

CS 498RK

SUMMER 2017

DESIGN

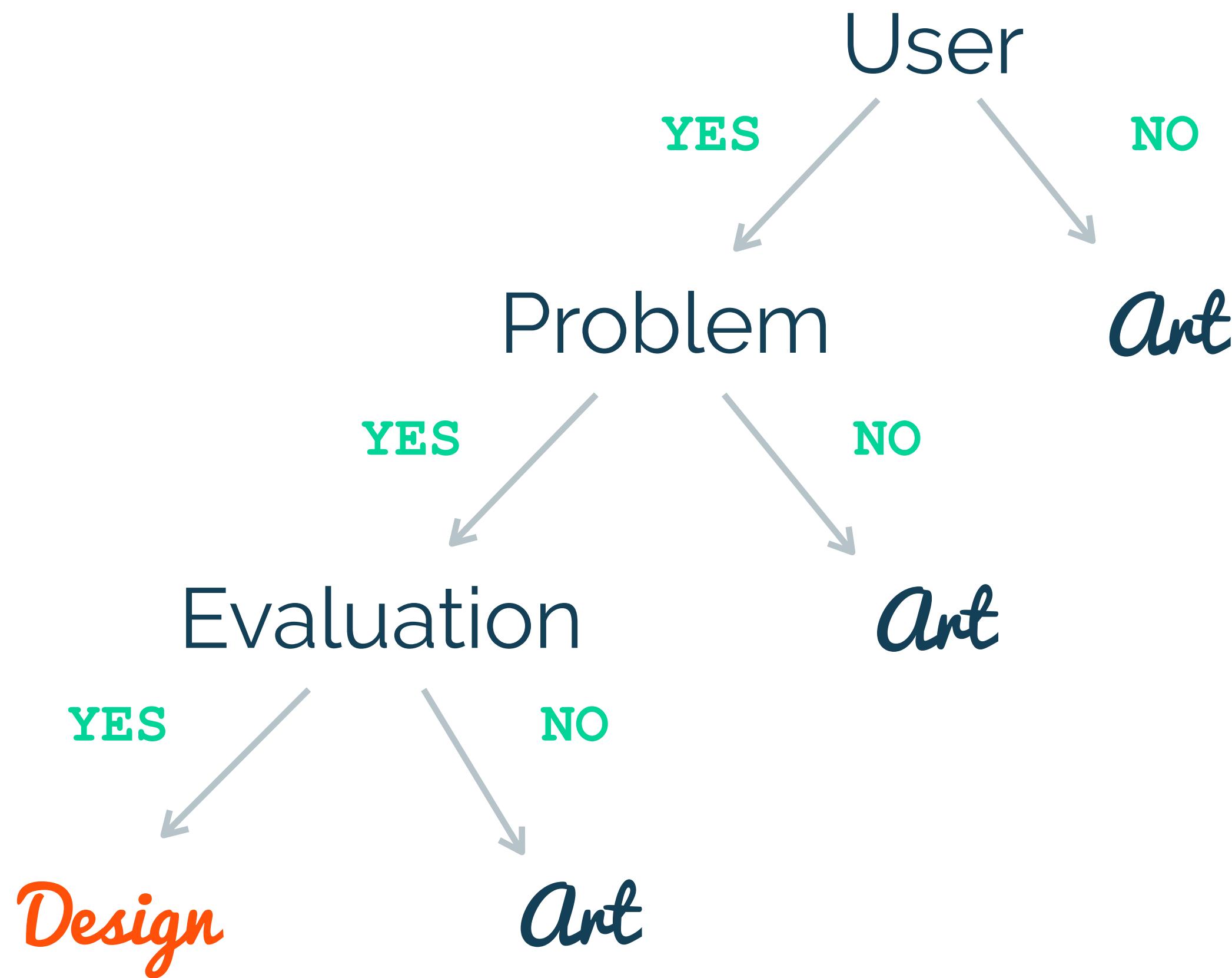
*What is Design?*

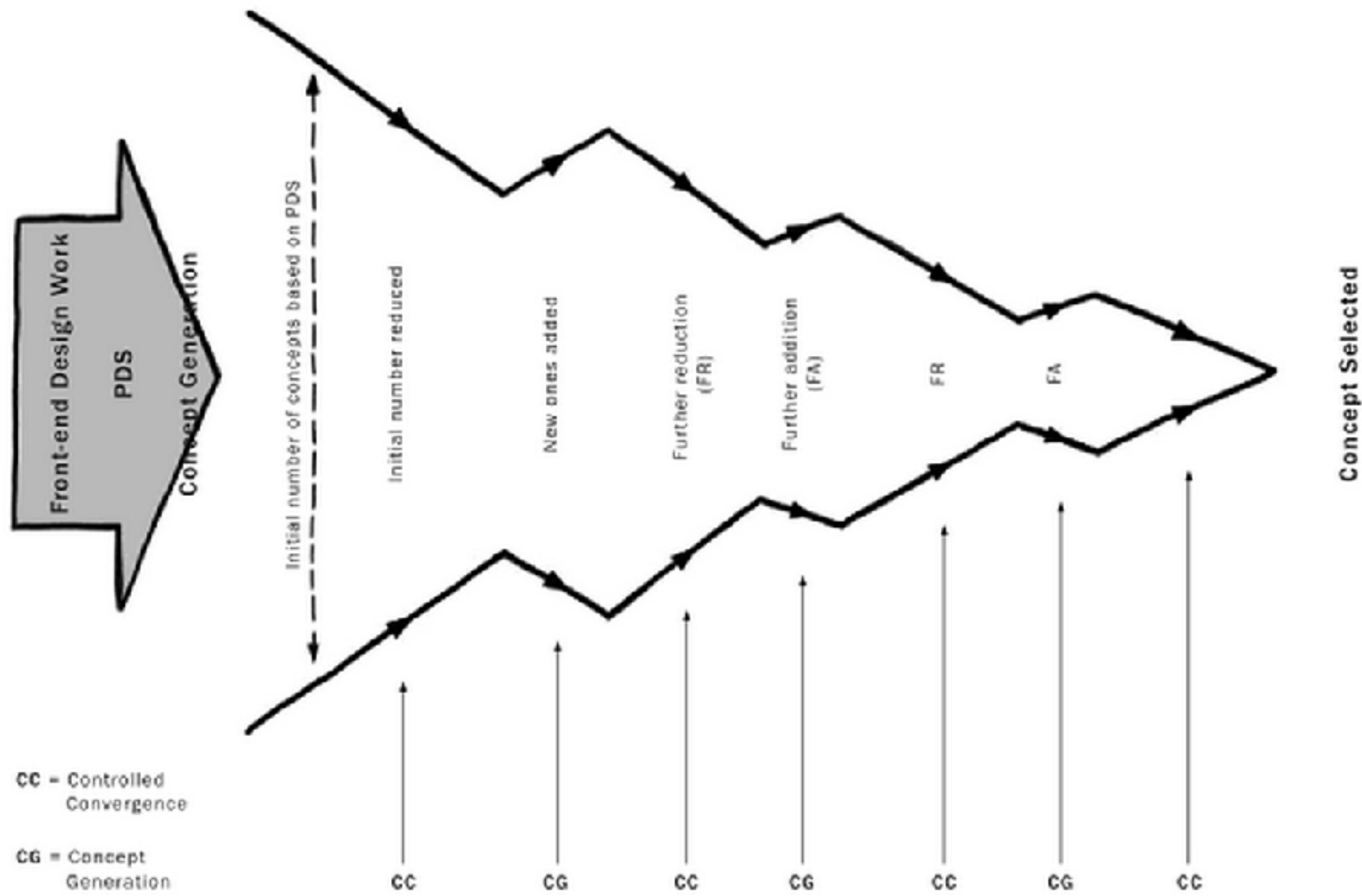
# “DESIGN IS DOING THINGS WITH INTENTION,

*trying to decide what's important to somebody, building a bunch of prototypes and showing them around, developing a point of view and getting it out so that it has impact in the world. So design is really a process of making impact on the world by doing this kind of creation of something new to the world and then getting it out there.”*

David Kelley

<http://boingboing.net/2012/09/22/design-thinking-for-social-goo.html>





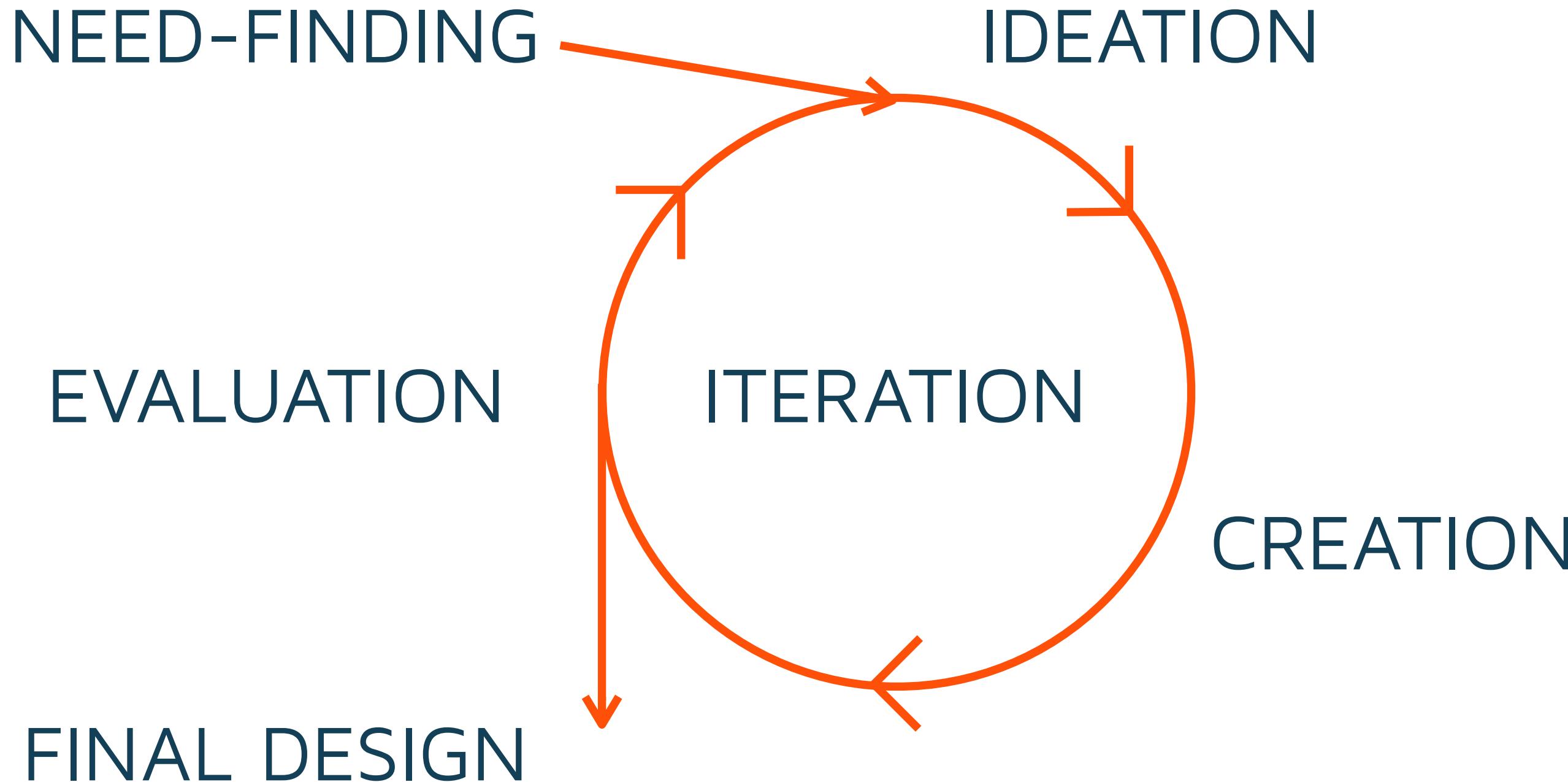
# “DESIGN IS CHOICE,

*and there are two places where there is room for creativity:*

- 1. the creativity that you bring to enumerating meaningfully distinct options from which you choose*
- 2. the creativity that you bring to defining the criteria, or heuristics, according to which you make your choices.”*

Bill Buxton  
*Sketching User Experiences*

# THE DESIGN PROCESS



# DESIGN IS *Wicked* HARD

indeterminate, incomplete, contradictory, and  
changing requirements

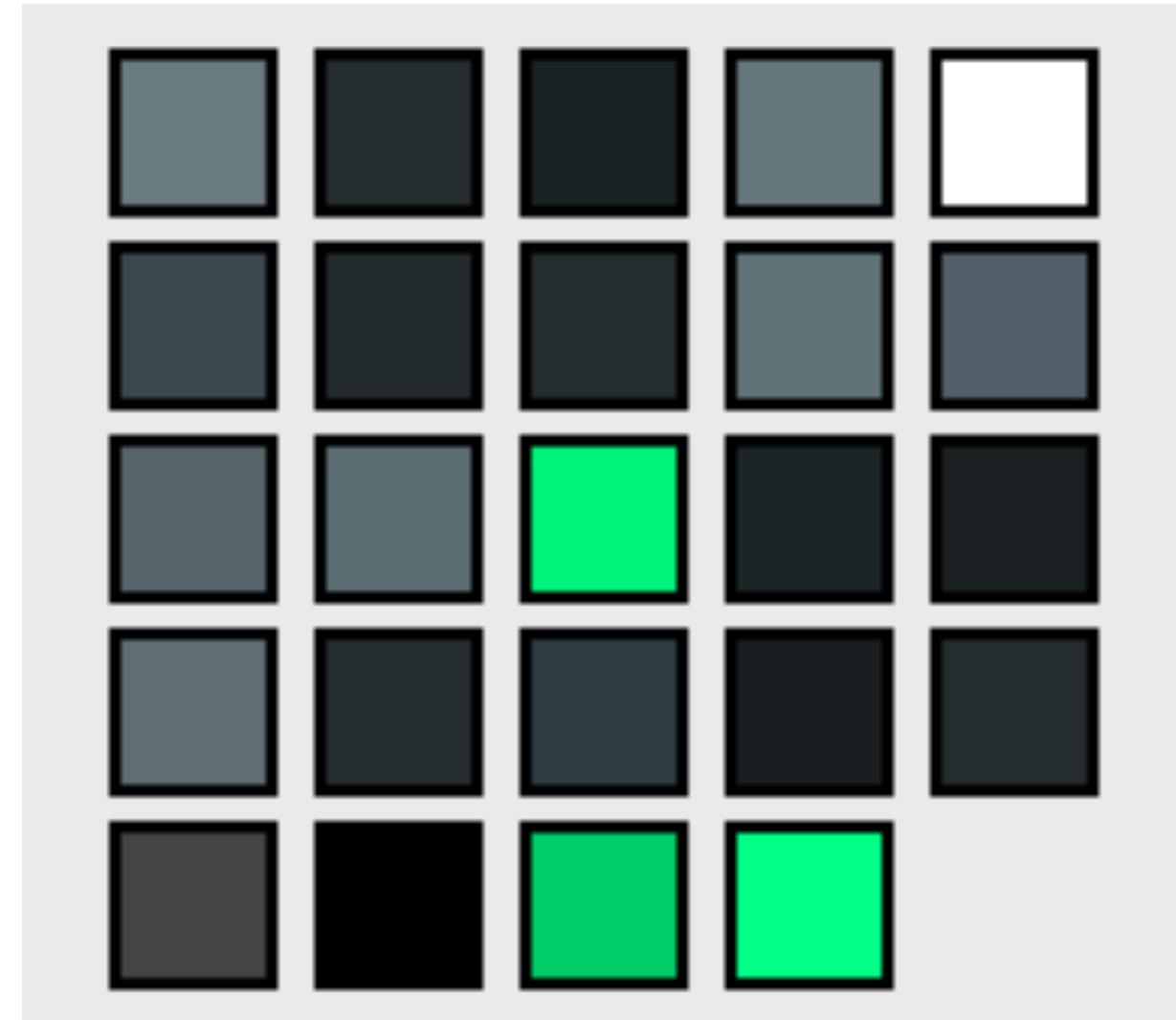
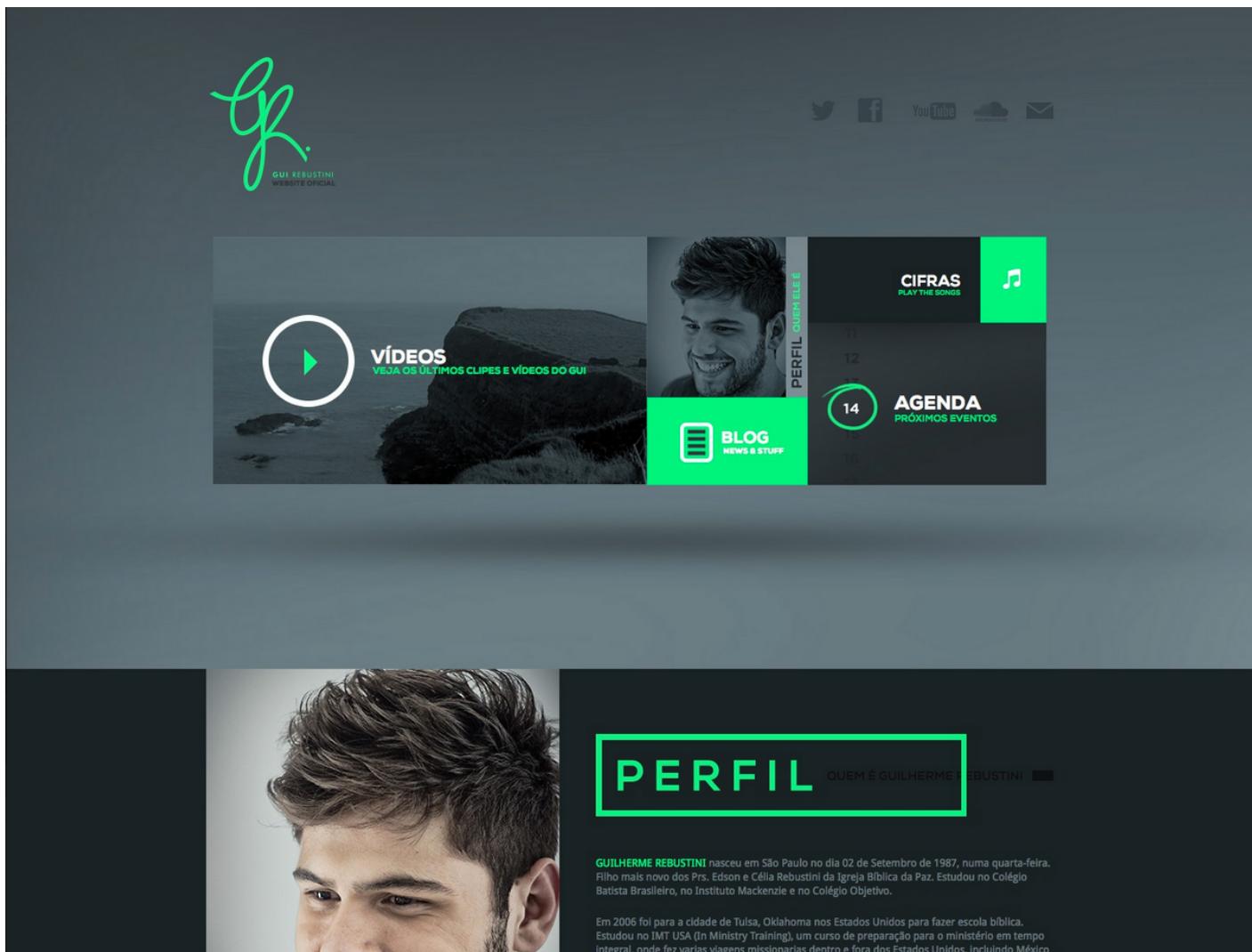
*Wicked Problem*

Exploring enough of the solution space

Evaluating amongst alternatives

Knowing when you're done

# NUMBER OF DESIGN DECISIONS



Fifty Shades of Grey

*What is Good Design?*

# MENTAL MODELS

User's understanding of how  
something works

Inferred from the interacting with  
the design

# MENTAL MODEL

Good design communicates the right mental model

Bad design: designer's model differs from user's model

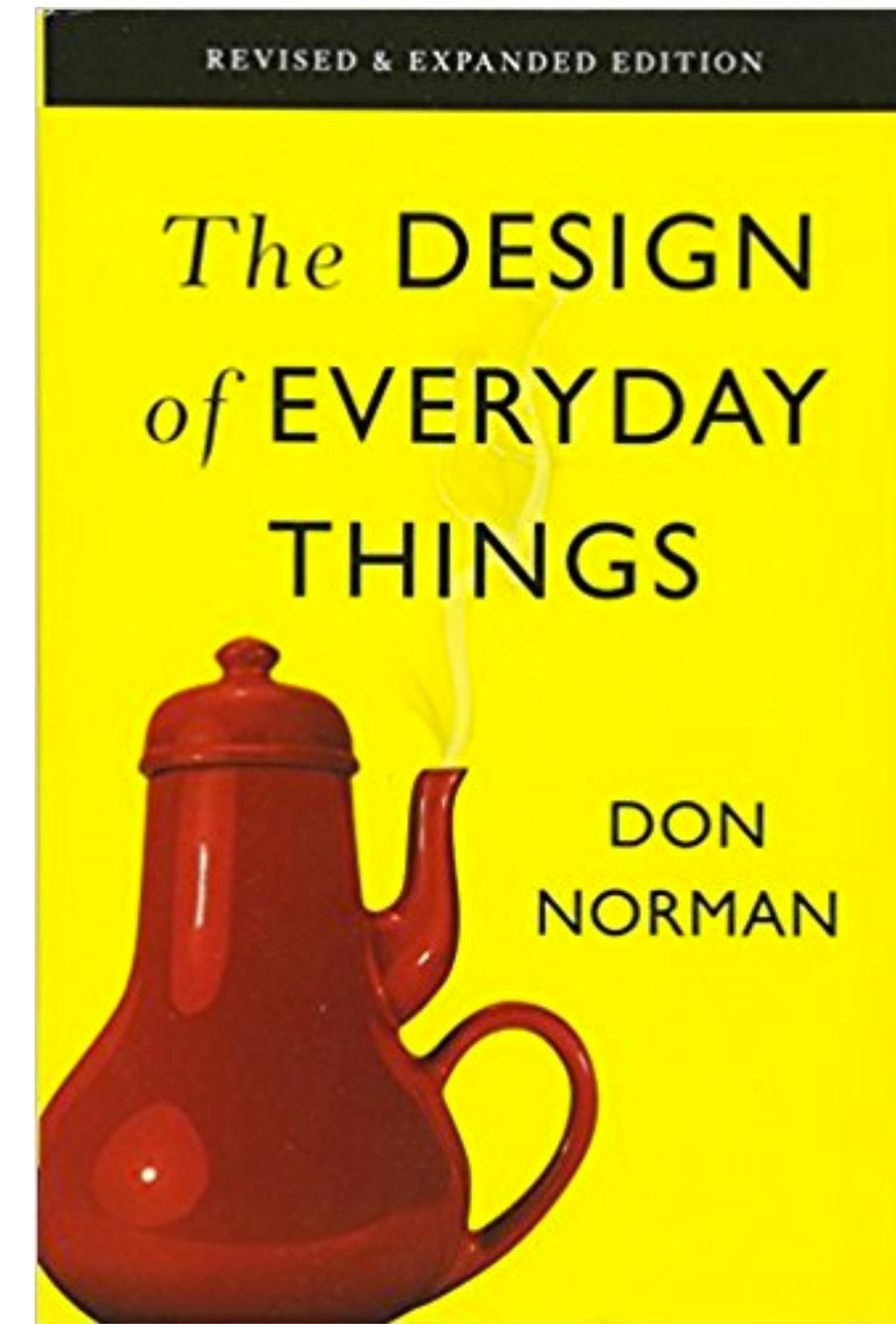
*Intention vs Perception*



clear **mapping** between  
controls and functionality

*not a natural mapping!*

# RECOMMENDED READING



# *The Web Design Process*

# DISCOVERY

*a.k.a. Need-Finding, Research*

figure out with the client what to build

analyze previous designs, competitors' designs

understand audience/users

determine scope, requirements, and constraints

Deliverable: Product Requirements Document (PRD)

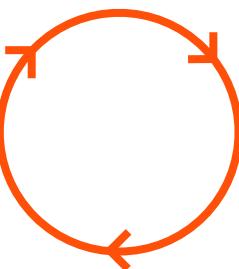
# DISCOVERY

PRD

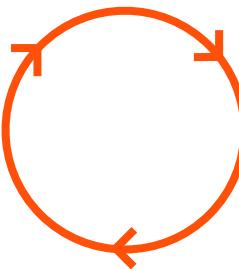


# DESIGN

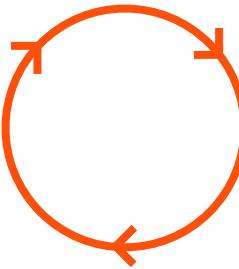
UI/UX Design



Information and  
Navigation Design



Visual Design



takes up to 50% of  
total project time

*many distinct concepts  
are explored*

*More on prototypes...*

# PROTOTYPES

Cheap and fast

Spectrum of fidelity

Multi-resolution design

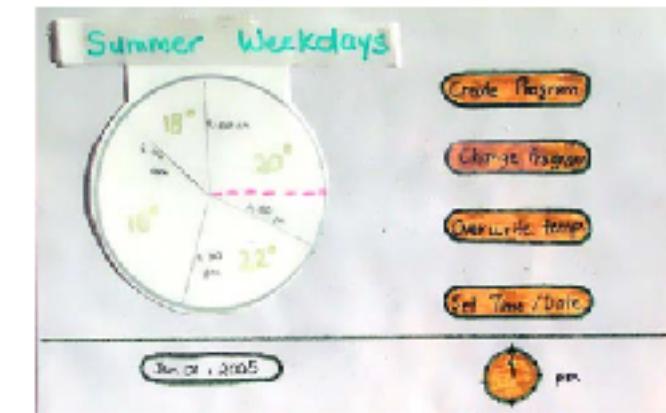
Tools: paper & pen, powerpoint,  
photoshop, balsamiq

# TYPES OF PROTOTYPES

Storyboarding



Paper prototypes



Video prototypes

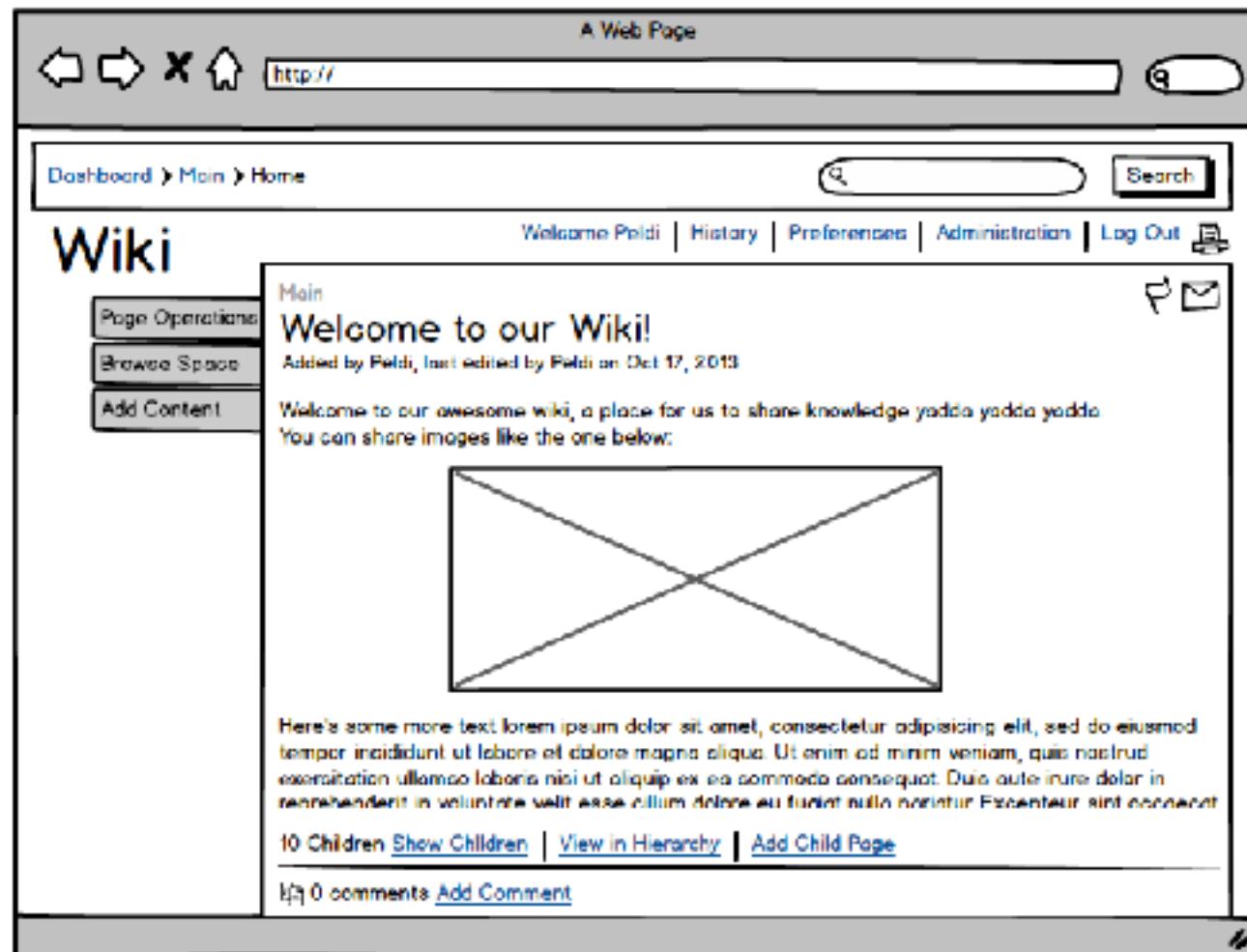
Functional prototypes

*higher fidelity*

# WIREFRAMES

## a.k.a. Schematics

Balsamiq



*not the final visual design*

content (information, navigation, interface elements) and layout

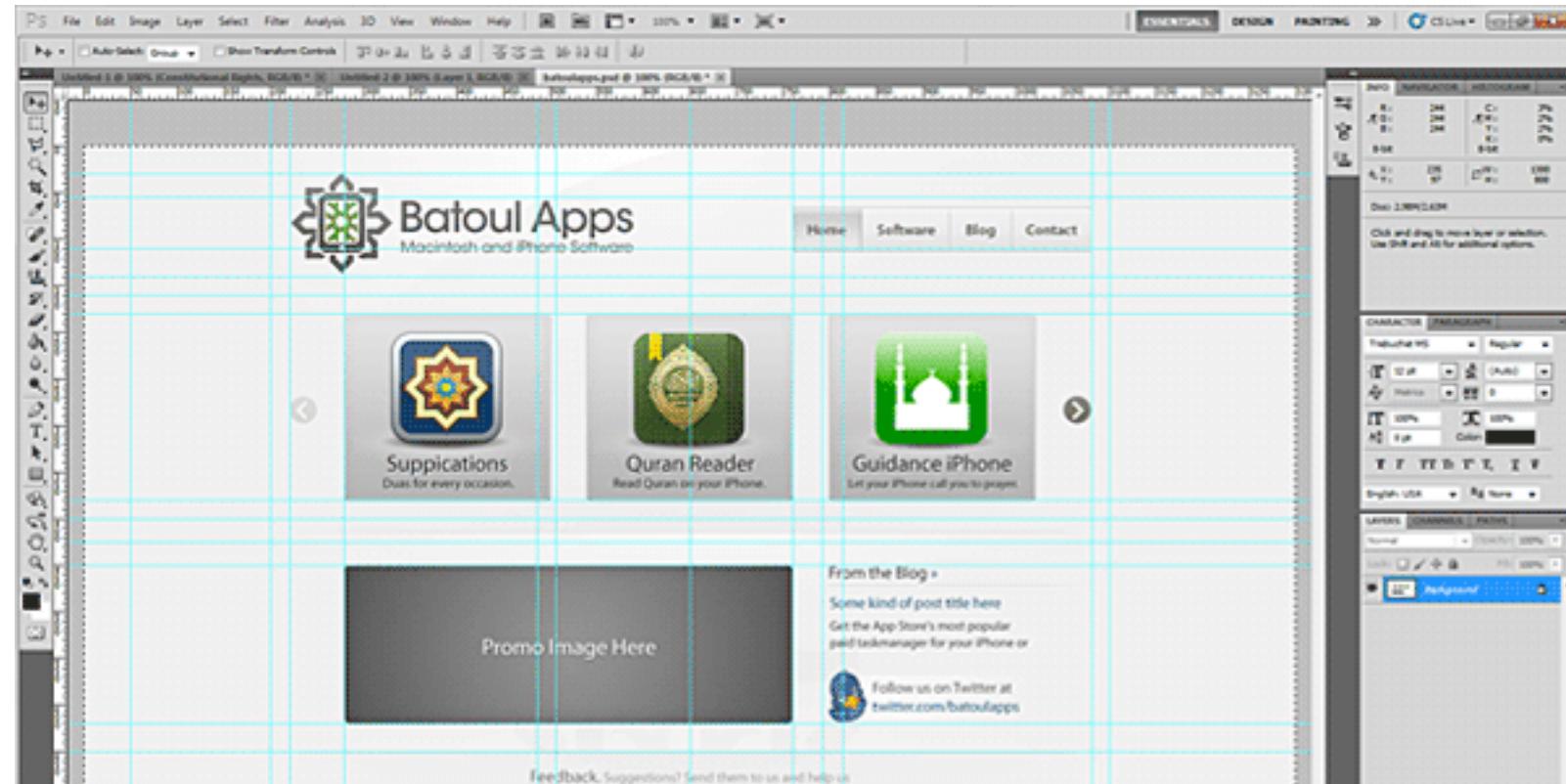
mixture of real content and annotated placeholders (images)

variations in color, typography used to differentiate different types of content

# MOODBOARDS



# MOCKUPS



high-fidelity prototypes of visual design

static: created in Photoshop, Illustrator, Sketch

WHY LOW TO HIGH FIDELITY?

# HIGH-FIDELITY MAKES IT HARD TO...

get useful feedback

get the right feedback

iterate quickly

calibrate clients

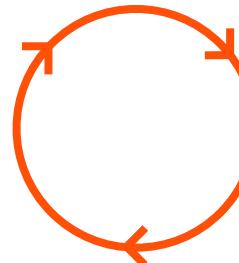
# *Separation of Design and Development*

DISCOVERY

PRD



DESIGN

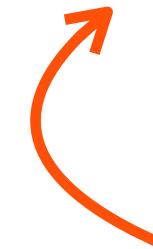


mockups and style guides



PRODUCTION

# VISUAL DESIGN



*a.k.a. Graphic Design*

# GOALS OF VISUAL DESIGN

structure content: relative importance,  
relationships, ordering

richer experience: branding

# WHY IS VISUAL DESIGN IMPORTANT?



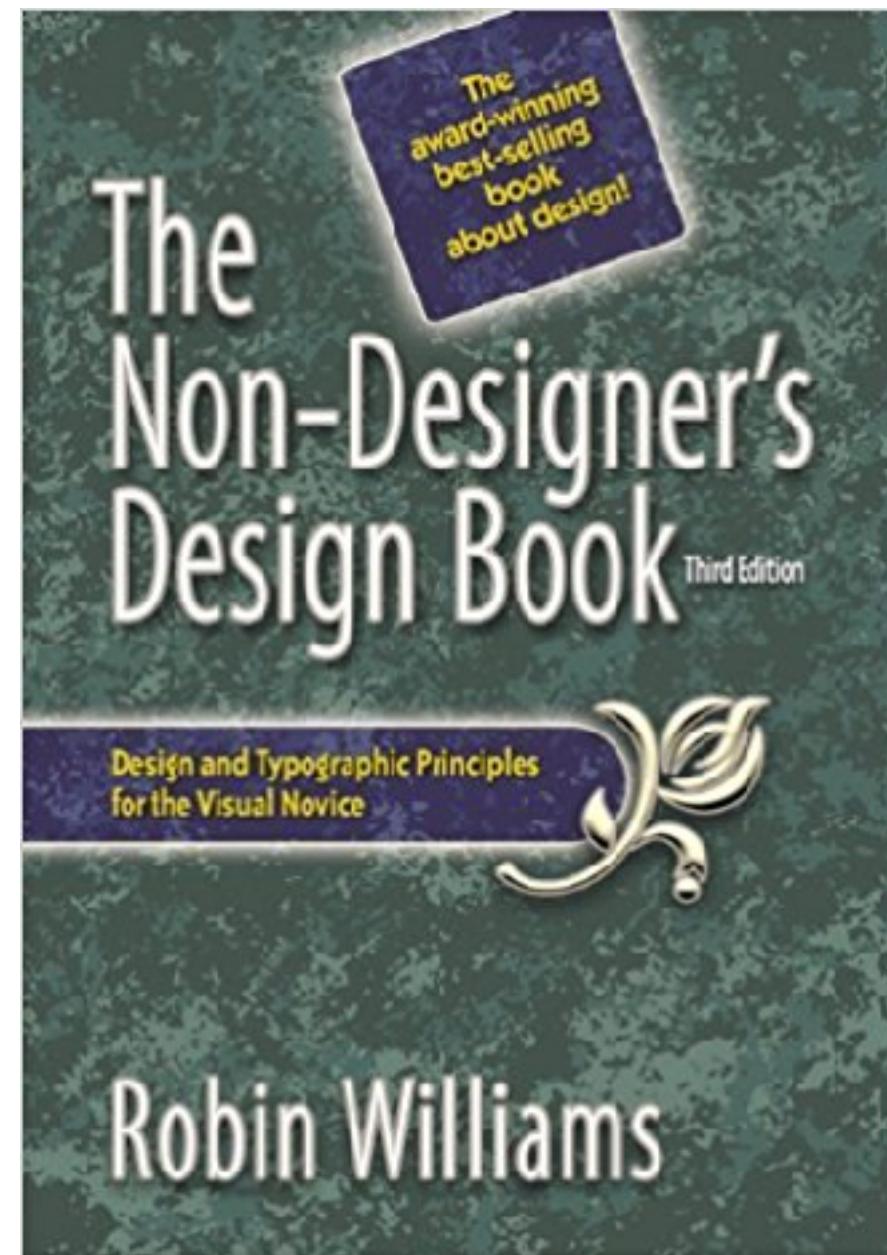
50 milliseconds to make a good first impression!

perceptions about trustworthiness, usability are based on visual appeal

What Do You See When You're Surfing? Buscher et al., CHI 2009  
Attention Web Designers, Lindgaard et al., Behaviour & Information Technology 2006

Human Perception plays a  
big role in visual design

# RECOMMENDED READING



# COMPONENTS OF VISUAL DESIGN

Layout

Color

Typography

*layout*

arrangement of visual elements

spacing, alignment, and relative  
sizing

# VISUAL HIERARCHY



The Outspoken website homepage features a large, central image of a man shouting into a megaphone. The text "Is Your Brand Outspoken?" is overlaid on the image, along with the subtitle "Use text, picture and video messaging to ensure your brand is heard." Below the image, there are three main service sections: "Messaging" (represented by a speech bubble icon), "Aggregation" (represented by a double arrow icon), and "Transcoding" (represented by a gear icon). Each section includes a brief description and a blue "See Features" or "Learn More" button.

**Outspoken**  
Be Seen. Be Heard. Be Remembered.

Messaging | Aggregation | Blog | Get Started | Login  
Contact us at 888.777.9882

Is Your Brand Outspoken?  
Use text, picture and video messaging to ensure your brand is heard.

**Messaging**  
If you're a brand or agency, our feature-rich SMS and MMS platform is perfect to help you increase your ROI on your mobile marketing campaigns.

**Aggregation**  
Working with carriers can be complicated. We give you the power of over 700 carriers in 250 countries simply with one API for SMS and MMS.

**Transcoding**  
Connect to the Outspoken transcoding API to optimize MMS video, picture, audio and other rich media for individual carriers, OS and phone make/model.

See Features | Learn More | Try it Now

What's important?

What's related?

How can you tell?

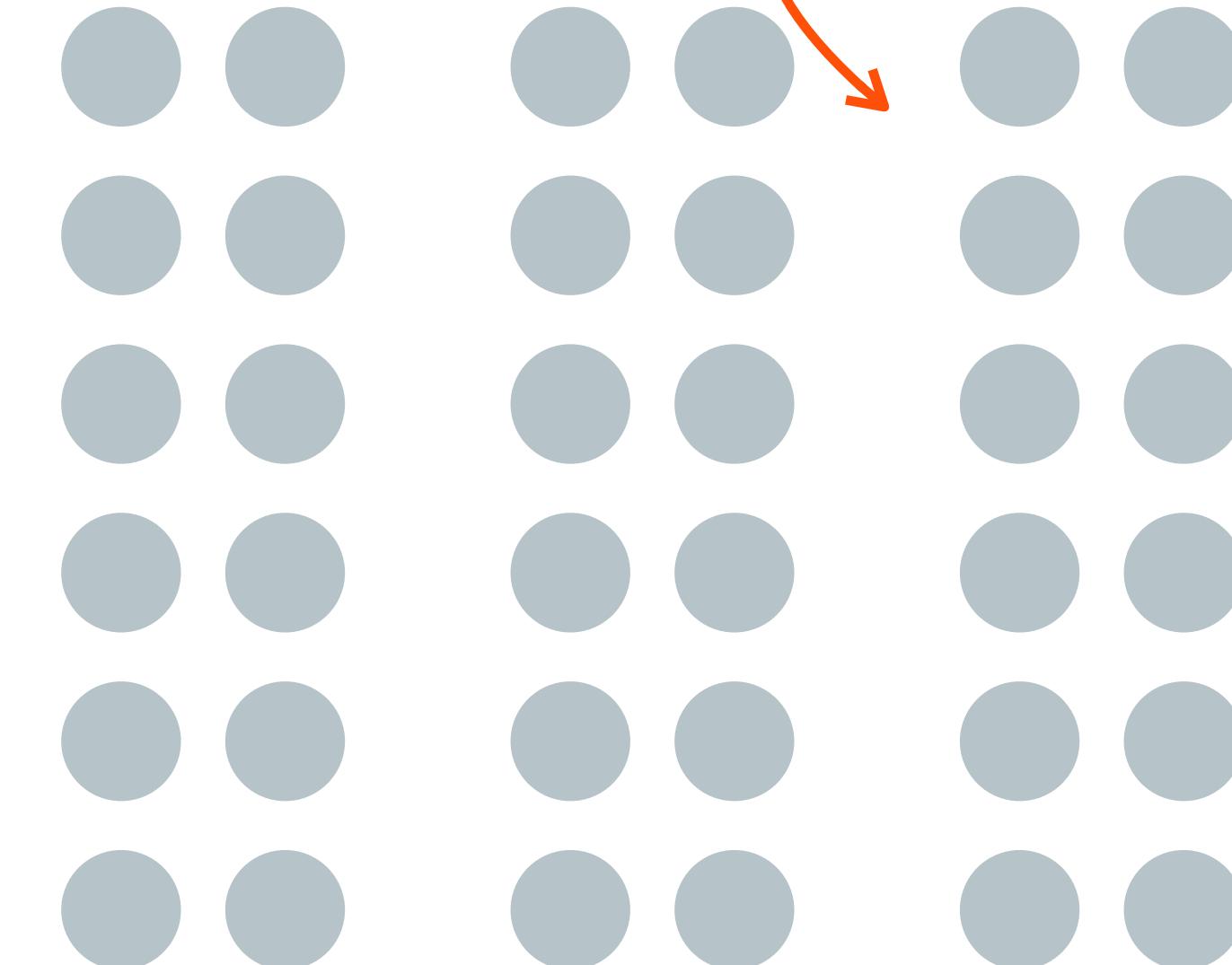
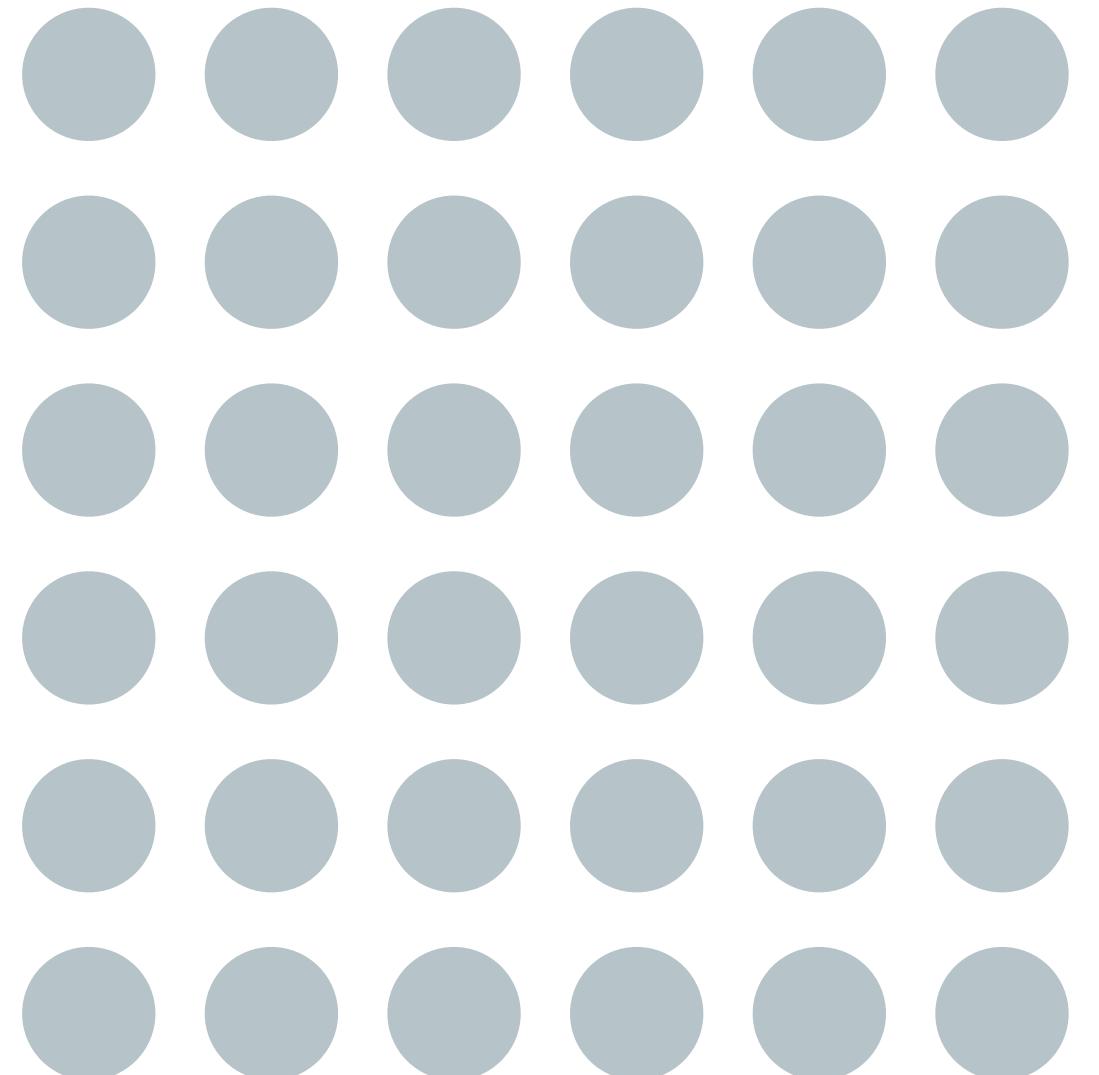
# GESTALT LAWS

theories of visual perception (1920s)

describe how people organize visual elements into groups

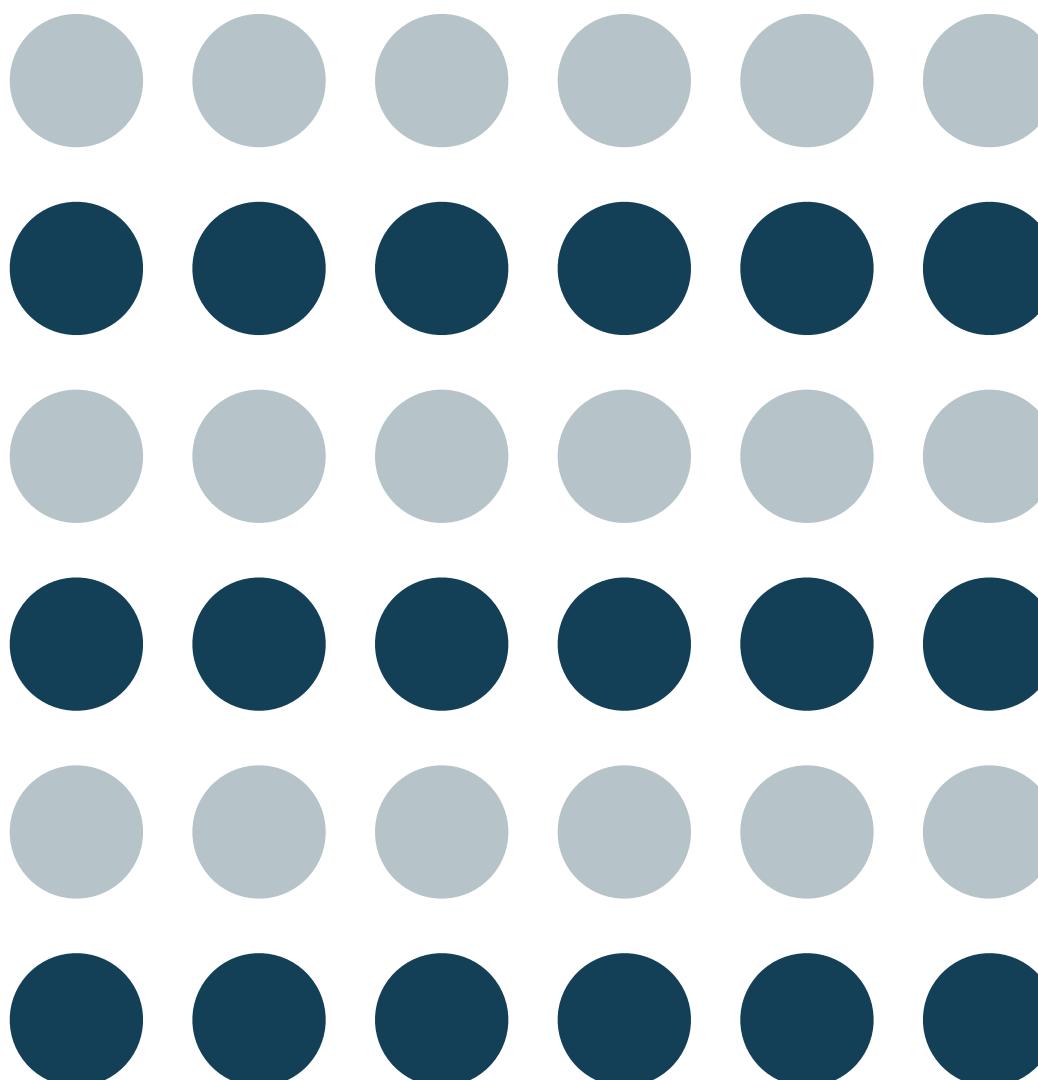
important for layout design

# PROXIMITY



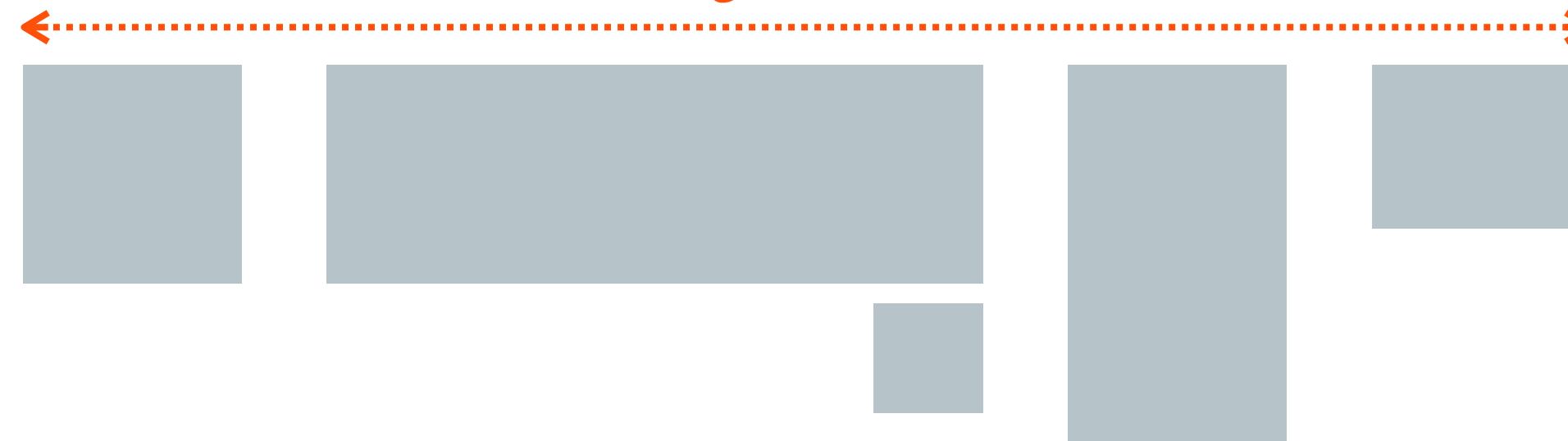
*white space matters*

# SIMILARITY

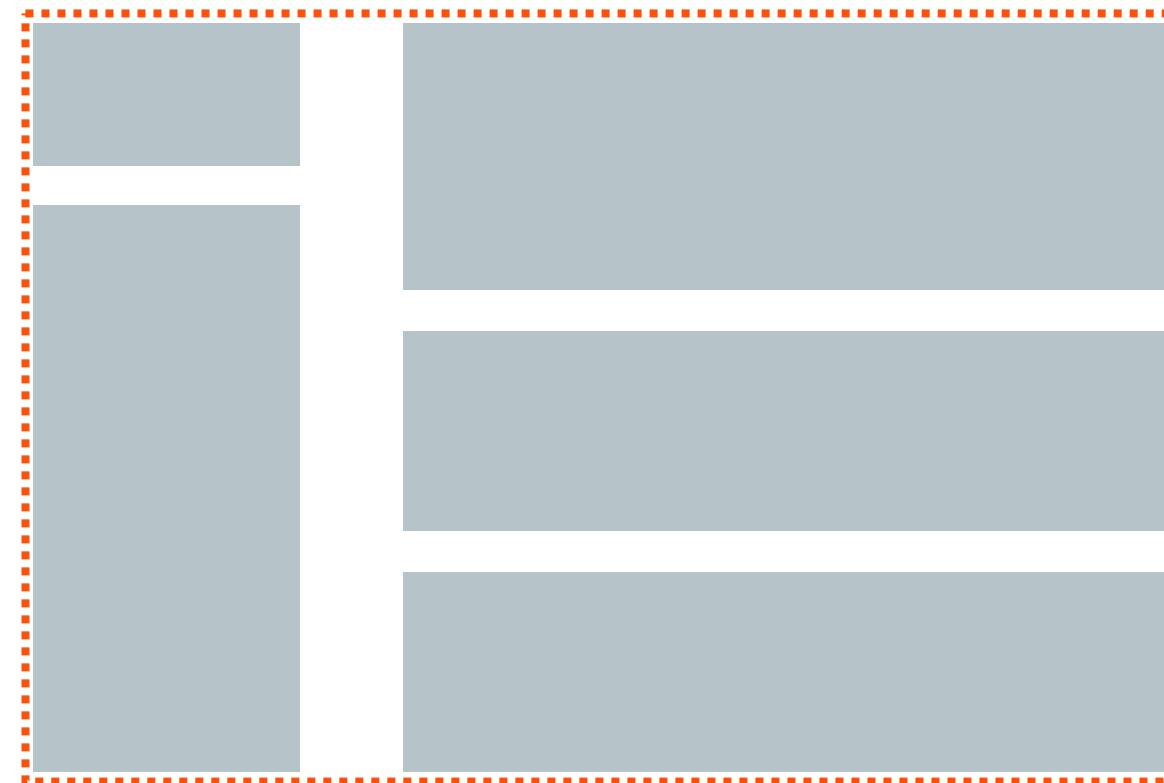


# CONTINUITY

*alignment*

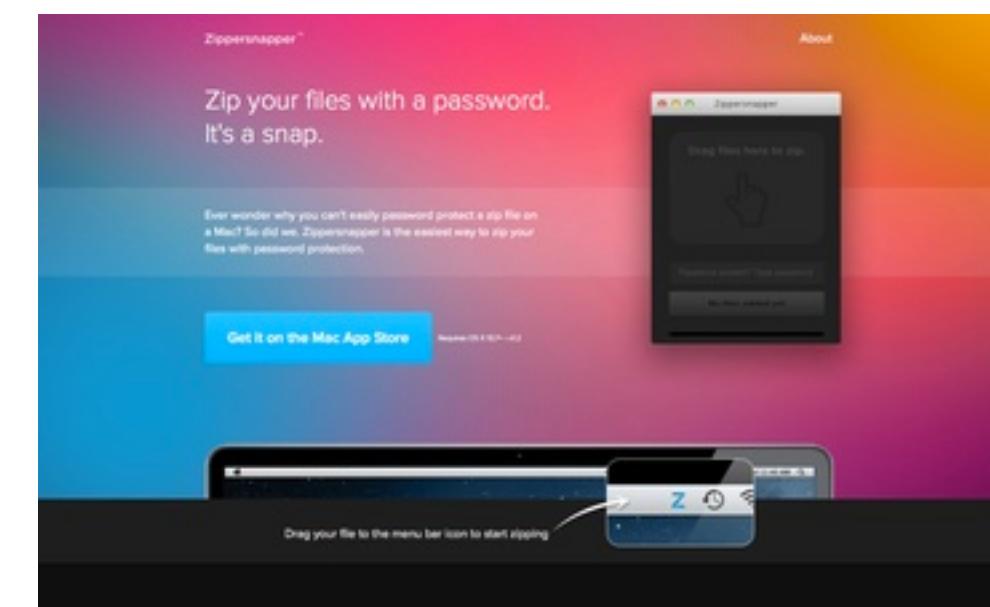
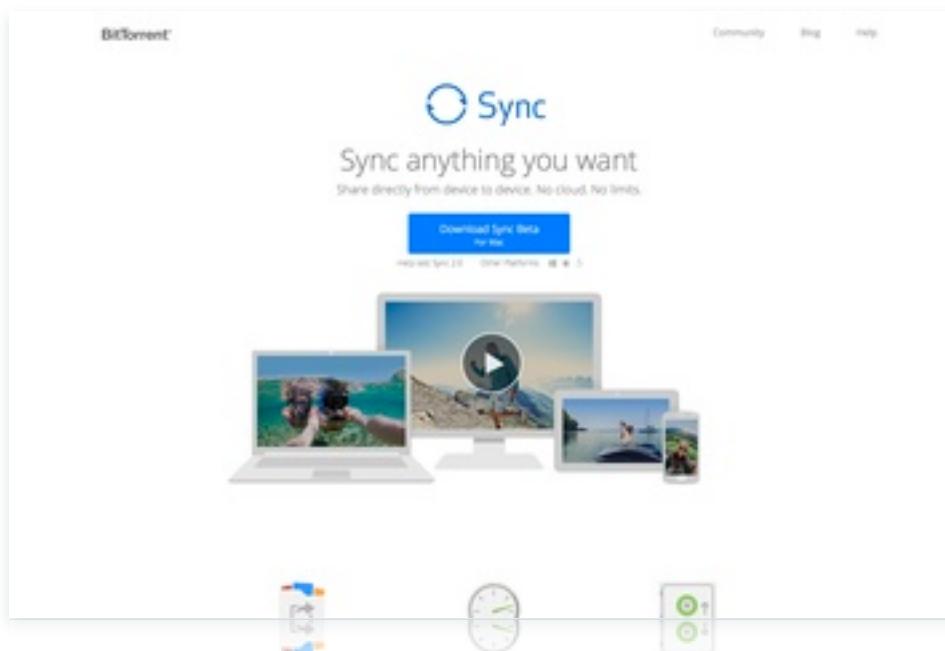
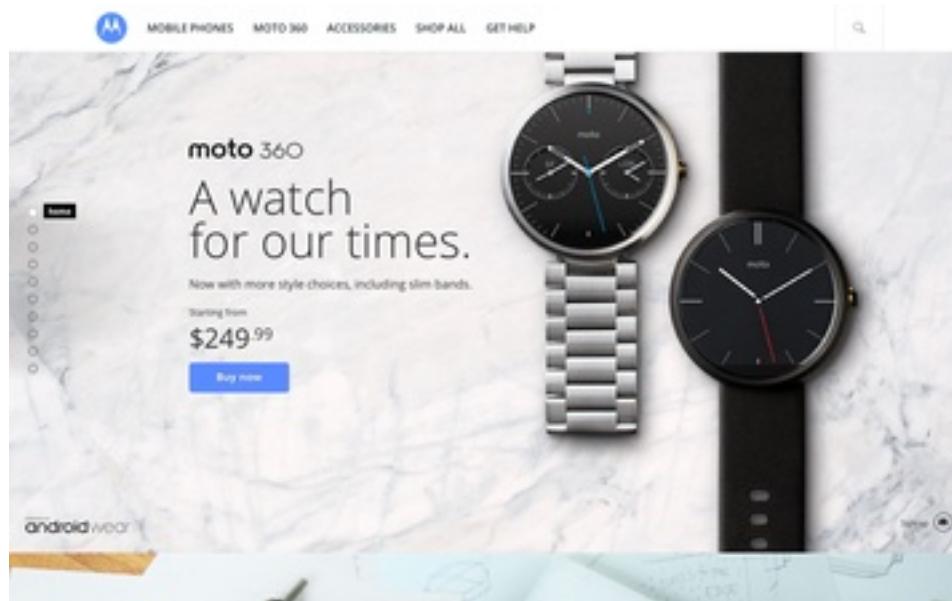


# CLOSURE



[en.wikipedia.org/wiki/Gestalt\\_psychology](https://en.wikipedia.org/wiki/Gestalt_psychology)

# Call-to-Action Buttons



TINT

DISPLAY ANY SOCIAL FEED FOR...

## In-Store Screens

Twitter Google+ Facebook LinkedIn YouTube Instagram Pinterest Tumblr

An all-in-one platform that allows you to showcase social media in minutes, helping audiences engage.

TRY IT FREE WATCH VIDEO

SEE HOW IT WORKS

Horizontal Stripe

CONNECT

CONNECT any social feeds & hashtags

Please connect to a third-party account to see your latest posts from social networks.

Customize

Custom brand your social hub

It's easy to change themes, colors, and add more content to fit your unique style.

CLASSIC MODERN GRID

CONTROL

Control your content from anywhere

It's never been easier to enjoy posts from any device or screen.

NASDAQ iPhone

All your content on any website or screen

Twitter Google+ Facebook LinkedIn YouTube Instagram Pinterest Tumblr

NASDAQ iPhone iPad Laptop

TRY IT FREE

# Trending: Horizontal Stripe

*Color*

hue, saturation, value

# FUNCTIONAL COLOR

Contrast between background and text is key to readability

Design in greyscale first and keep those luminance values when moving to color

# Colorful



# Warm



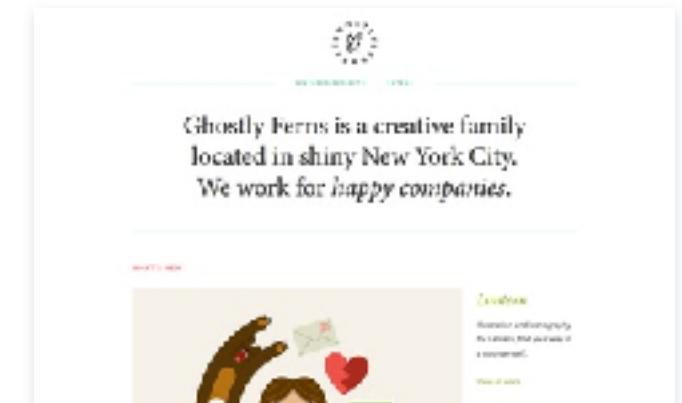
# Dark



# Greyscale



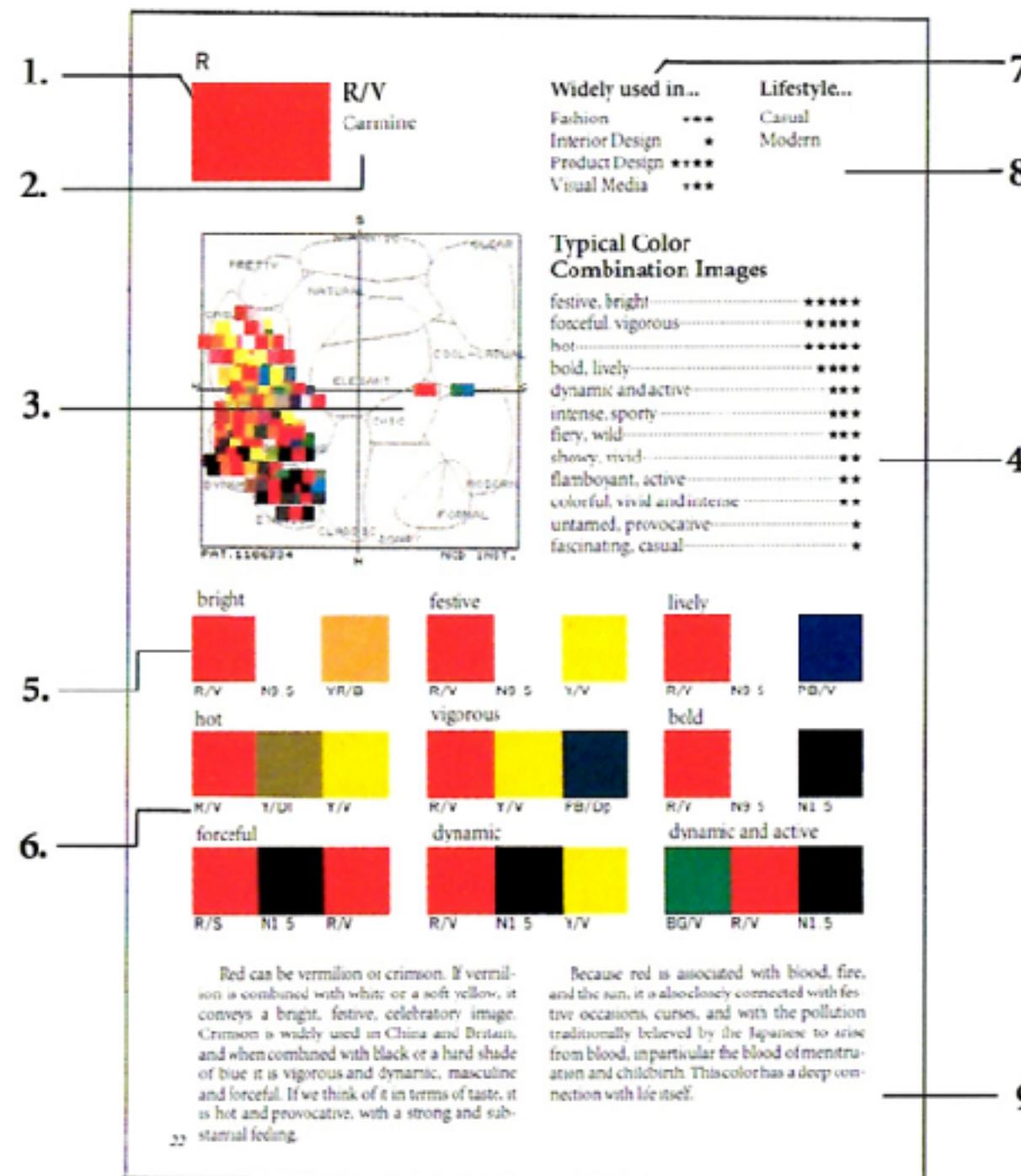
# Cool



# light

# Expressive

# SEMANTIC MEANING



Color Image Scale, Kobayashi

# Trending: Greyscale with Accent Colors

ABOUT BLOG WORK CONTACT

## Google Material Design's Animated Loading Spinner Using HTML, CSS and SVG

05 DECEMBER 2014

A look at how to create an animated loading spinner in the style of Google's Material Design.

## Simple Static Web Server with 1 Line of Python

23 JULY 2014

Setup a simple static web server for local development with just 1 line of Python  
SimpleHTTPServer.

# *Typography*

## Letterform Anatomy



**Serif**

**Sans Serif**

**Slab Serif**

*Script*

**Display**

**Monospace**

# FONT GUIDELINES

For small text, higher x-height easier to read

**serif or sans serif?**

2-3 font faces: use variations in size, weight,  
and style for contrast

# SPACING GUIDELINES

Use leading and margins

*distance between lines*

line-height: 120%

Keep text paragraphs narrow

60-75 characters / 12-15 words /  
30-45 em

# RESPONSIVE DESIGN





number of devices on which people view Web content is exploding

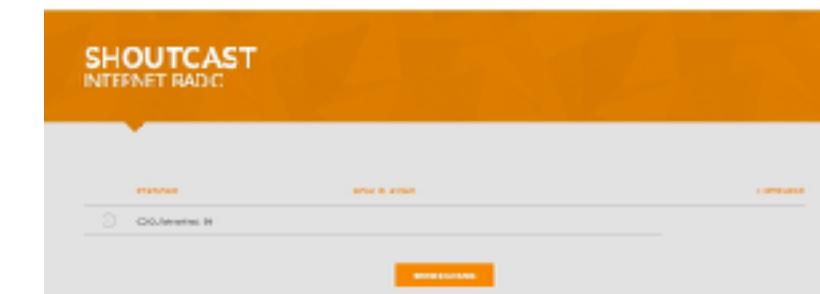


# GOAL OF RESPONSIVE DESIGN

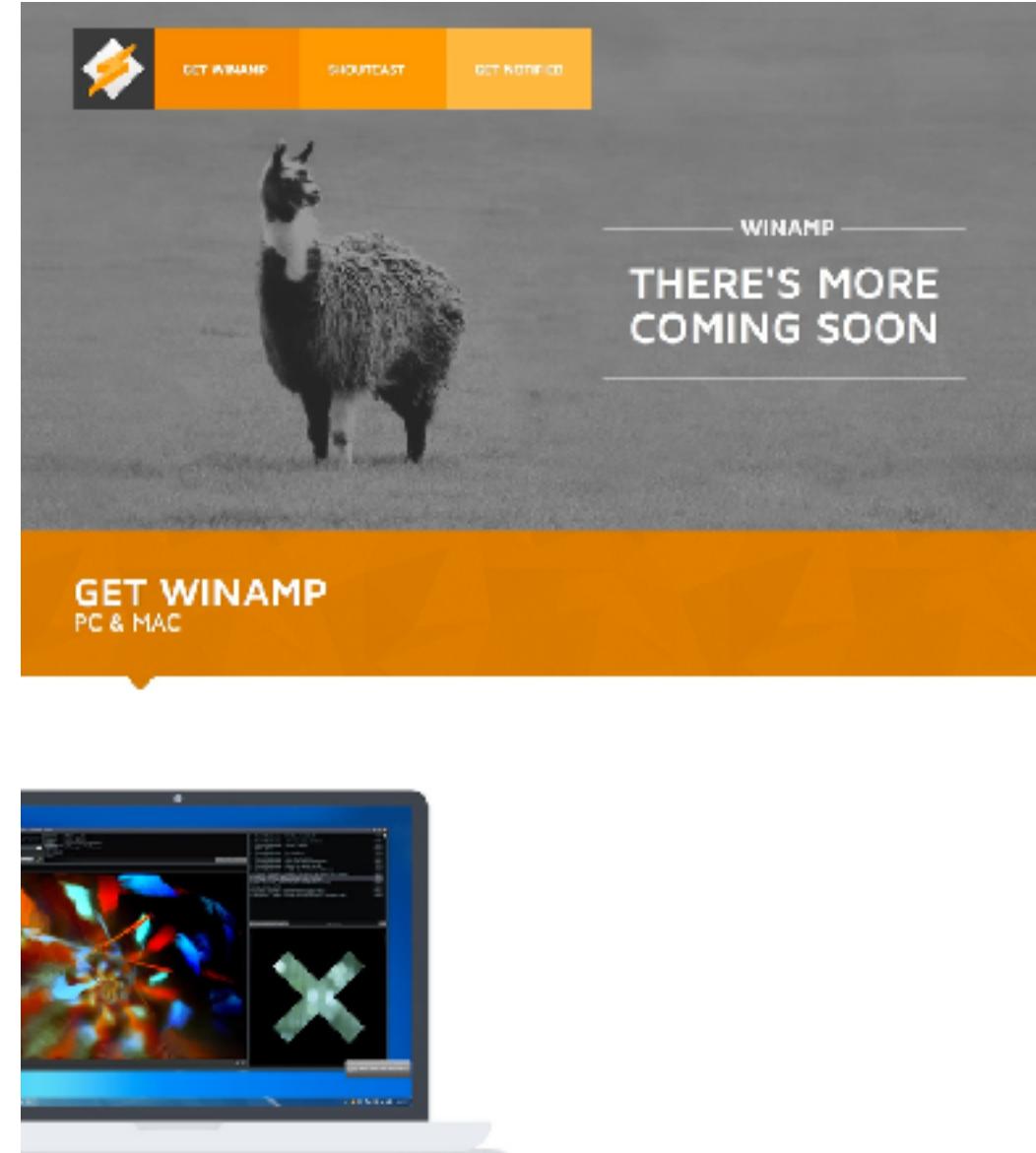
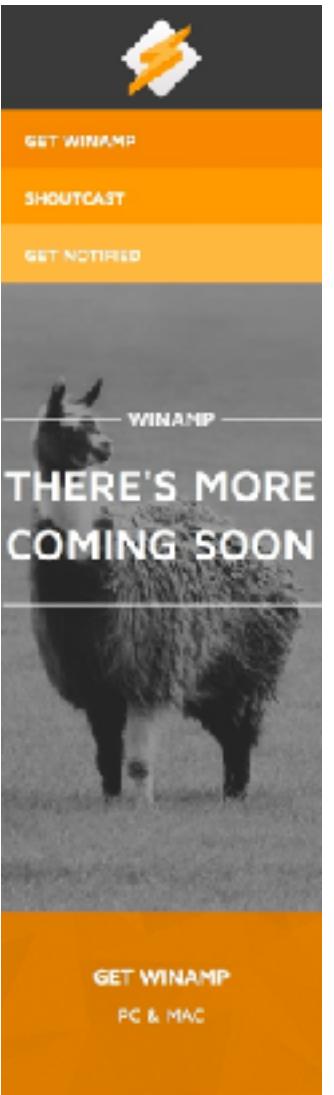
optimize design for different form factors



and everything  
in between



# DESIGN CONSIDERATIONS



How do styles and layouts change?

How is content remapped?

# @media

CSS media queries are used to define different style rules for different devices

usually defined on browser width and/or height

can also query device width, height, orientation, resolution, etc.

# @media SYNTAX

```
@media not|only mediatype and  
(media feature) {  
    CSS-Code;  
}
```

screen, print, tv  
max-width, min-width, width,  
max-height, min-height, height,  
max-resolution, ...

# @media EXAMPLE

```
@media only screen and  
(max-width: 640px) {  
  body {color: blue; }  
}
```

Hide style sheets from  
older user agents

breakpoint

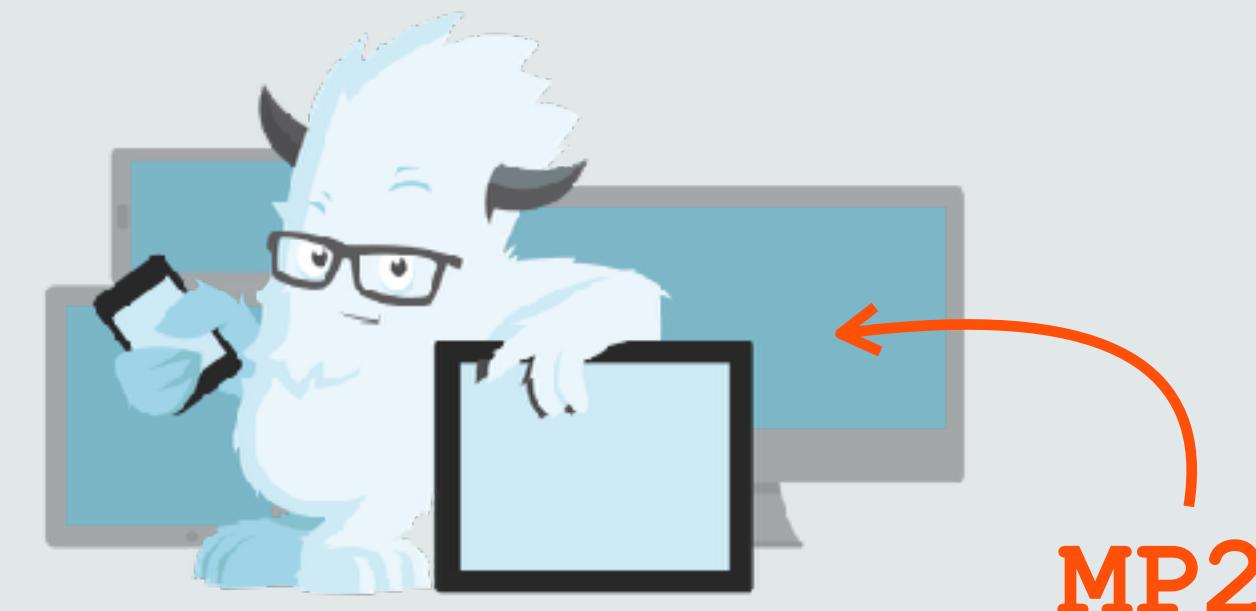
CODEPEN

writing media queries by hand is hard!

# CSS FRAMEWORKS



Twitter  
Bootstrap



Zurb  
Foundation



# GRID-BASED DESIGNS

divide screen into equal-width columns

columns separated by gutters

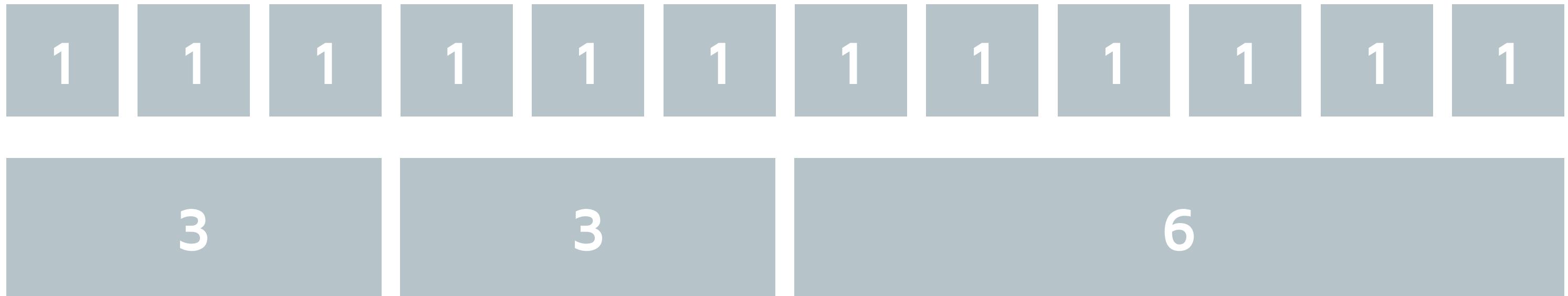
margins on both sides of window

elements may span multiple columns

elements start or end at column boundaries

alignment reduces visual clutter

# 12-COLUMN GRIDS



# GRID CLASSES

use predefined class libraries to  
create layouts and define  
responsive behaviors



Details in [Foundation's Docs](#)

# GRID CLASSES



```
<div class="row">  
  <div class="small-3 columns">...</div>  
  <div class="small-3 columns">...</div>  
  <div class="small-6 columns">...</div>  
</div>
```

All children of rows  
must be columns!



# COLUMN CLASSES

**small-#**      **max-width: 640px**

**medium-#**      **min-width: 641px and max-width: 1024px**

**large-#**      **min-width: 1025 and max-width: 1440px**

**xlarge-#**      **min-width: 1441 and max-width: 1920px**

**xxlarge-#**      **min-width: 1920px**



# COMBINING CLASSES



```
<div class="row">  
  <div class="small-3 columns">...</div>  
  <div class="small-3 columns">...</div>  
  <div class="small-6 columns">...</div>  
</div>
```

why don't we see any  
responsive behavior?



# MOBILE FIRST

design mobile first, then desktop

Google's approach, Eric Schmidt 2010

graceful degradation vs progressive enhancement



# MOBILE FIRST BEHAVIOR



larger devices will inherit  
styles from smaller ones

```
<div class="row">  
  <div class="medium-3 columns">...</div>  
  <div class="medium-3 columns">...</div>  
  <div class="medium-6 columns">...</div>  
</div>
```

CODEPEN



# MOBILE FIRST BEHAVIOR

```
<div class="row">  
    <div class="small-3 large-2 columns">...</div>  
    <div class="small-3 large-2 columns">...</div>  
    <div class="small-6 large-8 columns">...</div>  
</div>
```

what does this do?



# NESTING GRIDS

```
<div class="row">  
  <div class="small-3 columns">...</div>  
  <div class="small-9 columns">  
    <div class="row">  
      <div class="medium-6 columns">...</div>  
      <div class="medium-6 columns">...</div>  
    </div>  
  </div>  
</div>
```

CODEPEN



# MORE GRID CLASSES

```
<div class="row">  
  <div class="small-4 small-offset-2 columns">...</div>  
</div>
```

offset columns

```
<div class="row">  
  <div class="small-3 small-centered columns">...</div>  
</div>
```

center columns

CODEPEN



# REORDER COLUMNS

```
<div class="row">  
  <div class="medium-9 medium-push-3 columns">...</div>  
  <div class="medium-3 medium-pull-9 columns">...</div>  
</div>
```

CODEPEN



# CSS PREPROCESSOR INTEGRATION

Bootstrap is built on LESS,  
but also has SASS port

Foundation works with SASS



# CUSTOMIZING WITH SASS

customize grid with SASS variables in `_settings.scss`

```
$row-width: rem-calc(1000);
```

```
$column-gutter: rem-calc(30);
```

```
$total-columns: 12;
```



The screenshot shows the Chrome DevTools interface with the mobile emulation panel open. The device is set to an Apple iPhone 5 with a resolution of 320 x 568 pixels. The network settings are set to 'No throttling' and the user agent is Mozilla/5.0 (iPhone; CPU iPhone O...). The main content area displays a course landing page for 'THE ART AND SCIENCE OF WEB PROGRAMMING'. The page includes an announcement about enrollment being at max capacity, navigation links for PIAZZA, LABS AND MPS, and RESOURCES, and course details like CS458RK, SPRING 2015 UIUC, MONDAY AND WEDNESDAY, 11AM-12:15PM, and SIEBEL 0216. Below this is an 'OVERVIEW' section describing client- and server-side technologies. A red circle highlights the 'Elements' tab in the bottom navigation bar. The Elements panel shows the DOM tree with the root element <html>. The Styles tab in the right panel shows the following CSS rule:

```
element.style {  
}  
@media only screen and (max-width: 40em)  
.nav {
```

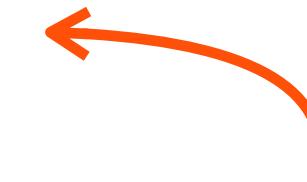
The bottom status bar indicates the selected elements are 'html body div.ng-scope div.row.course\_header div.small-L2.columns div.nav'.

# TAILORED EXPERIENCES

screen size is just one part of a user's context

there's **a lot** more you know: where people are in the world, where they've just come from, how long they've been on the site, etc.

design algorithms and interfaces that take into account more of the user's context



*percentage of influence specifier?*