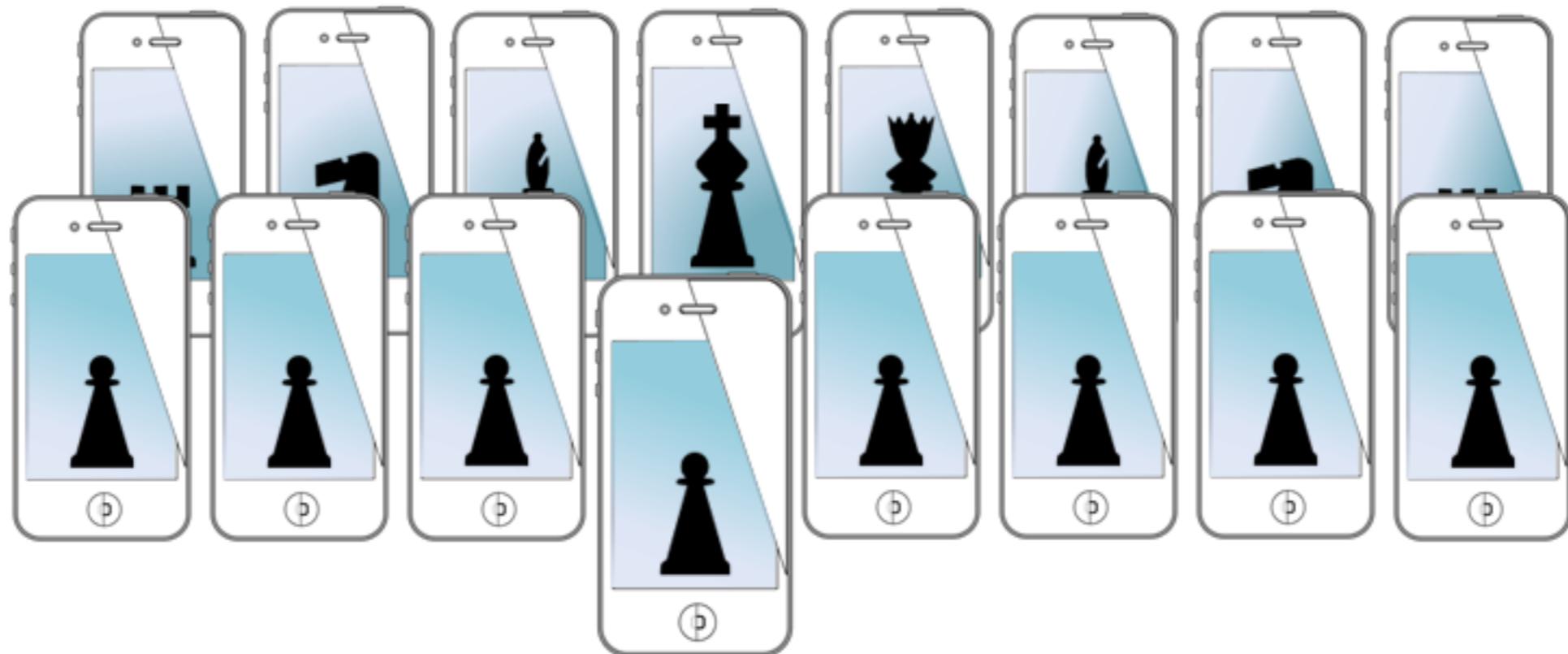


MOBILE SENSING LEARNING



CS5323 & 7323
Mobile Sensing and Learning

mobile design and interaction

Eric C. Larson, Lyle School of Engineering,
Computer Science, Southern Methodist University

course logistics

- lab one due at the end of the week!
- upgrading the macOS on late 2012 mac mini
 - only goes up to Catalina (10.15)
 - can use Xcode 12.4

Xcode 12.4	macOS Catalina 10.15.4 (Intel-based Mac)	iOS 14.4 macOS 11.1 tvOS 14.3 watchOS 7.2 DriverKit 20.2	x86_64 armv7 armv7s arm64 arm64e	iOS 9-14.4 iPadOS 13-14.4 macOS 10.9-11.1 tvOS 9-14.3 watchOS 2-7.2 DriverKit 19-20.2	iOS 10.3.1-14.4 tvOS 10.2-14.3 watchOS 3.2-7.2	Swift 4 Swift 4.2 Swift 5.3
------------	---	--	--	--	--	-----------------------------------

agenda

- mobile HCI
 - design, navigation, and interaction
 - many elements courtesy of apple
 - and some from others

another great resource:

227 pages of bliss, text, pictures, and video
navigable via web interface

iOS Human Interface Guidelines

<https://developer.apple.com/design/human-interface-guidelines/ios/overview/themes/>

what makes great UI

- you know it when you see it
- no matter what I tell you, nothing is a hard and fast rule except:
 - keep it simple, clear
 - kill the clutter, display only what is needed
 - use motion/physical metaphors when appropriate

a better slide

deference

never compete
with content

text legible
clarity
background subtle

subtle visual
motion cues

depth

planning

step one

look at core function

step two

add design sparsely

step three

examine assumptions
question every element

principles of great design

how to make this slide better?

principles of great design

make it obvious



make it obvious



text entry is awful

- avoid text input at all costs
- e.g., enter your state

solution text

Enter State

solution picker

Select State

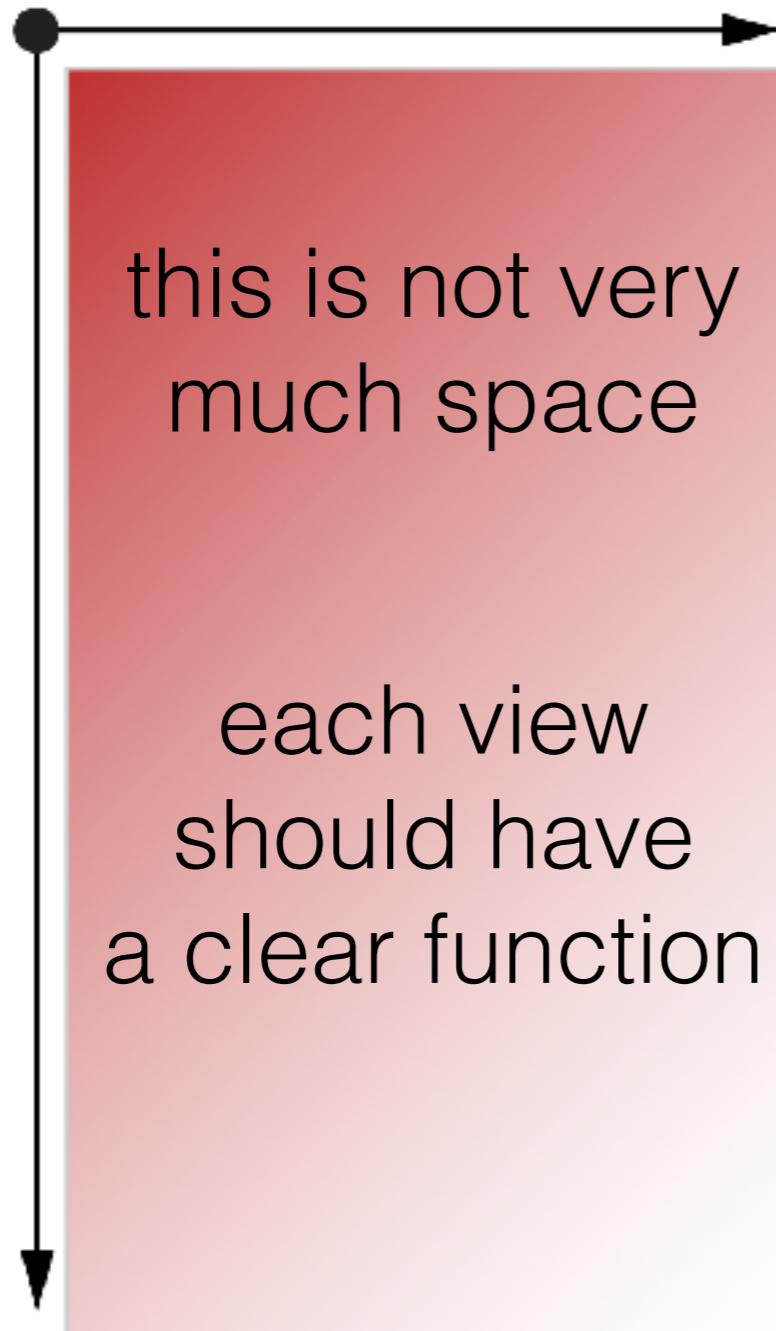
GA
HI
ID
IL
IN
IW
KA

solution get from current location

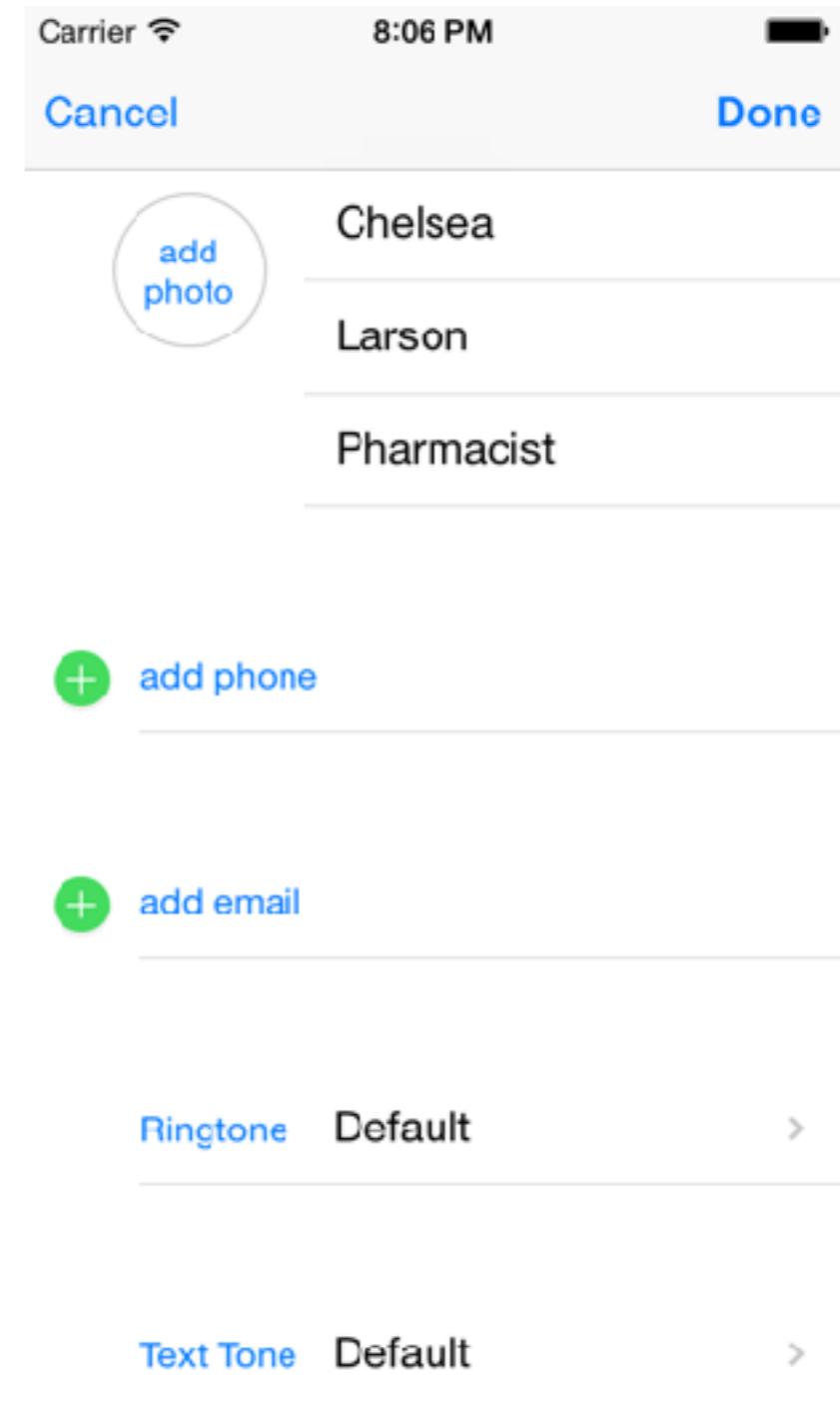
Autofill

layout with care

important



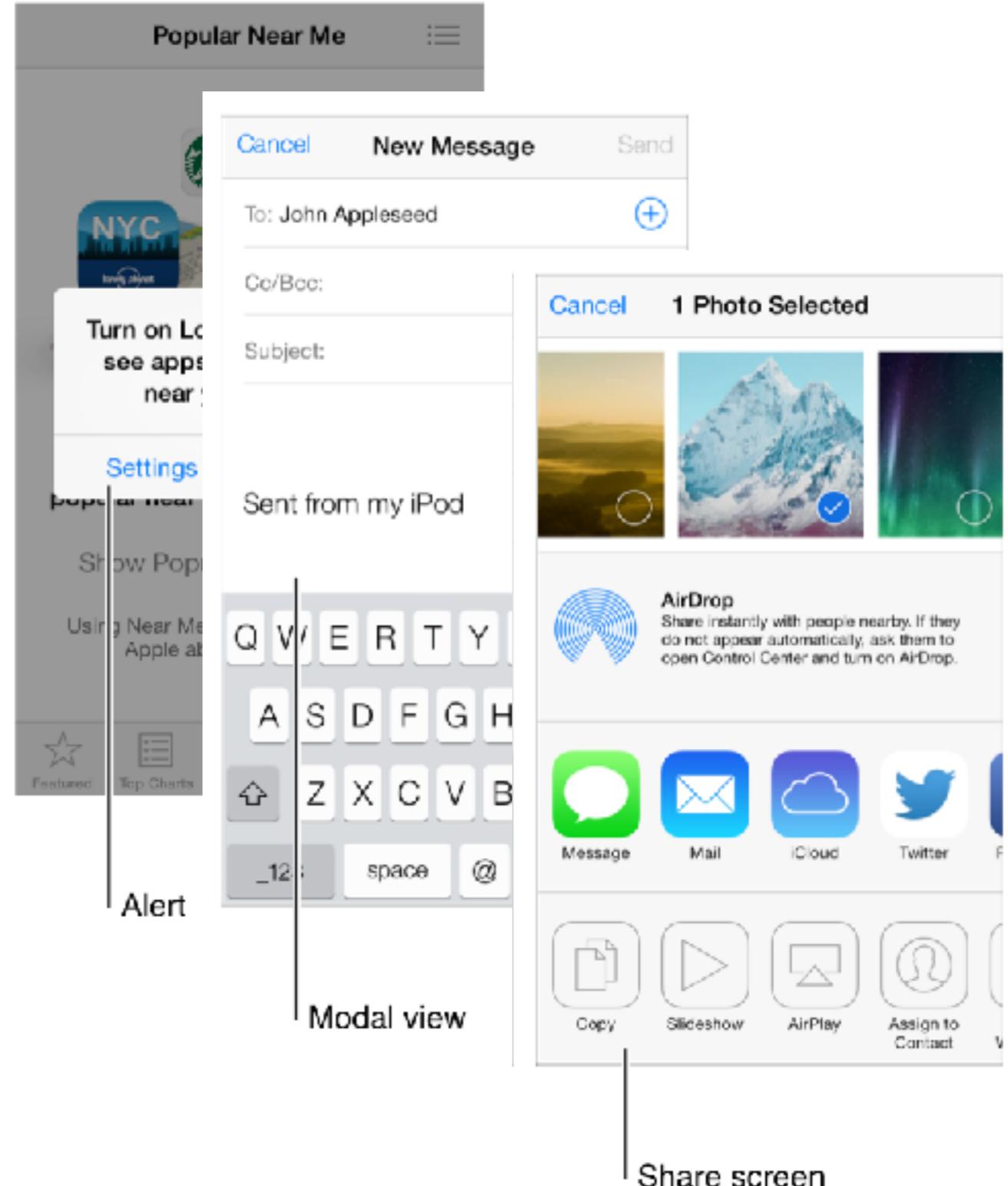
not so important



use modal sparingly

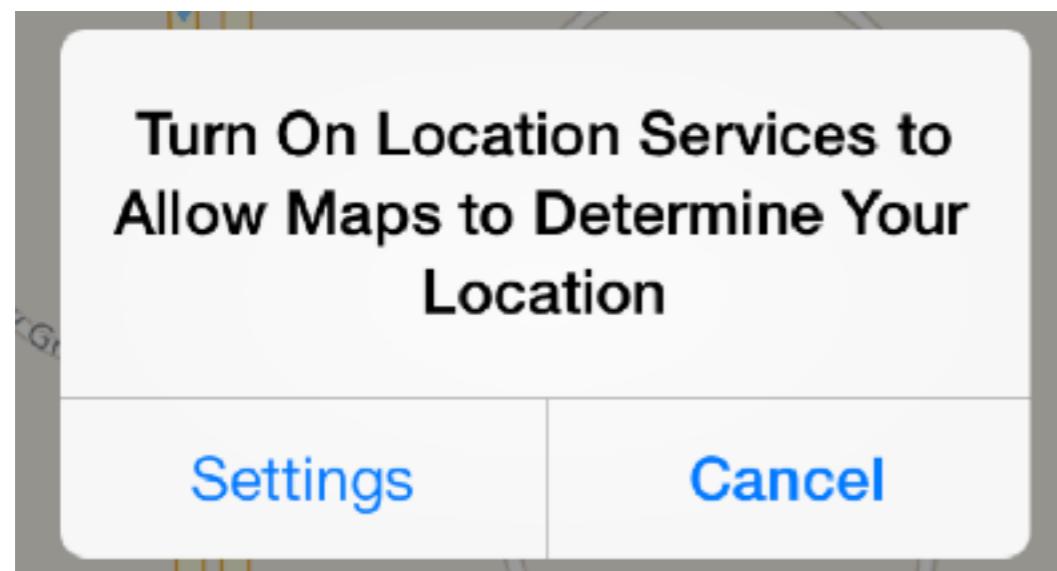
takes over the screen

- prevents other interaction
- use when:
 - critical to capture attention
 - self contained action
 - like sending email
- keep simple, not tied to nav
- provide easy, safe exit



keep alerts succinct

- change wording to be clear and concise
- avoid jargon



Problem Connecting

There might be a problem with the server. Do you want to notify our staff about the issue?

[Send Notification](#) | [Go Back](#)



- use verbs for buttons
- title is meaningful
- two choices, safe choice bolded
- full sentences used in explanation
- try to only have a title
- try not to say “we” and “our”

Apple says... design is...

formatting



design for touch



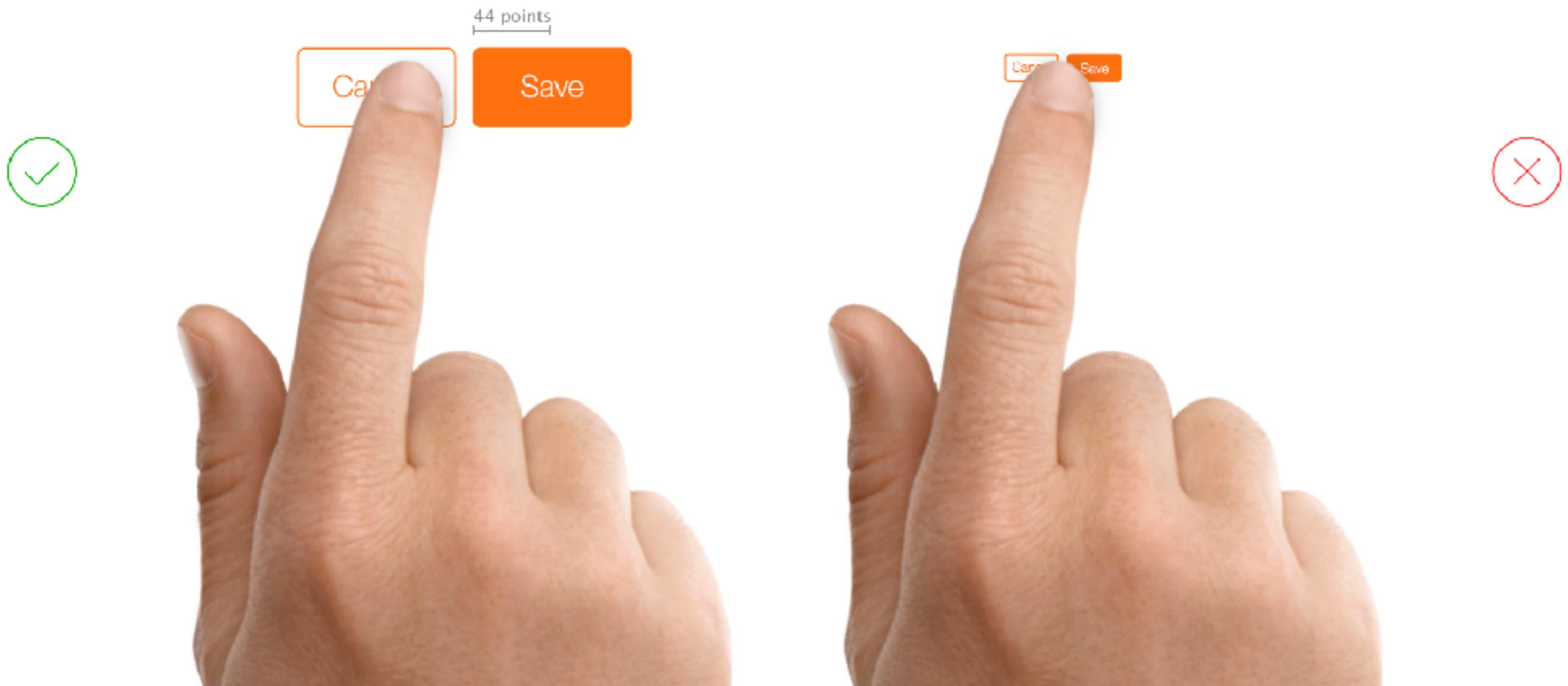
Date	October 11, 2013 4:00 PM	
Tue Oct 8	1	57
Wed Oct 9	2	58
Thu Oct 10	3	59 AM
Fri Oct 11	4	00 PM
Sat Oct 12	5	01
Sun Oct 13	6	02
Mon Oct 14	7	03

Time: : AM

Date:

S	M	T	W	Th	F	S
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

design for taps



legible text

Heading

Sub-Headline



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend egestas nisl vehicula nec. Nullam varius est dui, nec accumsan lectus posuere ut. Nullam viverra purus laoreet euismod tempor.

Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend egestas nisl vehicula nec. Nullam varius est dui, nec accumsan lectus posuere ut. Nullam viverra purus laoreet euismod tempor.

Heading

Sub-Headline

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high contrast

Heading

Sub-Headline



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Heading

Sub-Headline



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend egestas nisl vehicula nec. Nullam varius est dui, nec accumsan lectus posuere ut. Nullam viverra purus laoreet euismod tempor.

Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend.

negative space

Heading

Sub-Headline



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend egestas nisl vehicula nec. Nullam varius est dui, nec accumsan lectus posuere ut. Nullam viverra purus laoreet euismod tempor.

Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend.

Heading

Sub-Headline



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend egestas nisl vehicula nec. Nullam varius est dui, nec accumsan lectus posuere ut. Nullam viverra purus laoreet euismod tempor.

Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus. Duis vehicula elit nulla, eleifend.

organize



Edit	
Coffee	28 g >
Grain Size	~113.3 µm >
Water	1241 ml >
Temperature	103°C >
Time	223 s >
Serving	310.25 ml >
Metric	English



coffee: 28 g. Edit grain size:
~113.1 µm Edit water: 1241
ml Edit temp: 103° Edit
time: 223 s. Edit serving:
310.25 ml Edit

Metric English
Celsius Fahrenheit

alignment



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare*
Curabitur semper vitae urna ac adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus.



**Ornare imperdiet blandit lectus. Morbi tristique*

Continue

Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus. Morbi tristique urna ut volutpat ornare* Curabitur semper vitae urna ac tempus.



**ornare imperdiet blandit lectus.
Morbi tristique*

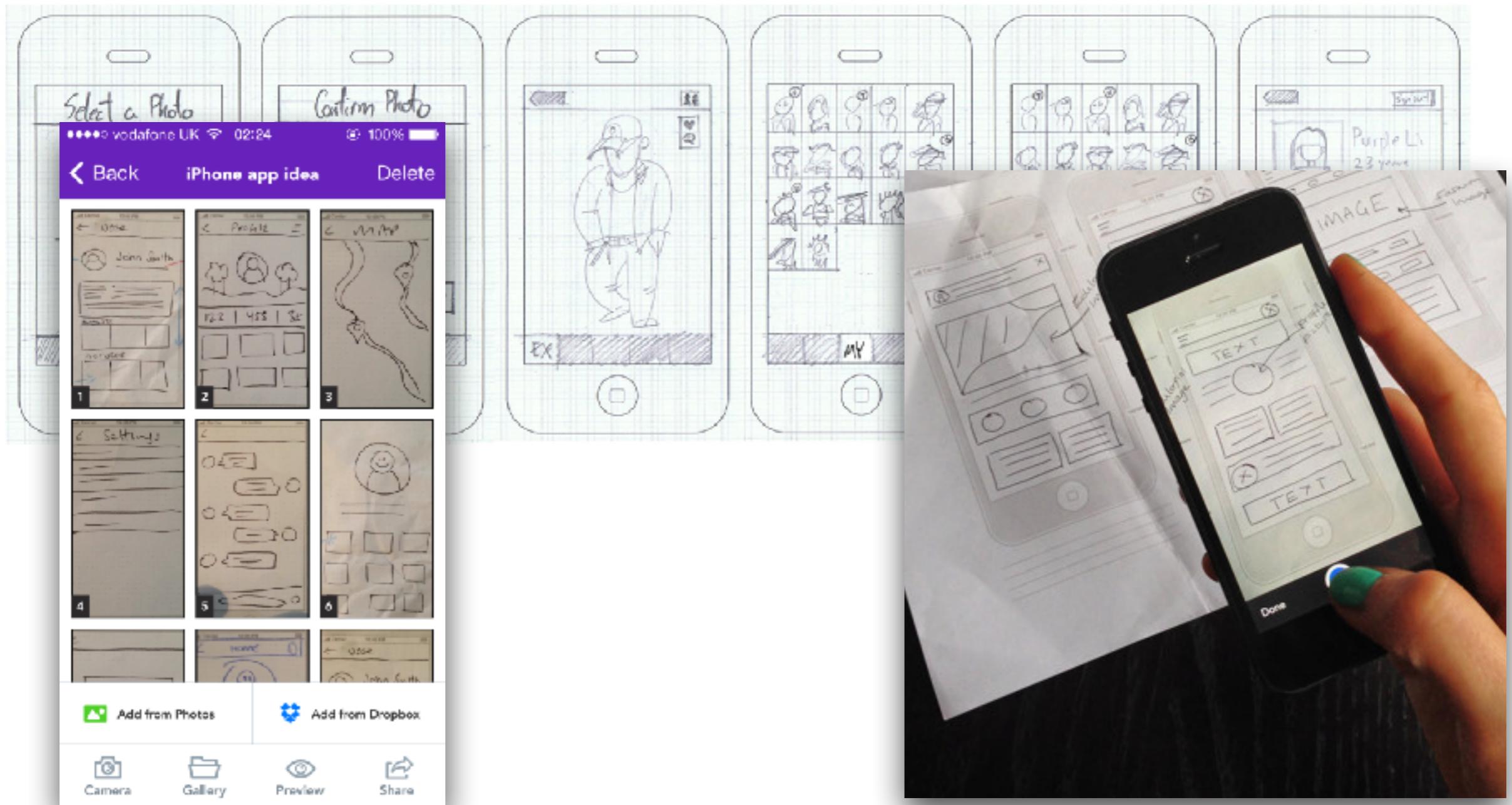
Continue



Adipiscing elit. Sed neque nisl, blandit vel ipsum eu, imperdiet blandit lectus.
Morbi tristique urna ut volutpat ornare. Curabitur semper vitae urna ac tempus.

get feedback early

paper prototypes



defining your style

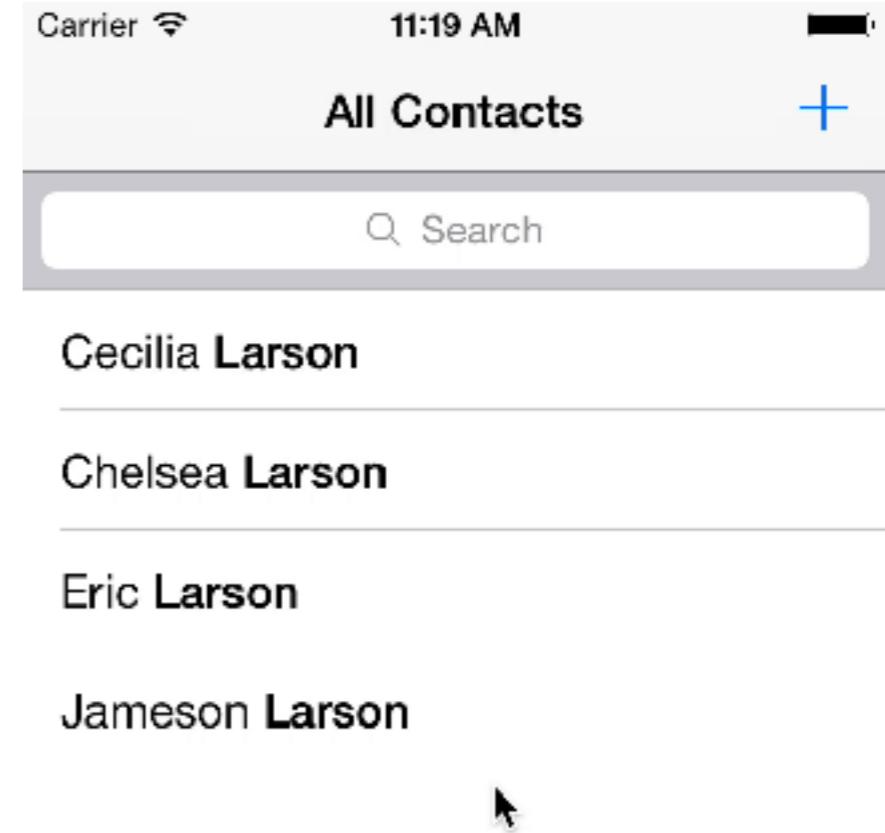
know your app: basics

style basics

design is flat

- color exposes purpose
- negative space
- subtle bordering when needed

- no shadows or bordering
- text filled minimally and descriptive
- **color** conveys interaction possible
- borders when ambiguous

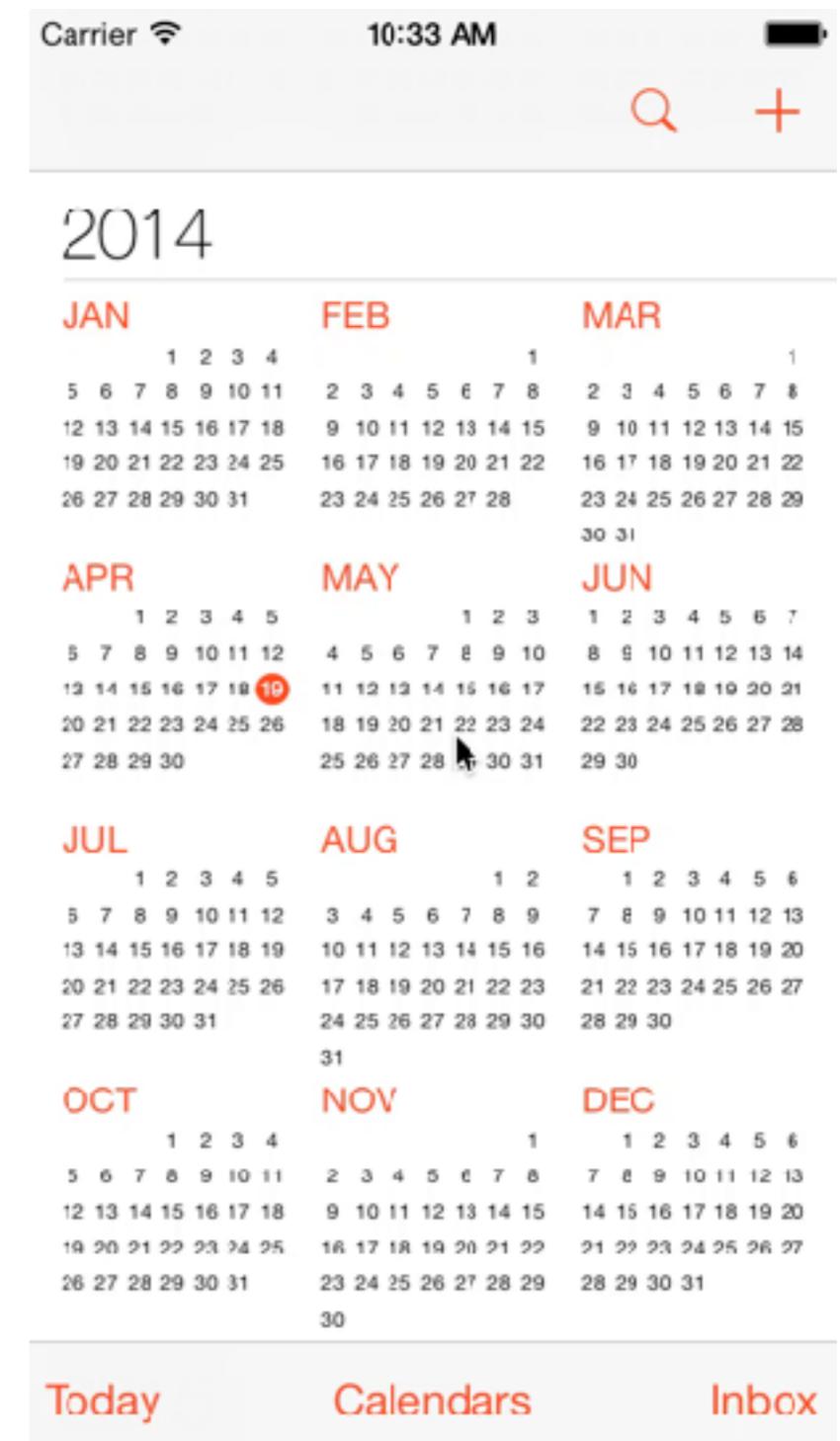


know your app: productivity

productivity apps

enables detailed manipulation

- organizing
 - adding and subtracting
 - drill down for detail
-
- depth conveys hierarchy
 - transition motion orients user
 - detail view takes over the screen
 - manipulation tabs change with depth



know your app: utility

utility

simple task, minimal input

- highly visual
 - enhanced display of info
 - no hierarchy
 - glance-able
-
- entire screen is used
 - navigation is flat
 - input is exploratory
 - no elements are in competition

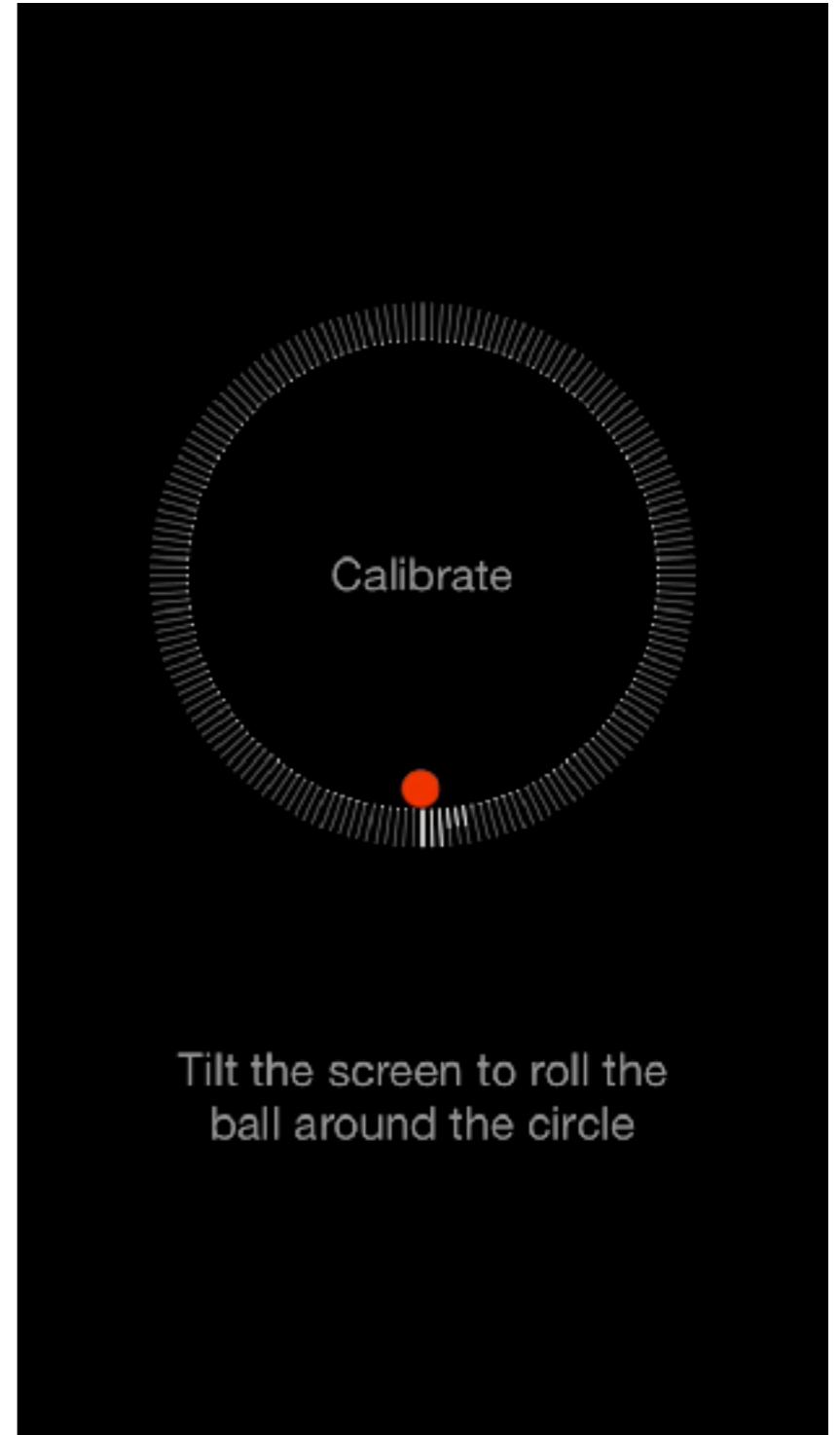


know your app: immersion

immersive

high interaction, visual experience

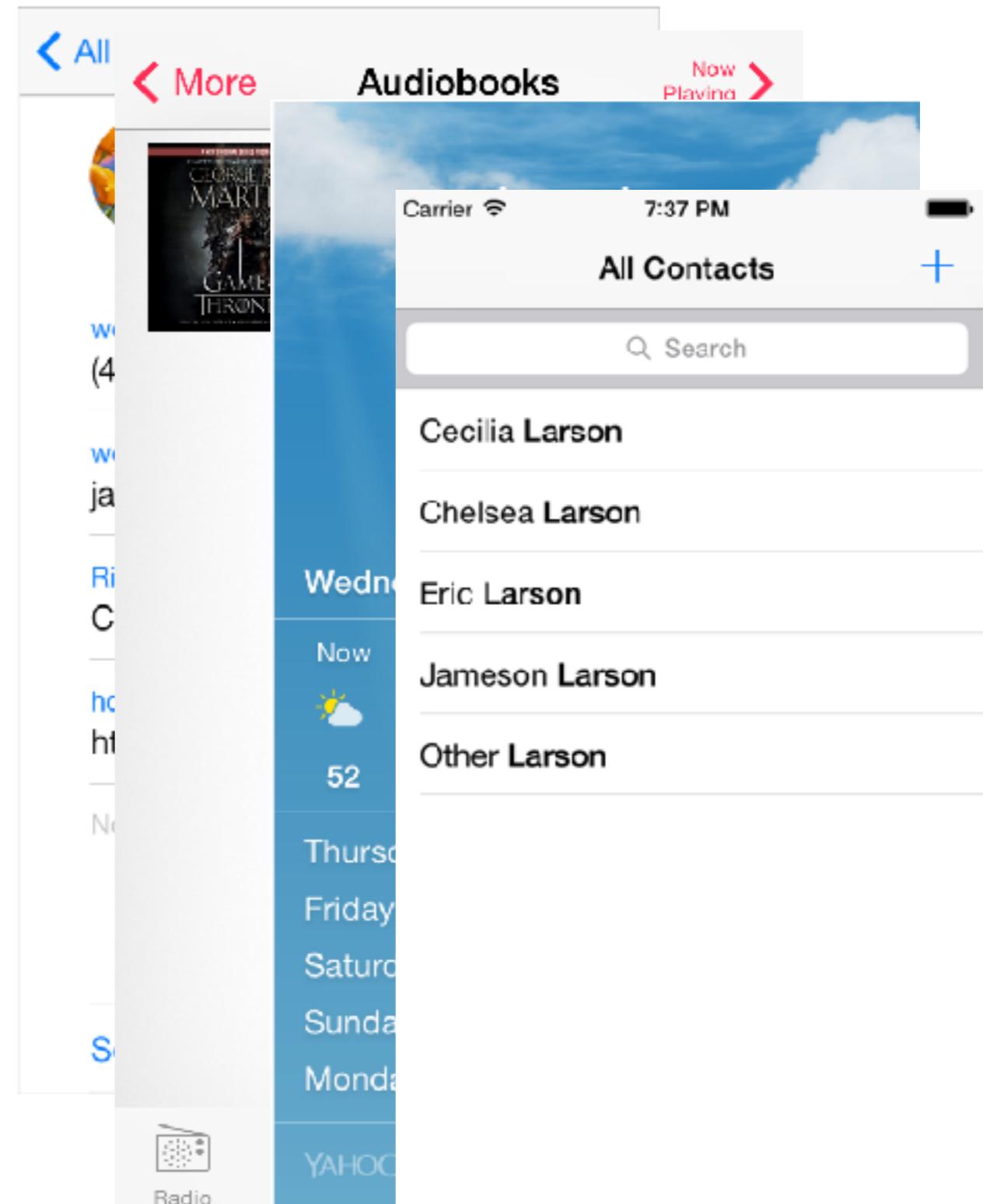
- hide UI elements
- nonstandard controls
- information centered on story, gameplay, experience



Tilt the screen to roll the ball around the circle

navigation is orientation

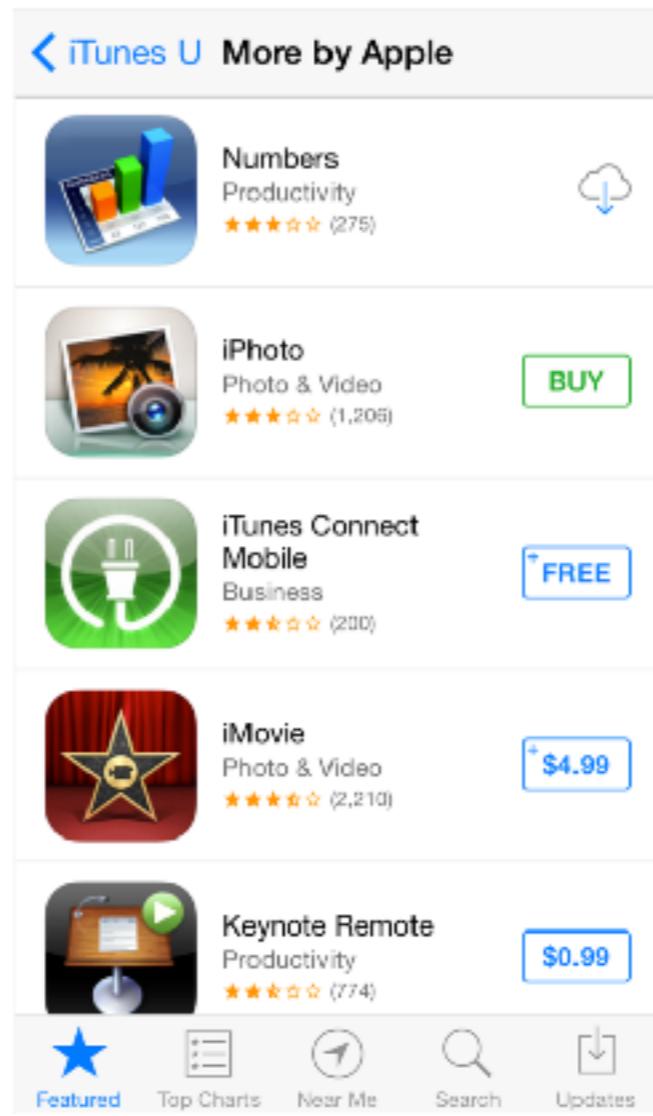
- the user must always know **where they are** in the app
- the **navigation bar** is the most understandable form of hierarchy, even when using animated hierarchy
- **tab bar** is for parallel content (peers)
 - each peer is different in function
- **page control** is for identical views, with new content
- **table view** is for master/detail
- only have **one way** of navigating to a view



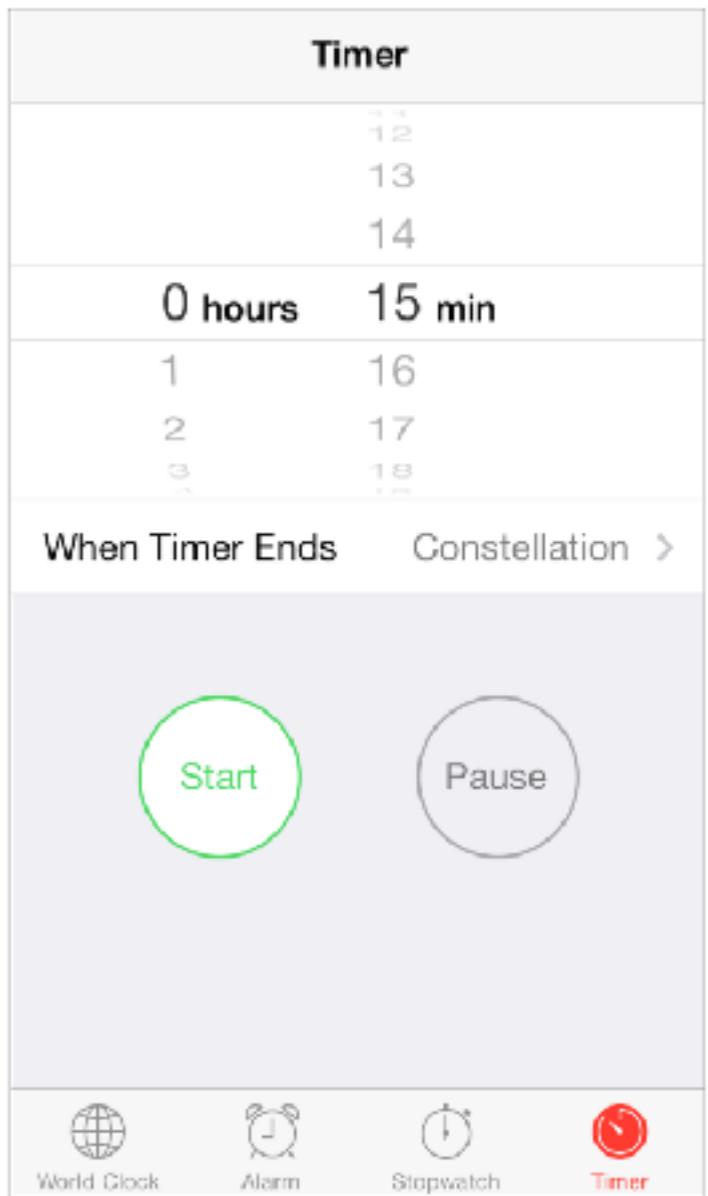
button design

- embrace the borderless
- until you need a border

distinguish
“tap button”
from “tap row”



most
important
interaction



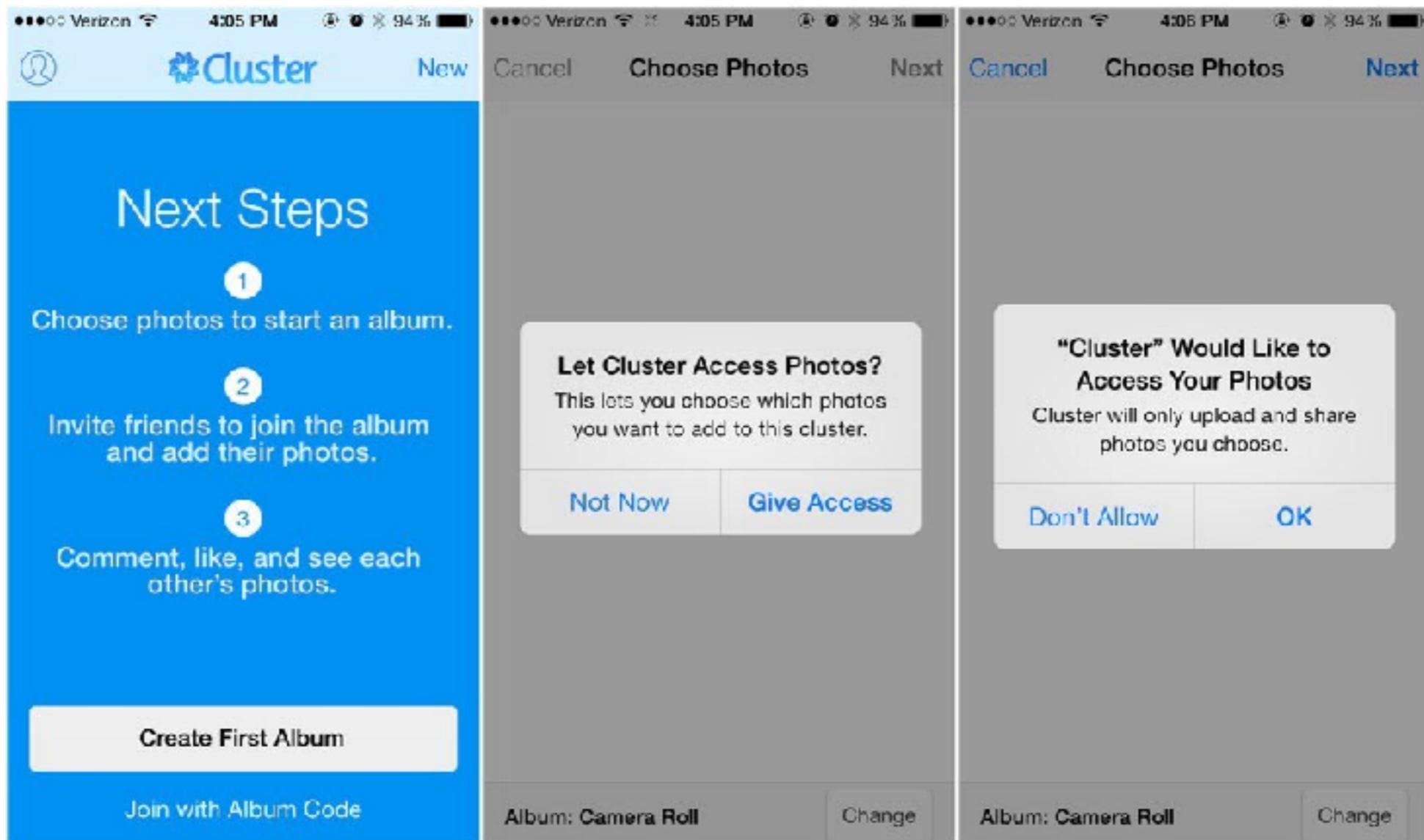
principles summary

- stay consistent
- use design elements that don't distract
 - for a game, engagement is king
 - for productivity, keep animation subtle and quick
- visible feedback and direct manipulation
- use metaphor to promote intuitive interaction
 - flick / tap / pinch
- give the user the control
 - the user always has control of their information

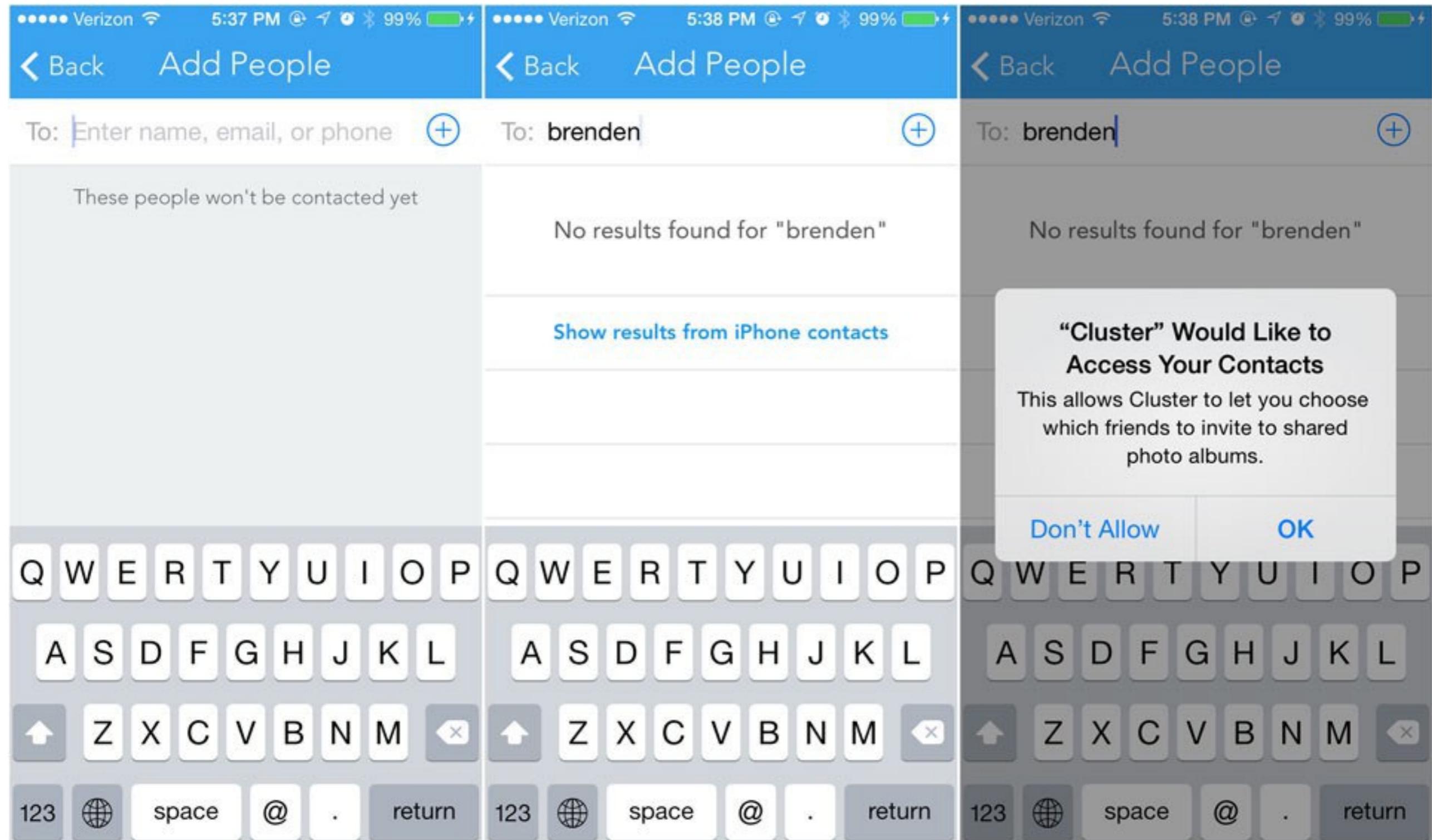
user control

user control

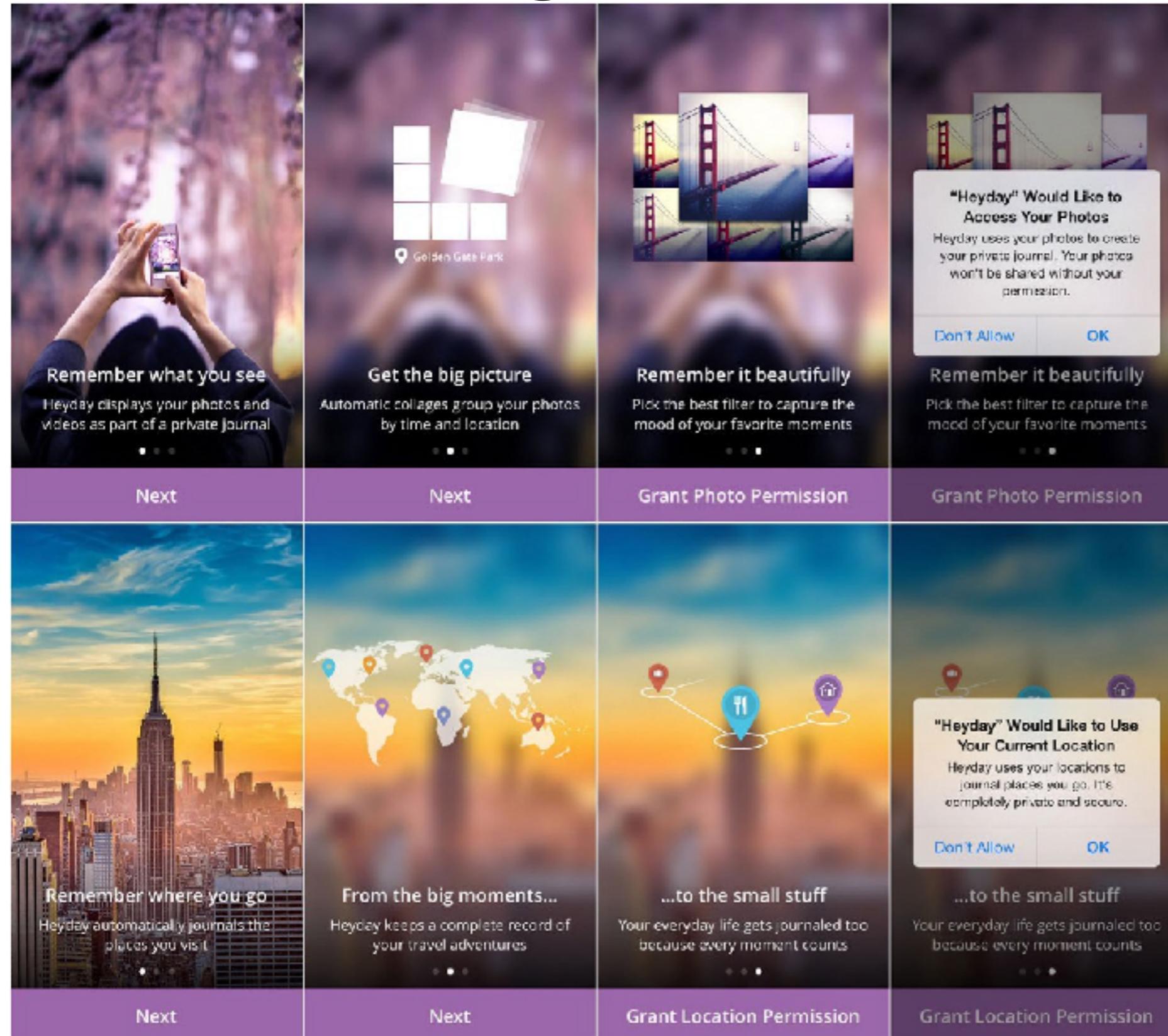
- don't ask until you need it, make sure the user knows the tradeoff
- use “benefit->explanation”
 - ask twice, showing the benefit in your own words



when asking for access



is this right?



what is good?

what is bad?

making our app better



And now its
time for a demo

for next time...

- concurrency in iOS
 - blocks/closures
- introduction to audio sensing

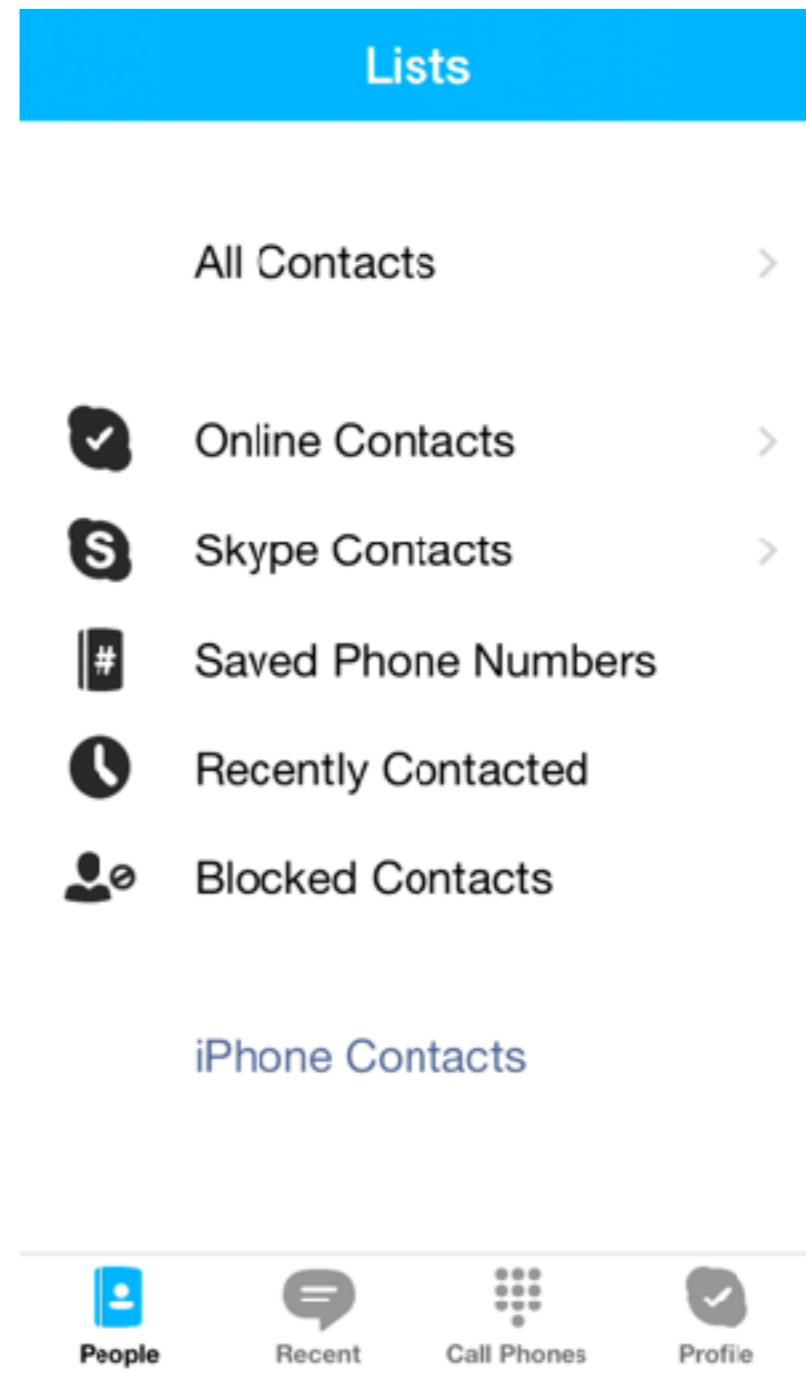
back up HCl slides

consider no splash

- use the splash screen to give impression of quickness

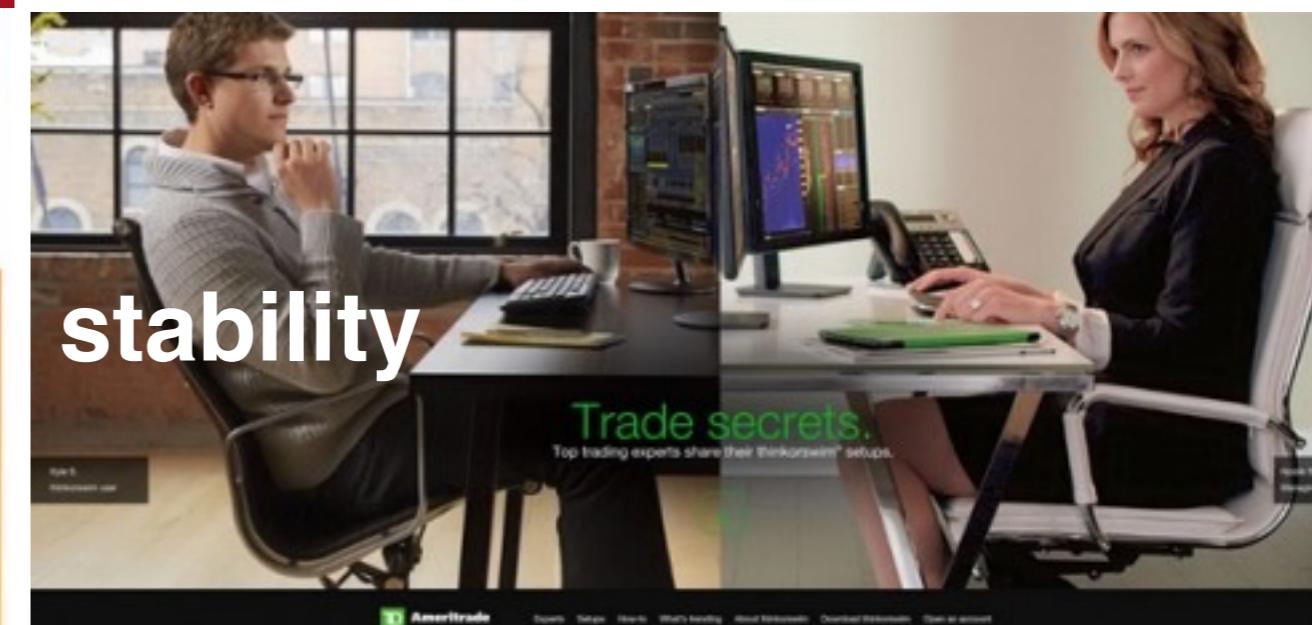
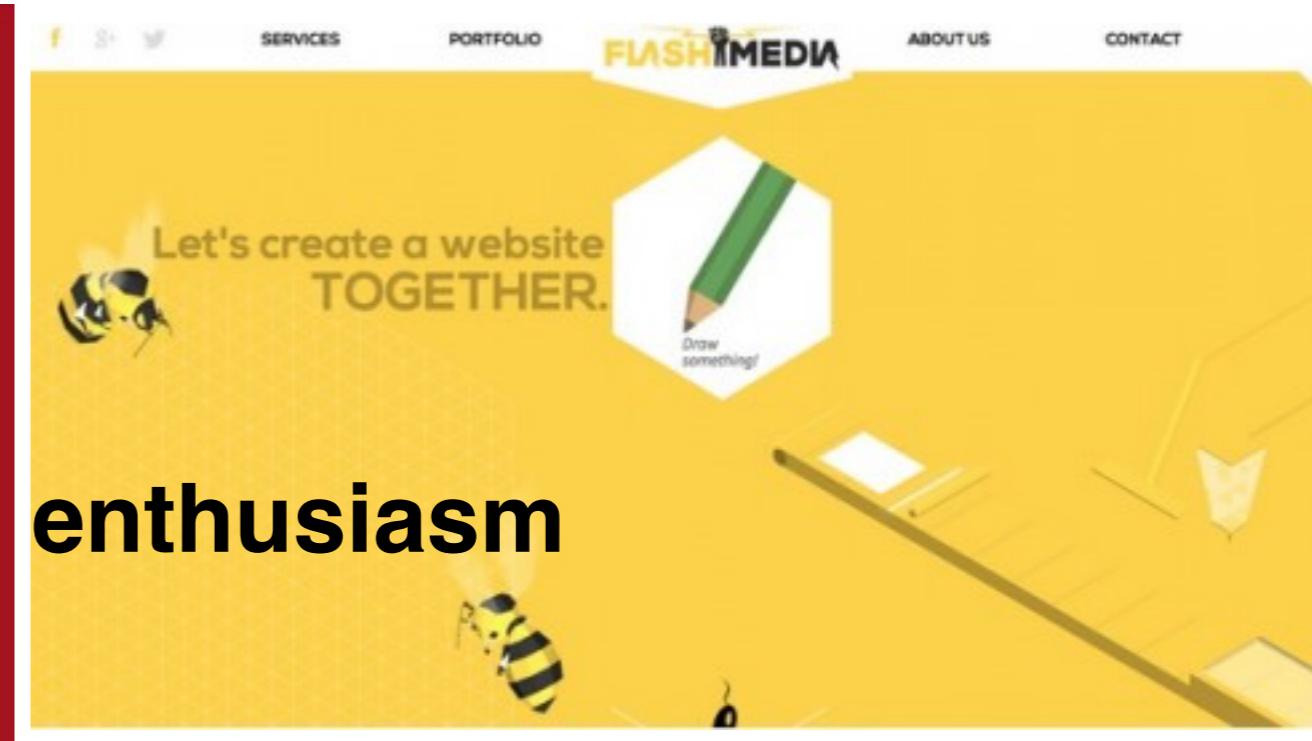


no



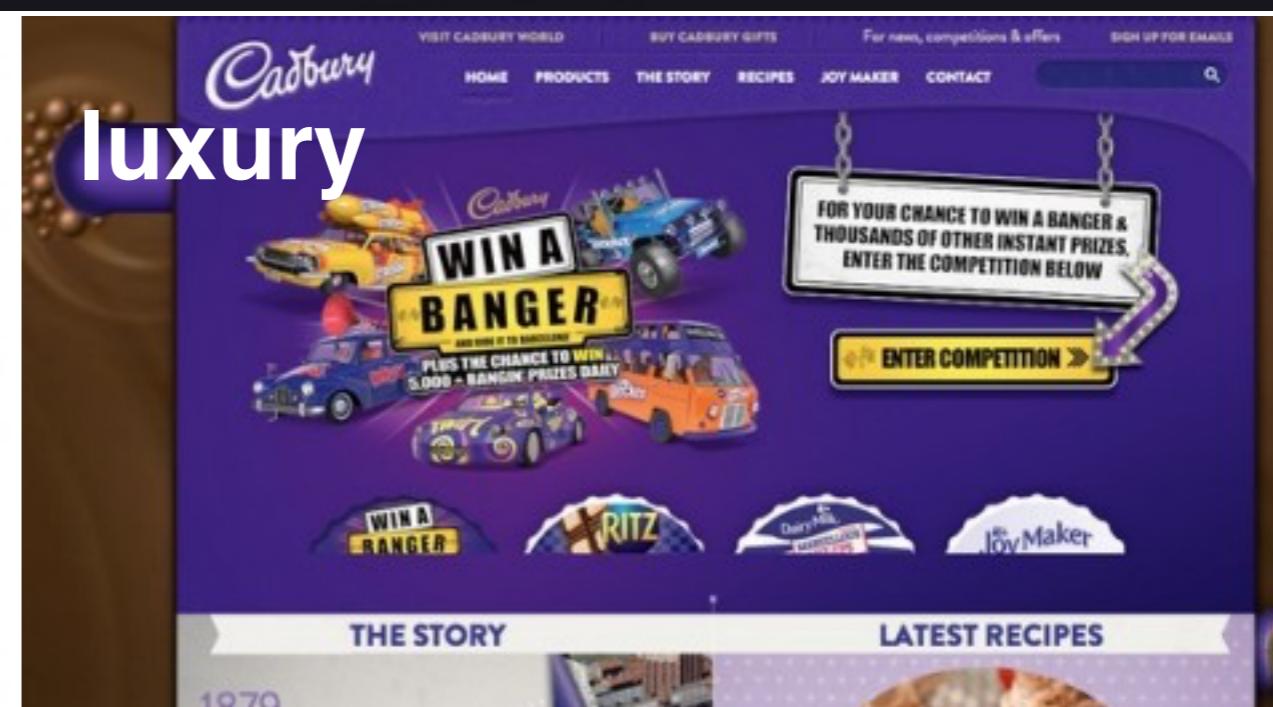
yes

use color “theory”



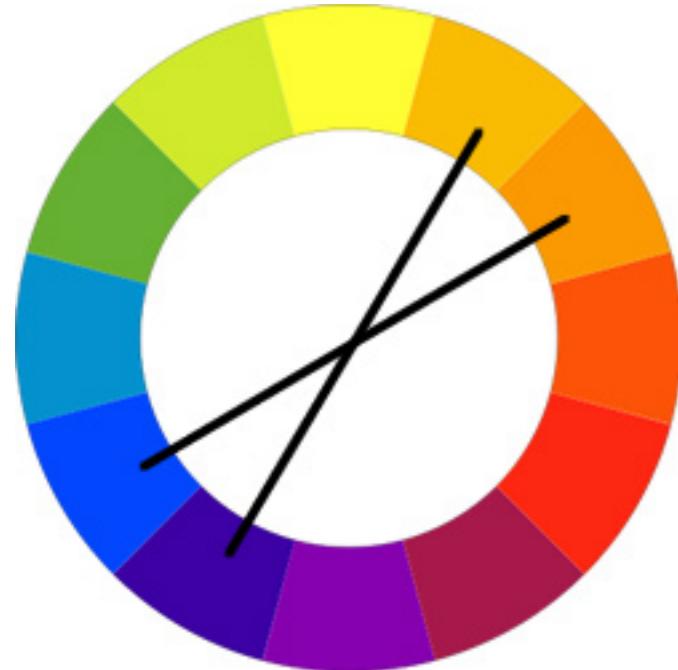
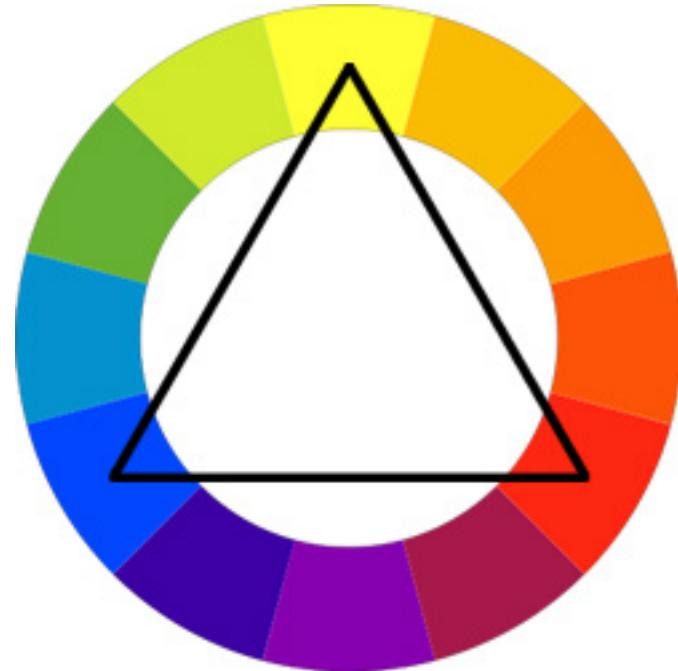
<http://thenextweb.com/dd/2015/04/07/how-to-create-the-right-emotions-with-color-in-web-design/>

use color “theory”



<http://thenextweb.com/dd/2015/04/07/how-to-create-the-right-emotions-with-color-in-web-design/>

use color



The image displays two screenshots of websites demonstrating color usage:

LemonStand (Top Screenshot): The page features a color wheel graphic at the top left. The text "The Only eCommerce Platform for Custom Online Stores" is displayed above a "Try It For Free" button. Below the button, there are three bullet points: "Easily customize anything, front-end or back", "Generate income by selling your custom modules", and "Support directly from our software engineers". To the right is a screenshot of a computer monitor showing a complex code editor with multiple tabs open.

National Multifamily Housing Council (Bottom Screenshot): This is a landing page for "APARTMENTS". The title "WE LIVE HERE" is centered above a paragraph of text: "In communities across the country, apartments work – helping people live in a home that's right for them. And demand continues to grow. Learn how apartments create communities and contribute to the economy." Below the text is a stylized illustration of buildings, trees, and clouds. At the bottom, there is a navigation bar with links like "Start", "We Build More", "We Work More", "We Spend More", "Start Over", and logos for NMHC and NAA.

<http://thenextweb.com/dd/2015/0>

use color theory



Analogous

mono-themed, but elegant
easy to select one other contrast color or highlights without
deviating from theme

A collage of various UI elements and app icons. It includes a grayscale gear icon, a green phone icon, a blue envelope icon, a purple microphone icon, a colorful flower icon, a map icon with a road sign for '280', and a black clock icon. Below these are several promotional banners for 'Silverback 2.0' usability testing software. One banner features a baby playing with a toy, another shows a person using a computer, and a third displays the software's interface. The overall theme is a consistent use of analogous colors (greens, blues, and purples) throughout the design.

match your
app icon
and
UI palette

Silverback 2.0
Guerrilla usability testing software for
designers and developers

- Capture screen activity
- Add chapter markers on-the-fly
- Video the tester's face
- Control recording with the remote
- Record the tester's voice
- Export to Quicktime

Features in 2.0 include

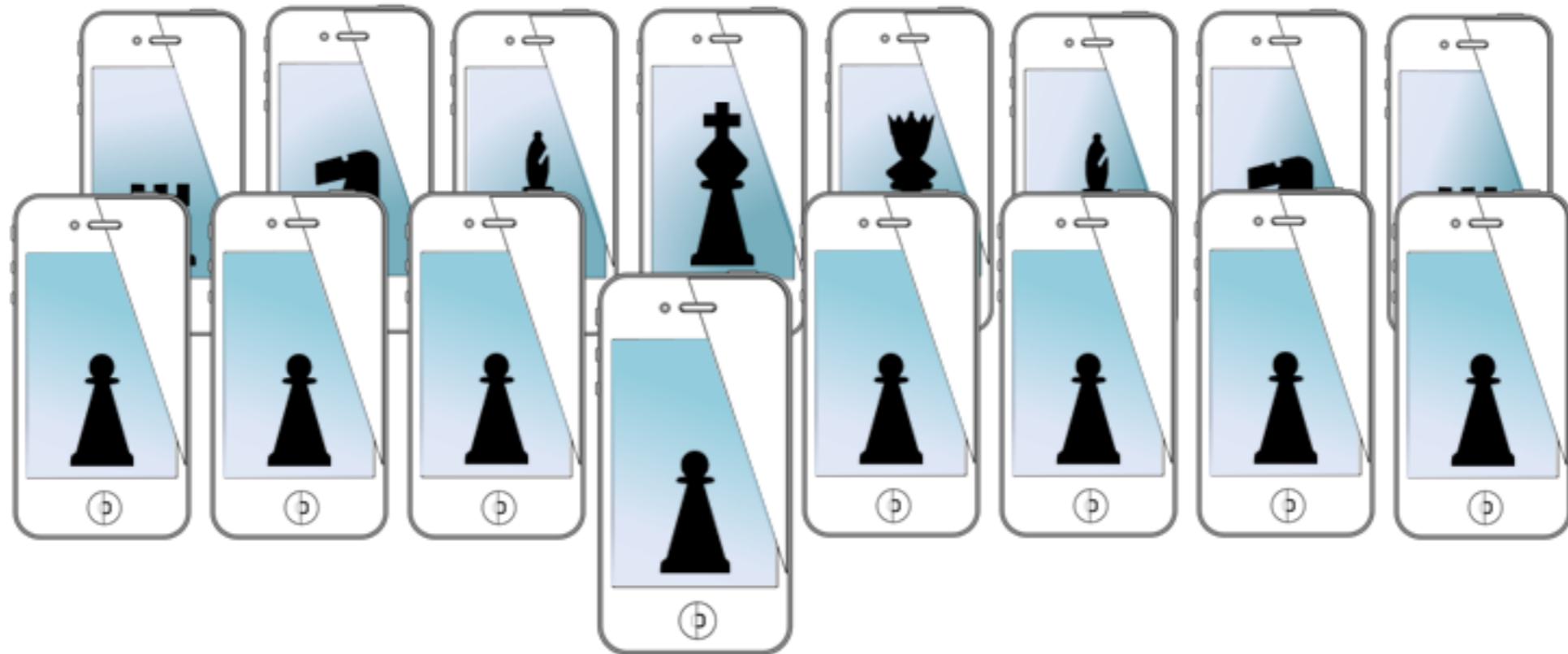
Preview	Batch Export
Watch sessions within Silverback	Save selected sessions, tasks, highlights or projects in one go
Tasks & Highlights	Performance
Set tasks and mark noteworthy moments within a session	Faster export, better usability

Download **Buy NOW** \$69.95 FREE upgrade for existing users

What does Silverback do?

<http://thenextweb.com/dd/2015/04/07/how-to-create-the-right-emotions-with-color-in-web-design/>

MOBILE SENSING LEARNING



CS5323 & 7323
Mobile Sensing and Learning

week 3, lecture one: mobile design and interaction

Eric C. Larson, Lyle School of Engineering,
Computer Science, Southern Methodist University