

# So you want to create an accessible app?

Accessibility Scotland Meetup – 4<sup>th</sup> April 2019 Glasgow



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Universal Accessibility

# What is a “native app”?

- Native apps live on the device and are accessed through icons on the device home screen.
- Native apps are installed through an application store (such as Google Play or Apple’s App Store).
- They are developed specifically for one platform, and can take full advantage of all the device features.

<https://www.nngroup.com/articles/mobile-native-apps/>



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# A (very) short history of the Web Content Accessibility Guidelines

- “WCAG” is an abbreviation for the “Web Content Accessibility Guidelines”.
- WCAG 1
- WCAG 2.0 - (Perceivable, Operable, Understandable, Robust – POUR)
- WCAG 2.1

# Guidelines and innovation

- WCAG 1 1999
  - iPhone release 2007
- WCAG 2.0 December 2008
  - Android release November 2008
  - Windows Phone December 2008
  - Apple iPad April 2010
  - Apple Watch April 2015
- WCAG 2.1 June 2018
  - Bendable phones... who knows



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# WCAG techniques – what's there and what's missing?

- HTML and XHTML techniques
- CSS techniques
- Client-side scripting techniques
- Flash techniques
- Silverlight techniques
- PDF techniques
- Native mobile...?

W3C Working Group Note

TABLE OF CONTENTS

**Abstract**

**Status of This Document**

**Introduction to Techniques for WCAG 2.0**

**General Techniques**  
(all General Techniques on one page)

G1: Adding a link at the top of each page that goes directly to the main content area

G4: Allowing the content to be paused and restarted from where it was paused

G5: Allowing users to complete an activity without any time limit

G8: Providing a movie with extended audio descriptions

G9: Creating captions for live synchronized media

G10: Creating components using a technology that supports the accessibility API features of the platform on which the user agents will run to expose the names and roles, allow user-settable properties to be directly set, and provide notification of changes

G11: Creating content that blinks for less than 5 seconds

G13: Describing what will happen before a change to a form control that causes a change of context to occur is made

G14: Ensuring that information conveyed by color differences is also available in text

G15: Using a tool to ensure that content does not violate the general flash threshold or red flash threshold

G17: Ensuring that a contrast ratio of at least 7:1 exists between text (and images)

**Techniques for WCAG 2.0**  
Techniques and Failures for Web Content Accessibility Guidelines 2.0

W3C Working Group Note 7 October 2016

This version:  
<https://www.w3.org/TR/2016/NOTE-WCAG20-TECHS-20161007/>

Latest version:  
<https://www.w3.org/TR/WCAG20-TECHS/>

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Wendy Chisholm (until July 2006 while at W3C)  
John Slatin (until June 2006 while at Accessibility Institute, University of Texas at Austin)

This document is also available in these non-normative formats:

- [Single file version](#)
- [Single file diff-marked version showing revisions since 17 March 2015, and](#)
- [Alternate Versions of Techniques for WCAG 2.0](#)

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<https://www.w3.org/TR/WCAG20-TECHS/>



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# So is WCAG relevant to native applications?

- Er, yes, legally it will be...
- European Union (EU) Directive on the Accessibility of Websites and Mobile Applications
- All public sector mobile apps by June 23 2021.

<https://ec.europa.eu/digital-single-market/en/web-accessibility>



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# Is WCAG really relevant to native applications?

“In Scotland the law obliges citizens to allow whoever knocks on their door to use their toilet”.

[The Telegraph Newspaper](#)



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# Where to get to help with app accessibility

- WCAG
- Platform guidelines
- Steal someone else's guidelines



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# Inclusive Design Principles

INTRODUCTION THE PRINCIPLES  
Choose a language: [English](#) [Español](#) [Français](#) [日本語](#) [Nederlands](#)

## Inclusive Design Principles

Contributors: [Henry Swan](#), [Ian Pouncey](#), [Heydon Pickering](#), [Léonie Watson](#)



These Inclusive Design Principles are about putting people first. It's about designing for the needs of people with permanent, temporary, situational, or changing disabilities — all of us really.

They are intended to give anyone involved in the design and development of websites and applications - designers, user experience professionals, developers, product owners, idea makers, innovators, artists and thinkers - a broad approach to inclusive design.

The principles are also available to hang on your wall as [a set of illustrated posters \(2MB\)](#) by [@BarclaysAccess](#).

<https://inclusivedesignprinciples.org>

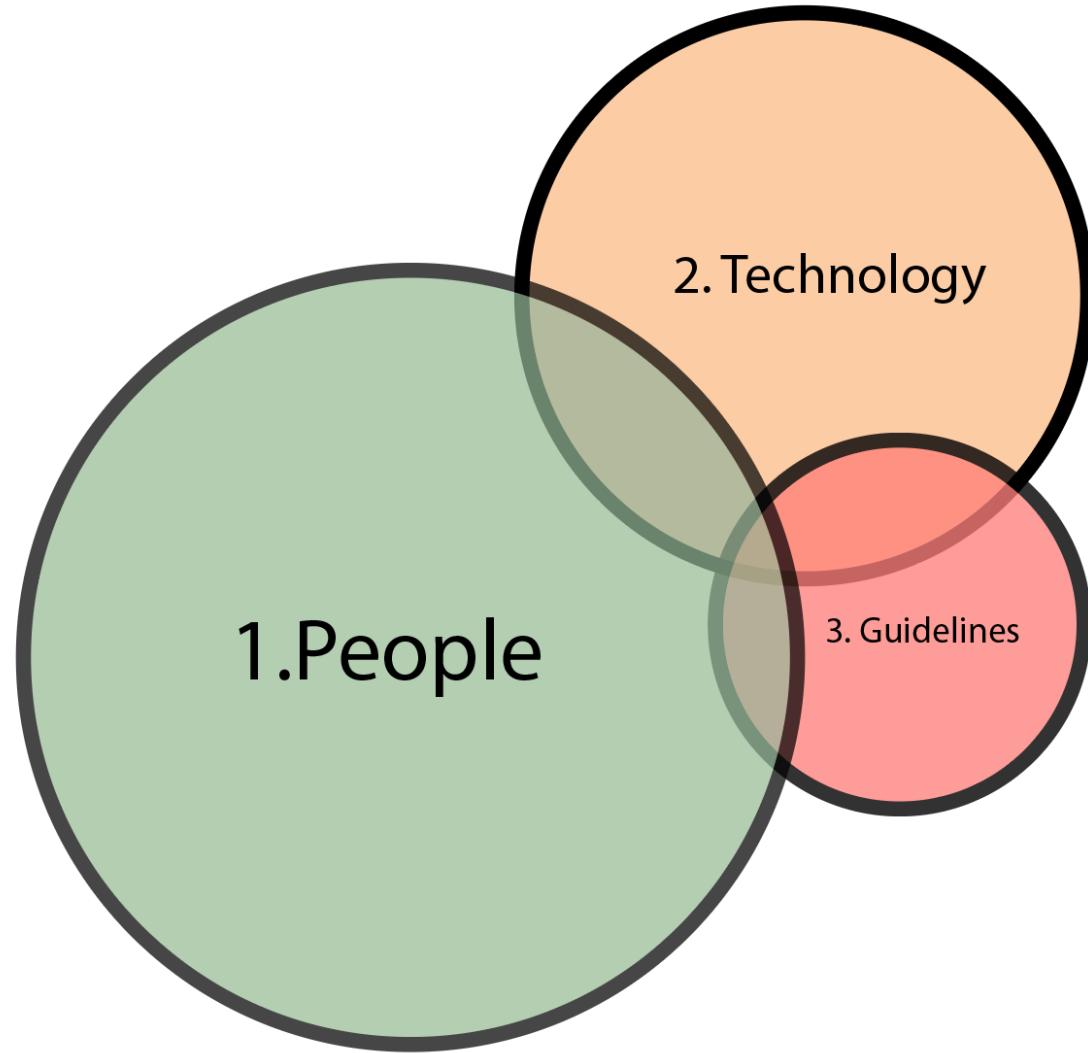


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# Priorities \*



\* I'm not a lawyer.



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# Basics you need to get right \*

- Examples include; Good colour contrast, logical reading order, interactive controls have labels, images that convey information have text alternatives, text size can be enlarged.
- Ensure your app's functionality and content is “POUR” by testing with the assistive tech
- Following the [cognitive walkthrough](#) technique is a recommended approach to test if your app is “POUR”

\* Not an exhaustive list



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# Be consistent

“Users spend most of their time on other sites. This means that users prefer your site to work the same way as all the other sites they already know.”

Jakob Nielsen.

<https://lawsofux.com/jakobs-law/>



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# Use “native” controls

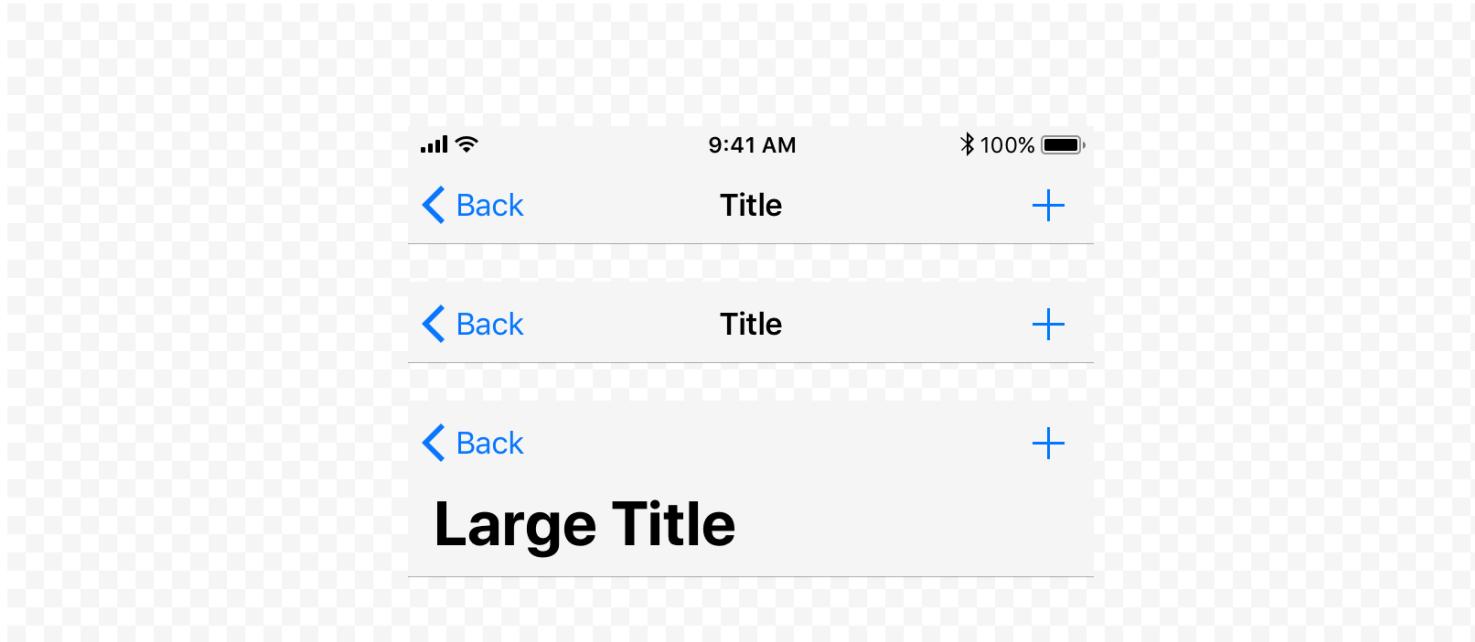


Image credit – [ivomynttinen.com](http://ivomynttinen.com)

Inclusive Design Principle - “Be Consistent”  
<https://inclusivedesignprinciples.org/#be-consistent>

# Most common examples of getting the basics wrong

- Missing or inaccurate labels
- Missing “traits”
- Text sizing problems



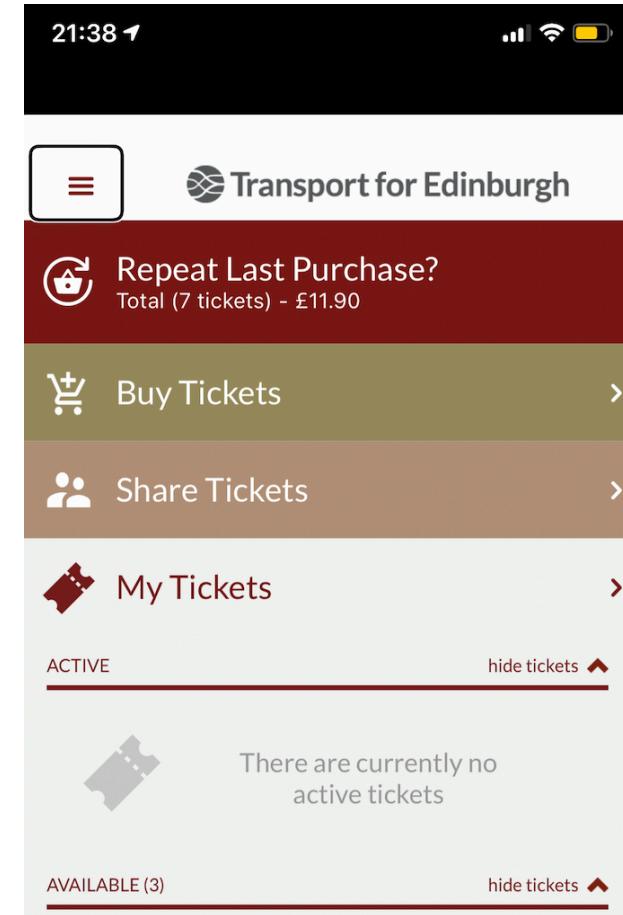
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# Missing or inaccurate labels

- Missing or inaccurate labels is a very common problem
- Example from “Transport for Edinburgh” iOS app



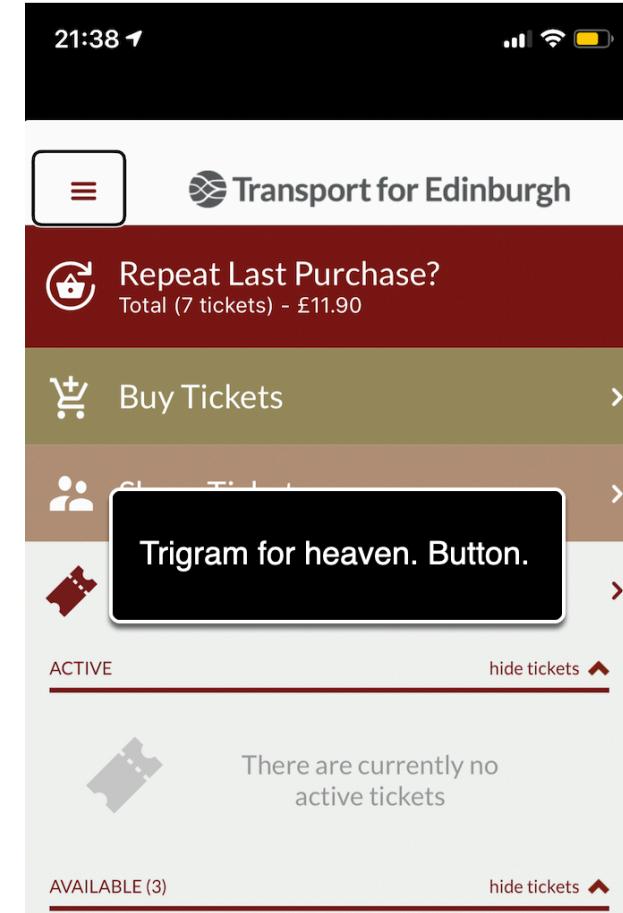
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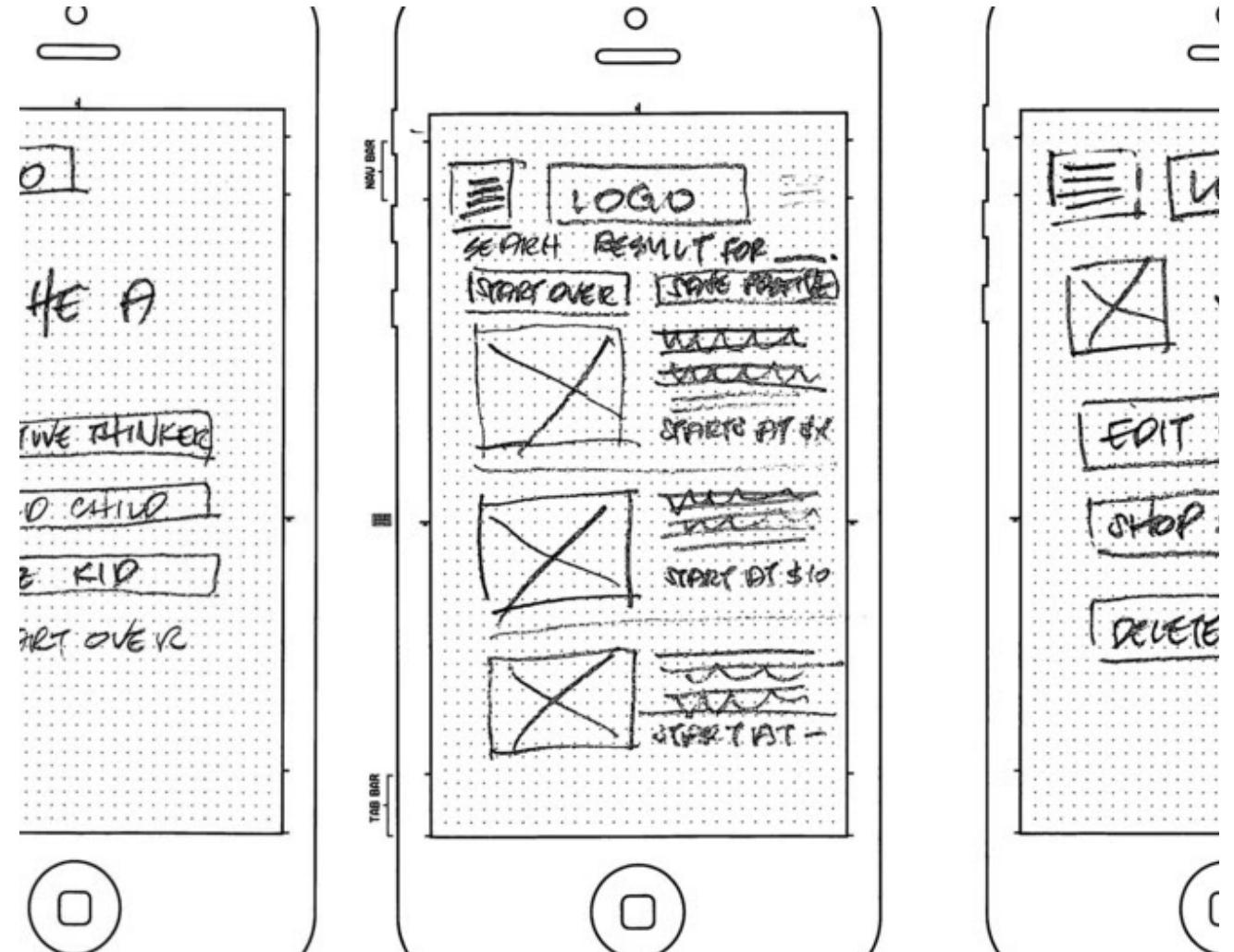
# “Trigram for heaven”

- Menu control is announced as “Trigram for heaven”
- The label (accessibilityLabel) for the UIButton is set to the Unicode character “U+2630”



# Writing screen reader labels is part of content design

- Apple Developer – accessibilityLabel  
<https://developer.apple.com/documentation/uikit/uiaccessibilityelement/1619577-accessibilitylabel>
- Inclusive Design Principles – Prioritise Content  
<https://inclusivedesignprinciples.org/#prioritise-content>



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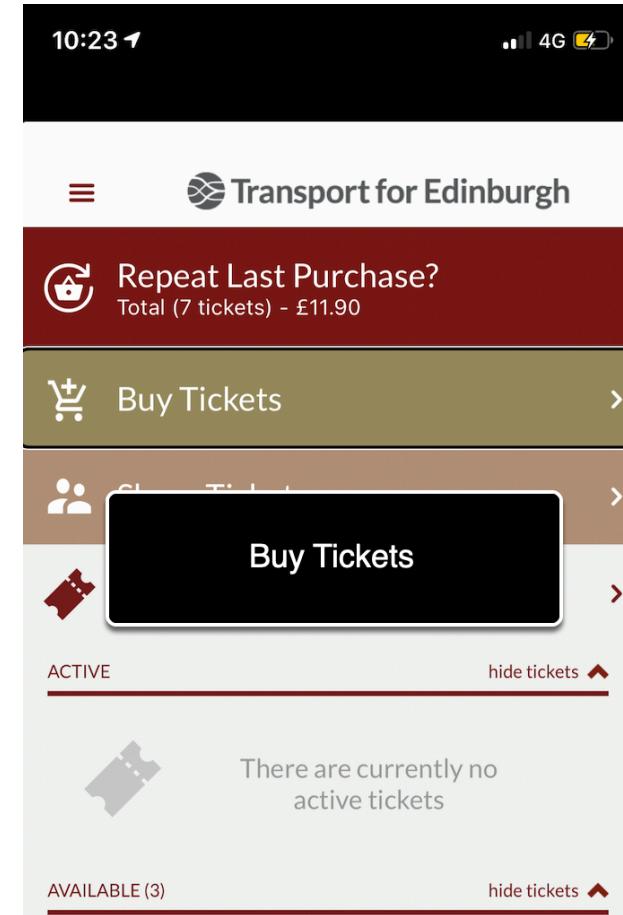
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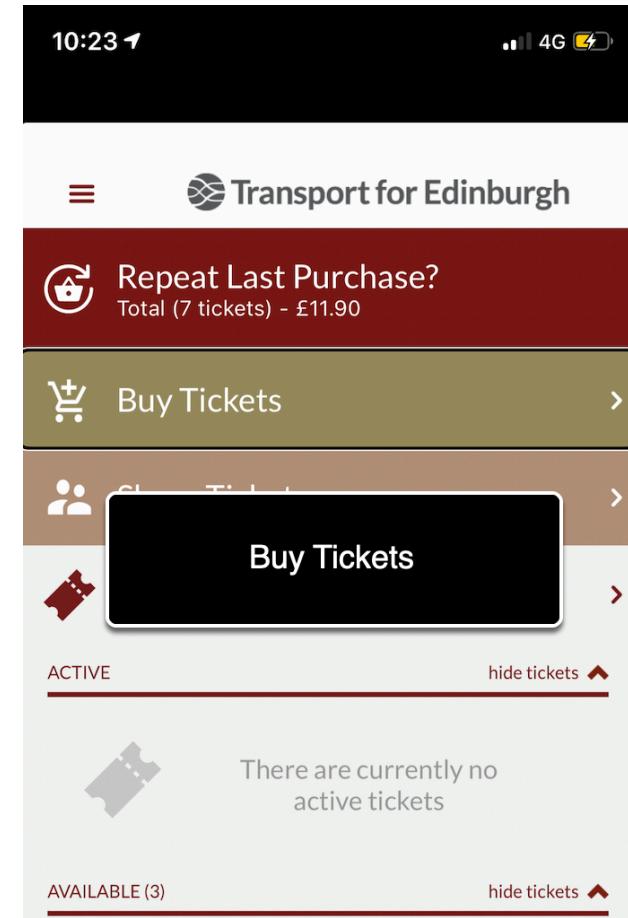
# Missing “traits”

- What's a trait?
- Visual affordances should have non-visual equivalents



# Faux buttons should have a button trait

- Control is not announced as a “Button”
- The control lacks necessary properties to ensure maximum capacity with assistive technology



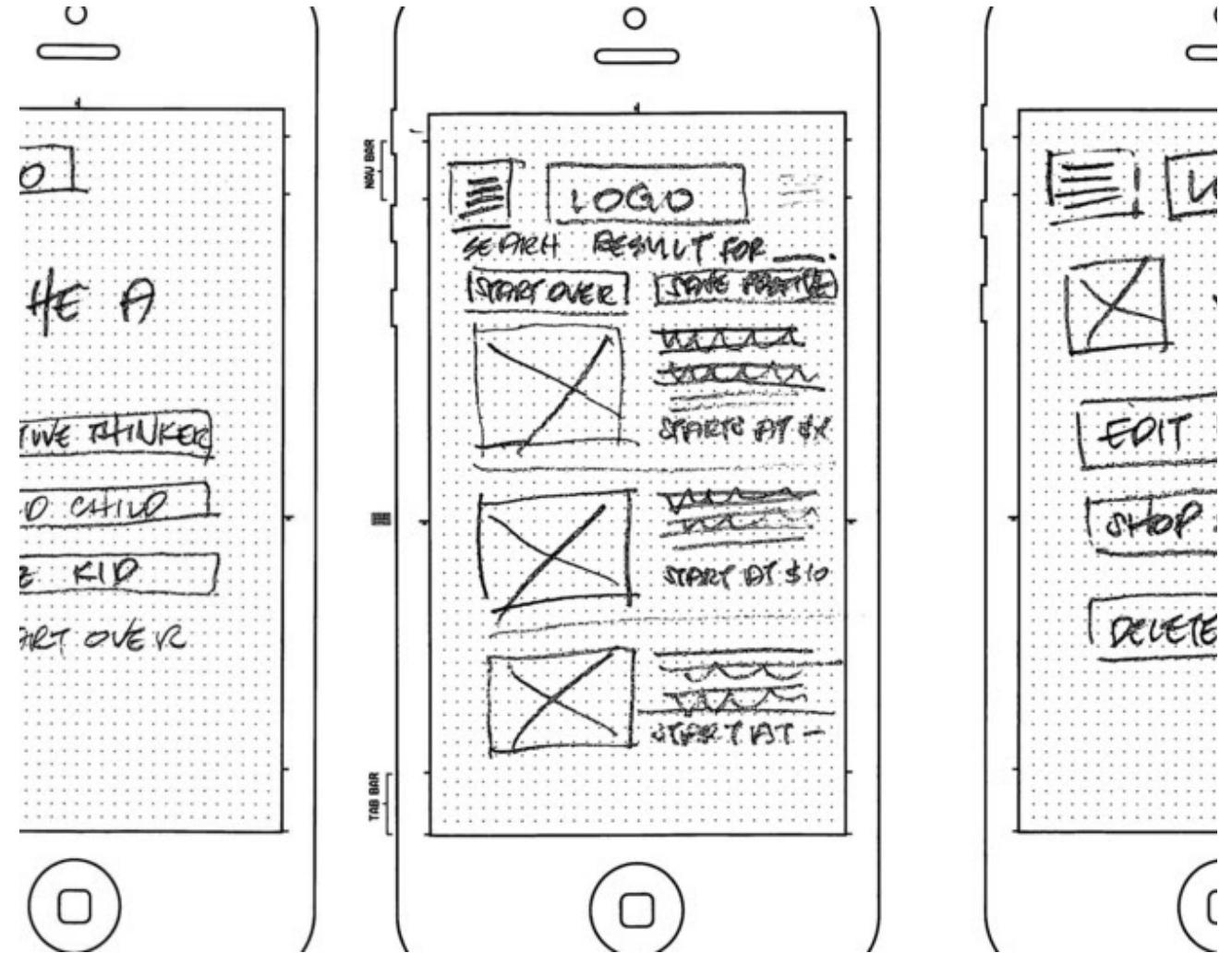
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# Determining traits needs to be a functional requirement

- Apple Developer –  
UIAccessibilityTraitButton  
<https://developer.apple.com/documentation/uikit/uiaccessibilitytraitbutton>
- Inclusive Design Principles – Provide comparable experience  
<https://inclusivedesignprinciples.org/#provide-comparable-experience>



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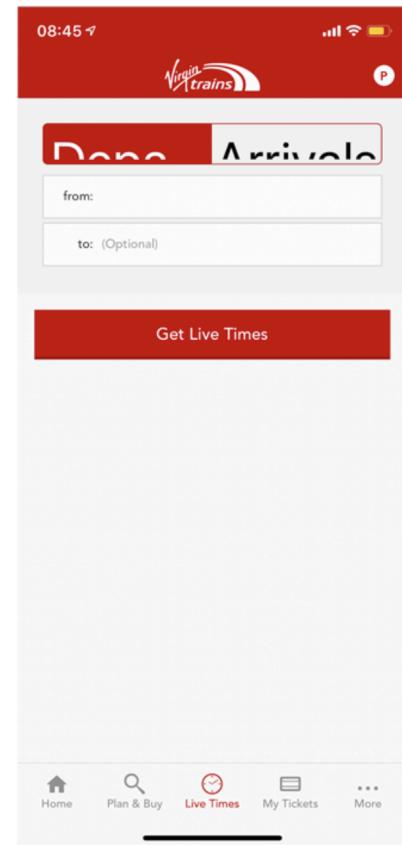
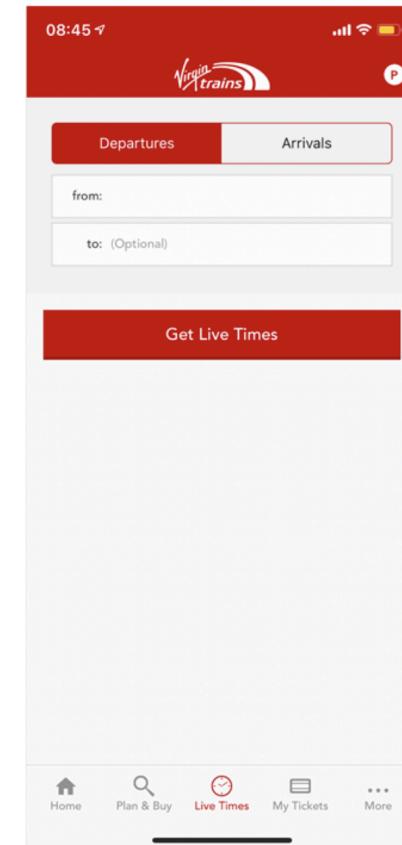
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# Text sizing problems

- Example from Virgin Trains app
- Common problem is dynamic text is not supported
- Or if it is supported, the container for the text does not expand as the text size increases



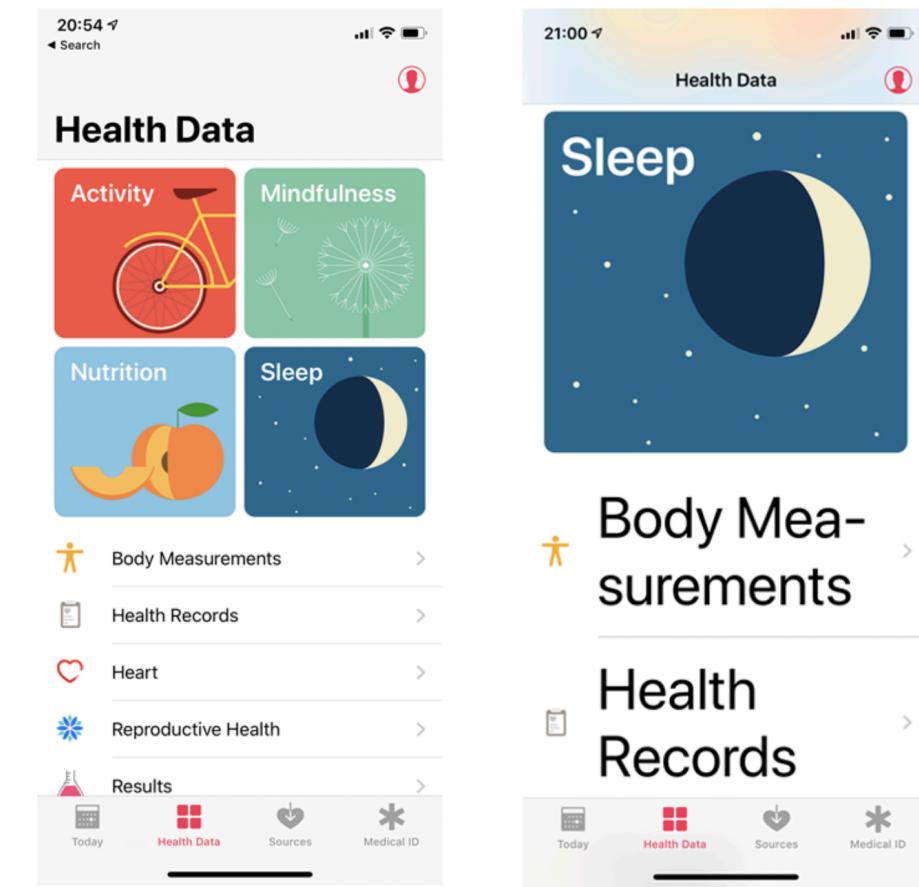
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# Best practice example

- Example from default Health app that comes with iOS
- Image on left shows text size at its default setting
- Image on right shows text size at its largest size



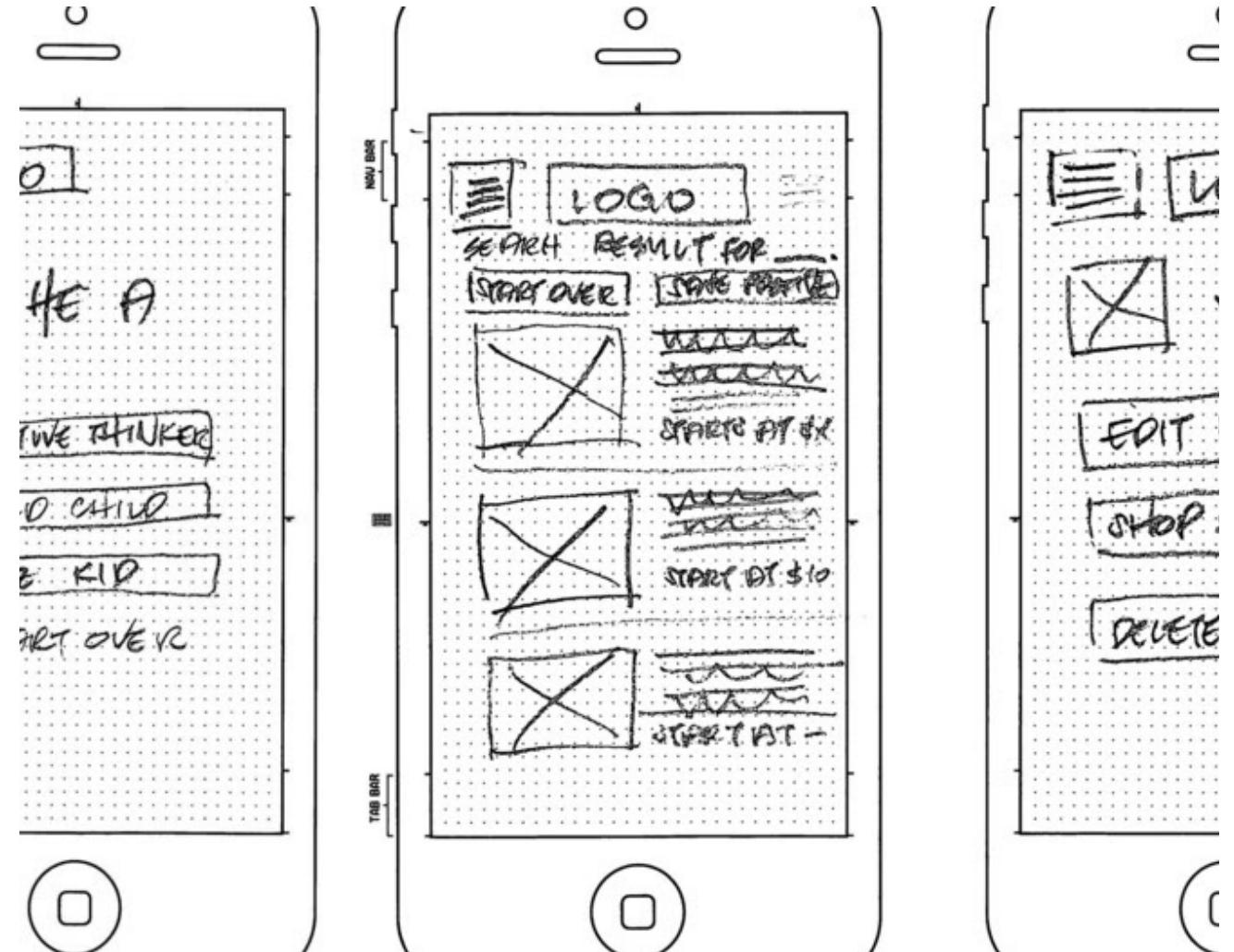
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# Text sizing is a design requirement

- Apple Developer – Scaling fonts automatically  
[https://developer.apple.com/documentation/uikit/uifont/scaling\\_fonts\\_automatically](https://developer.apple.com/documentation/uikit/uifont/scaling_fonts_automatically)
- Apple Developer – Understanding Autolayout  
<https://developer.apple.com/library/archive/documentation/UserExperience/Conceptual/AutolayoutPG/index.html>
- Inclusive Design Principles – Prioritise Content  
<https://inclusivedesignprinciples.org/#prioritise-content>



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# When necessary, support user customisation

- Example : Supporting reduce motion



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# Supporting reduce motion

- If your design includes motion that may be a vestibular trigger
- Support the users preference to opt out of this experience when the “Reduce Motion” setting is enabled



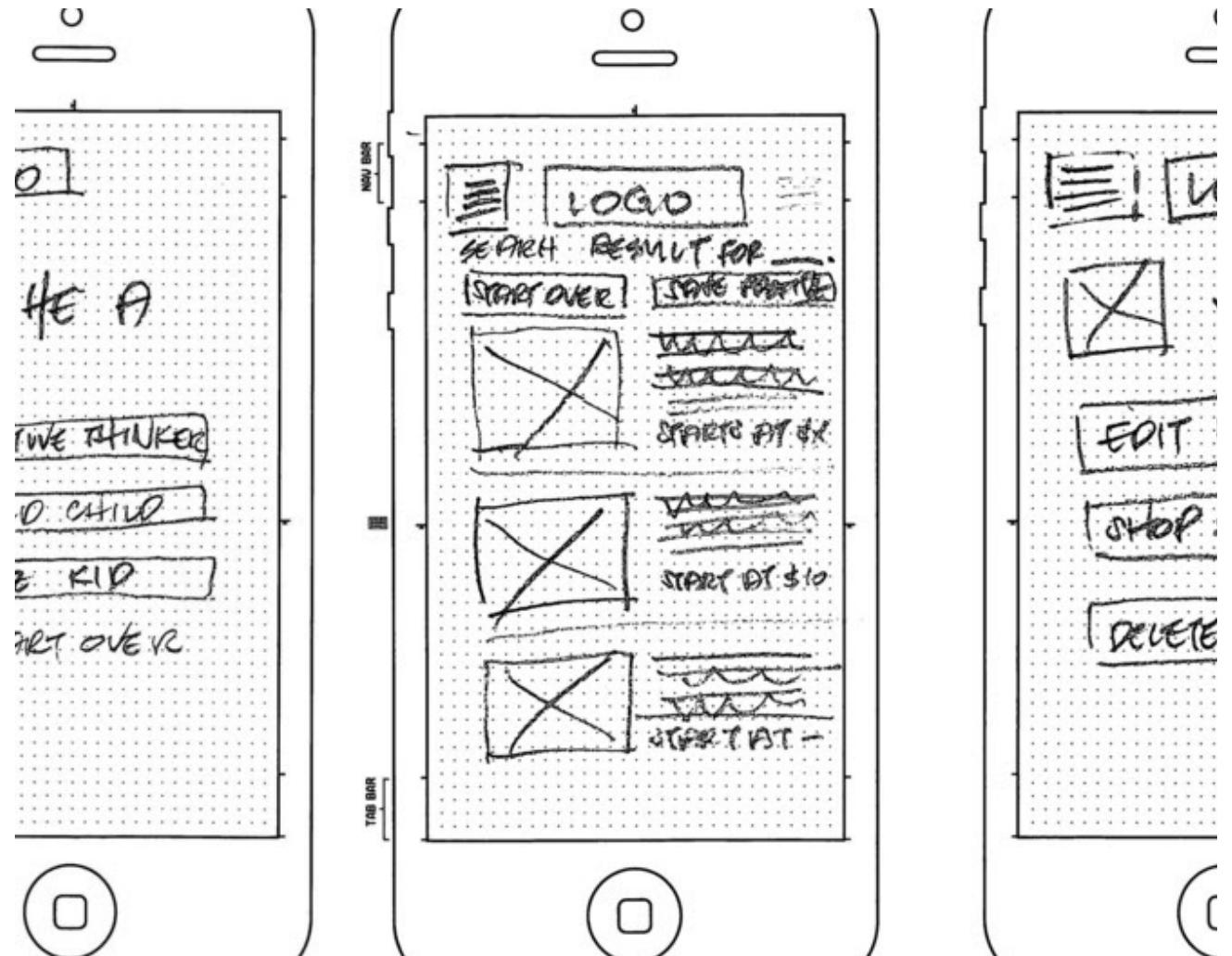
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If you use motion add a requirement to support reduce motion

- Apple Developer –  
UIAccessibilityIsReduceMotionEnabled  
<https://developer.apple.com/documentation/uikit/1615133-uiaccessibilityisreducemotionenabled>
- Inclusive Design Principles – Offer choice  
<https://inclusivedesignprinciples.org/#offer-choice>



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# “Custom” controls

- Example : Supporting VoiceOver typing preferences
- Example : Apple Maps “Search for places nearby”



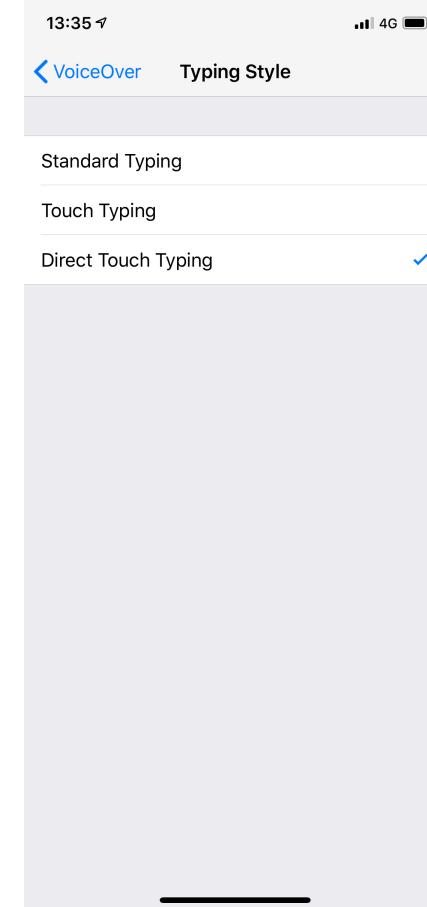
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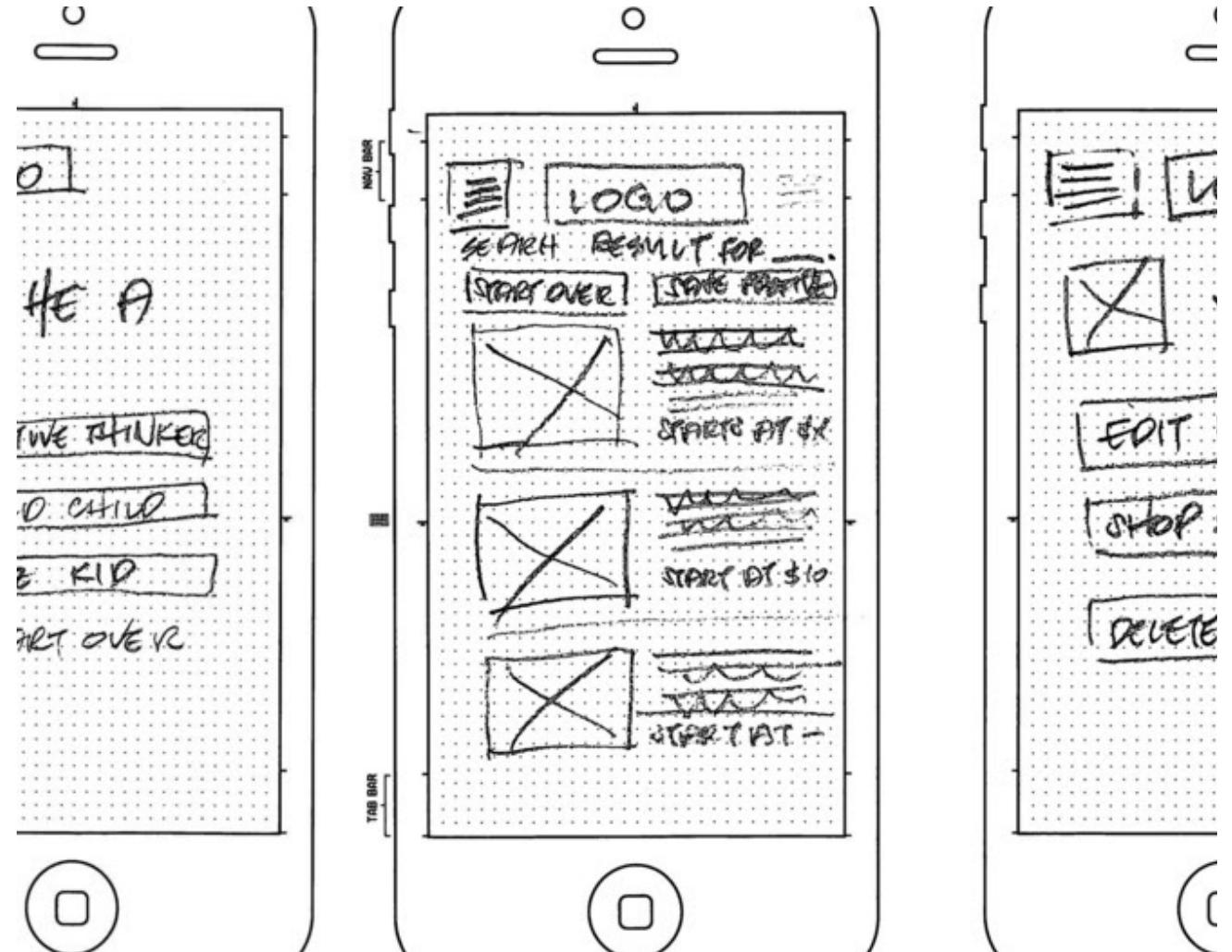
# Example : supporting VoiceOver typing preferences

- VoiceOver supports three typing modes
- Custom keypad implementations should support VoiceOver typing modes



If you are implementing  
a custom keypad,  
support VoiceOver typing  
preferences

- Apple Developer – keyboardKey  
<https://developer.apple.com/documentation/uikit/uiaccessibility/uiaccessibilitytraits/1620182-keyboardkey>
- Inclusive Design Principles – Offer choice  
<https://inclusivedesignprinciples.org/#offer-choice>



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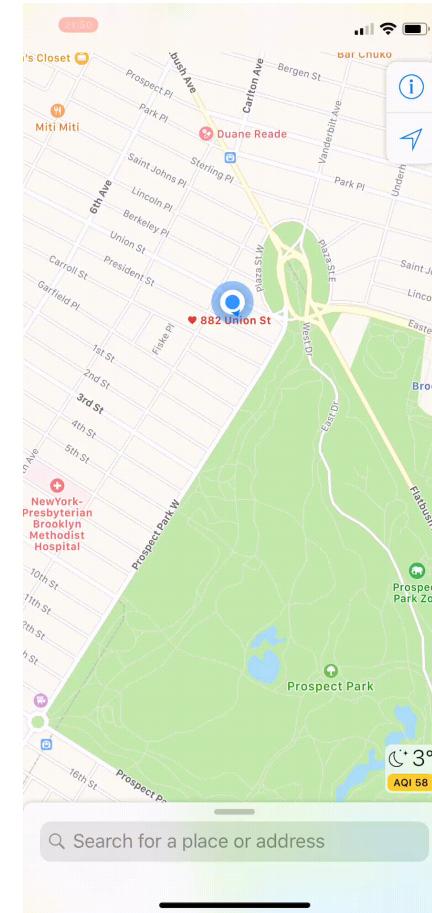
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# Example - Maps app

- “Search for places nearby” is a “custom” control
- Interaction is through custom swipe gestures
- How do you convey instructions for custom gestures to assistive technologies?



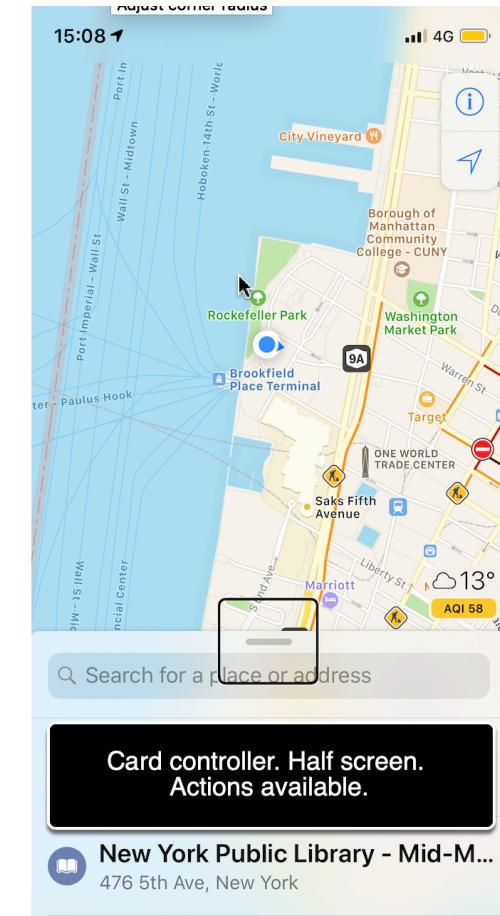
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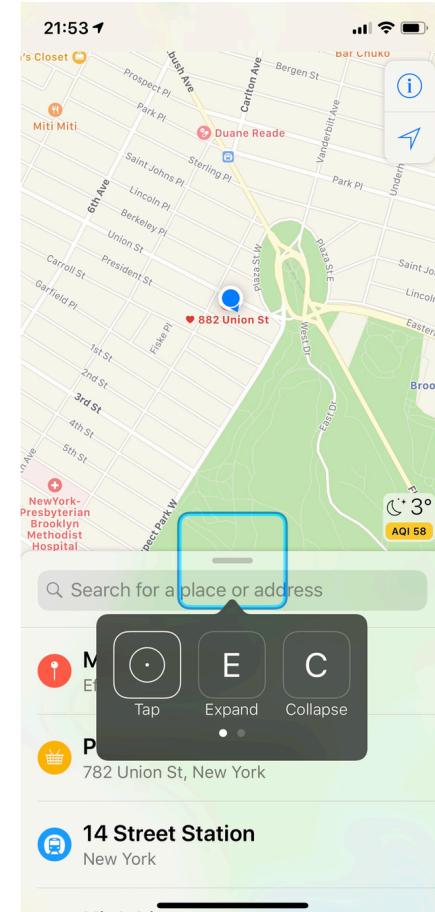
# Providing instructions for custom gestures

- Gestures that lack onscreen cues can be hard to discover or recall
- Providing instructions will help improve the apps usability and accessibility
- Make use of helpers in the platform accessibility API



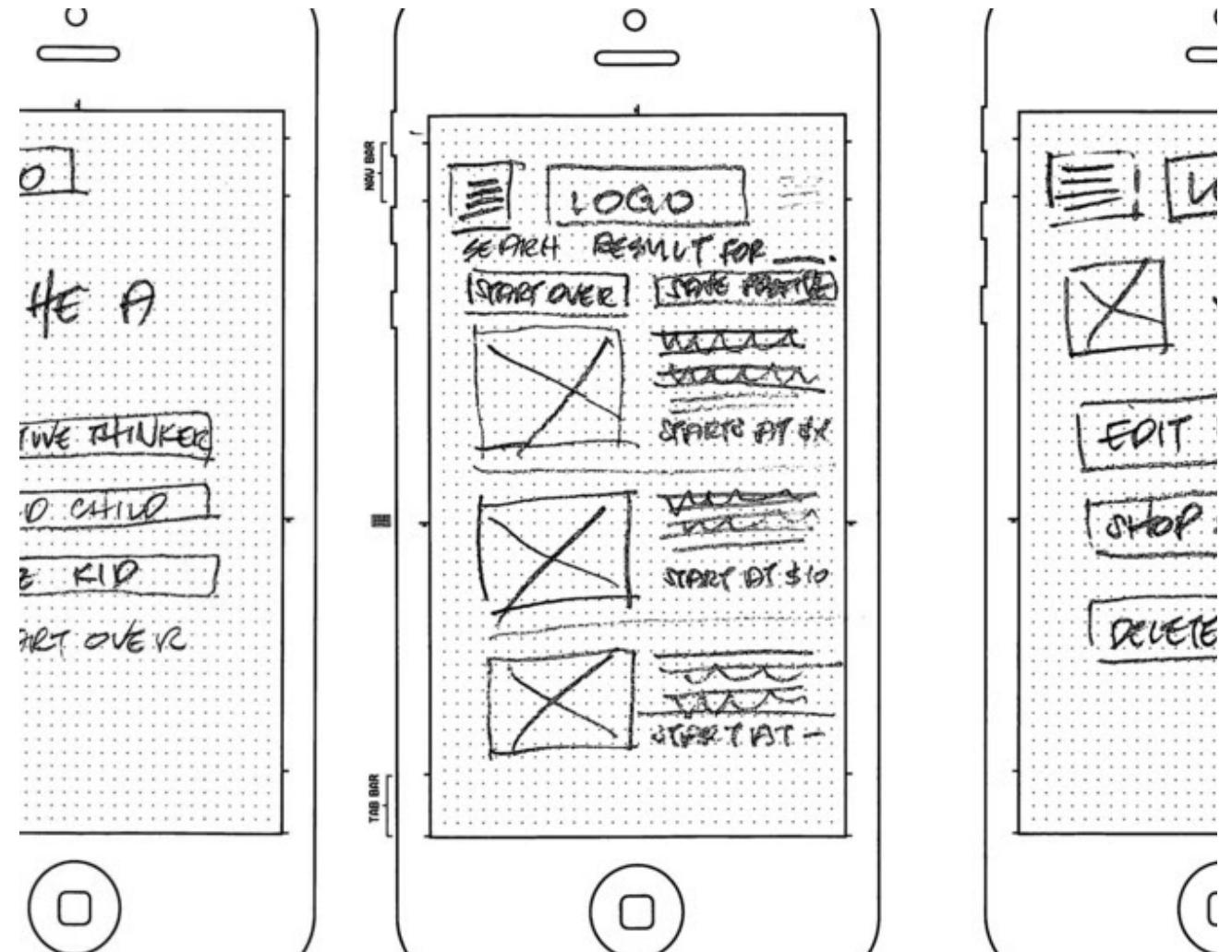
# Considering more than screen readers

- Consider Switch users as well as screen reader users.
- Switch control shares the same information from the Accessibility API as VoiceOver.



# Provide instructions for custom gestures

- Apple Developer –  
UIAccessibilityCustomAction  
<https://developer.apple.com/documentation/uikit/uiaccessibilitycustomaction>
- Inclusive Design Principles – Provide comparable experience  
<https://inclusive-design-principles.org/#provide-comparable-experience>



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# Takeaways

- Accessibility requirements can be established early in your project using Inclusive Design principles and WCAG “POUR” principles.
- Use standard controls whenever possible and support the users device customisation settings when applicable.
- Get feedback from disabled people and test your app using **all** of the devices assistive tech.



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# Thank you for listening

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# Resources

- Apple – [Human Interface Guidelines](#)
- Apple Developer – [UIKit Accessibility API](#)
- Android – [Developer guide](#)
- Android – [Accessibility Overview](#)
- BBC - [Mobile Accessibility Guidelines](#)
- Orange – [iOS Accessibility Guidelines](#)
- Apple Developer – [iOS Accessibility traits](#)
- Apple - WWDC - [Auto Layout techniques in the interface builder](#)



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