Be an Ally for Mobile A11y

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Rachael Yomtoob
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- 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

@ryomtoob  rachael-yomtoob
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](https://www.who.int)
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 48dp\(^x\)48dp. 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 lets 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!