Be an Ally for Mobile A11y

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Rachael Yomtoob

- Studied Computer Science at University of Michigan

- Built indoor navigation Android app for users with visual impairment

- 5 years at Deque Systems

- Developer to Product Owner to Developer Advocate

- Favorite color is purple and total cat person

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Agenda

1. What is Digital Accessibility?
2. Accessibility Guidelines
3. Accessibility Concepts for Mobile Apps
4. Automated Testing Tools

What is Digital Accessibility?

- Digital Accessibility is the practice of building digital content such as web and mobile apps in a way that allows access for everyone regardless of any disabilities

- Covers a wide range of concepts such as screen reader support, captioning videos, and color schemes

- **A11y** is a numeronym for Accessibility, there are 11 letters between A and y

- An estimated 1.3 billion people experience significant disability. This represents 16% of the world's population, or 1 in 6 of us[1]

[1] World Health Organization

Types of Disabilities

- Visual

- Hearing

- Speaking

- Cognitive

- Neurodivergency

- Mobility/Motor

- Permanent

- Temporary

- Situational

# Why is Mobile App Accessibility Important?

- There's more than 6.5 billion smartphone users worldwide, and it's predicted to continue increasing[1]

- 90% of screen reader users use a mobile device[2]

- Many people mount a tablet to their wheelchair

[1]Statistica Research Development

Accessibility Guidelines

- [Web Content Accessibility Guidelines (WCAG)](#) authored by the [World Wide Web Consortium (W3C)](#)

- WCAG versions
  - 2.0 released Dec 2008
  - 2.1 released Jun 2018
  - 2.2 released Oct 2023

- WCAG levels
  - A: bare minimum
  - AA: the standard
  - AAA: extra credit
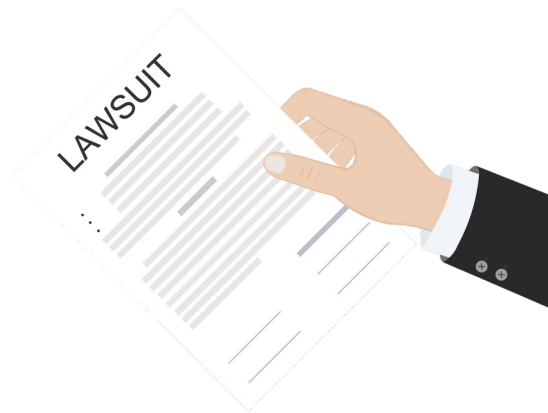
Accessibility Guidelines

- [Mobile Accessibility Task Force](#) and [WCAG2ICT Task Force](#)

- Accessibility recommendations in Apple's [Human Interface Guidelines](#)

- Android Developer [Accessibility Guide](#)

- [Appt Foundation](#)

Accessibility Concepts

1. Color contrast
2. Text Alternatives
3. Screen orientation
4. Resizable text
5. Touch Target Size and Spacing
6. Accessibility name, role and value

Color Contrast

- The visual presentation of text and images of text has a contrast ratio of at least 4.5:1

- Important for people with low vision or color blindness

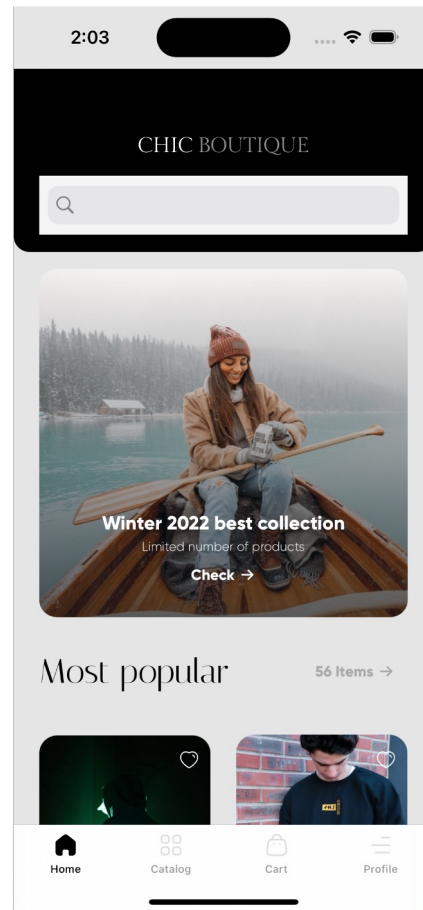- Large text exception can only be tested with access to source code
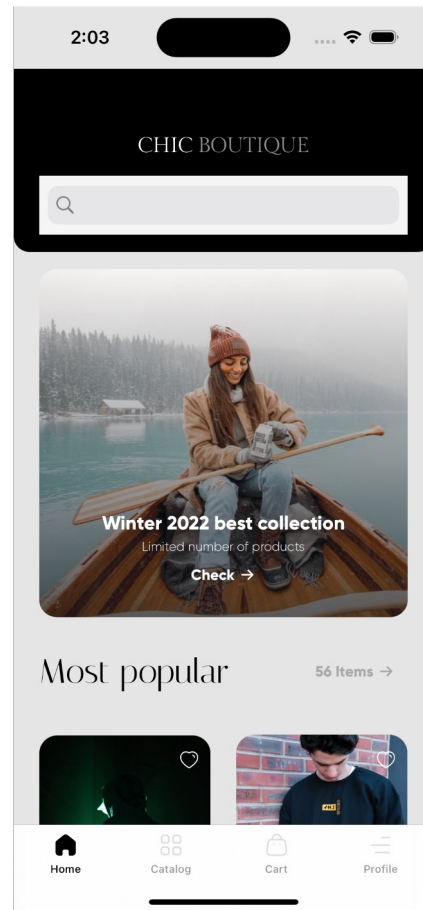
Text Alternatives

- All non-text content that is presented to the user has a text alternative that serves the equivalent purpose

- Commonly referred to as alt text

- iOS calls it accessibilityLabel

- Android calls it contentDescription

Screen Orientation

- Content does not restrict its view and operation to a single display orientation, such as portrait or landscape, unless a specific display orientation is essential

- Important for people with a tablet mounted to their wheelchair in a fixed orientation
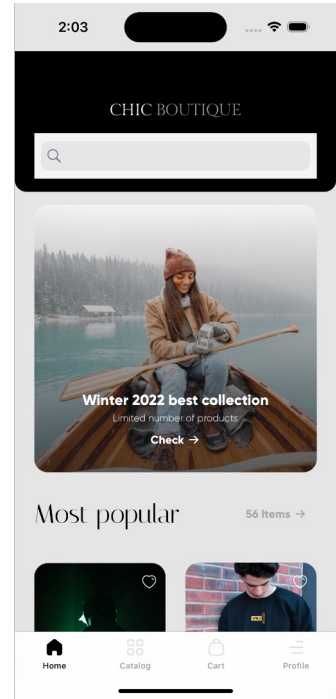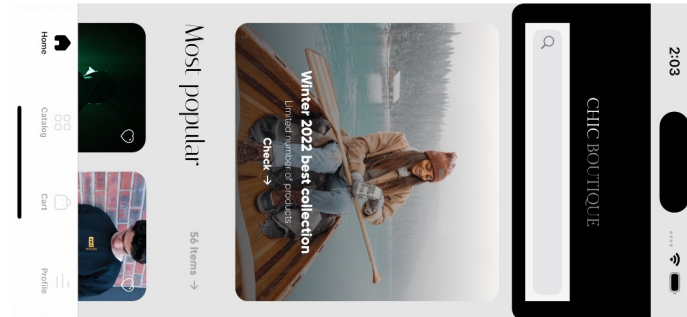
Resizable Text

- Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality

- Important for people with low vision

- Dynamic Type size specifications don't align with 200% guideline
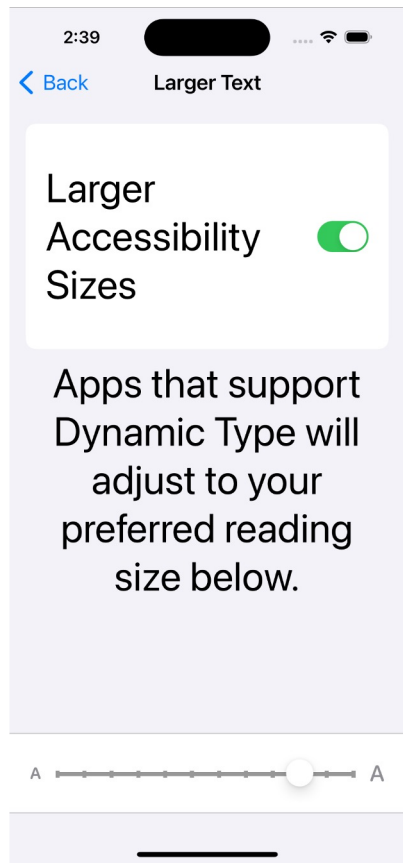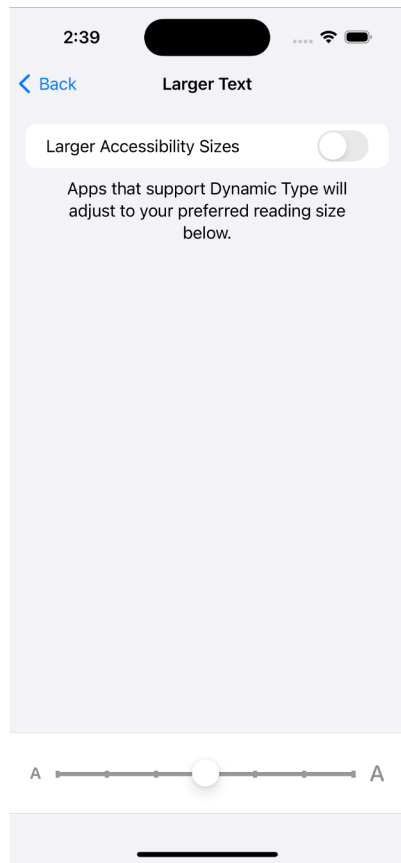
Touch Target Size and Spacing

- The size of the target for pointer inputs is at least 44 by 44 CSS pixels (WCAG 2.1 AAA)

- Give all controls and interactive elements a hit target that's large enough. For example, on touchscreen devices, a hit target needs to measure at least 44x44 pt[1]

- We recommend that each interactive UI element have a focusable area, or touch target size, of at least 48dpx48dp. Larger is even better[2]

[1]Apple Human Interface Guidelines

[2]Android Developer Accessibility Guide
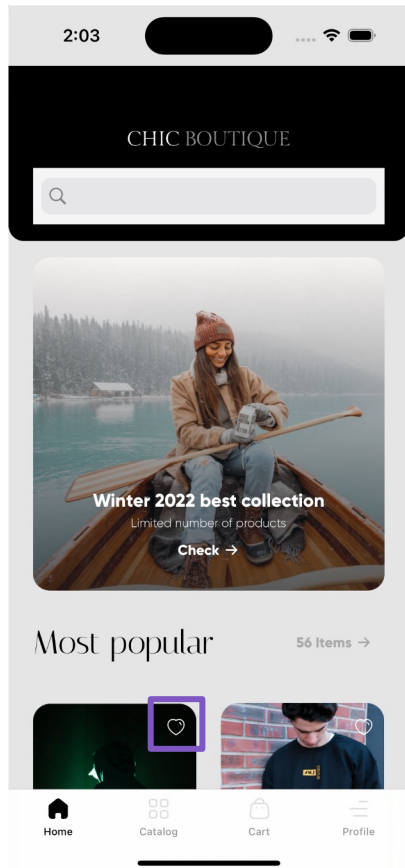
Touch Target Size and Spacing

- The size of the target for pointer inputs is at least 24 by 24 CSS pixels, except where:
  - **Spacing:** Undersized targets (those less than 24 by 24 CSS pixels) are positioned so that if a 24 CSS pixel diameter circle is centered on the bounding box of each, the circles do not intersect another target or the circle for another undersized target;

(WCAG 2.2 AA)

Accessibility Name, Role, and Value

- For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.
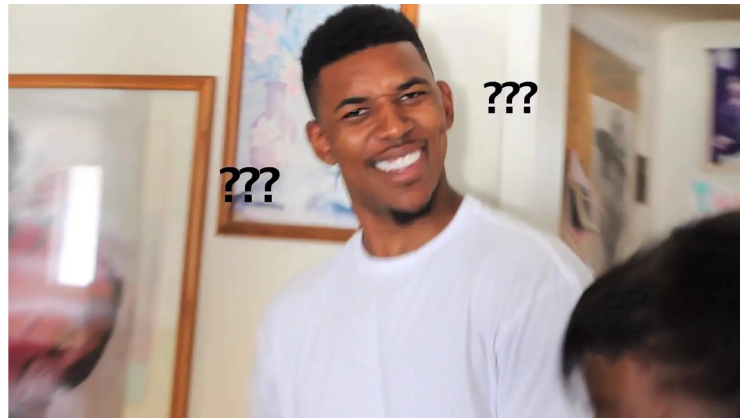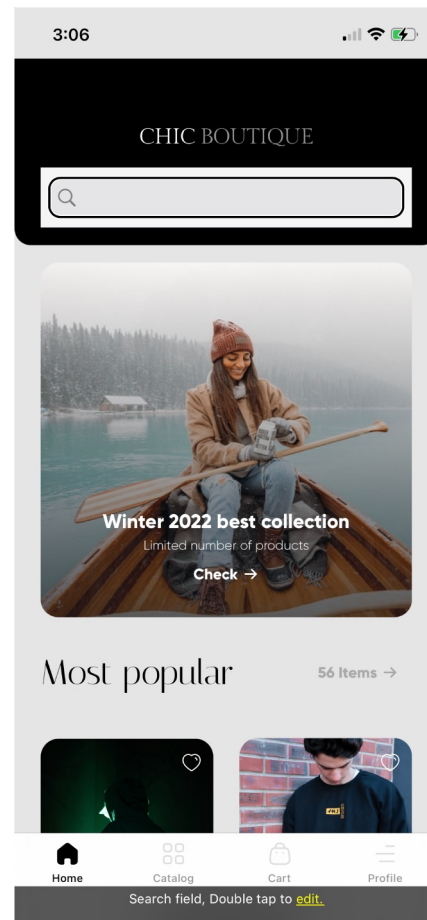
Accessibility Name, Role, and Value

- **Name:** description of the control

- **Role:** type or purpose of the control

- **Value:** current state/value of the control

- iOS terminology is accessibilityLabel, accessibilityTraits, and accessibilityValue

- Android has a more implicit approach using contentDescription, className, roleDescription, and AccessibilityNodeInfo

Accessibility Name, Role, and Value

- **VoiceOver:** "Search field, double tap to edit"

- **Name:** accessibilityLabel wasn't set :(

- **Role:** "Search field, double tap to edit"

- **Value:** search field is empty

Accessibility Name, Role, and Value

- Name and role are also important for Voice Control/ Voice Access users

- The role let's Voice Control know which elements are interactive

- The name can be used to interact with elements

- Names should be descriptive and unique
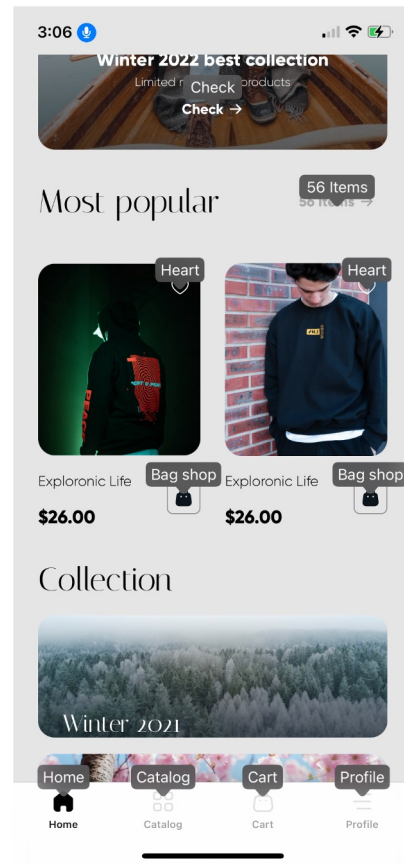
Automated Testing Tools

Free Tools

- [Xcode Accessibility Inspector](#)

- [XCUIAccessibilityAudit](#)

- [Google's Accessibility Scanner](#)

- [Accessibility Test Framework for Android](#)

Paid Tools

- [axe DevTools Mobile Analyzer](#)

- [axe DevTools Mobile SDK](#)

Thank You!