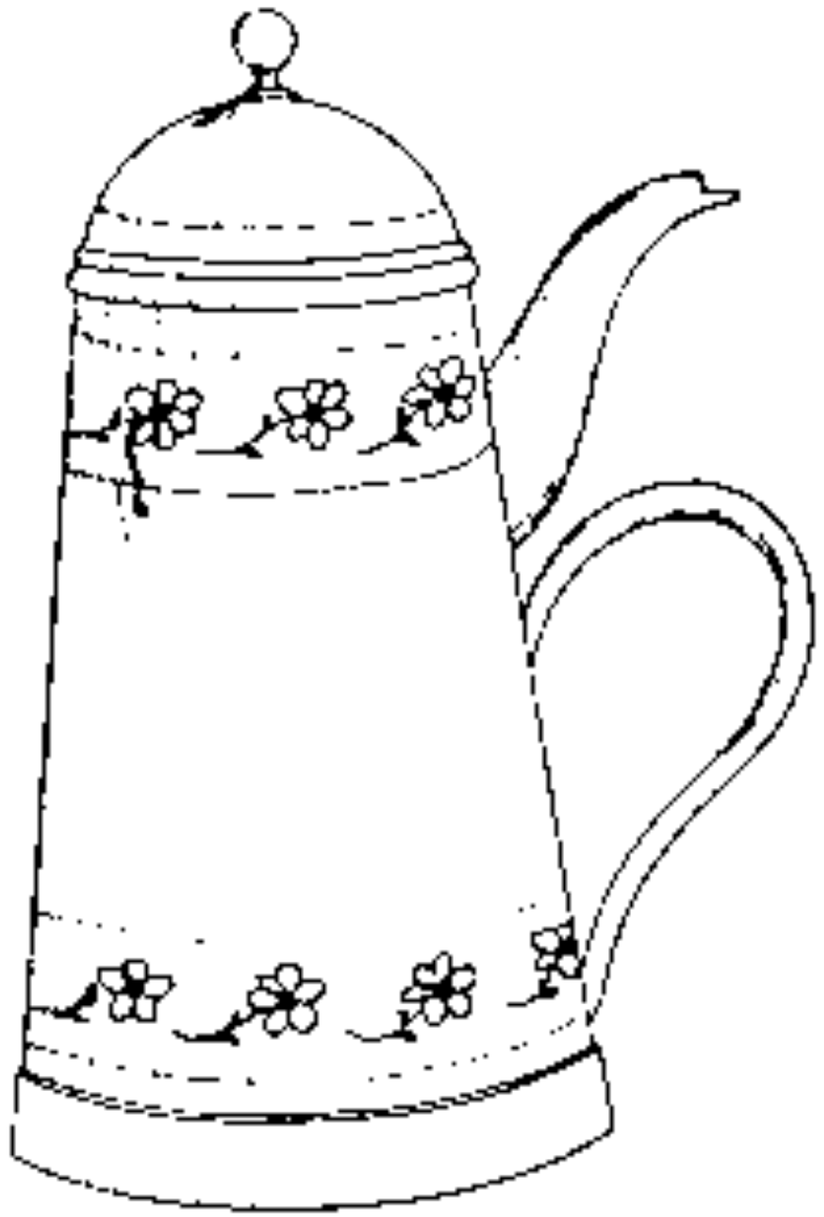
Have suggestions or clues about to how to use these properties

Can be **dependent** on the

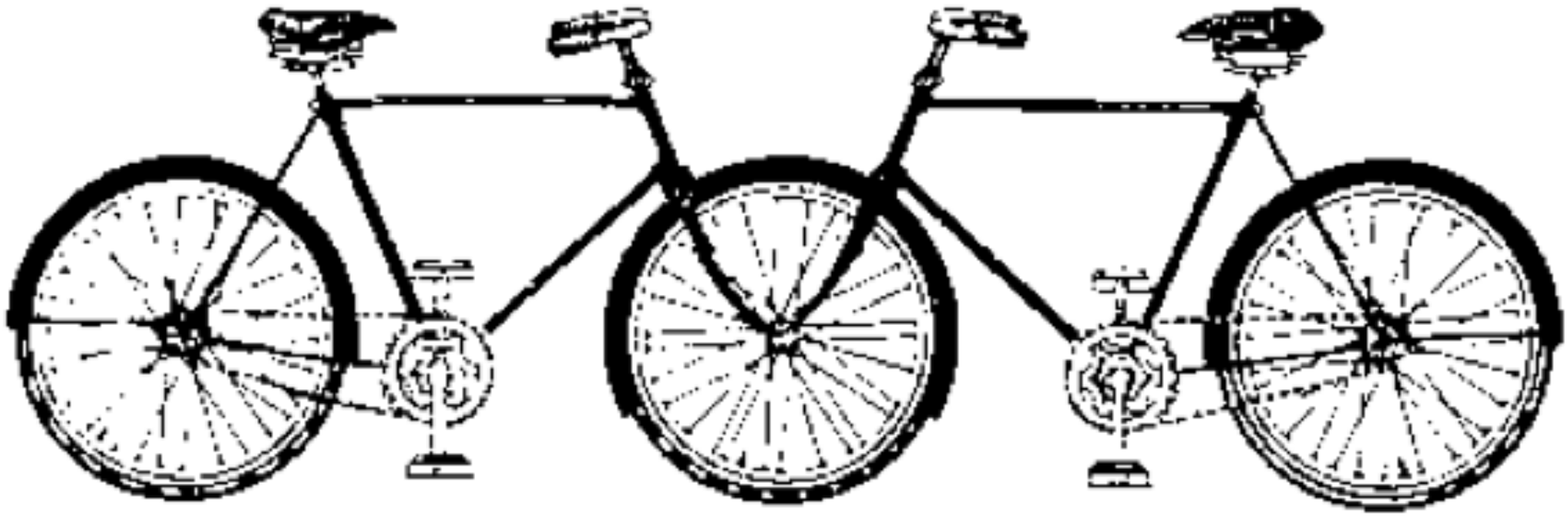
- Experience
- Knowledge
- Culture of the actor

Can make an action easy or difficult

Affordances of a Teapot?



Affordance of a tricycle?

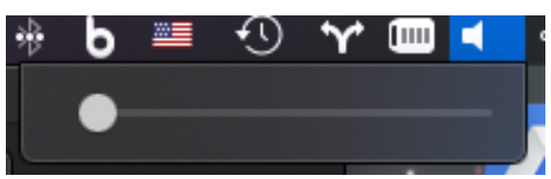


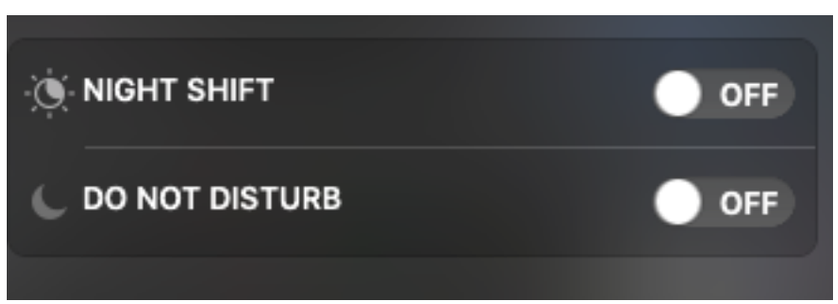
Affordances in Screen Based UI

Designer has control over perceived affordances

Graphical elements will afford only some kinds of actions

e.g. checkboxes and radioboxes





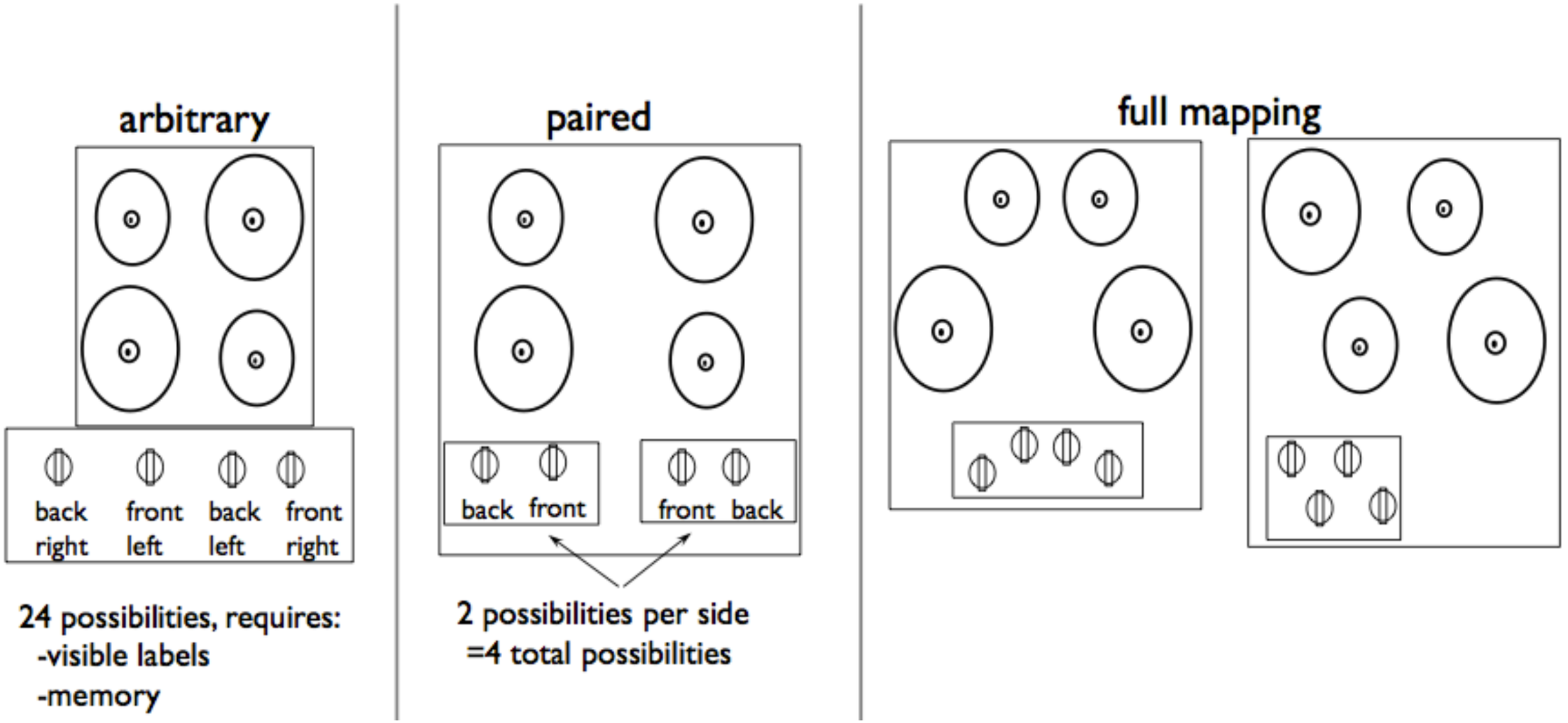
Mappings

Natural mappings use constraints and correspondences in the physical world

For computer UI design:

Mapping between controls and their actions on the computer

Mapping controls to physical outcomes



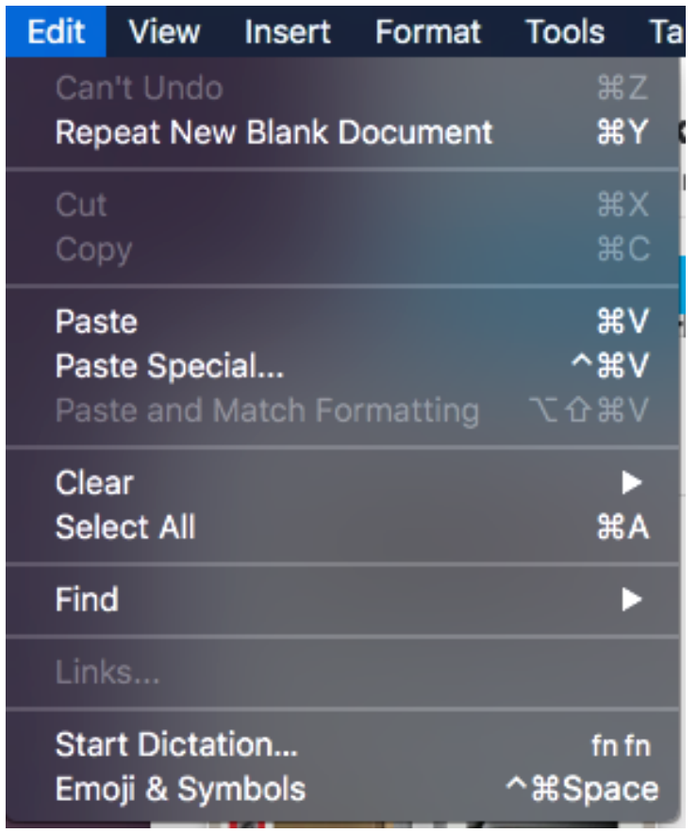
Transfer effects

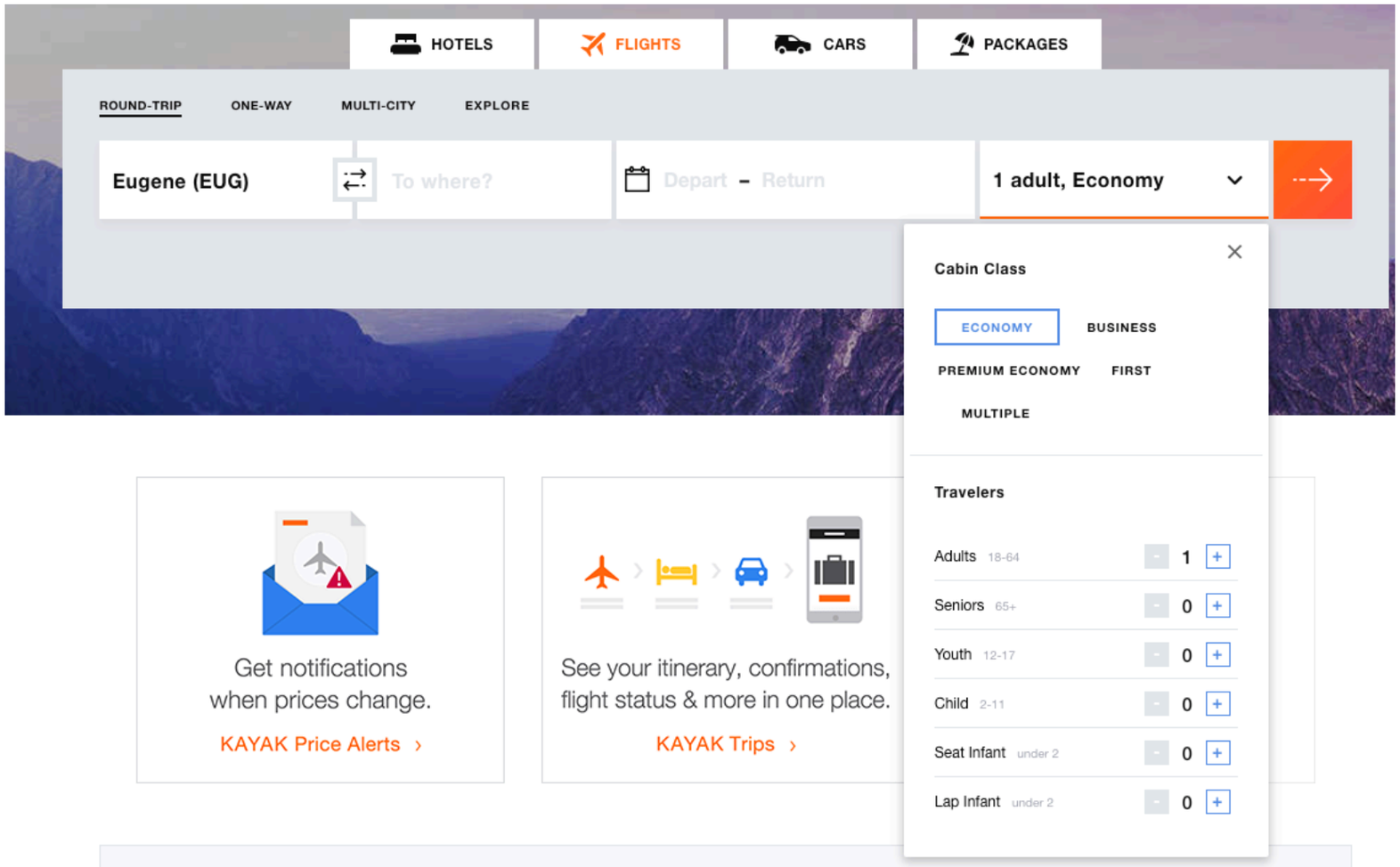
People transfer expectations from known objects to similar new ones

Positive: previous experience applies to new situation

Negative: previous experience conflicts with new situation

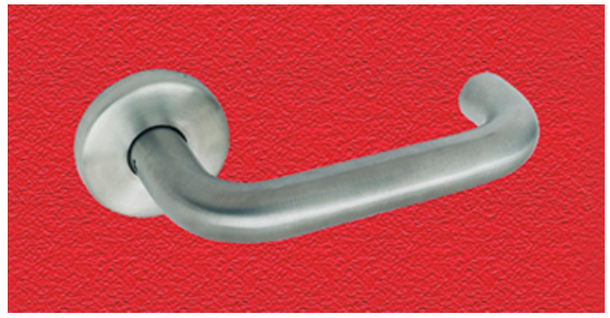
Restricting interaction to reduce errors





Visibility

Making it obvious which actions are available

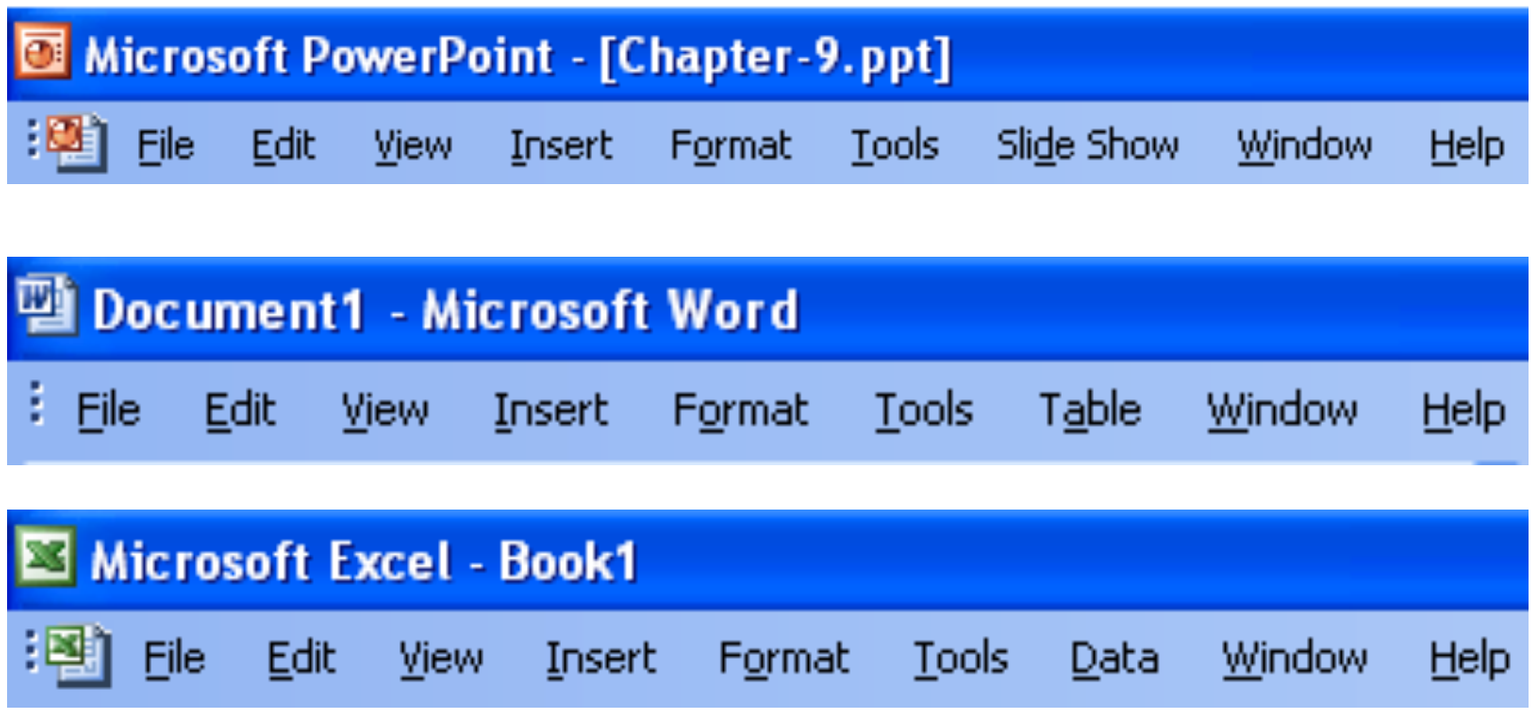


◄ Gooooooooooooogle ►

Previous 1 2 **3** 4 5 6 7 8 9 10 11 12 Next

Consistency

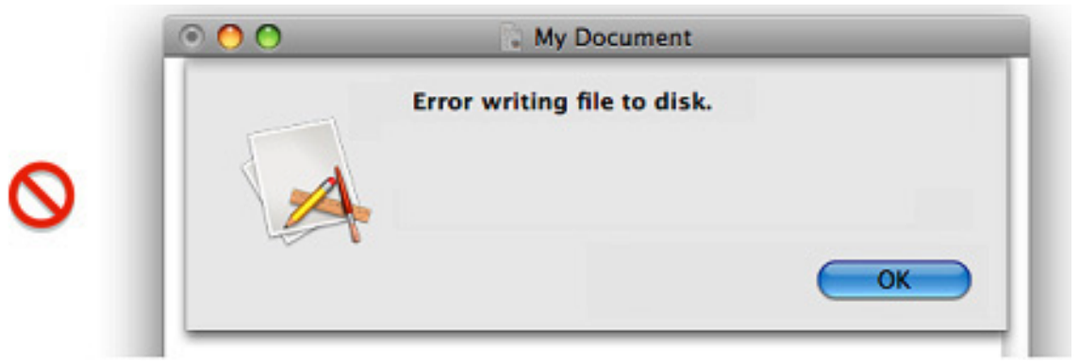
Uniformity in appearance, placement, terminology, and behavior

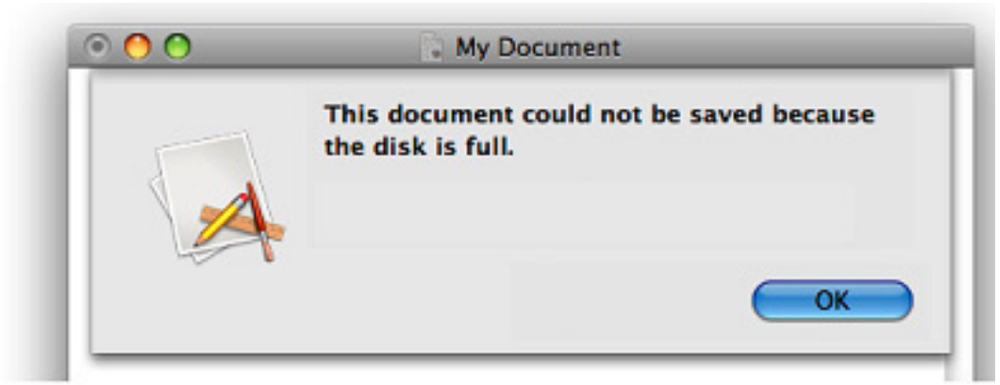


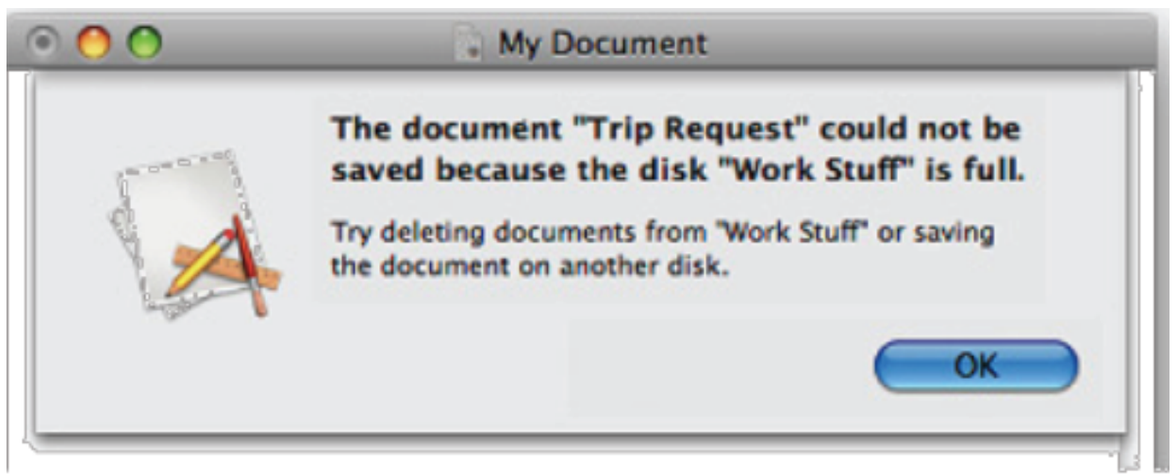
Feedback

Send information about what is happening back to the user

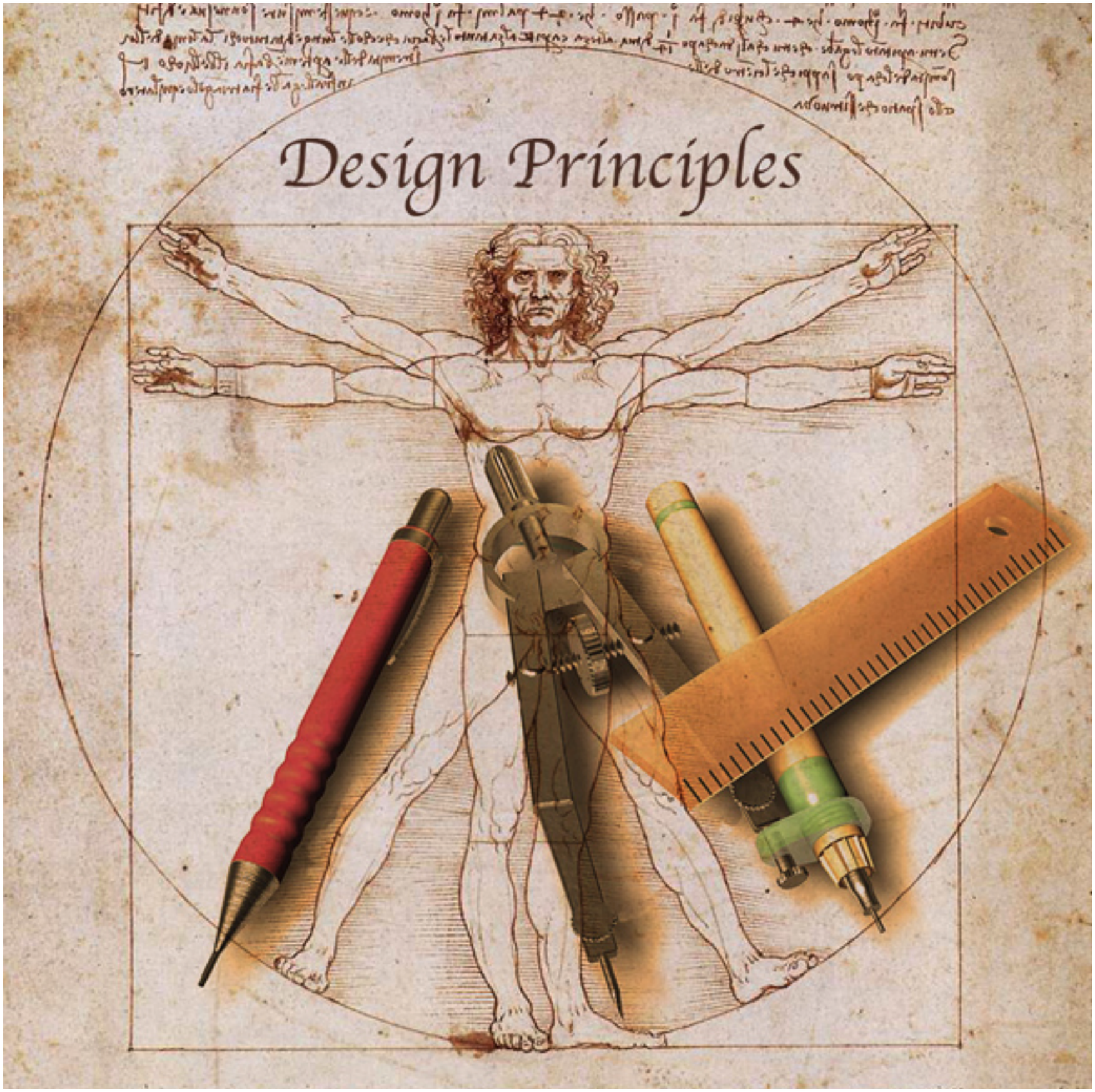
Feedback - from Bad to Better







Design Principles



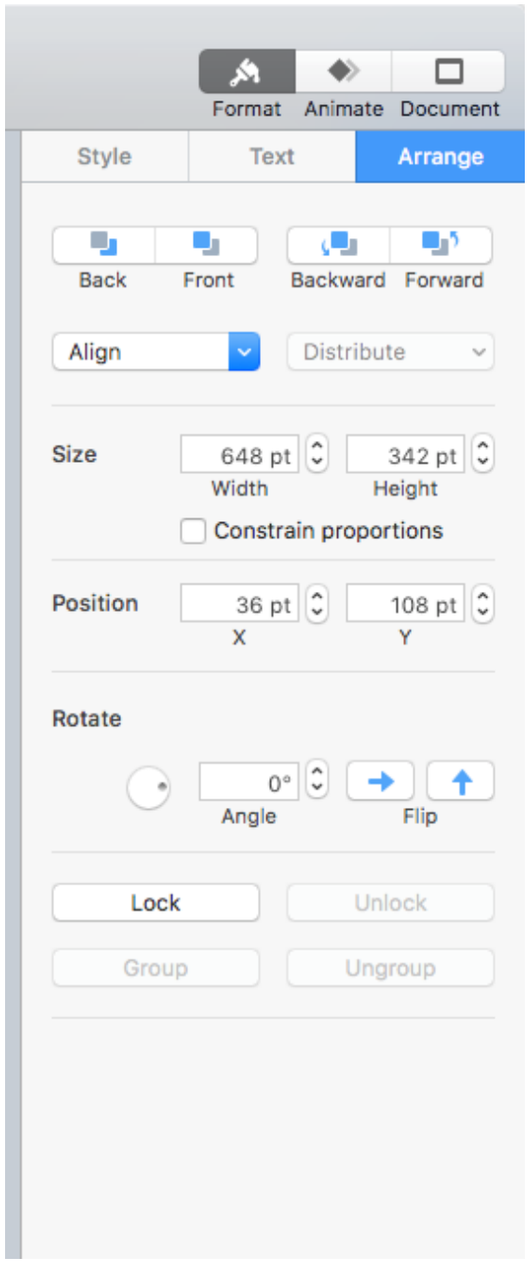
Keep it simple

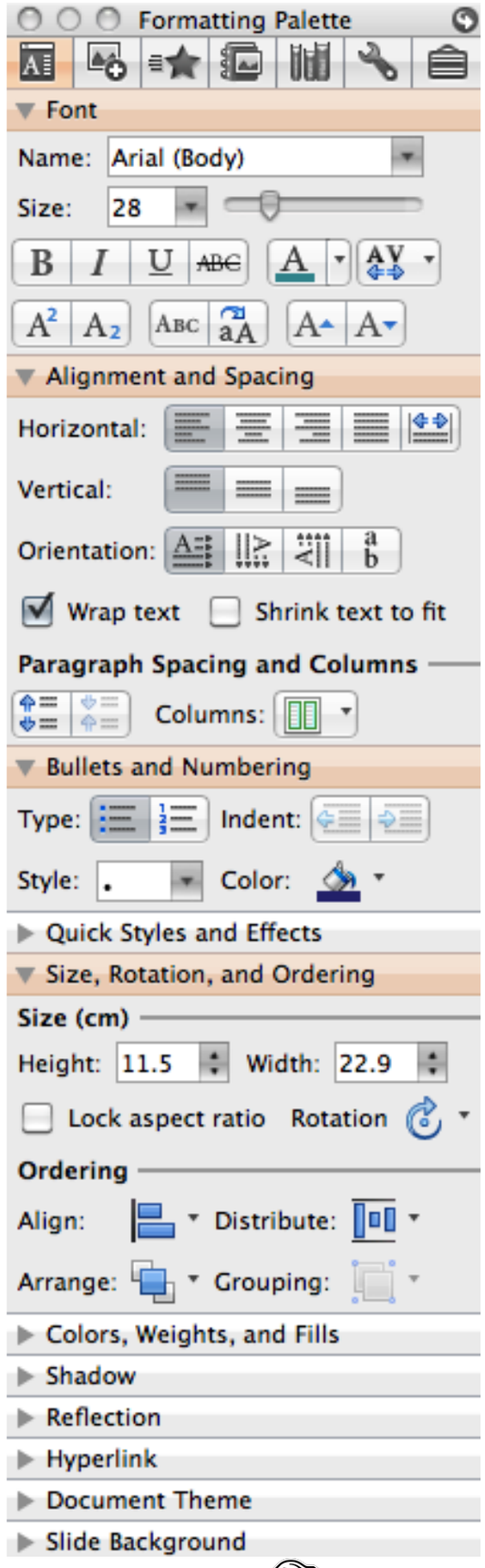
Google

Google Search I'm Feeling Lucky

All in one doesn't work

Organize the UI in a meaningful way



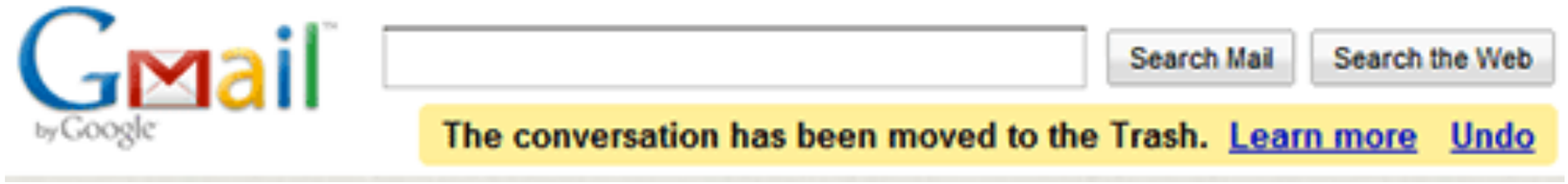


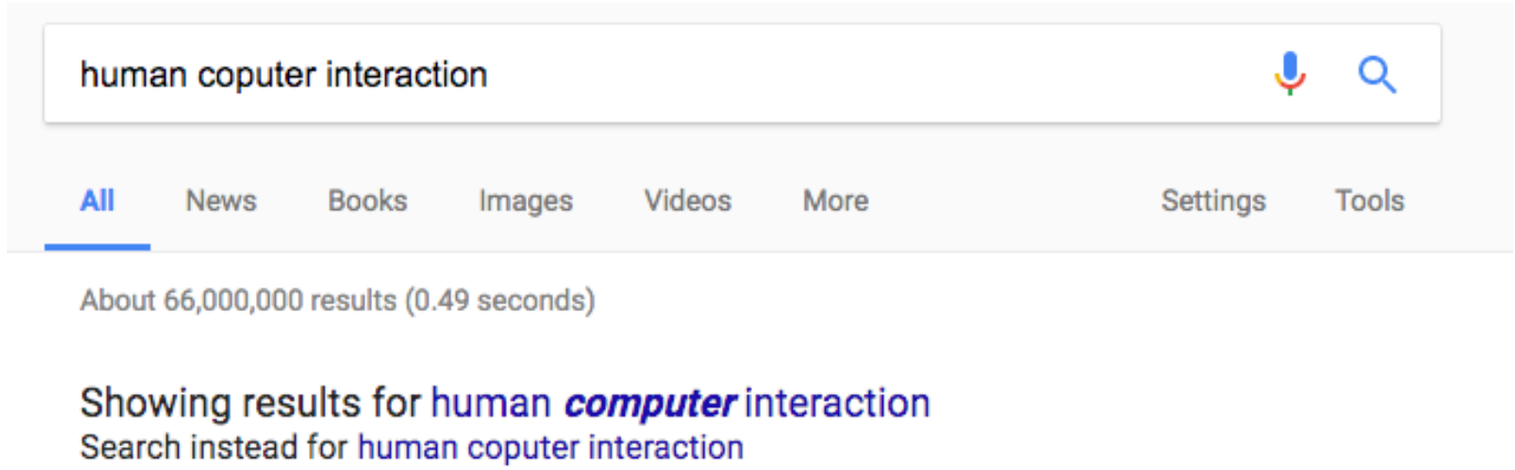
Tolerance

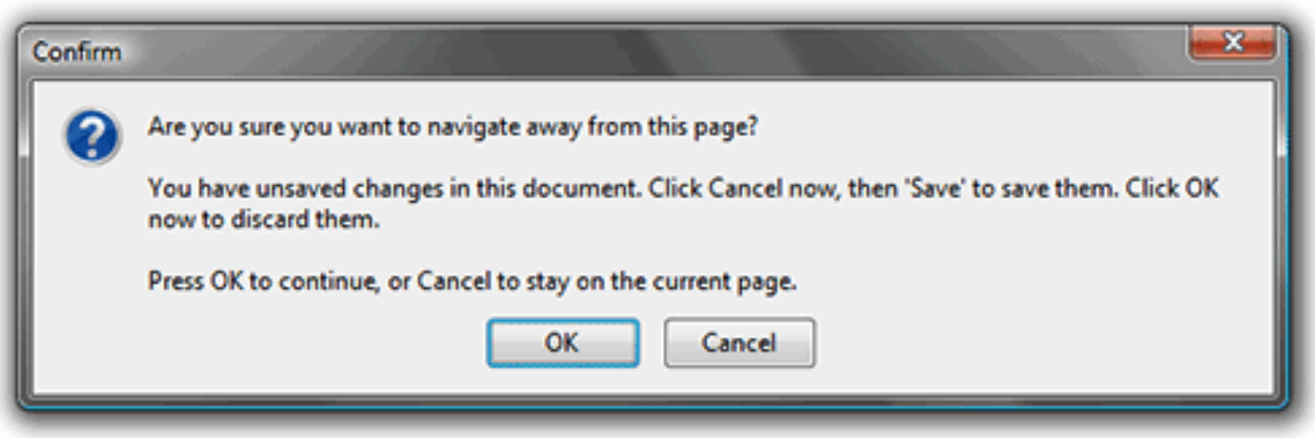
Prevent user from making mistakes. Or allow for an easy recovery (undo).

Forward error recovery - system accepts the error and helps the user to accomplish their goal

Backward error recovery – undo the effects of the previous interaction







Location on screen

The fold

SPECIAL COMMEMORATIVE SECTION

"All the News That's Fit to Print"

The New York Times

LATE CITY EDITION

Weather: Rain, warm today; clear tonight. Sunny, pleasant tomorrow. Temp. range: today 86-68; Sunday 71-66. Temp.-Hum. Index yesterday 88. Complete U.S. report on P. 86.

VOL. CXVIII . No. 40,721 © 1969 The New York Times Company NEW YORK, MONDAY, JULY 21, 1969 10 CENTS

MEN WALK ON MOON

ASTRONAUTS LAND ON PLAIN; COLLECT ROCKS, PLANT FLAG

Voice From Moon: 'Eagle Has Landed'

EAGLE (the lunar module): Houston, Tranquility Base here. The Eagle has landed.

HOUSTON: Roger, Tranquility, we copy you on the ground. You've got a bunch of guys about to turn blue. We're breathing again. Thanks a lot.

TRANQUILITY BASE: Thank you.

HOUSTON: You're looking good here.

TRANQUILITY BASE: A very smooth touchdown.

HOUSTON: Eagle, you are stay for T1. [The first step in the lunar operation.] Over.

TRANQUILITY BASE: Roger. Stay for T1.

HOUSTON: Roger and we see you venting'the ox.

TRANQUILITY BASE: Roger.

COLUMBIA (the command and service module): How do you read me?

HOUSTON: Columbia, he has landed Tranquility Base. Eagle is at Tranquility. I read you five by. Over.

COLUMBIA: Yes, I heard the whole thing.

HOUSTON: Well, it's a good show.

COLUMBIA: Fantastic.

TRANQUILITY BASE: I'll second that.

APOLLO CONTROL: The next major stay-no stay will be for the T2 event. That is at 21 minutes 26 seconds after initiation of power descent.

COLUMBIA: Up telemetry command reset to reacquire on high gain.

Neil A. Armstrong moves away from the leg of the landing craft after taking the first step on the surface of the moon

A Powdery Surface Is Closely Explored

By JOHN NOBLE WILFORD

Special to The New York Times

HOUSTON, Monday, July 21—Men have landed and walked on the moon.

Two Americans, astronauts of Apollo 11, steered their fragile four-legged lunar module safely and smoothly to the historic landing yesterday at 4:17:40 P.M., Eastern daylight time.

Neil A. Armstrong, the 38-year-old civilian commander, radioed to earth and the mission control room here:

"Houston, Tranquility Base here. The Eagle has landed."

The first men to reach the moon—Mr. Armstrong and his co-pilot, Col. Edwin E. Aldrin Jr. of the Air Force—brought their ship to rest on a level, rock-strewn plain near the southwestern shore of the arid Sea of Tranquility.

About six and a half hours later, Mr. Armstrong opened the landing craft's hatch, stepped slowly down the ladder and declared as he planted the first human footprint on the lunar crust:

"That's one small step for man, one giant leap for mankind."

His first step on the moon came at 10:56:20 P.M., as a television camera outside the craft transmitted his every move to an awed and excited audience of hundreds of millions of people on earth.

Tentative Steps Test Soil

Mr. Armstrong's initial steps were tentative tests of the lunar soil's firmness and of his ability to move about

The fold

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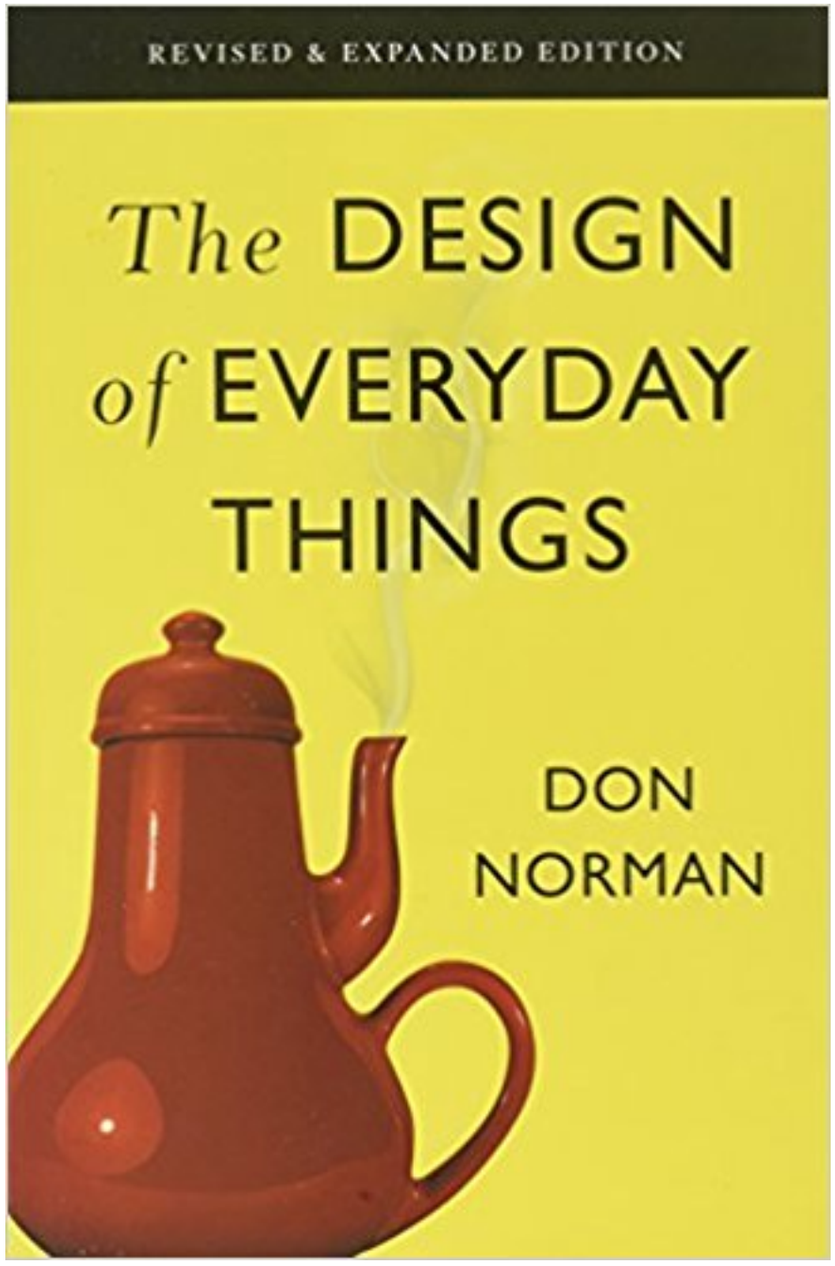

Resources

Usability Goals: Nielson's 5 Goals

https://www.nngroup.com/articles/usability-101-introduction-to-usability/

Design principles: First Principles of Interactive Design
http://www.asktog.com/basics/firstPrinciples.html

Design Rules: 8 Golden Rules

http://www.usask.ca/education/coursework/skaalid/theory/interface.htm