

# **IN4MATX 133: User Interface Software**

**Lecture 16:**  
**Mobile Design Principles**

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TA Jamshir Goorabian  
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# Class notes

- I am traveling Saturday 11/3-Thursday 11/8
  - I'm at a conference, theoretically with WiFi, but I'll be harder to reach
- As a result, the office hours schedule is changing
  - Check the calendar

# Class notes

- Guest lectures Monday and Wednesday
  - Josh Tanenbaum: Embodied Interface Design and Play
  - Bill Tomlinson: Computing Within Limits
- No clicker questions, but also no recording
  - Slides will hopefully be posted, but that's not a guarantee either

# Class notes

- Quiz 3 is next Tuesday
  - Quiz will cover 10/22 lecture (Express) through today (Mobile Design Principles)
  - There will be questions from Josh & Bill's lectures on Quiz 4

# Professor Epstein's travel



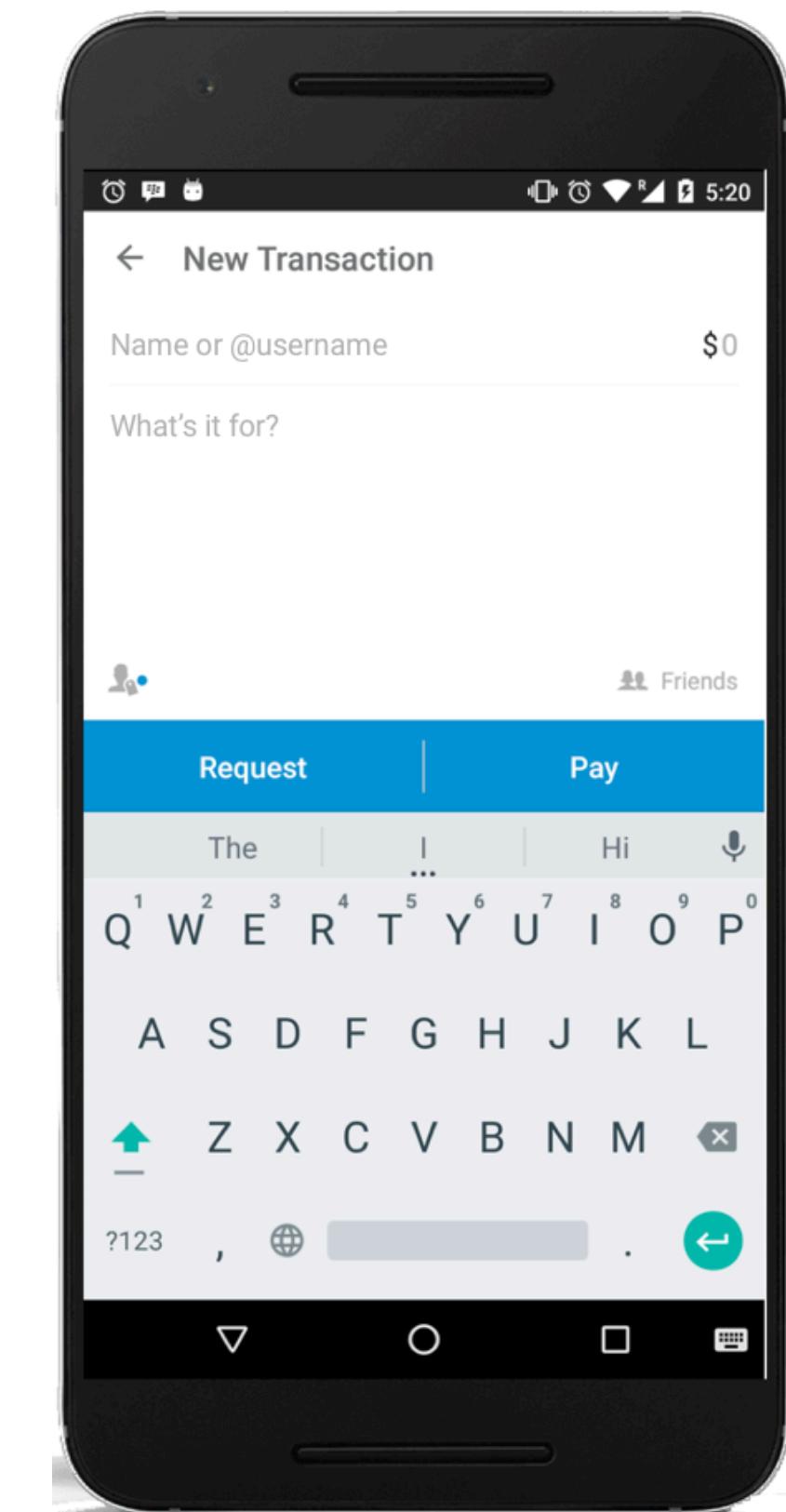
- “*The 21st ACM Conference on Computer-Supported Cooperative Work and Social Computing*” in Jersey City, NJ
- Computer Supported Cooperative Work
  - Understanding and improving how people work together
  - Office settings, remote work, gig work, hospital work...
- Social Computing
  - Understanding how people use social media
  - Facebook, Twitter, Instagram, Snapchat, Twitch, Tinder, Grindr...

<http://cscw.acm.org/2018/>

**Being at a top research university  
means you get to see the latest research,  
and potentially even work on it**

# Venmo

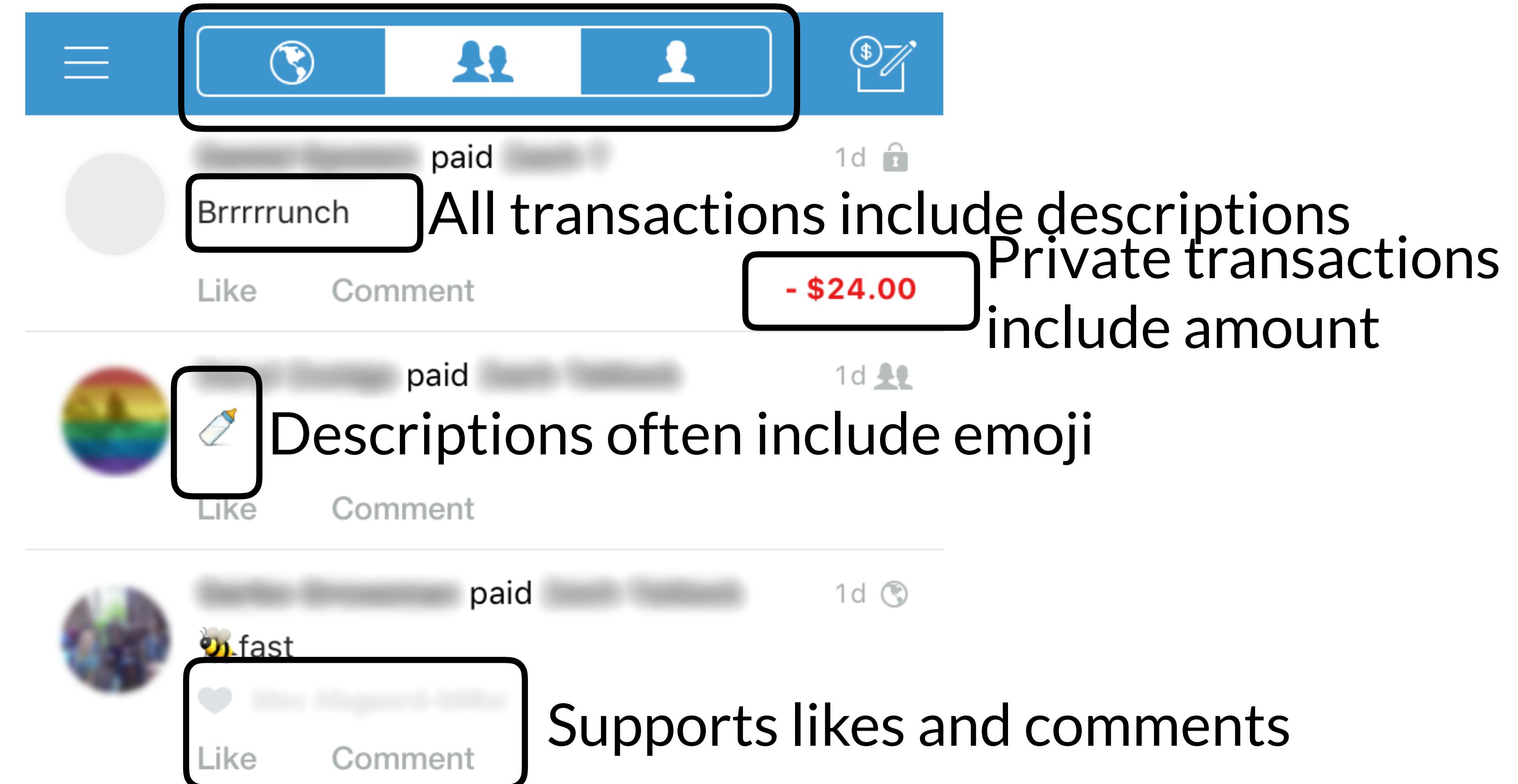
- Mobile peer-to-peer payments app
- Particularly popular among young people in the US
- \$25 Billion in transactions during the first half of 2018



Monica Caraway, Daniel A. Epstein, and Sean A. Munson. 2017. Friends Don't Need Receipts: The Curious Case of Social Awareness Streams in the Mobile Payment App Venmo. CSCW, 2017. <https://doi.org/10.1145/3134663>

# Venmo's social feed

Three feeds: public, friends, private



Monica Caraway, Daniel A. Epstein, and Sean A. Munson. 2017. Friends Don't Need Receipts: The Curious Case of Social Awareness Streams in the Mobile Payment App Venmo. CSCW, 2017. <https://doi.org/10.1145/3134663>

# It's weird that Venmo has a social feed

- Venmo's feed is about money, which a lot of people do not like talking about
- The app is goal-directed: sending or receiving money
  - Examples of goal-directed apps:  
Rideshare apps (Lyft, Uber),  
Music listening apps (Spotify, Pandora),  
Tracking apps (Fitbit, Strava, Mint)
  - Some of these apps do have feeds (Spotify, Strava), but most don't
  - Research primarily studies social feeds in apps more targeted at entertainment

Monica Caraway, Daniel A. Epstein, and Sean A. Munson. 2017. Friends Don't Need Receipts: The Curious Case of Social Awareness Streams in the Mobile Payment App Venmo. CSCW, 2017. <https://doi.org/10.1145/3134663>

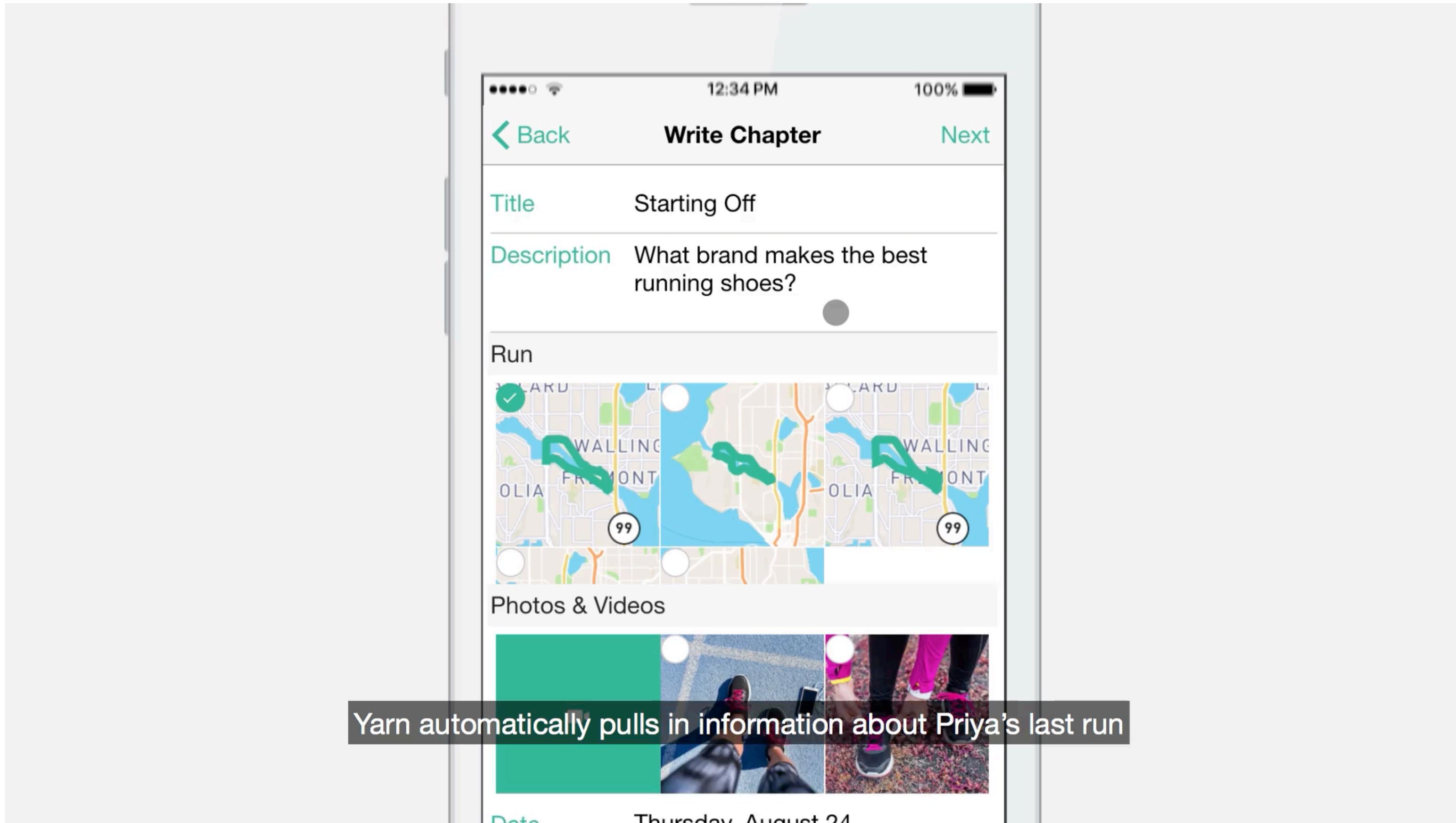
# **How do people feel about Venmo's social feed? How do people use it?**

Monica Caraway, Daniel A. Epstein, and Sean A. Munson. 2017. Friends Don't Need Receipts: The Curious Case of Social Awareness Streams in the Mobile Payment App Venmo. CSCW, 2017. <https://doi.org/10.1145/3134663>

# A feed makes payments more fun

- “[The feed is] icing on the cake... when it’s good, it’s funny, and I enjoy Venmo more. When it’s boring, it’s like, ‘Eh, whatever” (i13)
- “I knew my friend was going to see the transaction, and we both knew what it was for, and there wasn’t much thought outside of that. **It was just to send some emoji” (i11)**
- “Payments are thought of as serious because finances are a serious thing. Finances are your father’s bank or something like that but here it is, it’s like social media at the side. **Now, [with Venmo], it’s a fun way of thinking about money” (i5)**

# Yarn: authoring stories with personal data



Daniel A. Epstein. 2018. Helping People Find Support Through Data: Reflections from Four Projects on Sharing Personal Informatics Data Online. CSCW Workshop on Social Issues in Personal Informatics. [http://www.depstein.net/pubs/depstein\\_cscw18\\_work.pdf](http://www.depstein.net/pubs/depstein_cscw18_work.pdf)

# Yarn: authoring stories with personal data

- “*the prompts were good... having those fields where you could put what you were working on and what things you were actually encountering... it just focused me and allowed me to write a lot.*” (p2, diy)
- “*Yarn kind of motivated me to do different trails, since I’m taking photos and stuff it made me want to venture out to different areas.*” (p10, running)

# Today's goals

By the end of today, you should be able to...

- Follow high-level guidelines for developing mobile interfaces
- Find and interpret platform-specific human interface guidelines
- Differentiate iOS and Android platform guidelines

# What makes a good user experience?

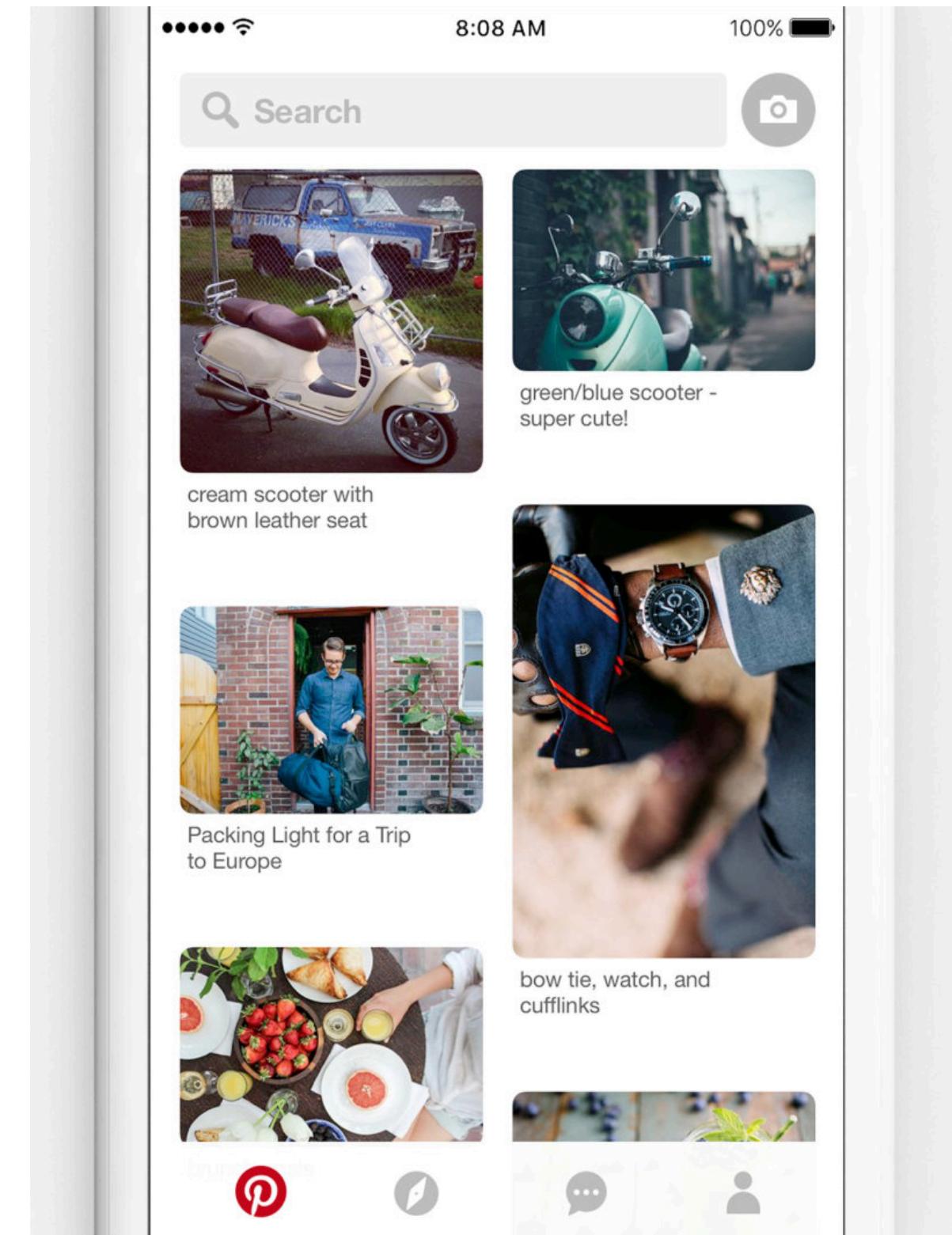
- It's not just the UI
  - The experience begins with the first time you launch an app or go to a website
- There are several components here
  - Initial impression (boot up to app start)
  - User interface
  - Visual design
  - Information presentation
  - The physical device and how it is used with the app

# A few principles of mobile design

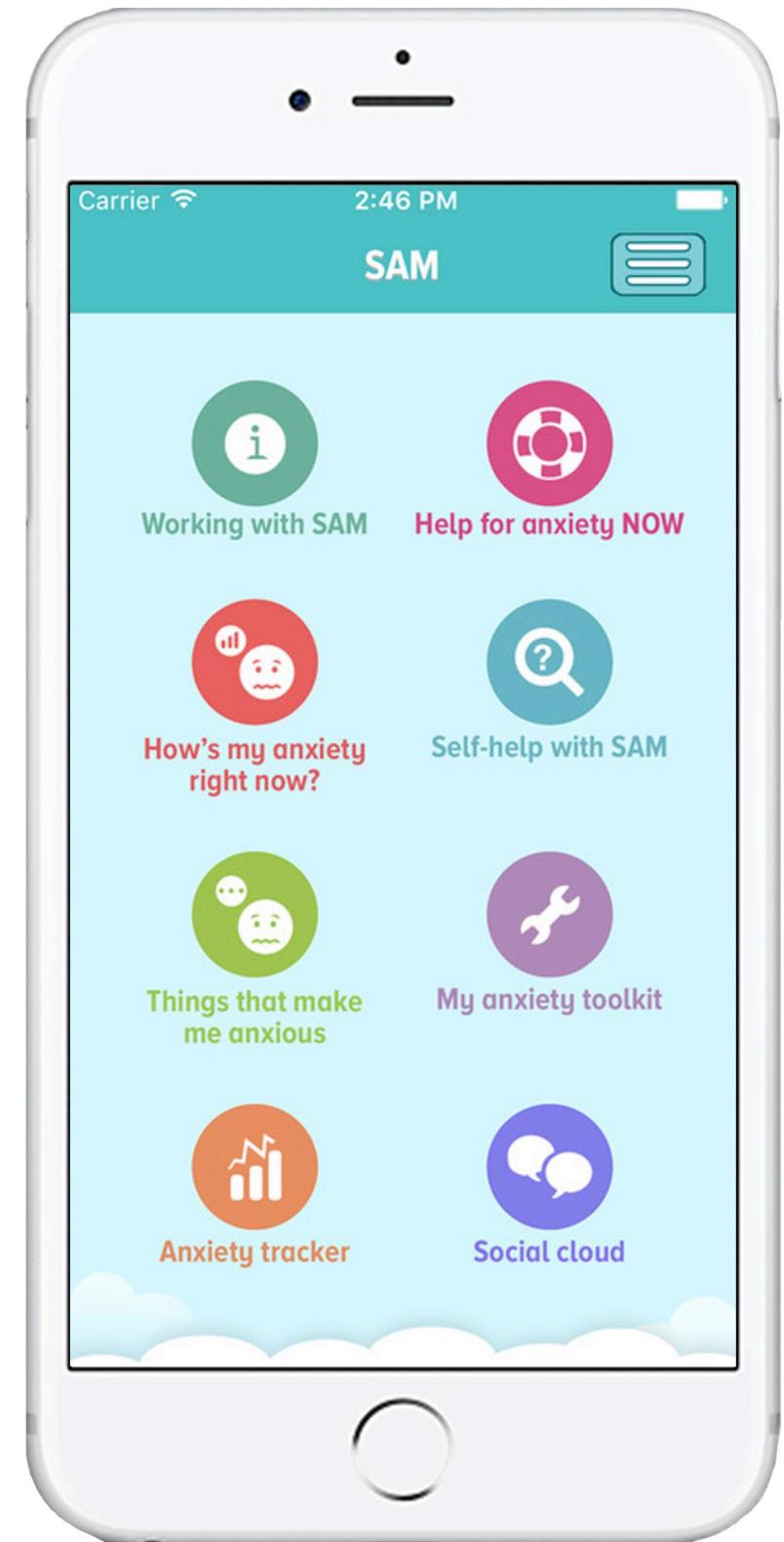
- A useful initial view
- The “uh-oh” button
- Error prevention
- Follow platform conventions

# A useful initial view

- Give users clear calls to action
- Put useful content on the homepage
  - Pinterest's images
  - Put more than navigation buttons
- Make it easy to get back to the homepage
  - Bottom navbar, side navigation menu



Pinterest



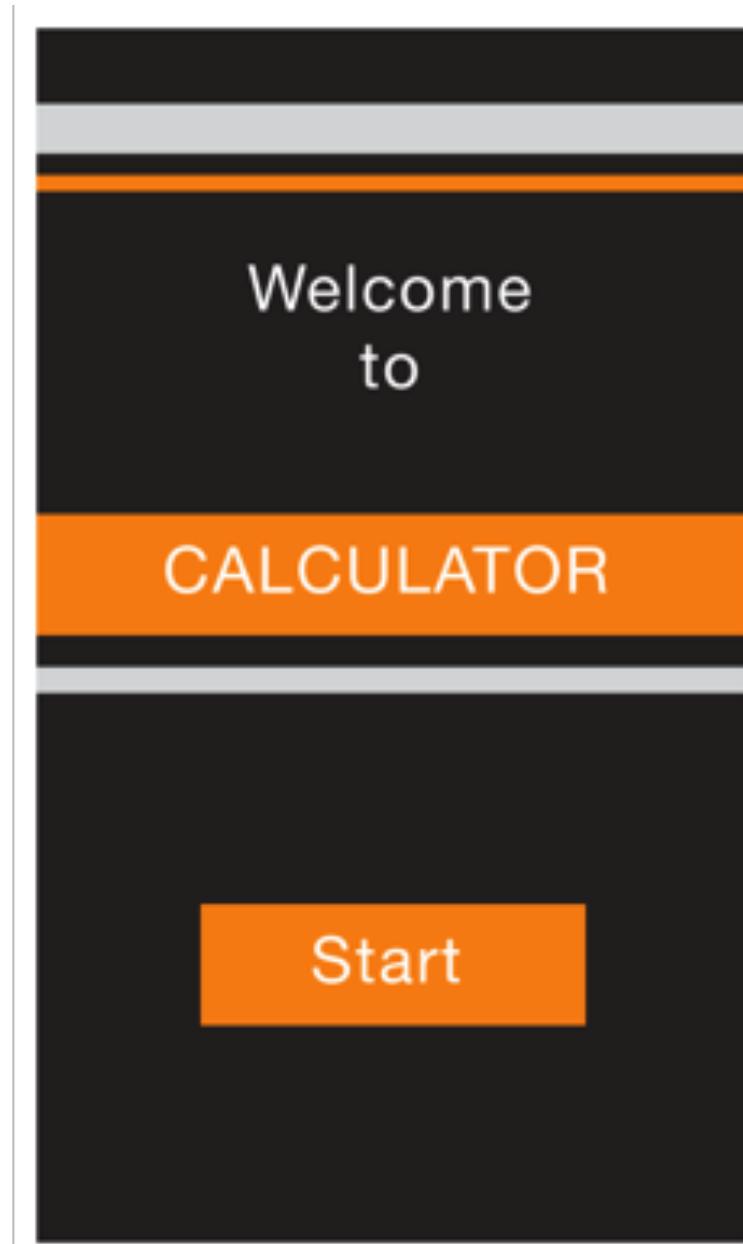
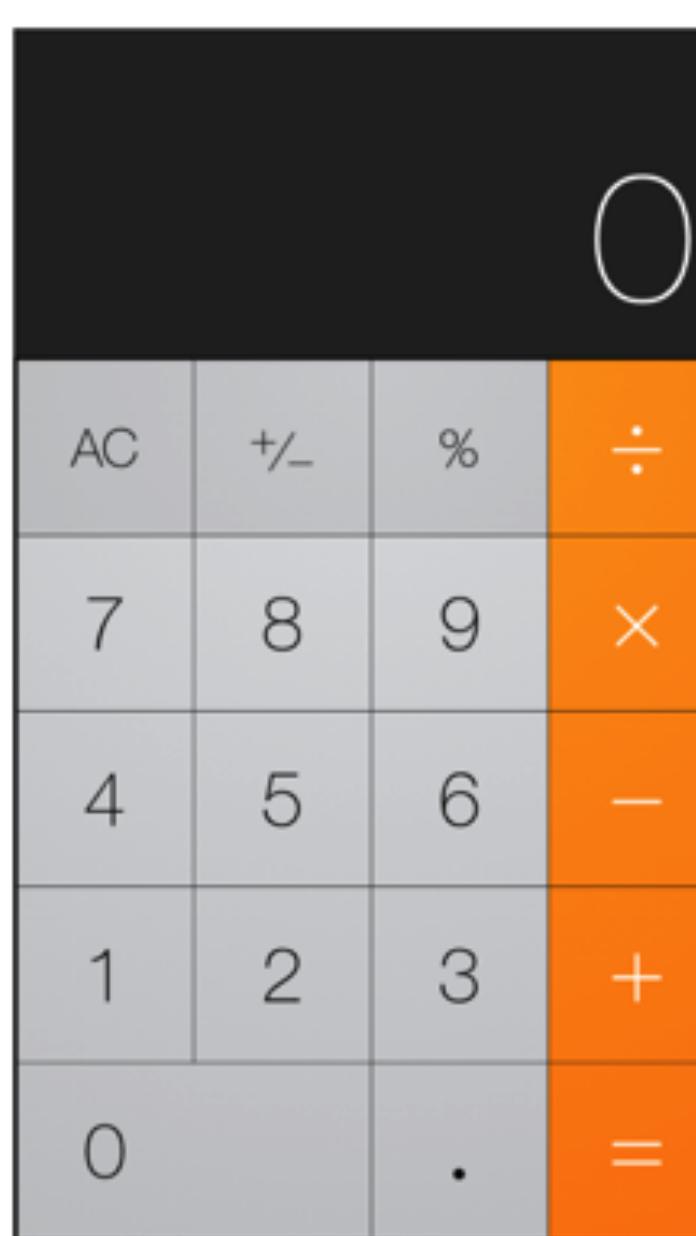
Anxiety management app

# Question



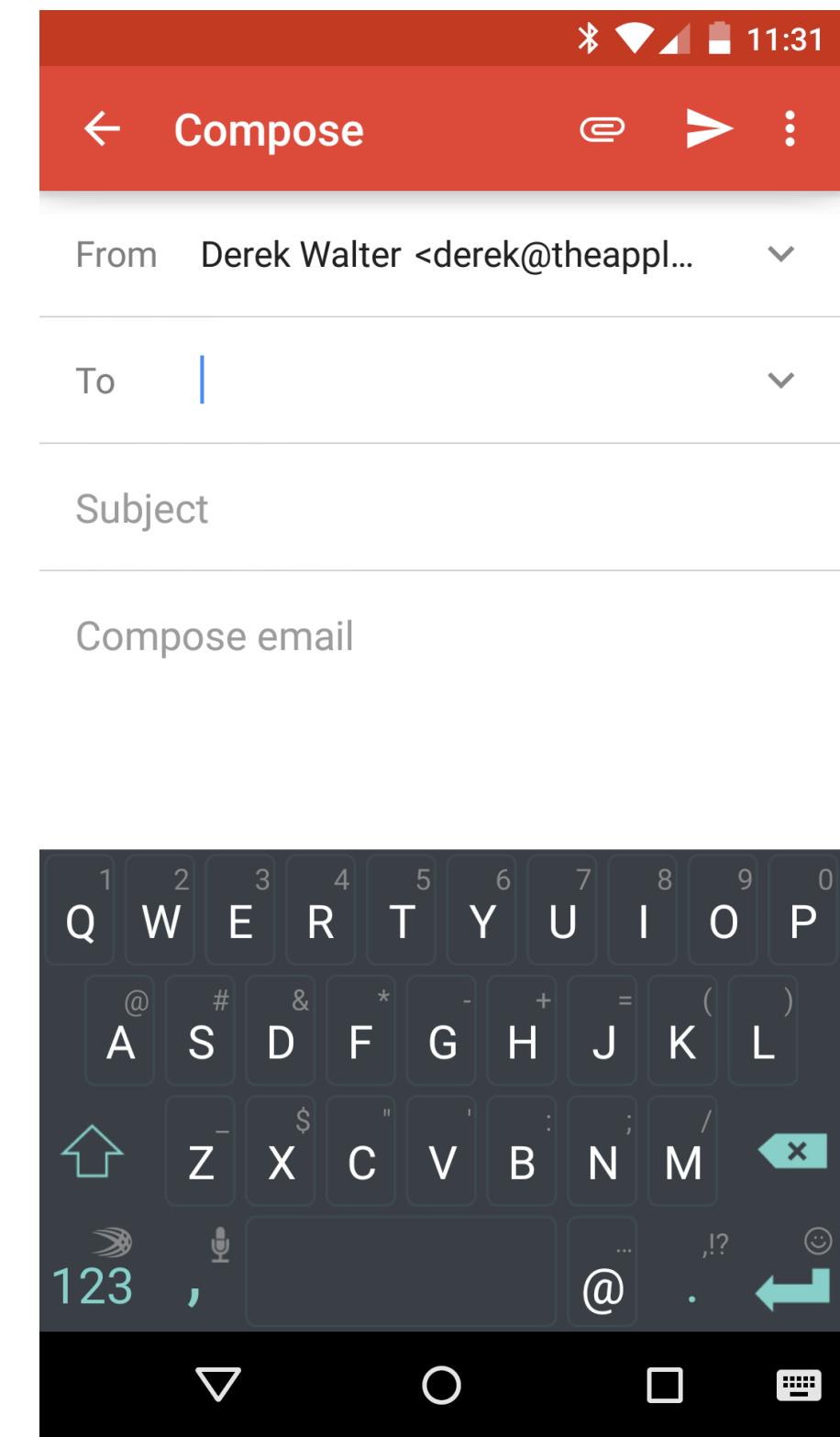
Which is the better start screen  
for a calculator app?

- A The left screen is better
- B The right screen is better
- C They're roughly equivalent
- D Neither is good, all math should be done in JavaScript
- E Neither is good, all math should be done in TypeScript



# The “uh-oh” button

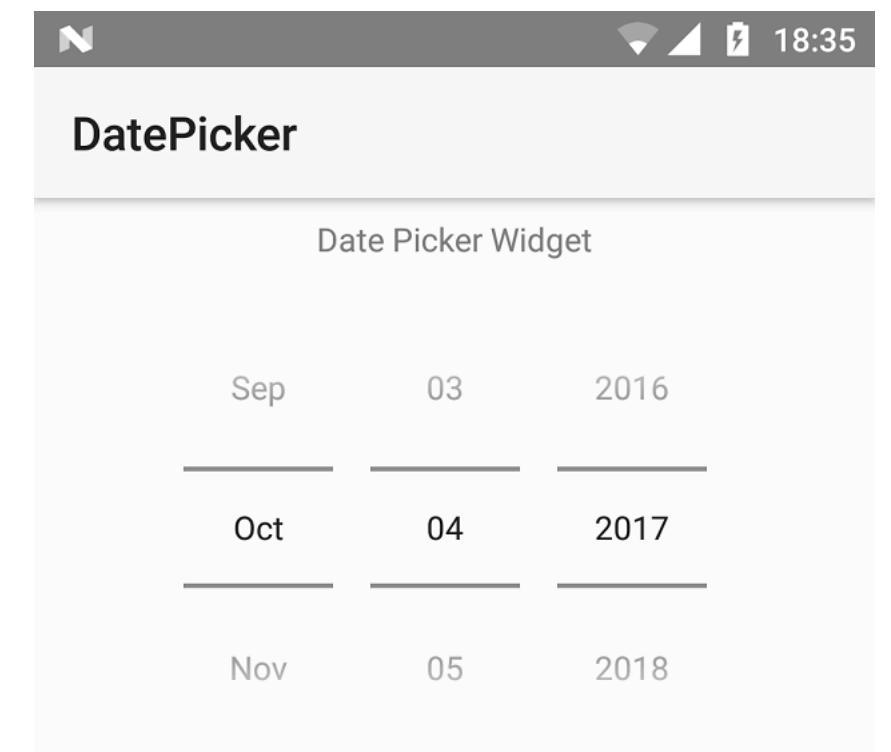
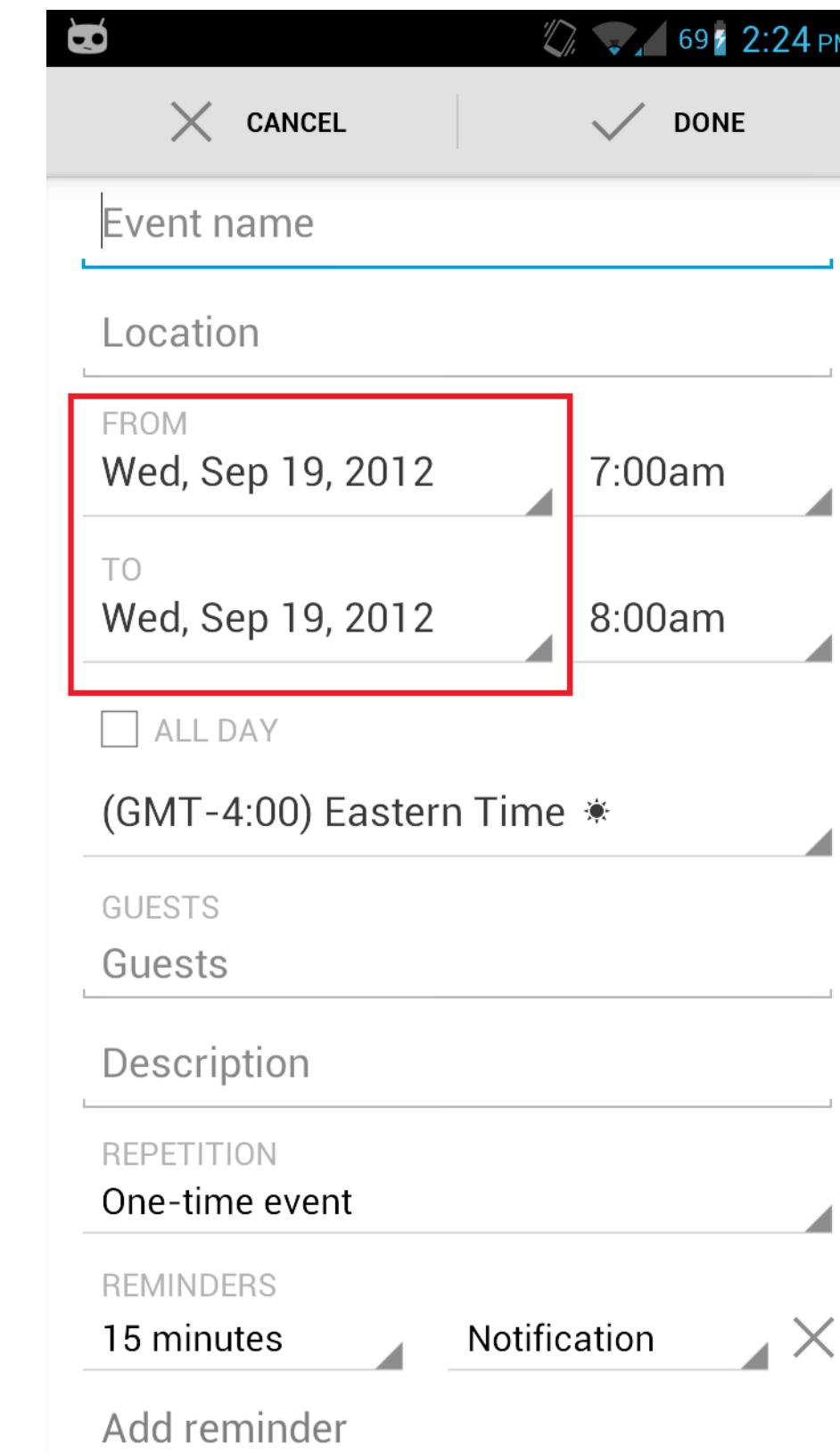
- Functions and buttons are often pressed by mistake
- Undo and redo should be easy
  - Gmail: “undo send”
- Navigating back a page should be easy
  - Breadcrumbs or back buttons (top left)



Gmail

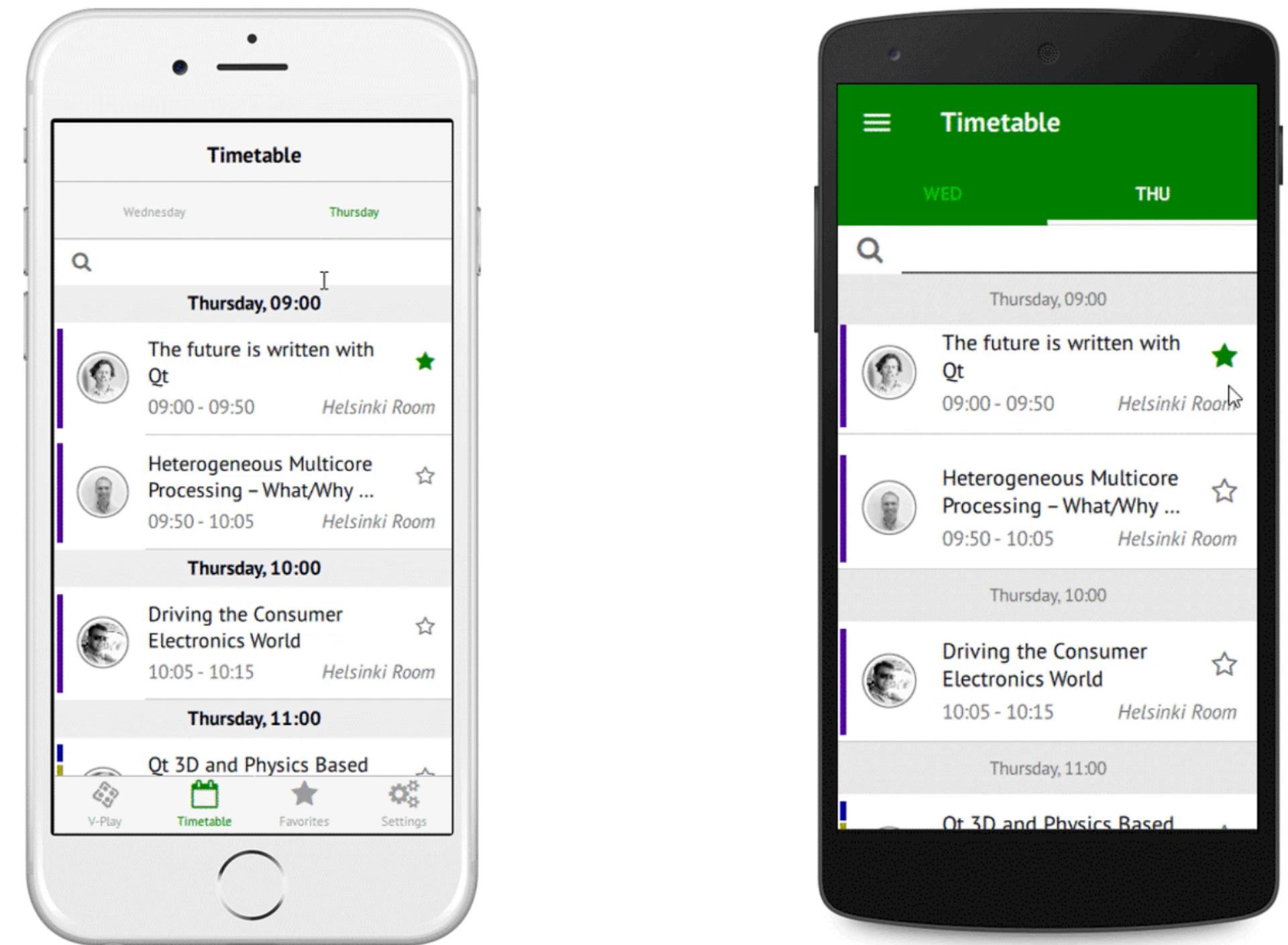
# Error prevention

- Providing input with small devices is difficult
  - Add in as much assistance as possible to aid with input
- Add input checks
  - How many digits are in that phone number? Credit card number?
- Use appropriate widgets
  - Date/time spinner
  - Sliders



# Follow platform conventions

- Users should not have to wonder whether different words, situations, icons, or actions mean the same thing
- Users should not have to remember app-specific navigation



# **iOS and Android platform conventions: Human Interface Guidelines**

# Human interface guidelines

- Created by web/mobile platform developers (Google, Apple)
- Key features:
  - Define rules for visual design and style
  - Specify interactions
  - Establish layout techniques
  - Provide consistency across the platform

# Human interface guidelines

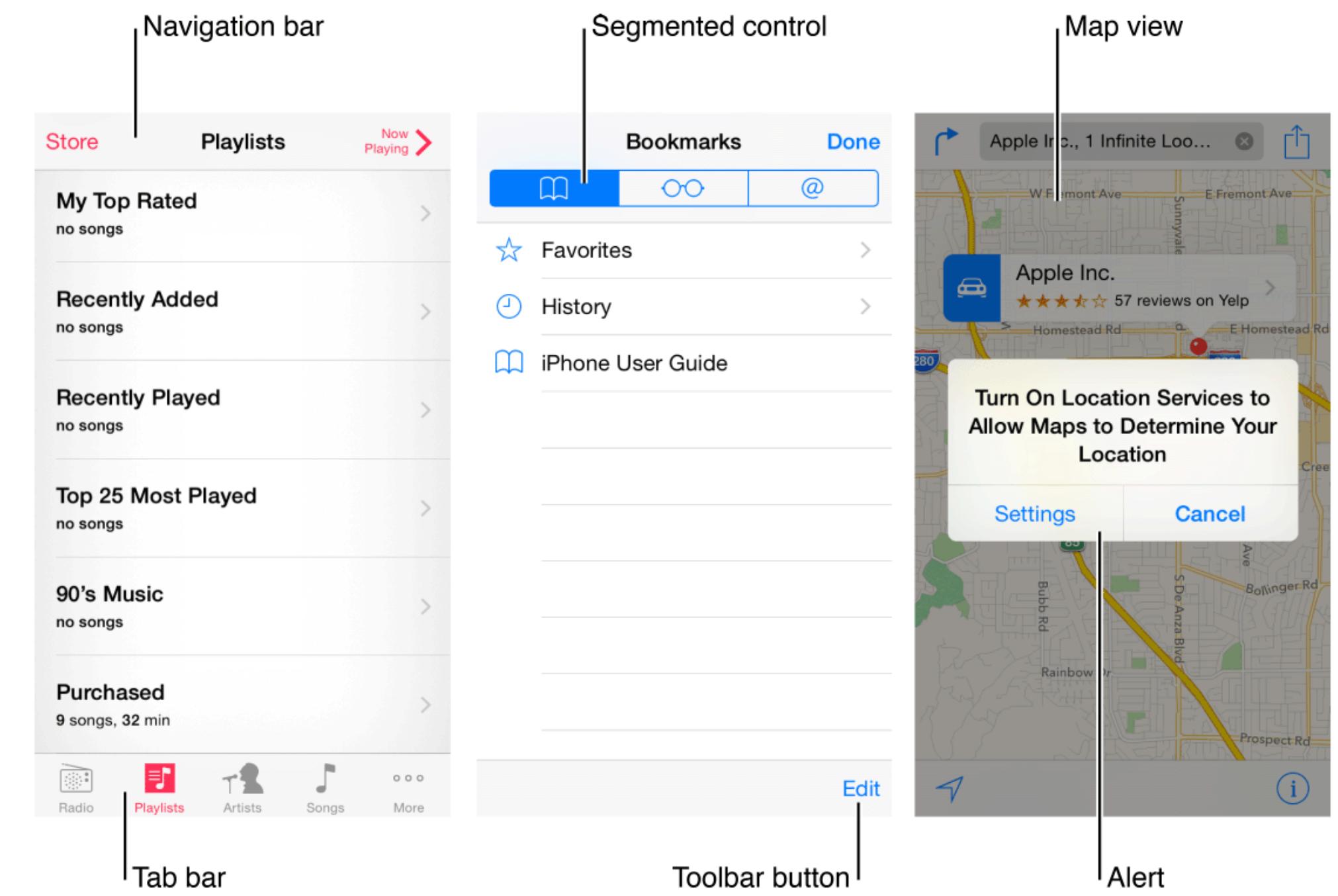
- HIGs are recommendations; you can choose to ignore them
  - The goal is to create an optimal experience for a device or platform
  - These guidelines most often follow best practices

# iOS Human Interface Guidelines

- Content over UI
- Use the whole screen
- Single / simple colors
- Borderless buttons and widgets

# Navigation

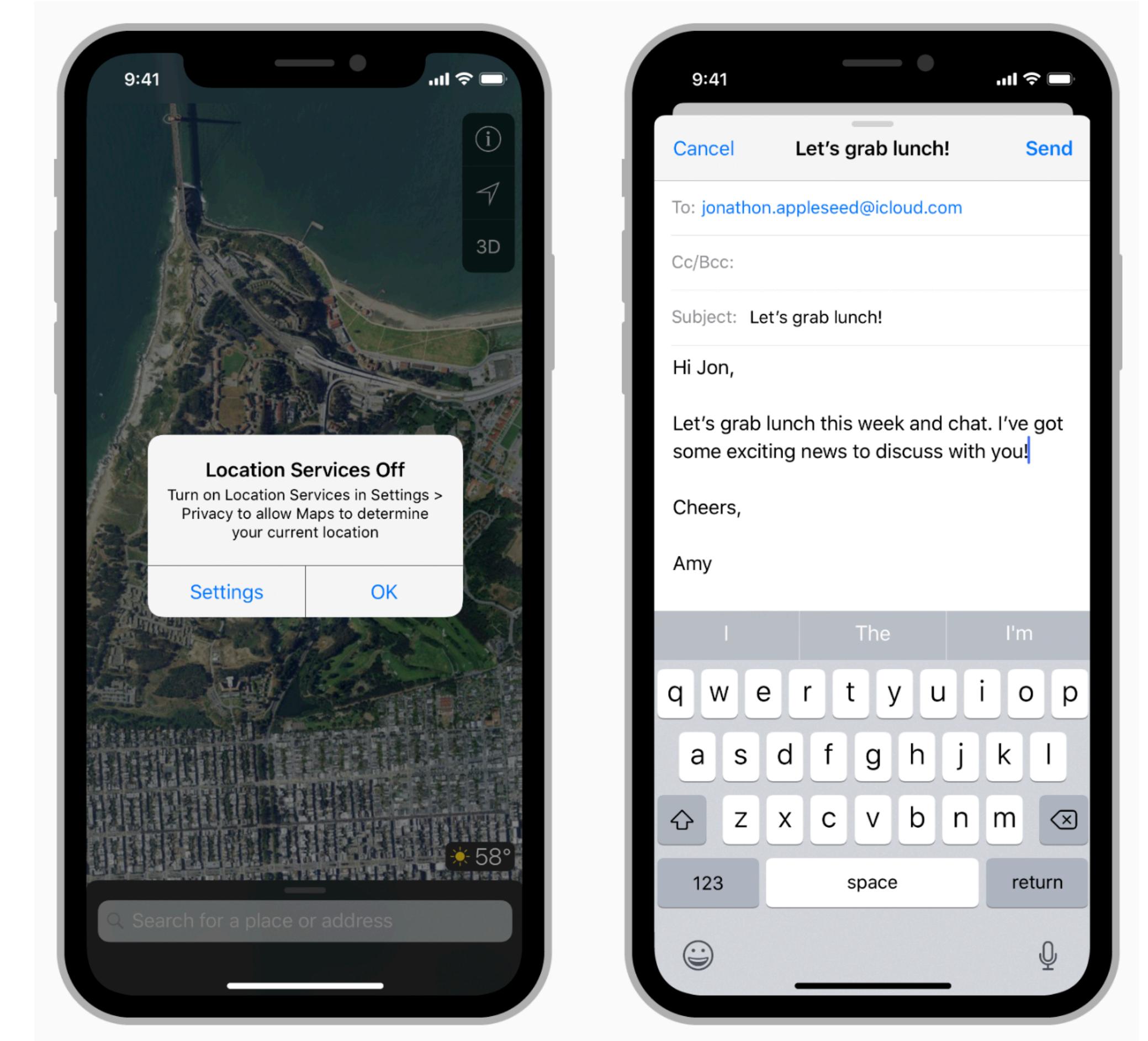
- Should be “natural”
- Use a navigation bar to traverse a hierarchy of data
- Use a tab bar for several peer categories
- Use a new page when that page is an instance of an item for another page



<https://developer.apple.com/design/human-interface-guidelines/ios/app-architecture/navigation/>

# Modals

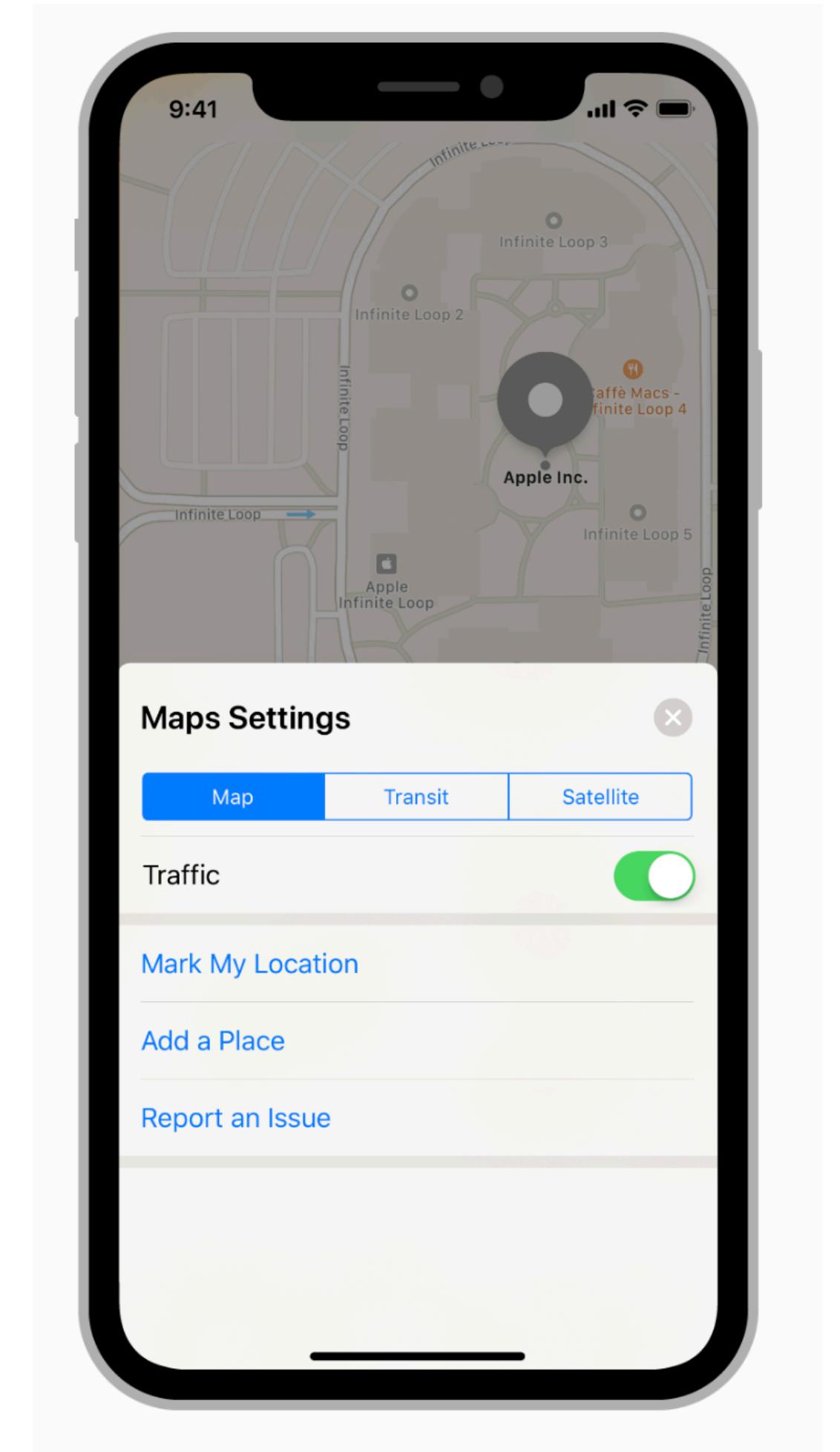
- Grab control of the experience until they are dismissed
- Meant to grab attention for doing one small, specific task
- Make sure the user can back out
- Respect notification wishes
- Use sparingly



<https://developer.apple.com/design/human-interface-guidelines/ios/app-architecture/modality/>

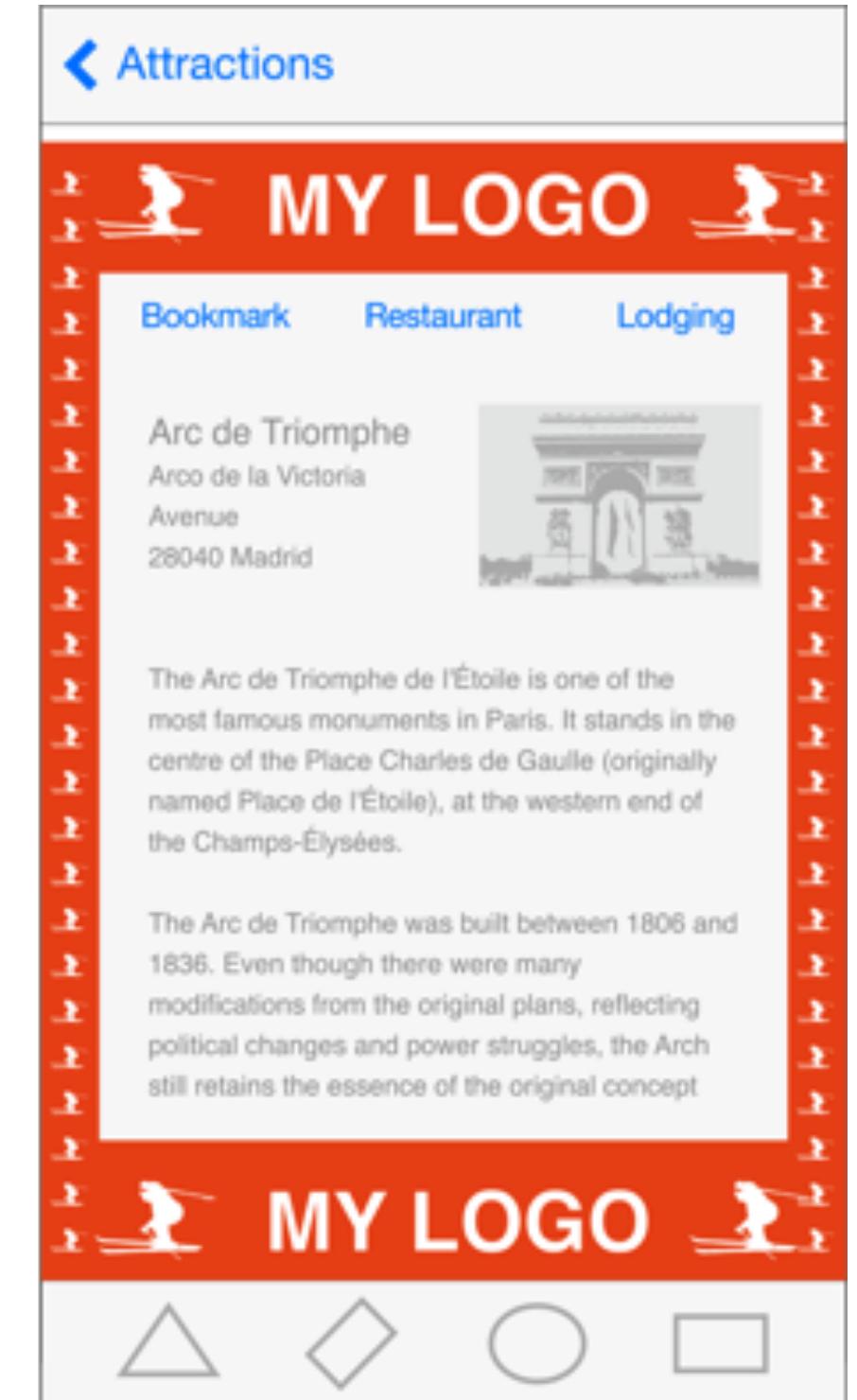
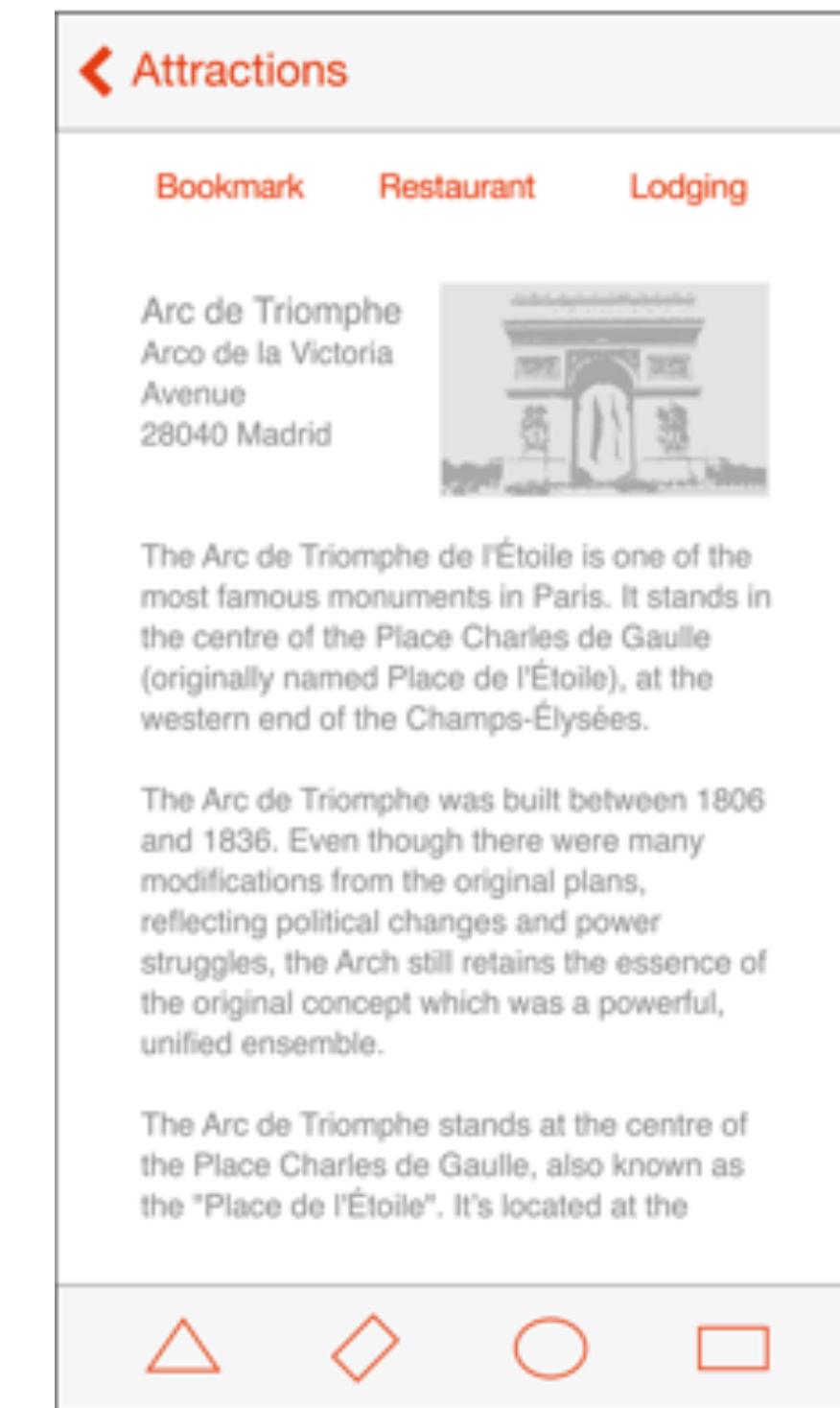
# Interactivity

- Use a key color to denote interactive elements
- Denote “active” and “inactive” components differently
- Be aware of colorblindness



# Branding

- It's important to be distinctive...
- But be careful not to pull a user out of the iOS experience
- Your app does not have to look like a default app, but...



# Color and Typography

- Colors are great for grabbing attention, but can be overused



- Use complementary colors

- Palette definers like [paletton.com](https://paletton.com)

- Use a single typeface (font), if possible

- Built-in fonts are just fine
  - Use font size, and color and weight (bold) to highlight information

(23pt) John Appleseed  
(22pt) John Appleseed  
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SF Pro Display (20pt) John Appleseed  
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<https://developer.apple.com/design/human-interface-guidelines/ios/visual-design/color/>

# Icons

- A good icon is important
- Keep background simple
- Only use words if they are essential or part of a logo
- Leave your icon out of the interface
- When appropriate, use system icons in the interface itself
  - Use as intended



Icon	Name	Meaning
↑	Action (Share)	Shows a modal view containing share extensions, action extensions, and tasks, such as Copy, Favorite, or Find, that are useful in the current context.
+	Add	Creates a new item.
📖	Bookmarks	Shows app-specific bookmarks.
📷	Camera	Takes a photo or video, or shows the Photo Library.
Cancel	Cancel	Closes the current view or ends edit mode without saving changes.
📝	Compose	Opens a new view in edit mode.
Done	Done	Saves the state and closes the current view, or exits edit mode.
Edit	Edit	Enters edit mode in the current context.
▶	Fast Forward	Fast-forwards through media playback or slides.

<https://developer.apple.com/design/human-interface-guidelines/ios/icons-and-images/app-icon/>

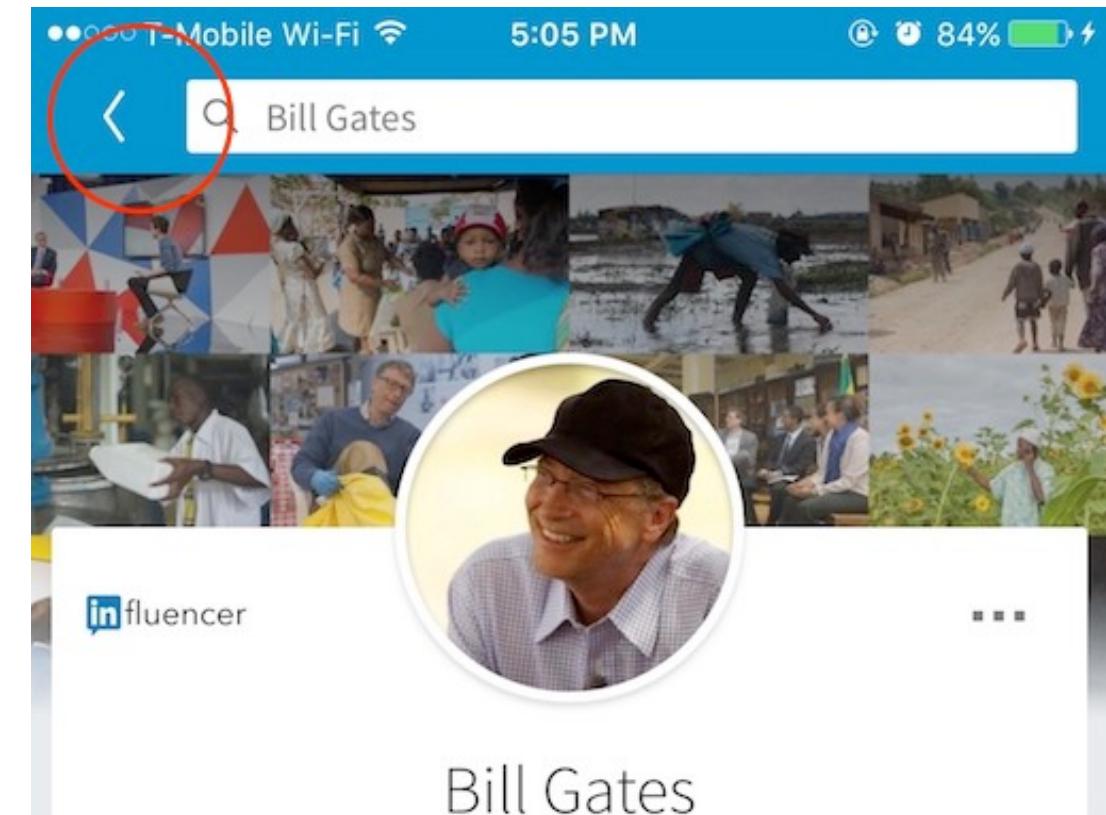
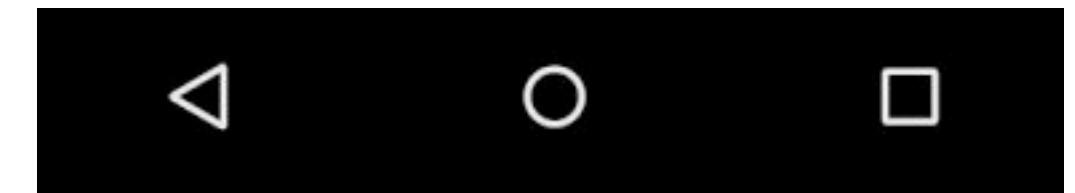
# Google Material Design

- Philosophy: interface should look like layers on a sheet of paper
  - Have 3D depth and motion
- Follows many of the same patterns as iOS design in terms of interaction
  - Limited use of modals
  - Use color to emphasize content
  - Be subtle with branding
- But, there are a few key differences

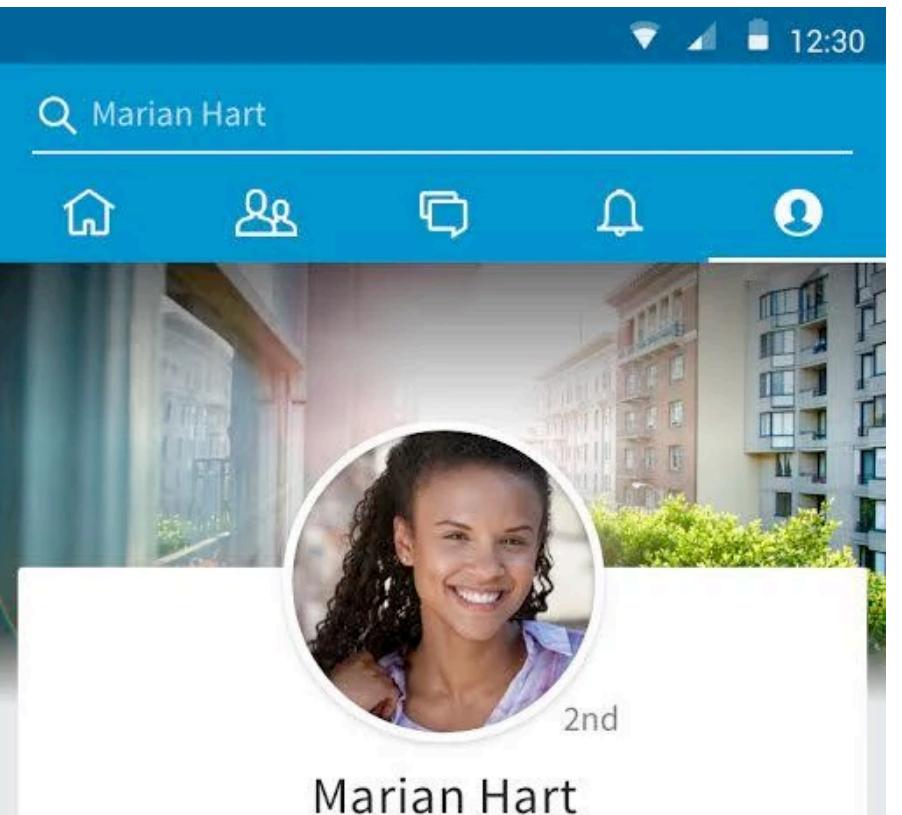
<https://material.io/design/>

# Universal navigation bar

- Android has a navigation bar at the bottom of the screen
  - Sometimes it's a hardware button, sometimes done in software?
  - But it's always present
  - iOS implements “back” in-app



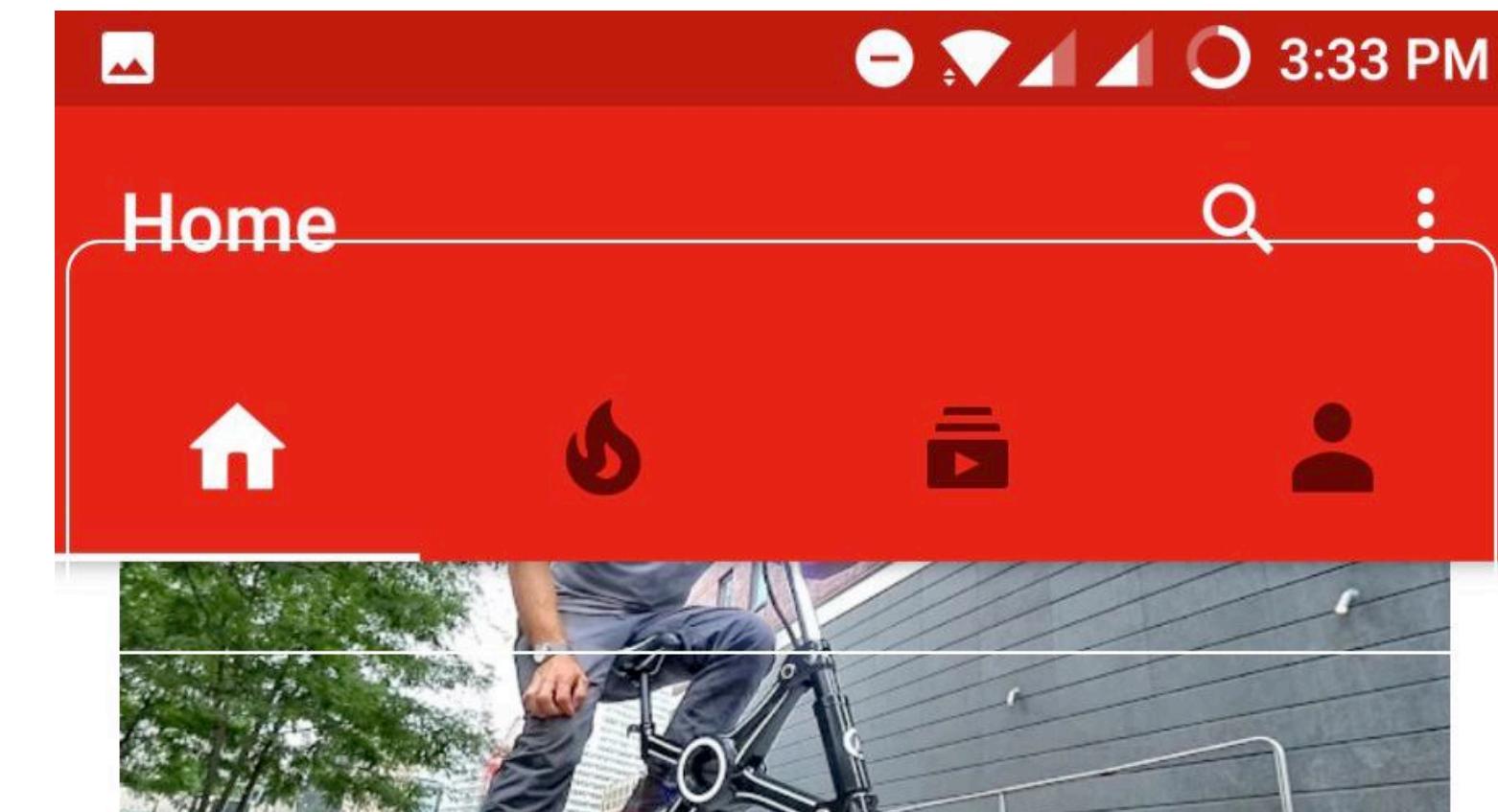
iOS



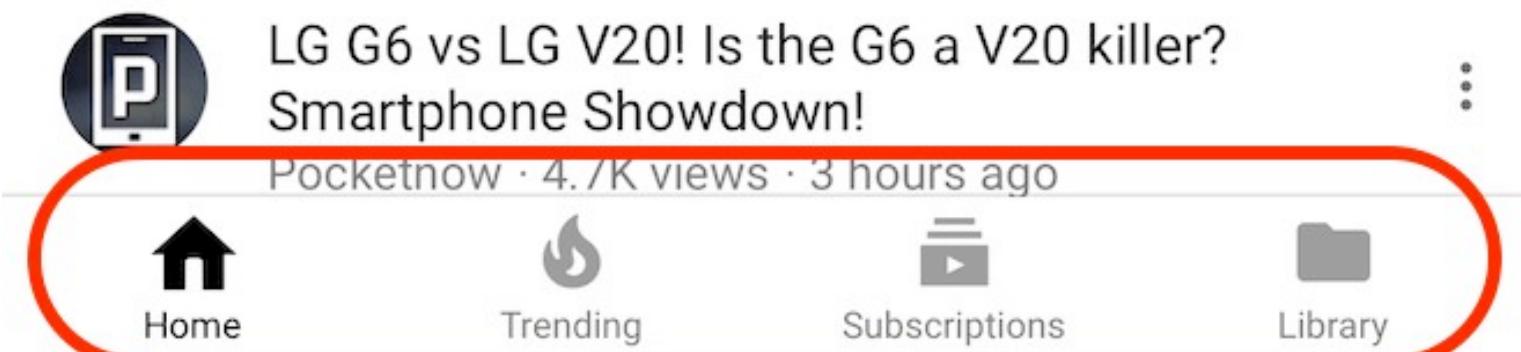
Android

# In-app navigation

- On top in Android, on bottom in iOS
  - Why the difference?
- Android only shows icons
- iOS icons have labels



Android

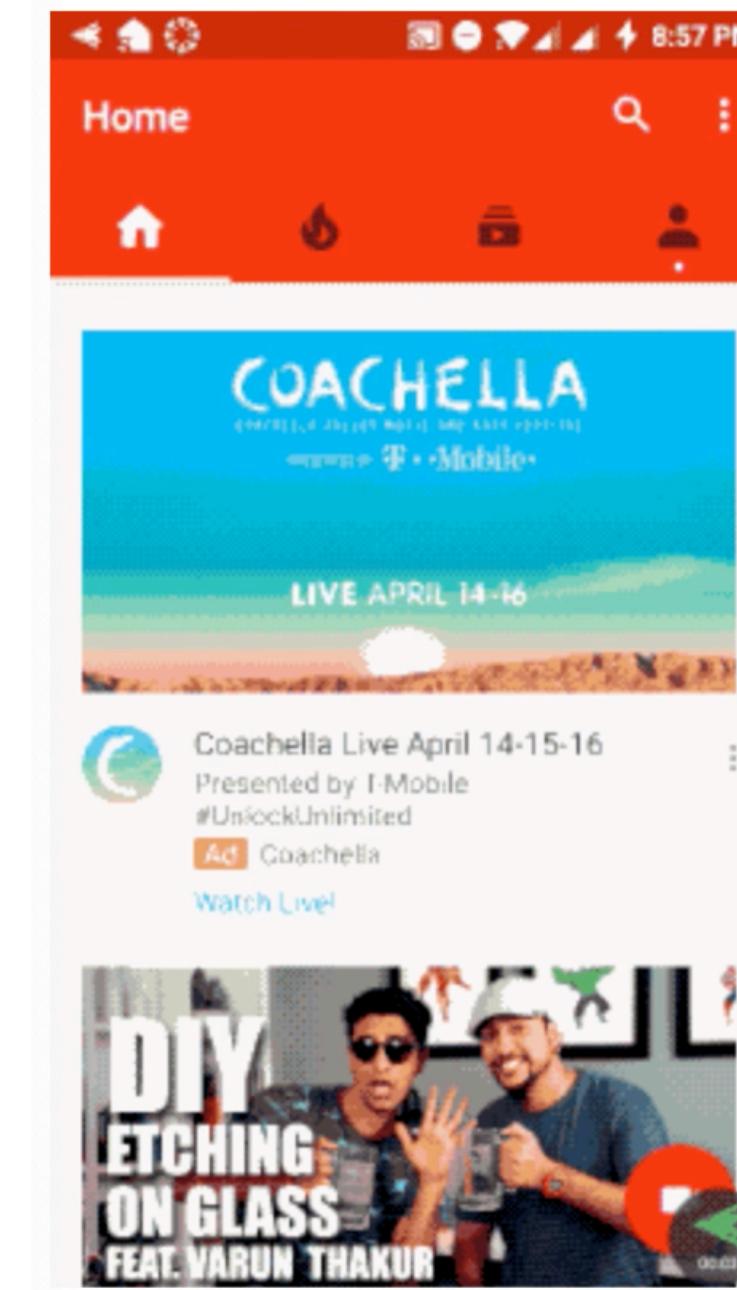


iOS

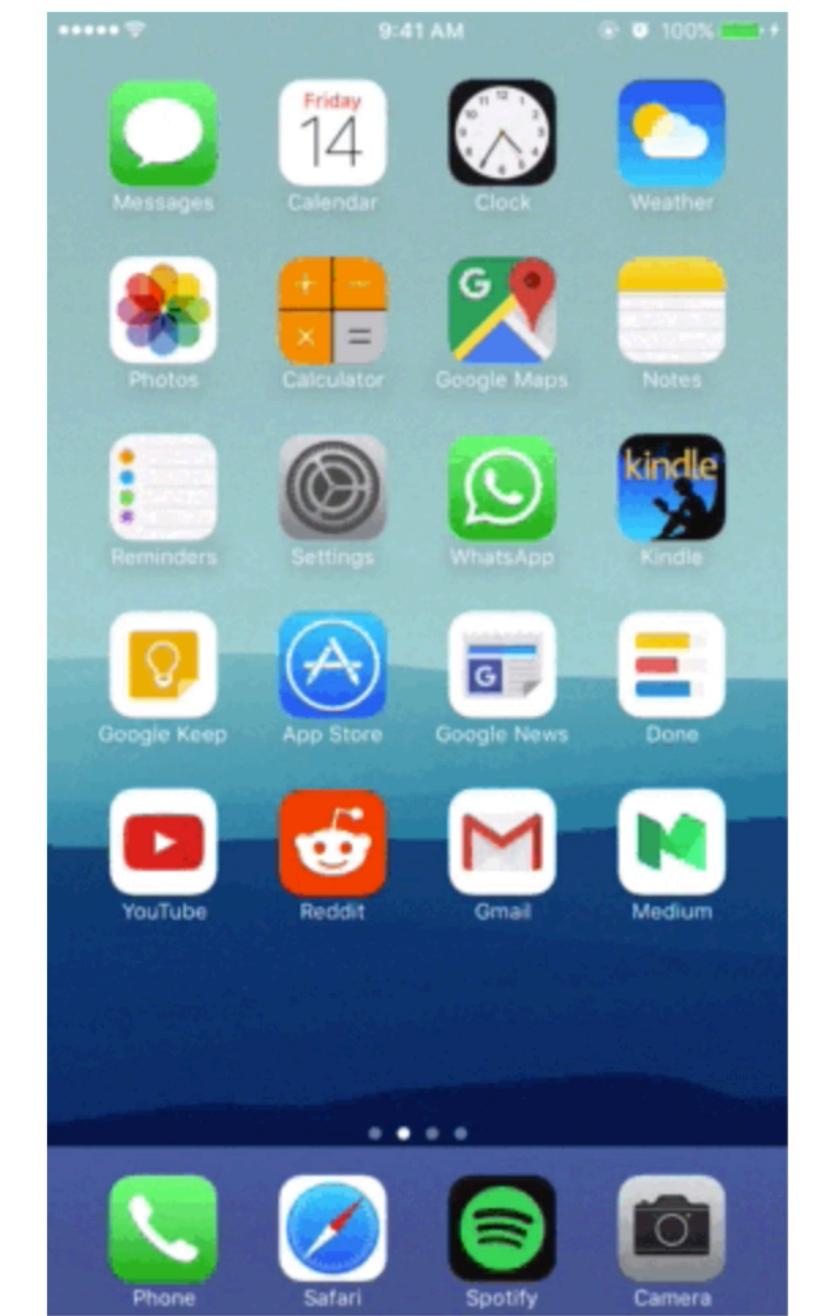
<https://medium.com/@vedantha/interaction-design-patterns-ios-vs-android-111055f8a9b7>

# Swiping

- On Android, swiping moves the user between tabs
- On iOS, swiping takes the user back a screen
- Android's always-present back button allows this navigation



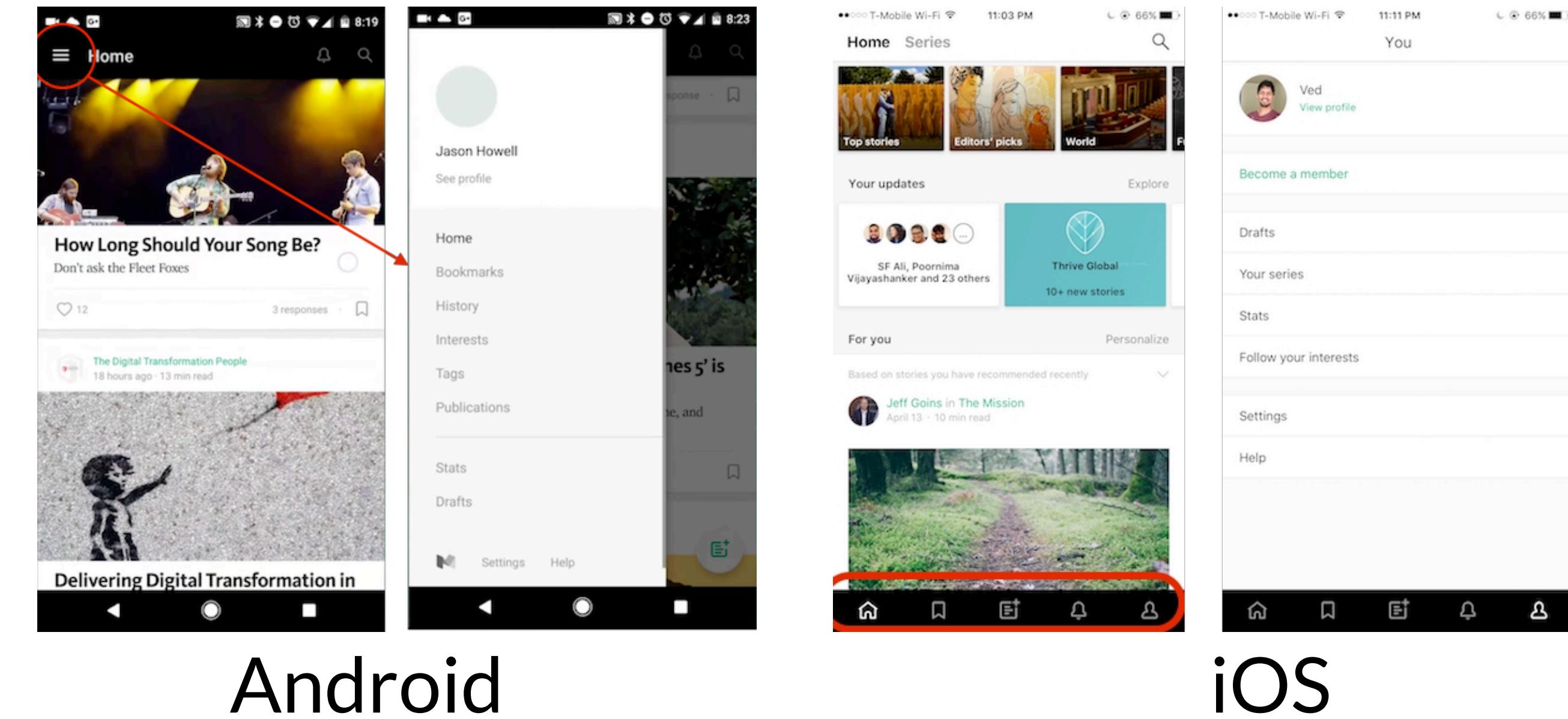
Android



iOS

# App settings

- Android apps usually load settings from a “hamburger” button in the top left
- iOS typically have settings as an item on the navigation bar



Android

iOS

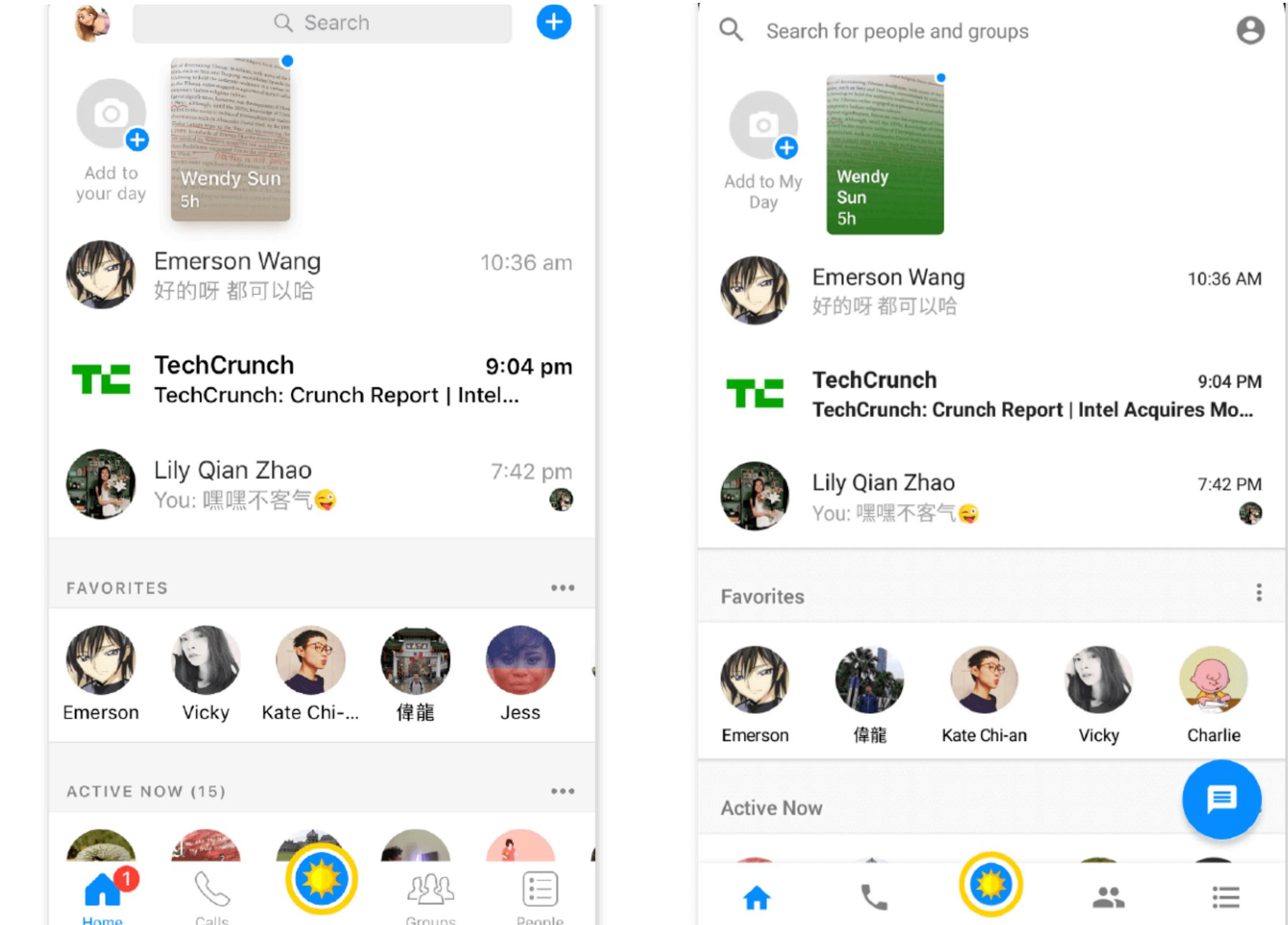
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# Question



Which is iOS, which is Android?  
(Facebook messenger app)

- A Left is iOS, right is Android
- B Left is Android, right is iOS
- C Both are iOS
- D Both are Android
- E Trick question! Left is Blackberry, right is Windows Phone

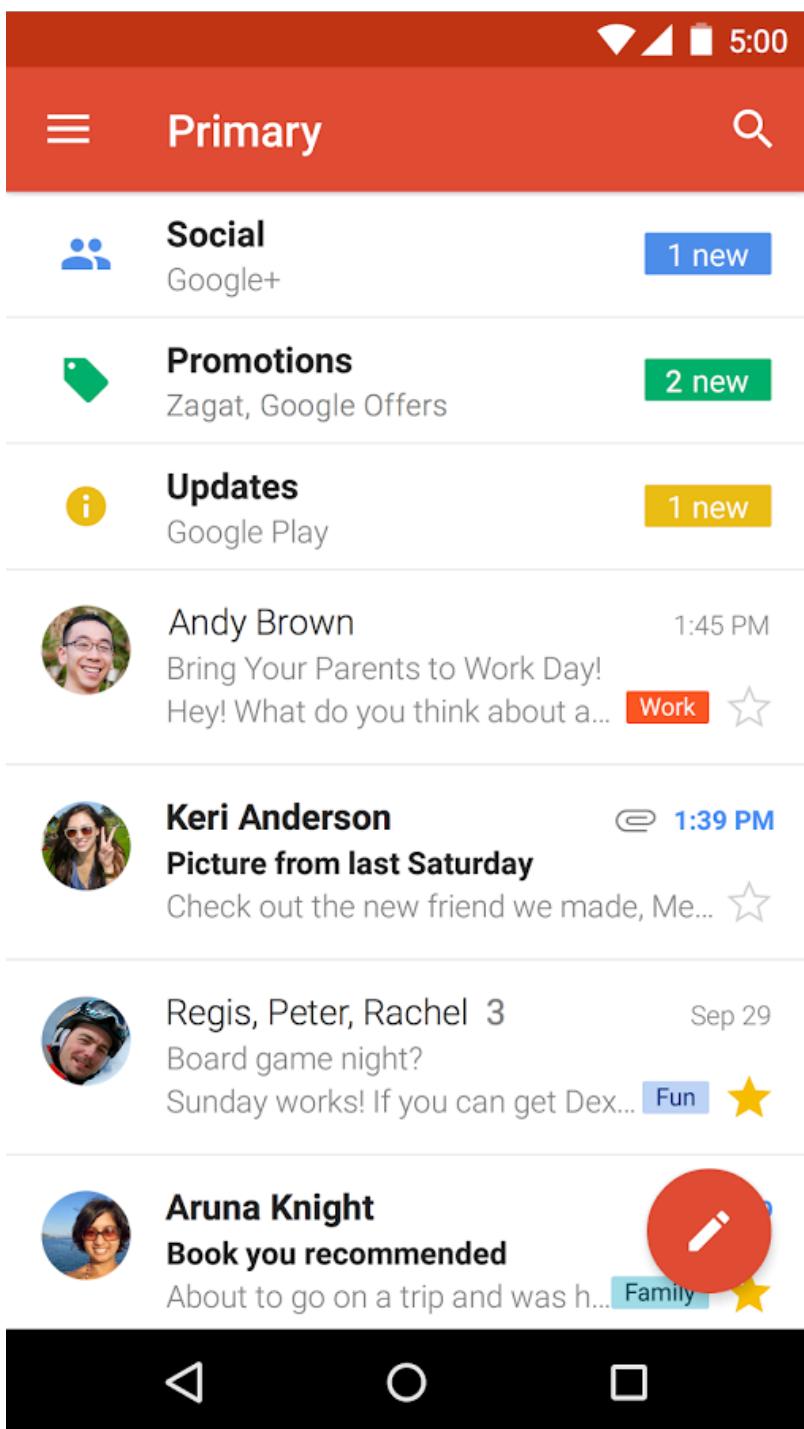


# Uniformity

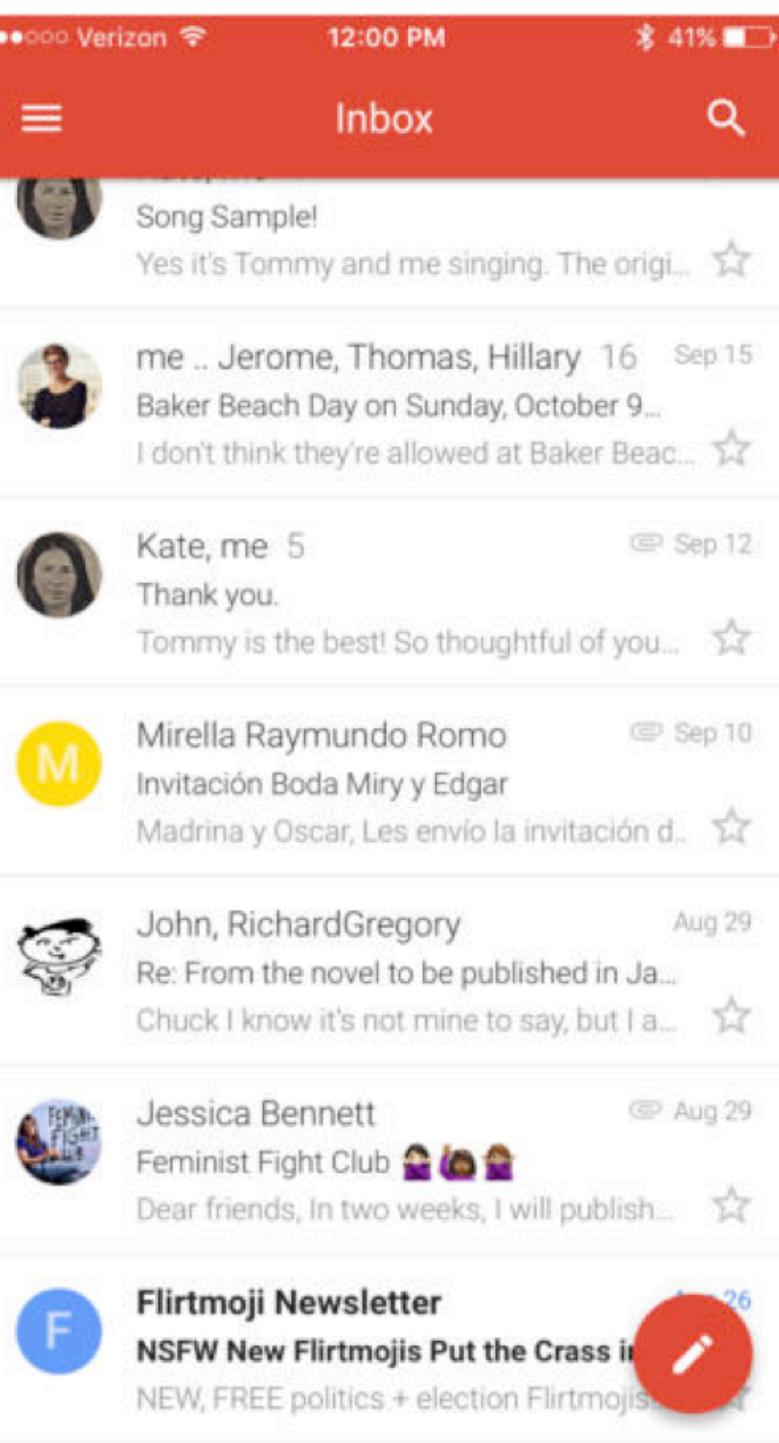
- There are always exceptions
- Not all apps vary the interaction and UI design patterns for each platform

<https://medium.com/@vedantha/interaction-design-patterns-ios-vs-android-111055f8a9b7>

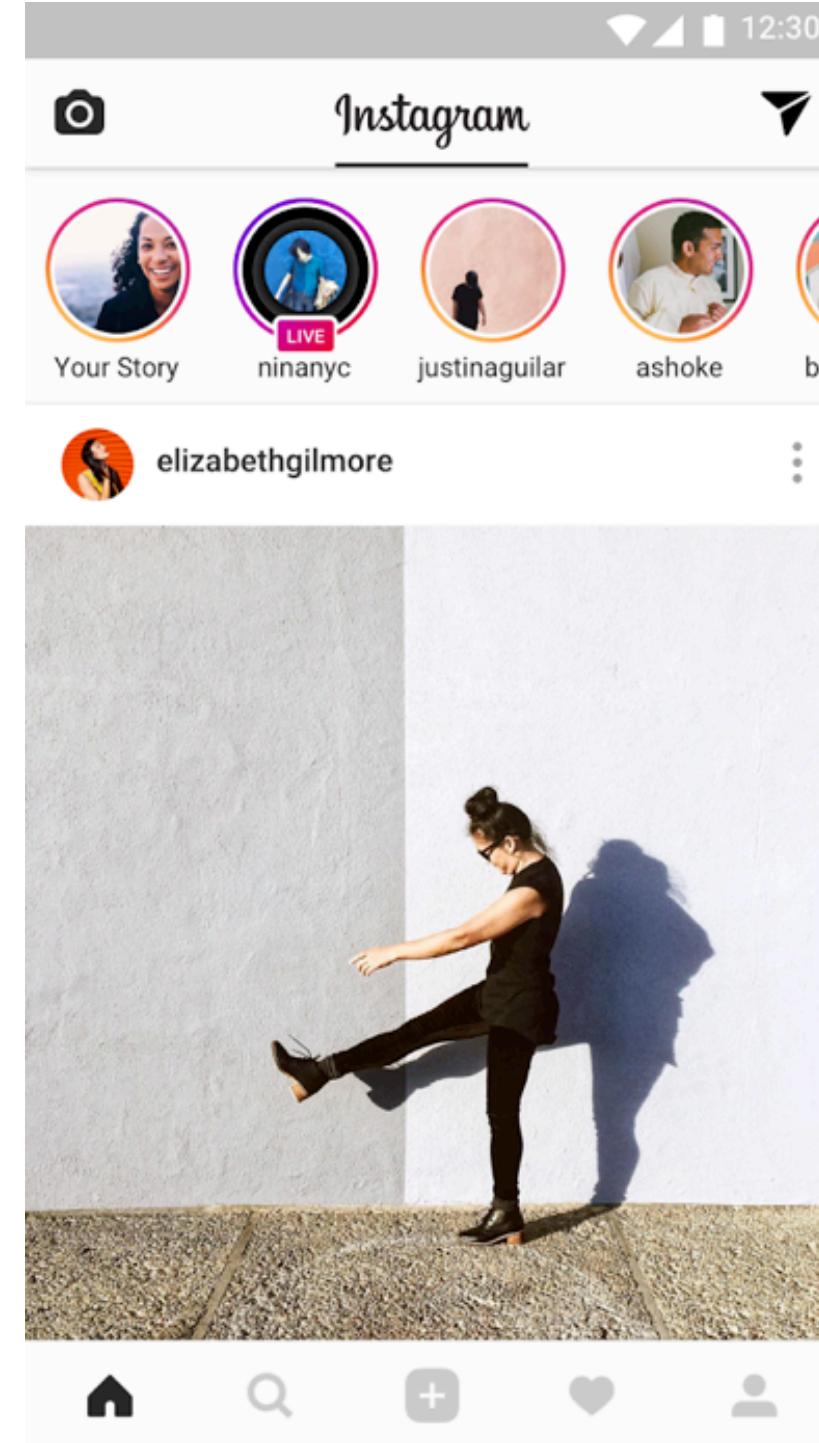
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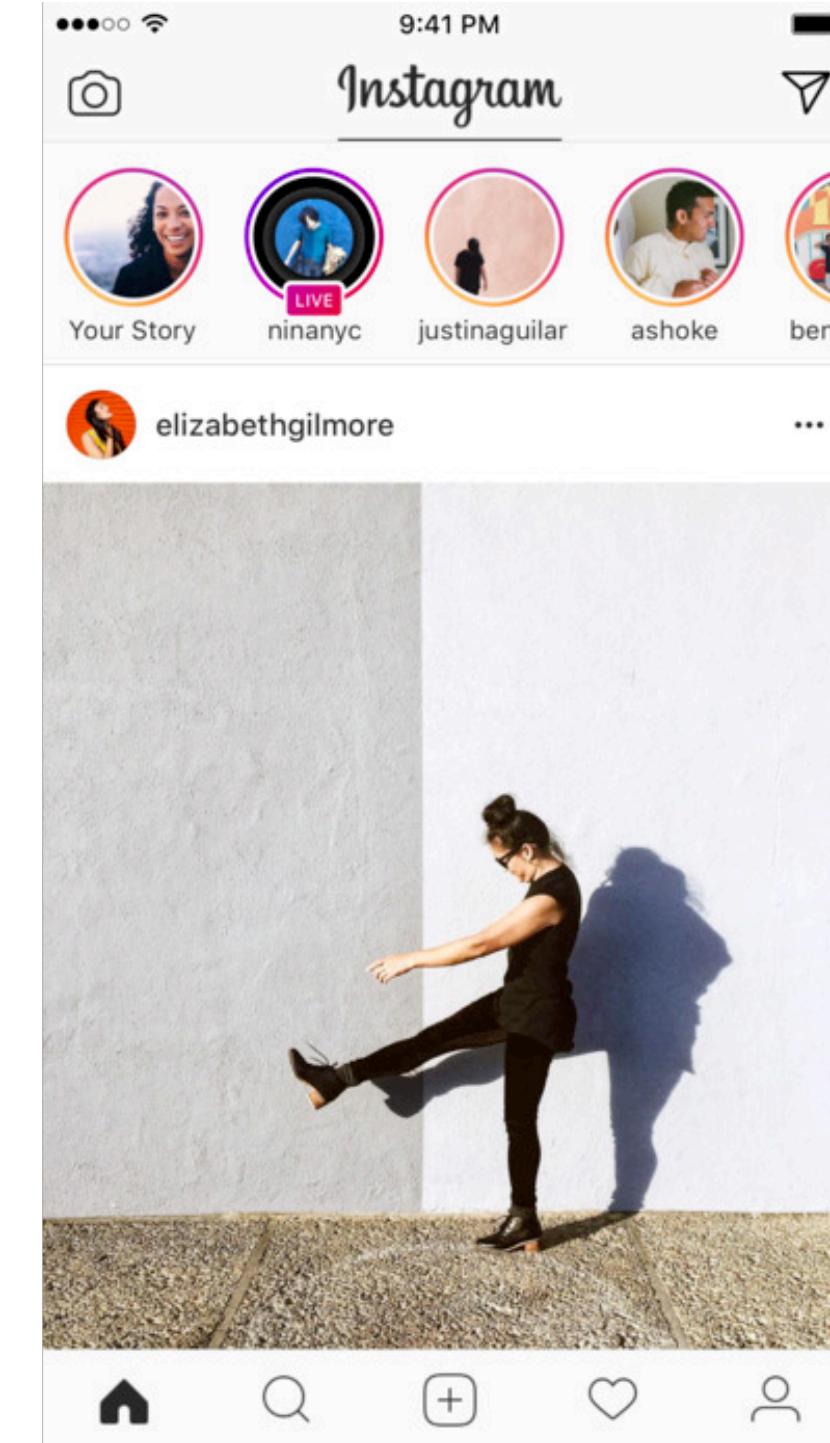
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