Mobile Accessibility Challenges And Best Practices

Shyamala Prayaga
Do we really need to bother about MOBILE?
Yes, it has become integral part of our life!
So has it, for them
Are we not being **biased** when developing mobile apps?
BUT
mobile is by definition DISABLING
REMEMBER THIS?

• An electronic telecommunications device
• make and receive calls
• Send and receive messages
Hence....

Smaller screen size
Poor light
Glare
Small fonts
Poor image and colour support
Small keyboards
No mouse
One hand
At the same **TIME**
mobile is by definition
ENABLING
Purpose is the same... needs and requirements changed

People want **more**
Hence….  

Task based  
  Geolocation  
  Camera integration  
  Calendar integration

Bridges the digital divide  
  I can’t afford a computer but I have a mobile
NEXT big question?
WHAT ARE DIFFERENT MOBILE APPLICATIONS TYPES?
Hybrid Apps

I now pronounce you hybrid mobile apps
So many mobile devices,
So any application types!

How to make them accessible?
Accessibility... What is that?
when your mobile application is ready for...
Diverse user model

Sight, hearing, mobility, learning and cognition
Assistive technology users

Screen readers, screen magnification, voice input
Hidden disability

Chronic fatigue, depression, ME, fibromyalgia, vertigo, nausea, photo sensitivity
Aging

Deterioration, first time users
Temporary

RSI, broken wrists, back pain, short-term illness
Cultural Language, color, iconography
Technology and changes

hardware, software, access
MOBILE ACCESSIBILITY CHALLENGES
Small devices
Different shapes and sizes
Touch screens
Lack of standardized UIs
Lack of device expandability
Using devices out “in the wild”
Next big question,

How to make mobile apps accessible with so many challenges?
First build accessibility into your decision making process
ESSENTIAL INGREDIENTS OF ACCESSIBILITY
1. Web standards – HTML, CSS, JavaScript and XML

2. Web browser

3. Platform Accessibility API – iOS, Android and Blackberry

4. Assistive technology

5. Platform accessibility features

6. USERS
Mobile Accessibility Principles, Guidelines & Techniques
1. Add descriptive text to user interface controls in your application - (images, sound, video)

Why?

User cannot perceive important information or loses information due to lack of alternative/descriptive text.
Functional Disability Context:

• User who is blind cannot perceive content that include non-text objects.

• User whose browser, assistive technology, other user agent doesn't support object.
Situational Disability Context:

- User can be billed for download volume so images might be turned off to save costs.
- Some mobile user agents have limited support for non-text objects.
- Some user agents also shrunk images in size to fit the device's screen which can make images meaningless.
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How do we achieve that?

Using Alt and Title

EXAMPLE

```html
<img src="meta.png" alt="This is meta refresh image" />
```

Using android:contentDescription

EXAMPLE

```xml
<ImageButton
    android:id="@+id/add_note_button"
    android:src="@drawable/add_note"
    android:contentDescription="@string/add_note"/>
```
Using label, hints and traits

accessibilityLabel

accessibilityTraits

isAccessibilityElement

accessibilityHint
**Label**

Short word or phrase

Describes the object or view i.e. ‘Play’

Does not describe the type i.e. ‘Play button’

**Trait**

Describes the type i.e. link, button, checkbox, selected, adjustable

More than one trait can be used i.e. checkbox, selected

**Hint**

Use sparingly

Explanation not a command i.e. ‘Plays video’ not ‘Play video’
Label: Done, back to...
Trait: Button

Label: [Program name, Episode number]
Trait: Static text

Label: Subtitles On/Off
Trait: Button

Label: Enter/Exit Full screen
Trait: Button

Label: Play / Pause
Trait: Button

Label: [00.07 of 59.37] swipe up or down to adjust
Trait: Adjustable

Label: Show/Hide more
Trait: Button
Descriptive text guidelines

- Add contextual information to images, such as the image name, to communicate the meaning and context of the images.
- Don’t do keyword stuffing for alternate/descriptive text for SEO ranking.
- Localize text.
Do not rely on color alone to convey meaning.

User perceives color incorrectly or not at all, and so misses or misunderstands information or makes mistakes.

Why?
User who are blind or colorblind perceives color incorrectly or not at all.

Functional Disabilities Context

Who does it helps?
Situational Disability Context

Many screens have limited color palette and color difference is not presented.

Device is used in poor lighting (for example, outdoors), so colors are not clearly perceived.
How do we achieve that?

Use blocks of color rather than vague outlines/shades.
• Contrast between foreground and background
  AA (minimum): 4.5:1
  AAA (enhanced): 7:1
Compensates for the loss in contrast that results from:

- moderately low visual acuity,
- congenital or acquired color deficiencies,
- the loss of contrast sensitivity that typically accompanies aging.

Compensates for the loss in contrast sensitivity usually experienced by:

- users with vision loss equivalent to approximately 20/80 vision.
- users with low vision who do not use assistive technology.
- provides contrast enhancement for color deficiency.
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Color guidelines

- Ensure that foreground and background color combinations provide sufficient contrast.

- Ensure that information conveyed with color is also available without color.
Minimize text input in the interface

Why?

User has difficulty entering text so text is entered incorrectly or mistakes are made.
Functional Disabilities Context

User with motor disability (for example, partial paralysis, hand tremor, lack of sensitivity, coordination) has difficulty entering information.

Who does it helps?
Situational Disability Context

- Device has small keypad which has limited functionality
- The context of mobile could be unpredictable

Who does it help?
How do we achieve that?

- Provide alternative means to enter text if possible.
- Avoid free text entry where possible.
- Provide pre-selected default values where possible.
- Specify a default text entry mode, language and/or input format, if the device is known to support it.
- Use keyboard shortcuts if supported by the device and browser.
4 Use Semantic Markup

If the page markup is invalid this will result in unpredictable and possibly incomplete presentation of the content.
Functional Disabilities Context:

Assistive technology or browser cannot handle invalid markup.

Easier for disabled users using screen readers to understand the purpose of elements and quickly jump between different types of elements.
Situational Disability Context:

Some older mobile browsers do not display content with invalid markup.
How do we achieve that?

EXAMPLE

<form action="http://example.com/donut" method="post">
  <p>
    <input type="checkbox" name="flavor" id="choc" value="chocolate" />
    <label for="choc">Chocolate</label>
  </p>
  
  <input type="checkbox" name="flavor" id="cream" value="cream" />
  <label for="cream">Cream Filled</label>
  
  <input type="checkbox" name="flavor" id="honey" value="honey" />
  <label for="honey">Honey Glazed</label>
  
  <input type="submit" value="Purchase Donuts" />
</form>
How do we achieve that?

EXAMPLE

android.view.accessibility.AccessibilityNodeProvider

This semantic structure allows accessibility services to present a more useful interaction model for users who are visually impaired.
Have a concise page content and page size

User only sees small areas at a time, is unable to relate different areas of a page, and so becomes disoriented or has to scroll excessively.
Functional Disabilities Context

User with restricted field of vision or using screen magnifier gets only small part of page or image at a time.

Who does it helps?
Situational Disability Context

Mobile device has small screen, so not all inform can be displayed

Who does it helps?
How do we achieve that?

• Clear and concise language, as mobile users are looking for a quick access to information.

• Limit scrolling to one axis throughout the app (vertical or horizontal axis) a

• Avoid image larger than the screen size

• Divide pages into usable but limited size portions.

• Position important things higher up and less important things lower down in scrolling views

• Create large clickable areas
Do not insert functions that can only be managed via gestures. Always add a button/link.

Why?

- Most gestures are not intuitive
- Not recognized by many users
Functional Disabilities Context

- Blind users cannot use gestures at all
- Users with temporary disability cannot use gestures
- Gestures are guess work for most users
Situational Disabilities Context

Gestures cannot be used in most of the outdoor or indoor context
How do we achieve that?

- Use gestures which can be used even with button or link
- Don’t rely completely on gestures for the interaction, have alternate interactive mechanisms
Ensure that it is possible to zoom the interface

Why?

Due to small screen, readability goes for a toss
Who does it helps?

Zooming helps users who cannot read or see tiny letters or have sight disability.
How do we achieve that?

```html
<meta name="viewport" value="initial-scale=1.0, minimum-scale=1.0, maximum-scale=2.0">
```
CONCLUSION
Mobile is for everyone. Think about it in your next application!
Guidelines *related* to mobile accessibility

- Web Content Accessibility Guidelines *(WCAG)*
- Mobile Web Best Practices *(MWBP)*
- Relationship between WCAG and MWBP
- Widget Accessibility Guidelines
- Widget Usability Best Practices
- Mobile Website Guidelines *(University of Austin)*
Device specific mobile accessibility guidelines

**Android**
- Designing for Accessibility
- Android Accessibility

**Blackberry** Best Practice Designing Accessible Applications

**iOS**: Accessibility Programming Guide

**Nokia/Symbian**: User Experience checklist for Touch and Keypad (PDFs)
Shyamala Prayaga
@pshyama