Visual Design

SWE 432, Fall 2018 Web Application Development

With at least 30 new things you won't believe!

#10 will shock you!

(actually we hope you believe it all)



HW4 Discussion Go to: <u>b.socrative.com</u>, Click student login Room name: SWE432 Student ID: Your G-number (Including the G)

Reminder: Survey can only be completed if you are in class. If you are not in class and do it you will be referred directly to the honor code board, no questions asked, no warning.

Today

- Importance of visual design: solving communication problems
- Some guidelines
- A lot of example and anti-examples

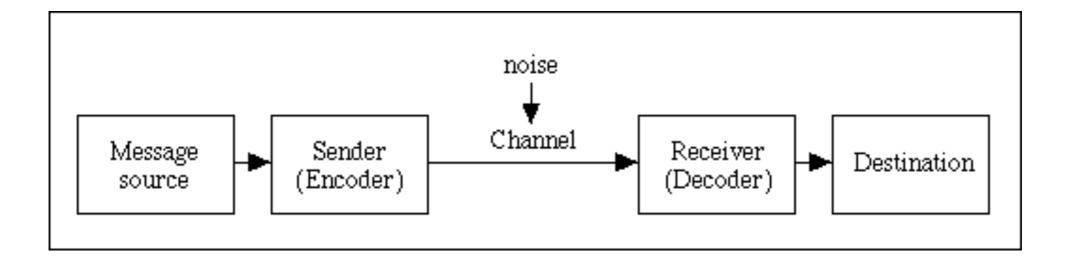
Plus a ton of practical visual guidelines!

Visual design

- Solving **communications problems** in ways that are both functionally effective and aesthetically pleasing.
- Creating a visual language containing a vocabulary of design elements characterized by
 - Visual variables—shape, size, position, orientation, color, texture, ...
 - Organizational relations—balance, structure, proportion, …
 - Visual syntax—rules for assembling elements w/in design language

Visual design as communication

- Goal: efficiently & accurately transmit information from system to user
- Visual variables & organization encode information



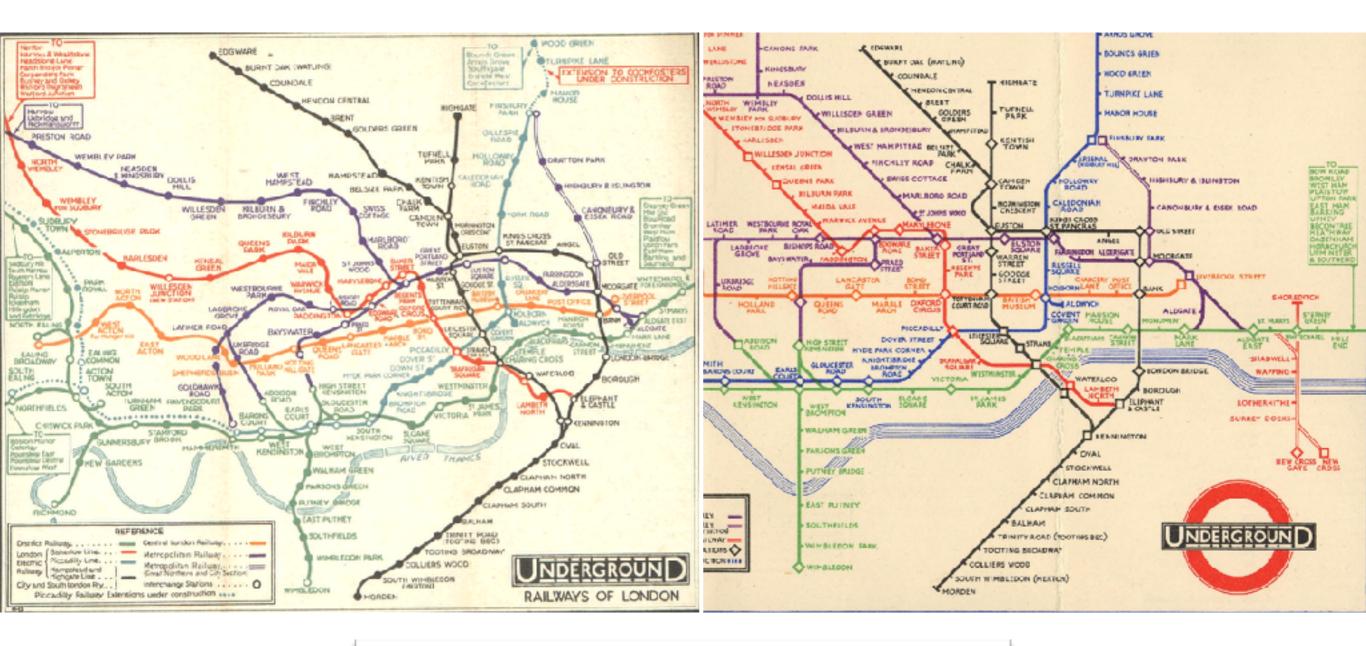
Goals for visual design

- Successfully **transmit** information
- Reduce visual search time through layout & organization
- Create desired emotional reactions through aesthetic choices
- Present coherent & consistent design that reduces ambiguity and potential confusion

Guidelines for Visual Design

Besides using "Marker Felt thin" for callouts!

Guidelines for Visual Design



Consider: Two Subway Maps

Elegance & simplicity

- *Elegance*—derives from Latin eligere, to "select carefully"
- Judicious selection of elements and economy of expression revealing an intimate understanding of problem
- Removing & combining superfluous elements until only the necessary remains



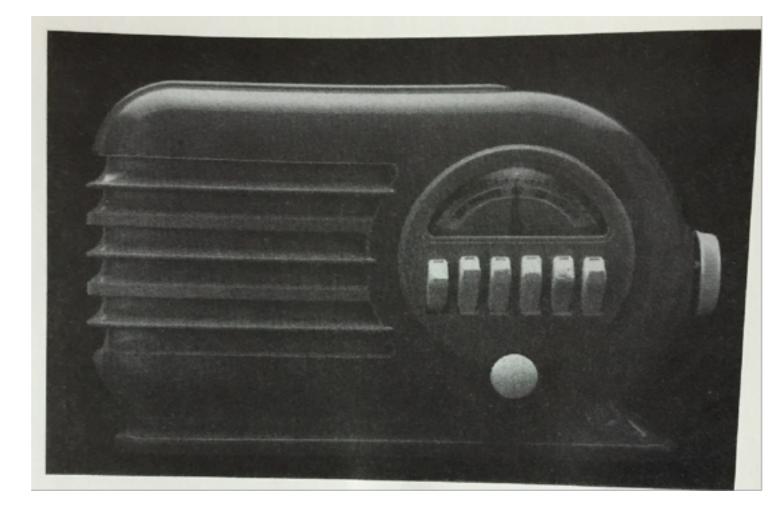
Benefits of simplicity

• Approachability -

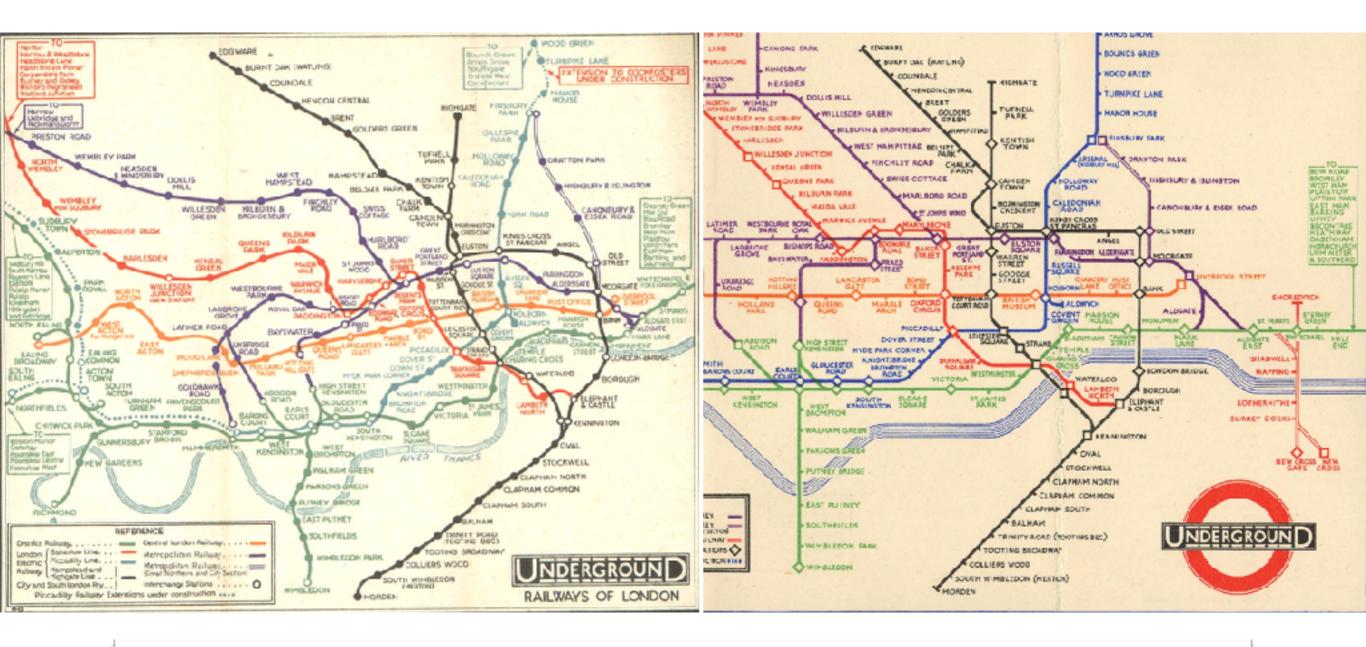
rapidly understood affordances, allowing glanceable understanding of possible interactions

Immediacy -

greater emotional impact because interactions can be quickly understood



Guidelines for Visual Design



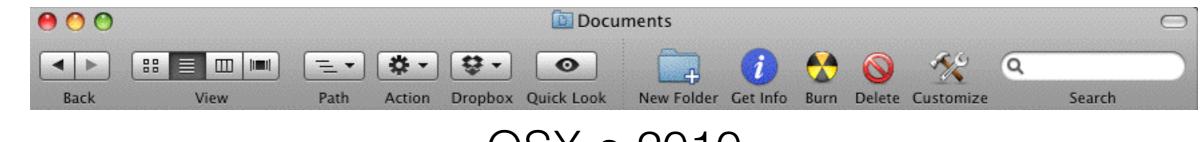
Simplicity in new map: Abstract Geographic Details

Reducing a design to its essence

- Make design simple, bold direct by removing inessential details & elements
 - Even essential elements may be suggested
- 1. Determine essential qualities & information to be conveyed
- Critically examine each element & ask how design would suffer without it.
- 3. Try removing elements. What happens?



Trade-offs in Simplicity



OSX c.2010

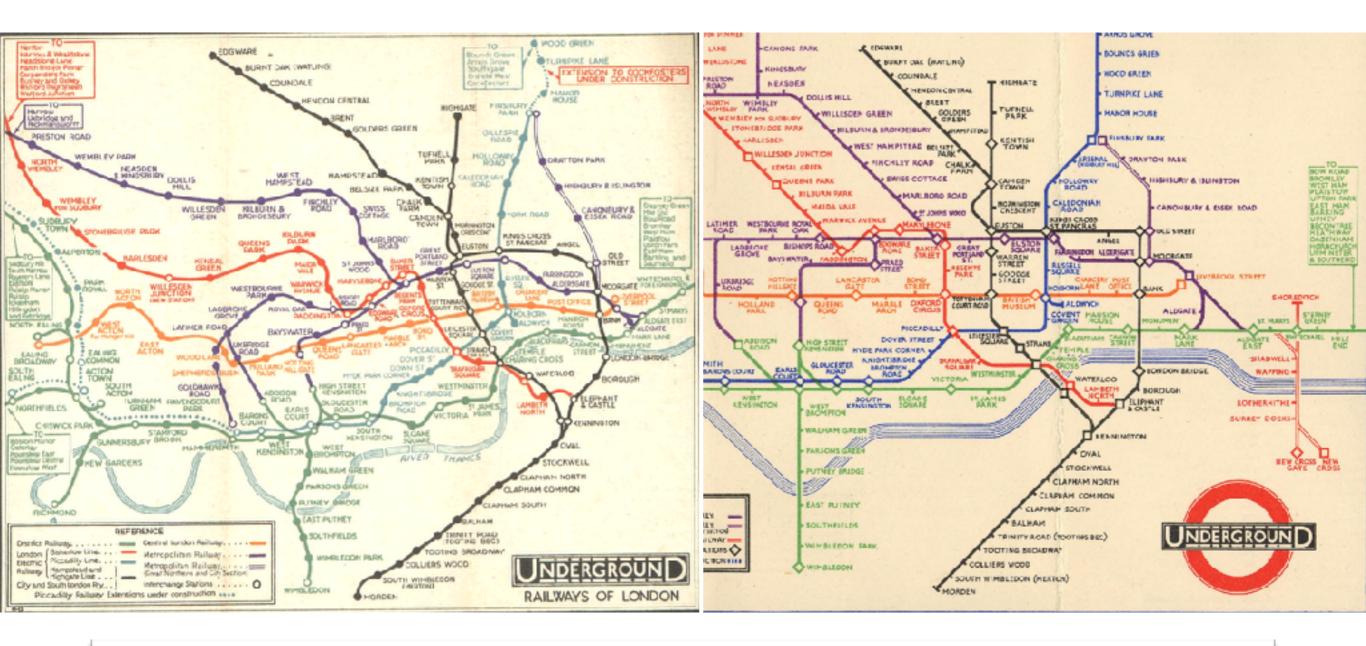
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OSX c.2011



OSX c.2016

Guidelines for Visual Design

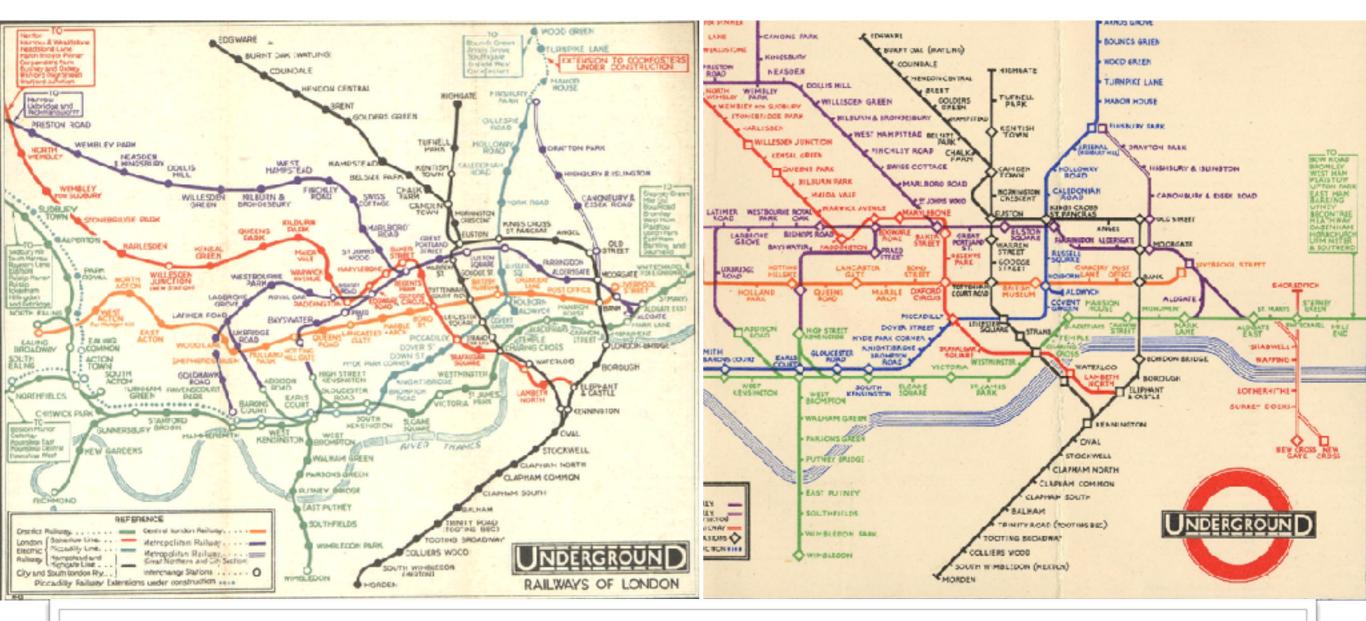


Reduction in new map: relative distances don't matter

Regularizing the elements of a design

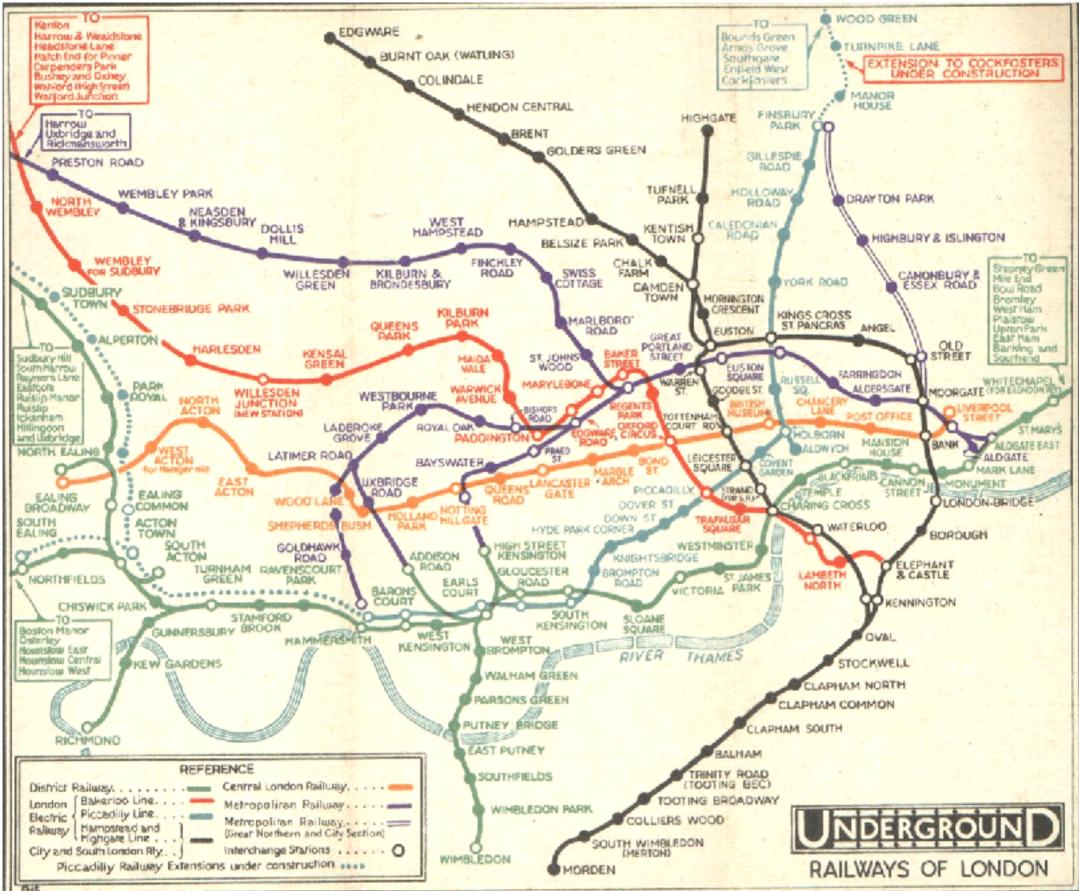
- Reduce information by repeating elements according to a rule, principle or rhythm
- Enable user to scan ahead
- Use irregularity where needed to clarify that something is irregular!
- 1. Use **regular** geometric forms, simplified controls, muted colors where possible
- 2. If multiple similar forms required, make them identical as much as possible in size, shape, color, texture, spacing, alignment
- 3. Limit variation in typography to a few sizes
- 4. Make sure critical elements intended to stand out are **not** regularized

Guidelines for Visual Design



Regularization in new map: Straight lines result in station names laid out in a line, rather than bouncing around

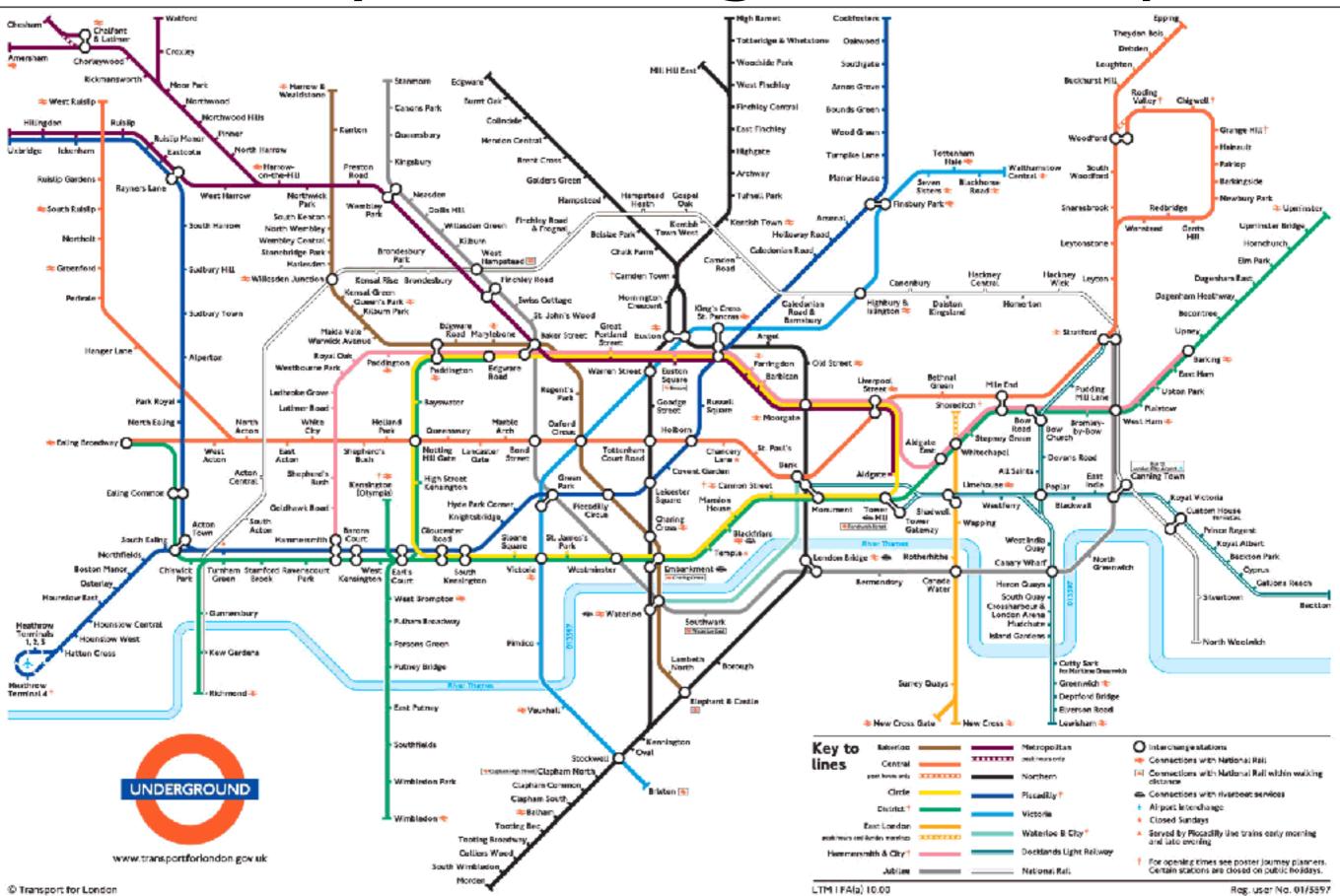
Original (1920's?) Underground Map



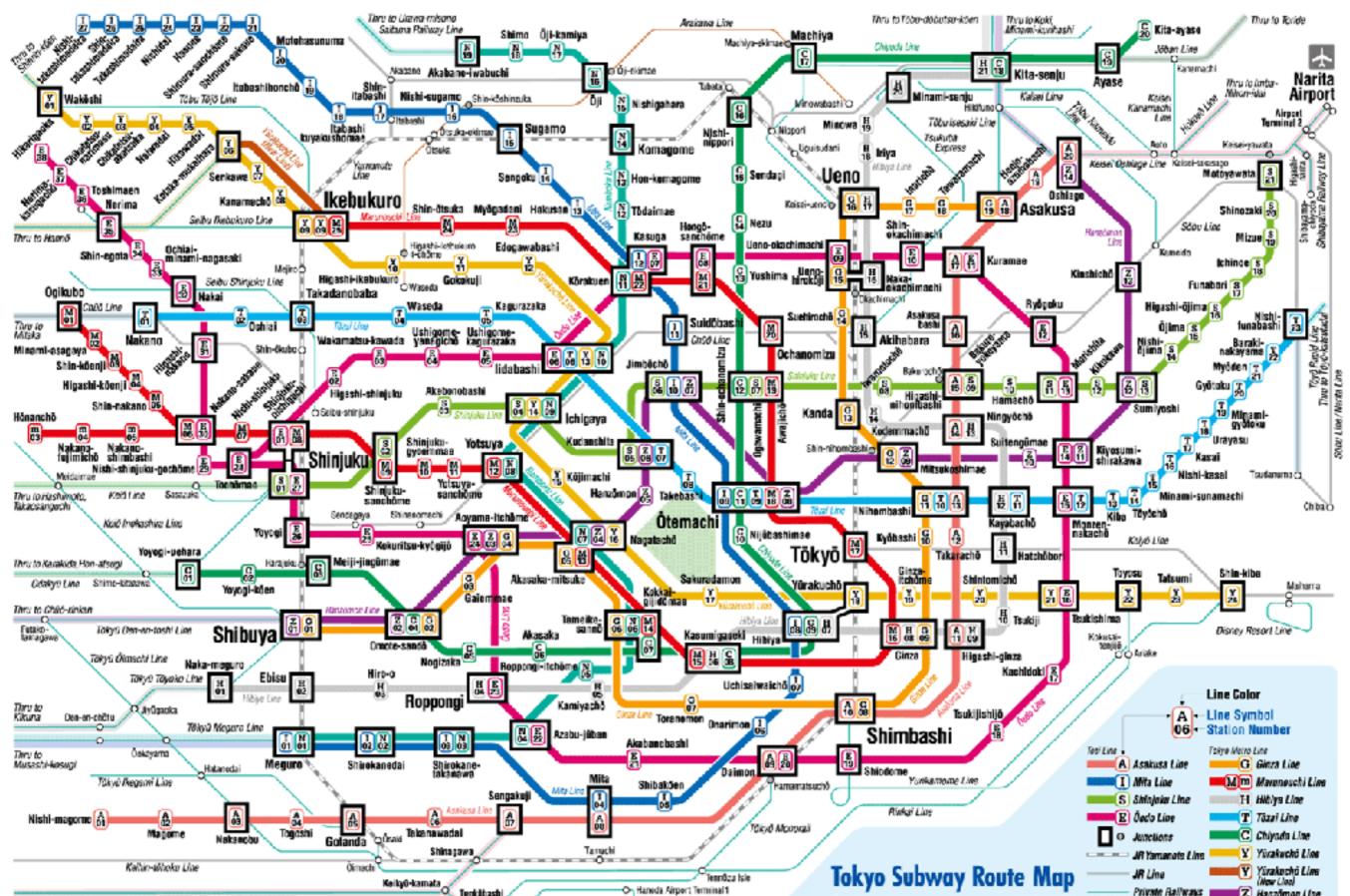
Beck's 1933 Underground Map



Today's Underground Map

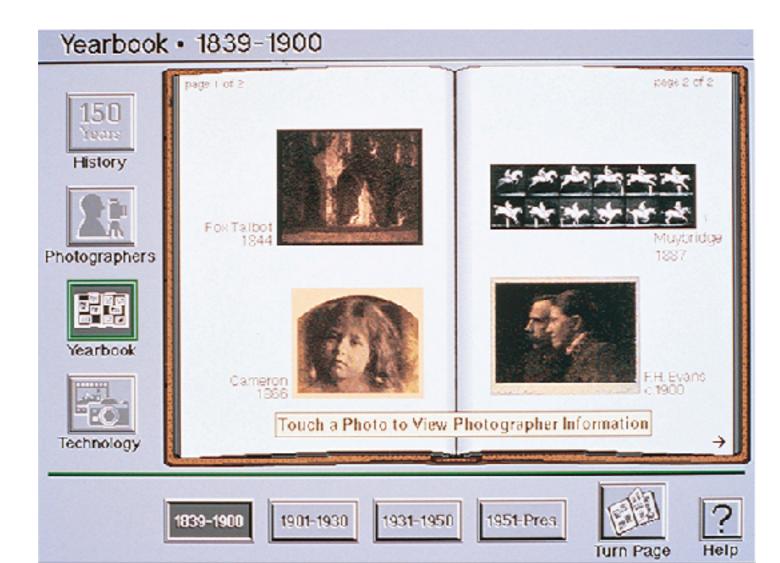


Tokyo Metro Map



Error - excessive skeuomorphism

- Skeuomorphism making visual design resemble reality (like metaphors)
- Excessive skeuomorphism is distracting and wastes potential visual bandwidth that could encode meaningful information



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CAPSULES	May 31
APRIL INVOICES	Apr 30

It's the City Journal Books Podcast: 21st century conversatio... +

2 days ago

Jun 15 11:41 AM It's the City Journal Books Podcast: 21st century conversations for 19th century attention spans.

I'm Joel Mathis, contributing editor to Philadelphia Magazine online.

(Ben)

AND we're joined today by Erica GREEDER. She's a senior editor at Texas Monthly-formerly, she was the southwest correspondent for The Economist. Her work has also appeared in the New York Times, the New York Sun, The Spectator (UK), and More Intelligent Life. And she is currently the author of BIG HOT CHEAP AND RIGHT: WHAT AMERICA CAN LEARN FROM THE STRANGE GENIUS OF TEXAS. Welcome to the podcast

What CAN America learn from the strange genius of Texas?

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In fact, kind of the underlying thesis is that the quote-unquote "TEXAS MODEL" works, "incontrovertibly" you say at the end of the book. So a twopart question: What exactly is the Texas Model? It's not quite simply unfettered free enterprise is it?

The second part of the question is: Who is the model working for? I know you're familiar with the "Texas on the Brink" booklet put out by the state's Democrats in 2011, but let me kind of go through the quick litany here: Texas ranks 50th among the states in the percentage of its population 25 or older

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Monday	July 15	3 PM
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Jacks birthday 11 AM	M to NOON	7 PM
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Calendars

Scale, Contrast, & Proportion

Scale, contrast, & proportion

Information consists of differences that make a difference. (Edward Tufte, Envisioning Information)

Individual visual variables of design that encode information

Terminology

- Scale relative size or magnitude of element in comparison to related elements
- Contrast visually noticeable
 distinctions along a common visual dimension
- Proportion ratio and balance between elements
- Emphasis contrasts can emphasize important elements or areas & add visual interest by creating tension & drama



Train Tables: Which is Better?

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North Elizabeth	1.03	1.51 1.56			6.31 6.36		6.56 7.01	7.11 7.15	7.30 7.32 7.37		7.54 7.59		8.10 8.13 8.18	8.26 8.31	8.46 8.51	9.01 9.06	9.11	9.31 9.36	10.01 10.06	10.31 10.36	10.46	11.01 11.06	11.31 11.36	12.01 12.06
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Principles

- Clarity contrasts should be clear and easily differentiated, not slight and subtle
- Harmony proportions and ratios should be harmonious
- Activity use contrasts to maintain orientation & context within design
- Restraint contrasts should be conscious, strong, few in number, and never overwhelming

Error: Lack of Clarity



Error - excessive typographic contrasts

5 different types sizes in 3 different fonts (!!)

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Show and tell - highlighting visual features

\$92.76 **√prime**

FREE Delivery Monday, Nov. 19 -Tuesday, Nov. 27

Get it Saturday, Nov. 24 if you order within 219 hrs 58 mins and choose paid Saturday Delivery at checkout Details

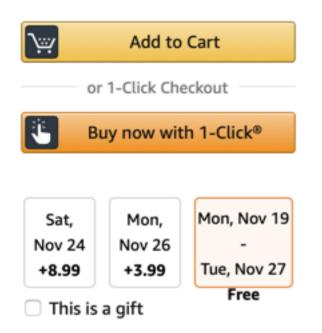
In Stock.

Sold by Market Choice and Fulfilled by Amazon. Gift-wrap available.

Qty: 1 🛊

Add a Protection Plan:

 ASURION 4 Year PC Peripheral Protection Plan (\$75 - \$99.99) for \$1.89
 3-Year Protection for \$1.36



What is (or not) important to the customer and is (or not) visually highlighted?

Good: add to cart/buy buttons; prime logo

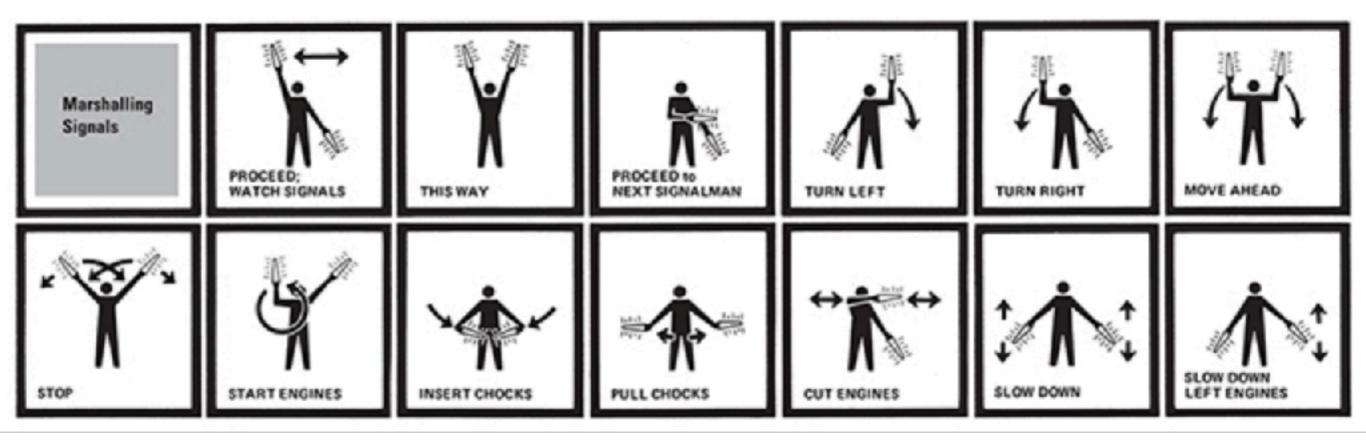
Bad: Screencap taken on Weds Nov 14 ("free prime option" is >7 days!)

Layers

- Contrasting color, value, texture can segregate information into separate layers
- Supports overlapping information in displays, allowing selective processing of specific sets of elements
- Allows different layers to be read and interpreted separately



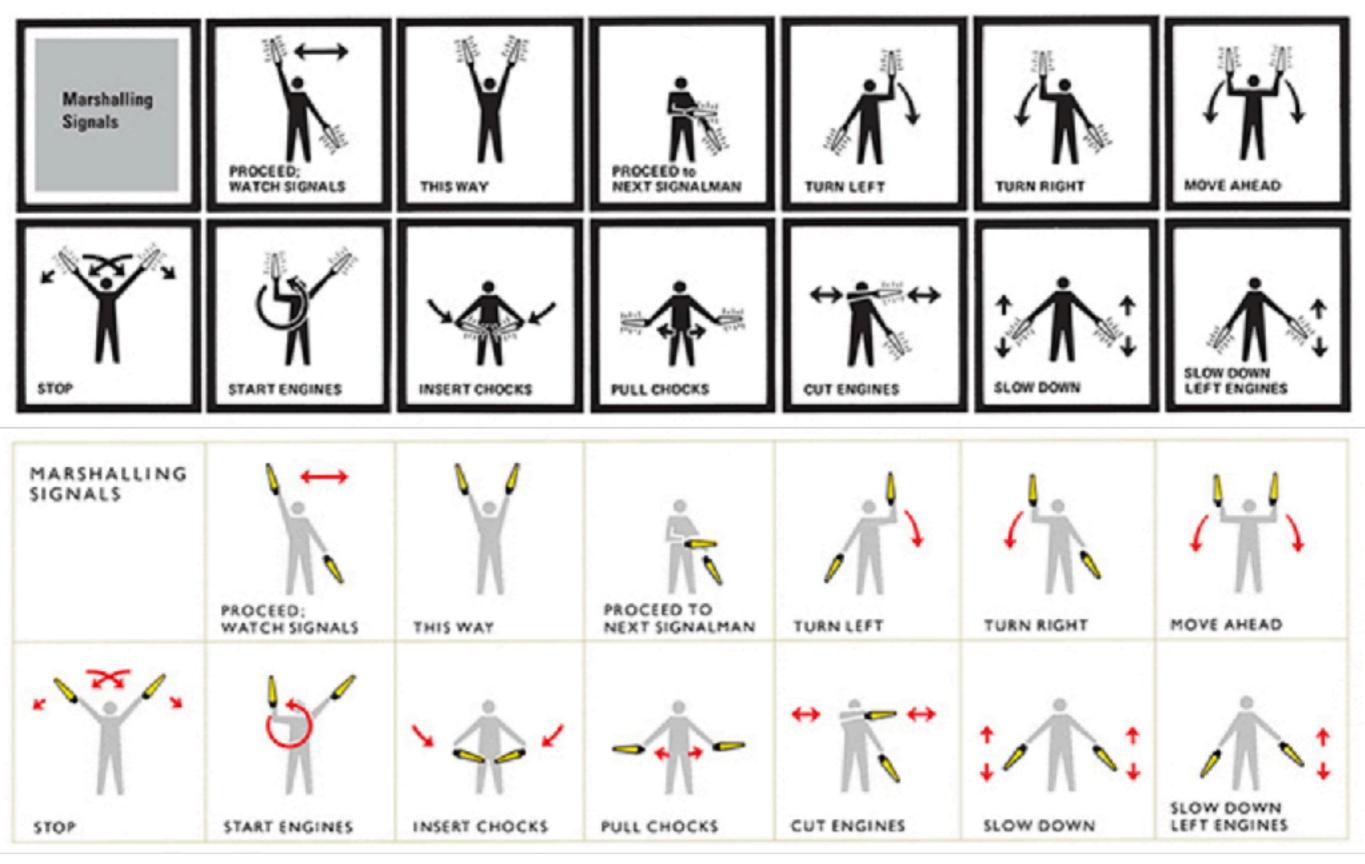
No Layers, Confusing



Creating layers

- 1. Group items into categories based on intended use
- 2. Determine rank & importance of groups
- 3. Use perceptual variables (size, value, hue, etc.) to establish layering effect
- 4. Maximize differences between groups while minimizing differences within groups
- 5. Use squint test to ensure elements in group retain together but visually separated

Layers



Organization & Structure

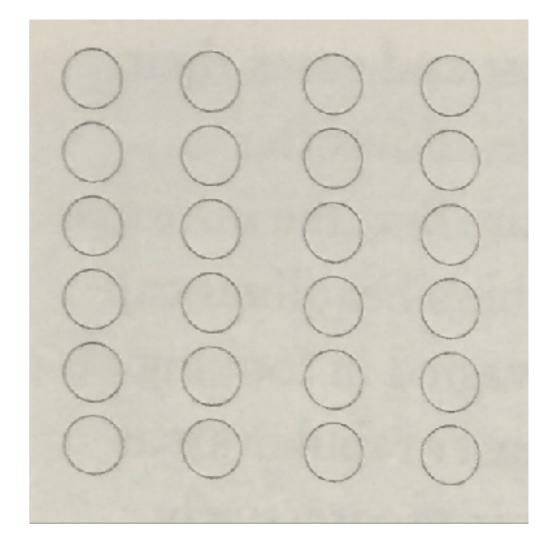
Organization & structure

- Organization needs to be designed
- Benefits
 - Unity ties together related elements so that they work together
 - Integrity & readability offers structure that helps user to easily scan & make comparisons
 - Control determines where user will focus attention in the design
- Gestalt -> psychology of perception

Gestalt principle - Proximity

 Elements associated MOST strongly w/ nearby elements

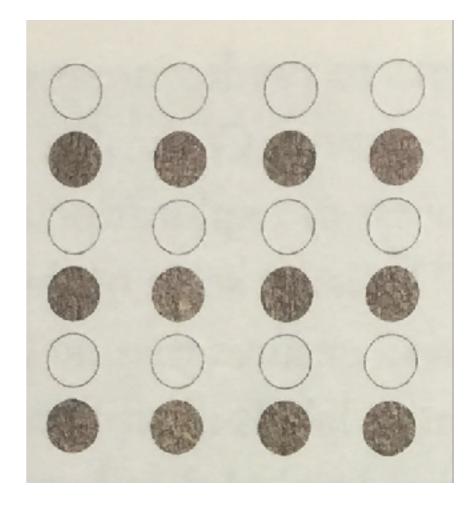
- parsed as 4 columns based on close vertical spacing
- then parsed as two sets of two columns based on spacing



Gestalt principle - Similarity

• Elements associated more strongly when share common visual attributes than when they differ

 parsed as rows based on fill similarity, despite closer column spacing



Gestalt principle - Continuity

 Preference for simplest physical explanation of complex figure

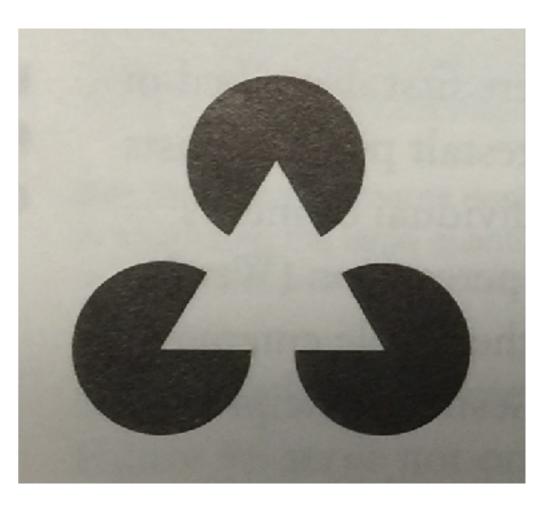
parsed as two lines, rather than 4 separate lines or 4 opposing angles

Gestalt principle - Closure

 Preference to interpret figures as complete, even when missing information

Parsed as triangle superimposed on 3 complete circles, even though none of these is actually present

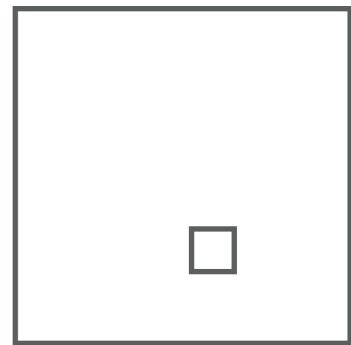




Gestalt principle - Area

 Preference to interpret smaller overlapping elements as figure, larger as ground

Small rectangle parsed as small rectangle on top of larger, rather than hole

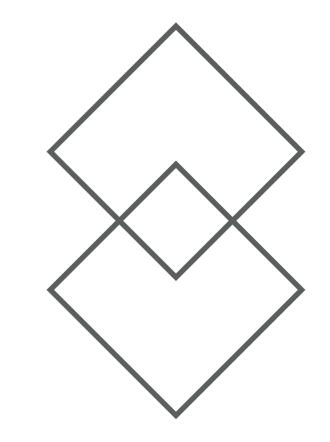




Gestalt principle - Symmetry

 Preference to interpret ambiguous form as multiple symmetric elements

Parsed as two overlapping objects rather than 3 separate shapes



Grouping

- Binding UI elements tightly together while distinguishing them from surrounding controls
- "Showing" note "telling"
- Can be achieved through
 - Bounding boxes (not recommended)
 - Negative space & contrasts
 - Arrangement & alignment

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Hierarchy

Order groups based on perceptual prominence corresponding to intended reading sequence

Can help solve "skimming" problems

Structure can help people focus attention on key parts

Key points might get lost though.

But bolding helps! Plus this obnoxious red arrow and text in a totally different font!

Hierarchy in UIs

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Error - Haphazard layout

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(b)

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Groups are aligned, contents are not

Error - Excessive display density

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tiny font, tons of dead space. fixed by breaking into separate panes

Use negative space

- Directs attention to critical regions of display
- 1. Review design, prioritizing groups
- 2. Add extra **space** to ensure spatial separation & emphasis, particularly for important elements

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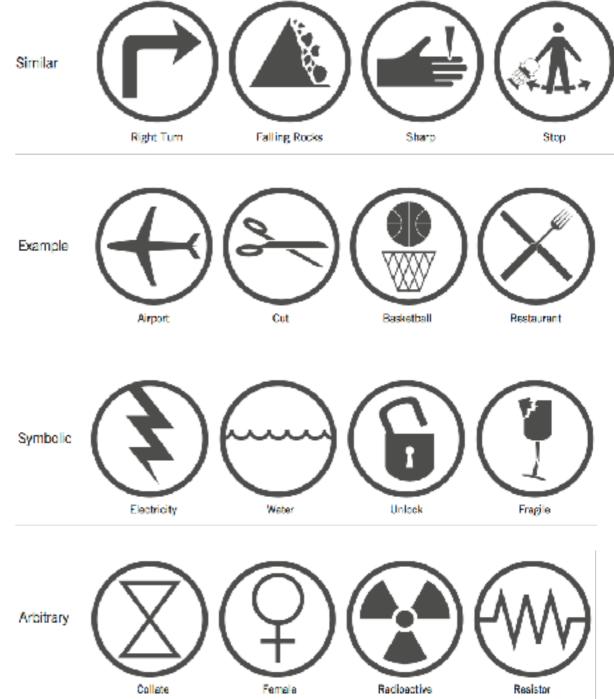
Images & Icons

Images & Icons

- Benefits
 - Identification images are easy to recognize
 - Expression breadth of artistic expression that can make design more engaging & enjoyable

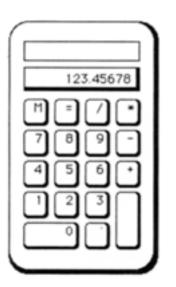
Types of iconic representation

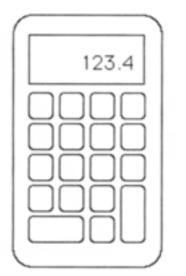
- Similar visually analogous to action, object, concept
- Example things that exemplify or are commonly associated
- Symbolic represent concept at higher level of abstraction
- Arbitrary little or no relationship to concept, must be learned through standard

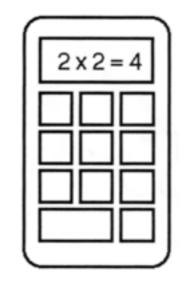


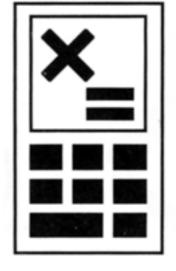
Use of abstraction

- Simplifying highly concrete, realistic representations makes them easier to interpret up to the point at which further abstraction obscures icon's semantics
 - Makes icon more generic, more canonical, less complex











Principles of icon design

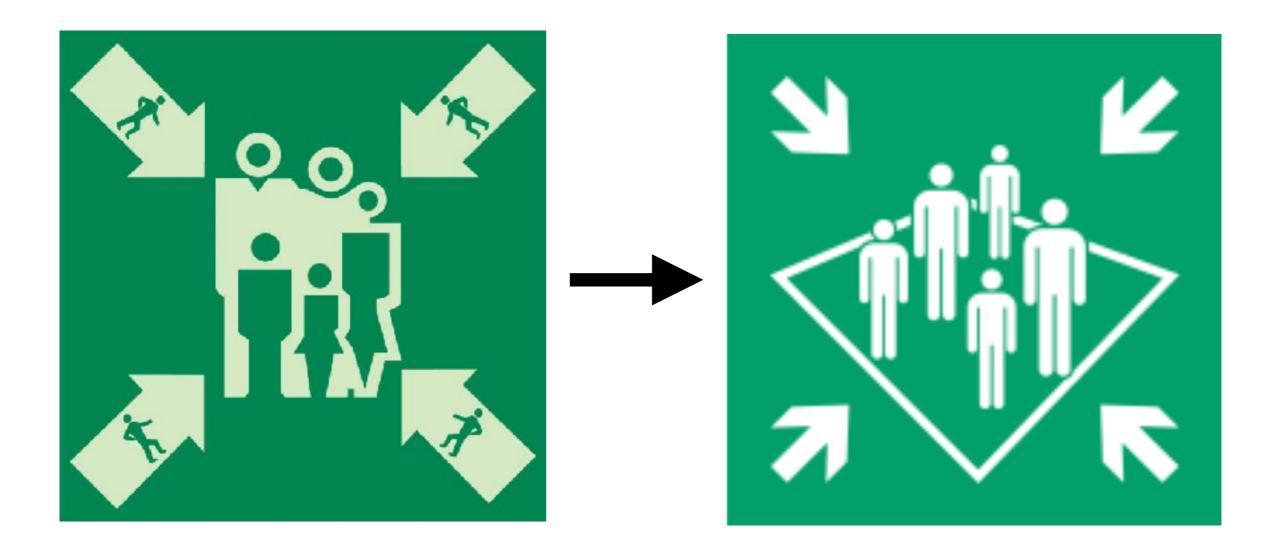
- Immediacy can be perceived effortlessly & involuntarily by being **bold**, clear, balanced
- Generality represents a
 class of items, rather than an
 individual element, by
 removing details that may vary
- Cohesiveness set of icons that function **together** by sharing visual variables
- Characterization call to mind one or more **distinctive** features



Selecting the right type of icon

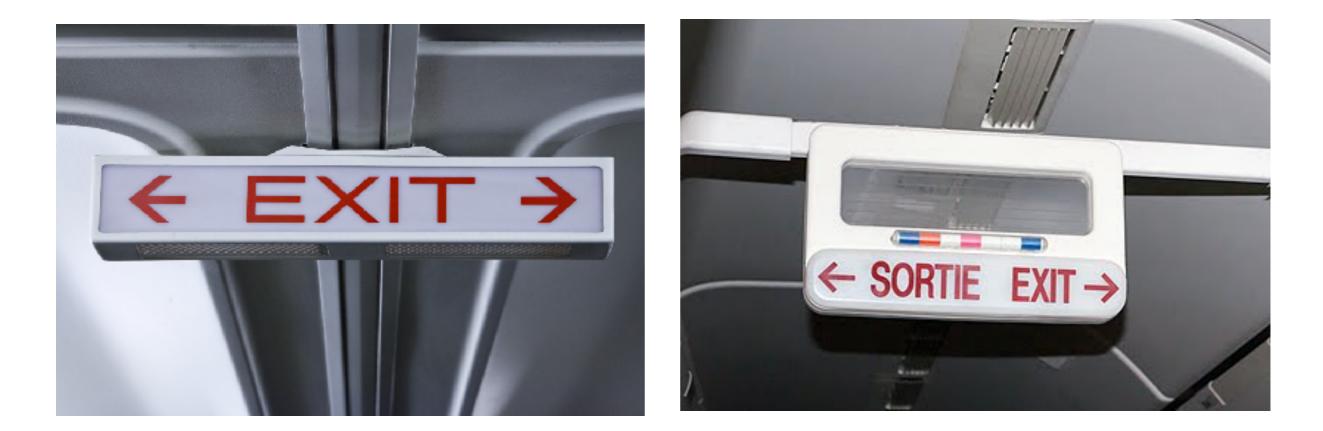
- If concept is concrete, familiar, tangible, use similar or example icon
- If concept will be used repeatedly, consider using more symbolic or arbitrary icon based on convention
- If concept is abstract process or subtle, use textual label

Misleading Syntax



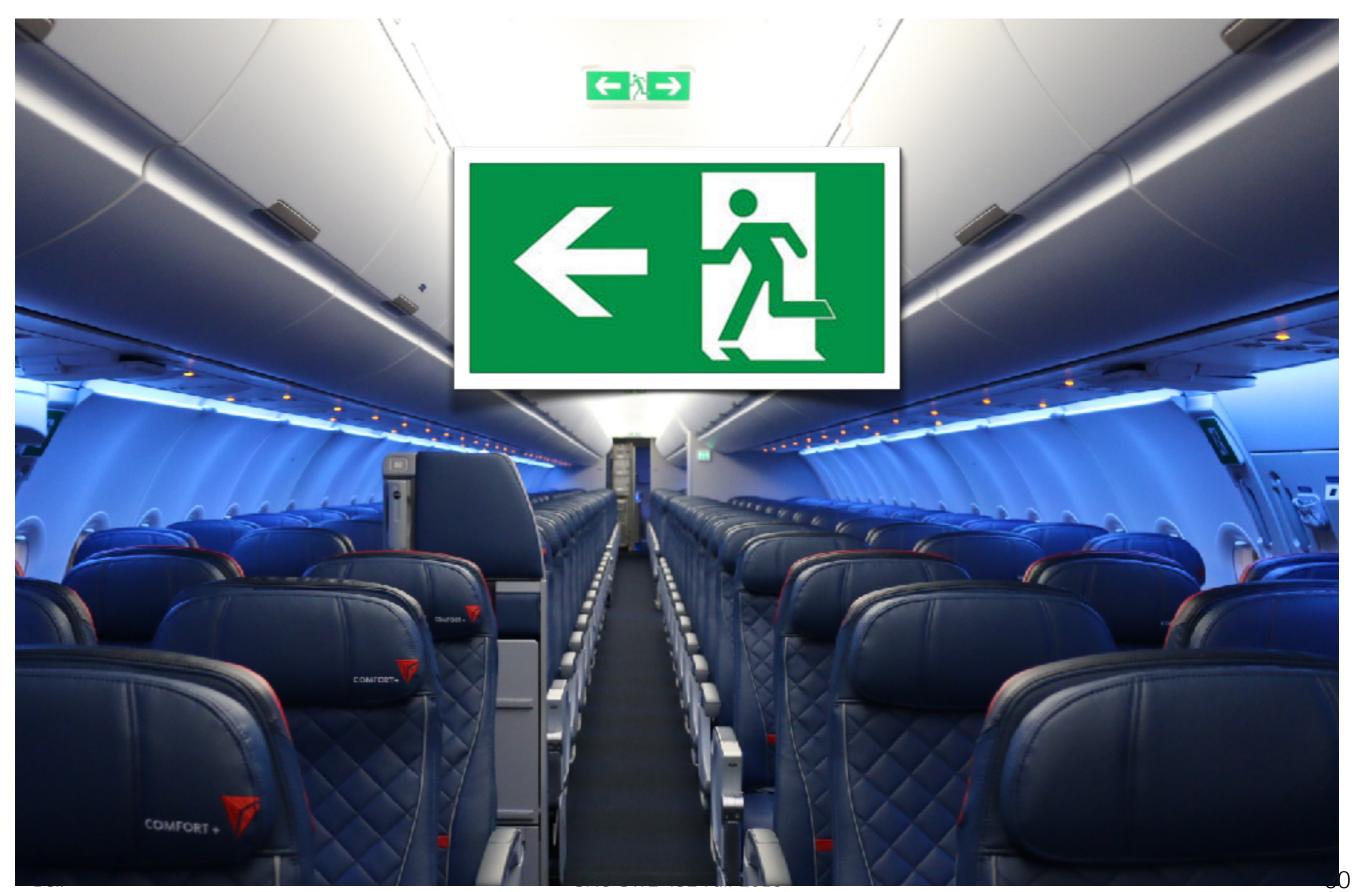
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Cultural Errors: Airplane Exit Signs

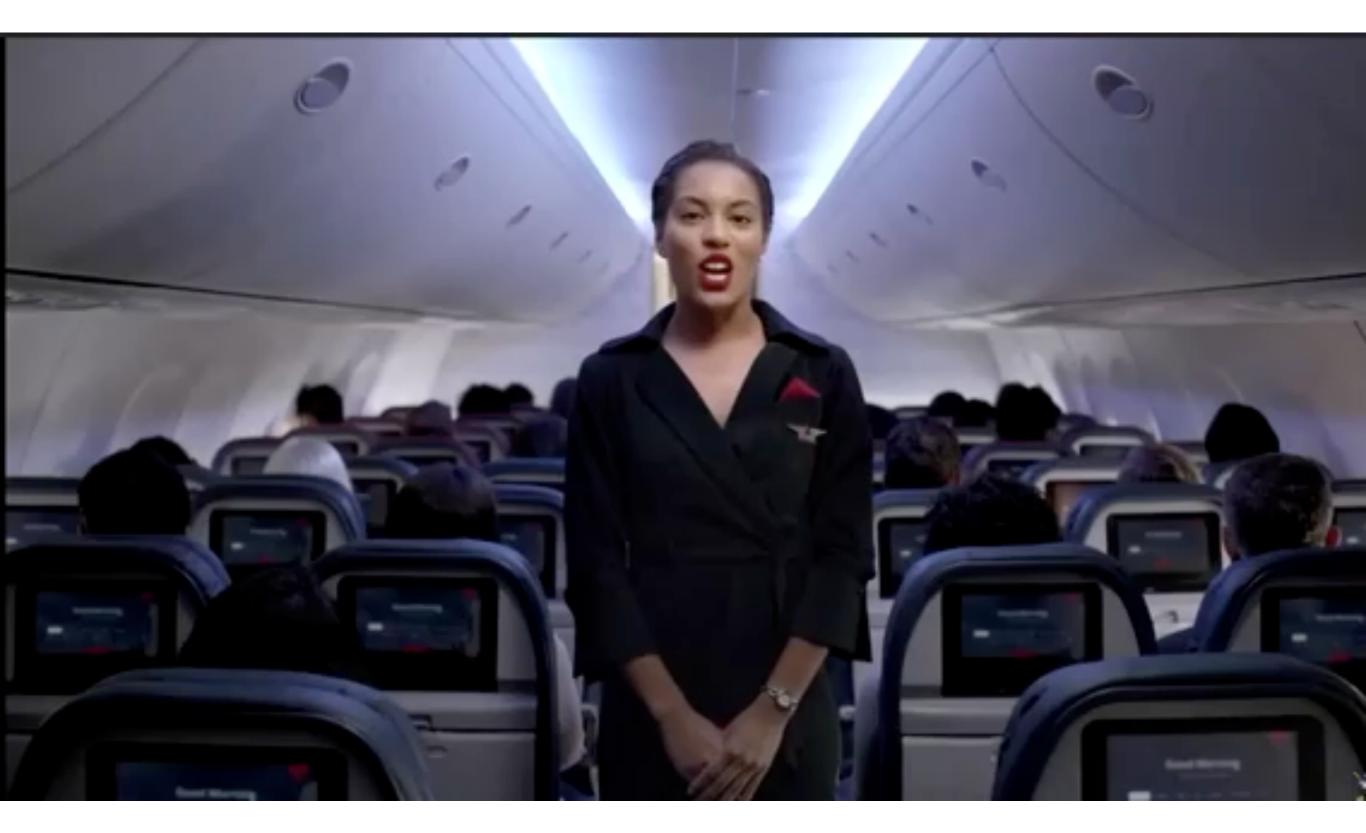


"Please be aware that the nearest exit may be located behind you."

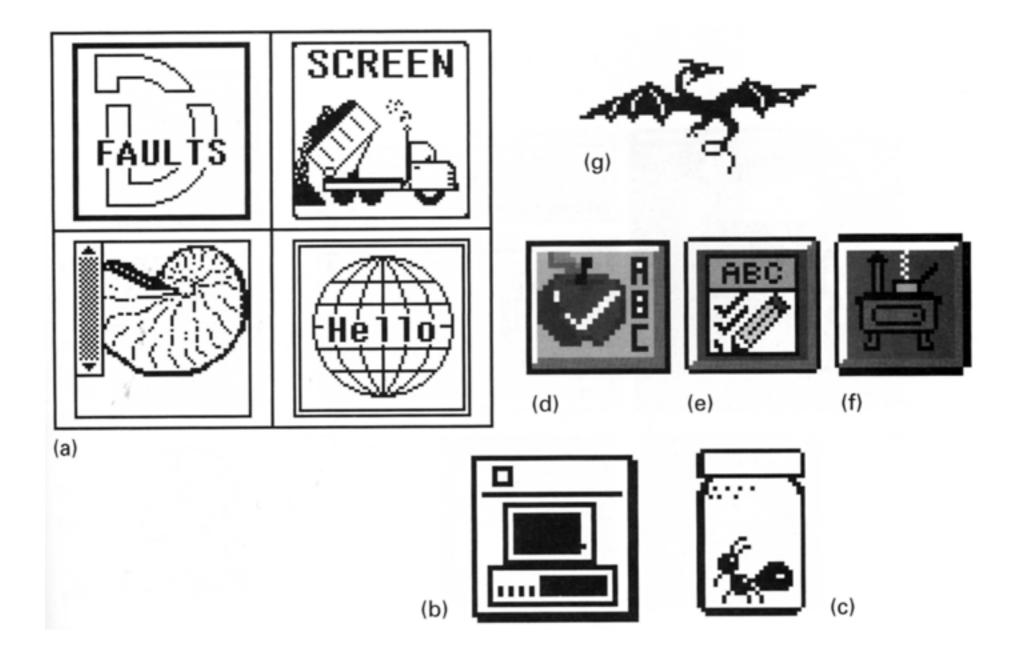
New Airbus Exit Sign



New Airbus Exit Sign



Error - Cultural or language dependence



Activity: OS 10.2 Preferences Icons

0 0		9	System Prefere	nces		
Show All	Displays Sound	Network	Startup Disk			
Personal						
		File New	3		1	P
Desktop	Dock	General	International	Login Items	My Account	Screen Effects
Hardware						
\bigcirc	<u>(</u>			<u> </u>	\bigcirc	
CDs & DVDs	ColorSync	Displays	Energy Saver	Keyboard	Mouse	Sound
Internet &	Network					
		Ø	1			
Internet	Network	QuickTime	Sharing			
System						
11	Q	A		٥	?	\bigcirc
Accounts	Classic	Date & Time	e Software Update	Speech	Startup Disk	Universal Access

Best 3, worst 3 and why? Then: How to make worst 3 better?

	< >)	System Pre	eferences	(Q Se	arch
General	Desktop & Screen Saver	Dock	Mission Control	Language & Region	Security & Privacy	Spotlight	Notifications
Displays Displays Startup Disk	Energy Saver	Keyboard	Mouse	Trackpad	Printers & Scanners	Sound	lnk
iCloud	(Q) Internet Accounts	App Store	Network	Bluetooth	Extensions	Sharing	
Users & Groups	Parental Controls	Siri	Date & Time	Time Machine	Accessibility		
TeX Distribution							

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