Enabling Mobile Applications for people with visual Impairments

Mobile Application Accessibility Enablement
Mobile App Accessibility

- Understanding "Mobile App Accessibility" and how visual impairment people access Mobile Application.

- Mobile App Accessibility Industry Standard.

- Things BA should consider while requirement gathering specific to Accessibility. (IOS and Android Perspective)

- Things Tester should consider while performing Accessibility Testing. (IOS and Android Perspective)

- Best Practices and Automation.
Overview

• Introduction
  – Forrester Estimate by 2015*
    • Total Technology economy of the world will be US $3 Trillion.
    • Mobility will account for 1/3rd – around US $1 Trillion.
    • Mobile Application Market at US $56 Billion.
  – US Government Statistics on Disability*
    • Estimated that 19% of US Citizen have some form of disability
    • Meaning 1 in 5 US Citizen is disabled.
    • Estimated around 56.7 Million people with disability.
  • Current Industry GAP: Companies servicing customer through Mobile Channel are not been able to address the mobility needs of people with disability.
  • This is due to the tedious nature and high costs involved during verification and validation of specific processes.
  • Our presentation focuses on solving this very problem.

* - Refer reference slide for source
Overview

- **US Law - Section 508 Amendment to the Rehabilitation Act of 1973 (in 1998):**
  - US Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disability.

- **Legal requirement specific to web accessibility**
  - A growing number of countries around the world have introduced legislation which either directly addresses the need for websites and other forms of communication to be accessible to people with disabilities. Some of the counties includes:
    - United Kingdom
    - Australia
    - Brazil
    - Ireland
    - Israel
    - Italy
Overview of Accessibility:

- **What’s Accessibility?**
  - Enable users with disabilities (i.e: Vision Disability, Color disability, etc) to access electronic information.

- **Web Accessibility**
  - Over more than a decade tester utilize many tools to verify the Web accessibility

  E.g.: JAWS, NVDA, WAVE...etc
Overview

What’s Mobile Application Accessibility?
- Enabling “Mobile Applications” accessible to users with Disability. (i.e.: Vision Disability, Color disability, etc).

How does the Mobile platform supports it?
- Platform specific tool for enabling accessibility.
  - IOS – Voice Over
  - Android – Talk Back
**Overview**

- **Enable Accessibility in iPhone:**

```
<table>
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<td>Profiles</td>
<td>14 Installed</td>
</tr>
<tr>
<td>Reset</td>
<td></td>
</tr>
</tbody>
</table>

**Vision**

- VoiceOver: Off
- Zoom: Off
- Large Text: Off
- Invert Colours: OFF
- Speak Selection: Off
- Speak Auto-text: OFF

Automatically speak auto-corrections and auto-capitalisations.

**Hearing**
• **Enable Accessibility in Android:**

1. Choose Accessibility

2. Enable Talk Back
Video explaining Mobile Accessibility

- Video of Mobile App Accessibility
- (We have shared the videos. Total time of video is 7.30 Min)
Accessibility Industry Standard

- Mobile Accessibility Standard - [http://www.w3.org/WAI/mobile/](http://www.w3.org/WAI/mobile/)
  - Created and managed by W3C
  - Focused mostly on Mobile Web application accessibility.

- Mobile Web Best Practices 1.0 [www.w3.org/TR/mobile-bp/](http://www.w3.org/TR/mobile-bp/)
  - Detailed best practice on development, delivery and user experience of Mobile Web applications.

- No industry standards for native app (yet)
  - No standard emerged yet specific to Native applications.

- IOS Best Practices

- Android Best Practices
IOS (IPhone / iPad) App Accessibility
Enabling Accessibility for iOS Applications

iOS (iPhone / iPad) Expects following details specific to Accessibility:

- **Accessibility Label**:
  - Short, localized word or phrase
  - Precisely describes the control or view
  - Examples are “Add” or “Play”

- **Accessibility Hint**:
  - A brief, localized phrase
  - Describes the results of an action on an element
  - Examples are “Adds a title” or “Opens the shopping list”

- **Accessibility Traits**:
  - A combination of one or more individual traits
  - Describes a single aspect of an element’s state, behavior
  - Example, an element that behaves like a keyboard key and that is currently selected can be characterized by the combination of the “Keyboard Key” and “Selected” traits.
Things to consider in Requirement Gathering – IOS Apps

Accessibility
Label: “Login ID”
Hint: “Please Enter Login ID”

Accessibility
Label: “Password”
Hint: “Please Enter Password”

Accessibility
Label: “Login”
Hint: “Click to Login”
Options for Testing IOS Application Accessibility

**Option -1: IOS Simulator based Testing**

- **IOS Simulator Accessibility Inspector:**
  - Free option part of the IOS SDK from Apple.

- Using this BA/Tester can verify the accessibility detail for individual control.

![Accessibility Inspector](image)
Option - 2: Voice over based verification

- BA / Tester can enable the Voice over on IOS Device.

- Option available on all IOS Device, provided by apple with no additional cost.

- When enabled IOS device will speak out the element on the App.

- Tester can navigate the application using gestures.

- By listening to the voice over BA/Tester can verify the Accessibility enablement of IOS Apps.
Android App Accessibility
Enabling Accessibility for Android Application

“Content Descriptor” in Android enable Accessibility.

- Textual description to be presented to the people with visual Impairments.
- Defines text that briefly describes content of the view.
Things to consider in Requirement Gathering in Android App

Content Descriptor: “Please Enter Login ID”

Content Descriptor: “Please Enter Password”

Content Descriptor: “Login”
Option for Testing Android Application Accessibility

- **Following Android Apps enable the Accessibility Verification:**
  - TalkBack
  - Explore by Touch

- Both the Apps are provided by Google for Free.

- When enabled Android device will speak out the element on the App.

- Tester can navigate the application using gestures.

- By listening to the “TalkBack” BA/Tester can verify the Accessibility enablement of Android Apps.
Manual Mobile App Accessibility Verification and Validation Problem:

- Tester has to go through individual element on Mobile App Screen to perform accessibility testing.

- No test case created due to High time consumption

- No Metrics followed due to non availability of Testing data.

- Highly time consuming process lead to increase in Project cost.
How did we solve the problem

- We followed the “Innovation workflow” for identifying solution:
  - Identify Tools and technology to solve our problem
  - **Result:** There was no tool in the market to solve our problem

**Industry / Tool Research**

**Brainstorming**

- **Core Issues:** Tester has to go through the Accessibility verification and validation manually.
- No Test case created and No Metrics Followed.

**Solution Design**

- **Innovation** - Identified an approach to extract all details from Mobile Application in automated way

**POC / Product Creation**

- POC created and validated
- Built an Automation tool.
Automated Accessibility Verification

Automated Accessibility Verification Process

- Tool Automate the extraction of Accessibility Label
- Tester key-in the Expected Accessibility Label

Automated Comparison

<table>
<thead>
<tr>
<th>View</th>
<th>Control Name</th>
<th>Actual Accessibility Label</th>
<th>Expected Accessibility Label</th>
<th>Result (Automated Comparison)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Field</td>
<td>Enter Login ID</td>
<td>Enter Login ID</td>
<td>Pass</td>
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</tr>
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<td>Text Field</td>
<td>Enter Password</td>
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<td>Pass</td>
<td></td>
</tr>
<tr>
<td>Button</td>
<td>Login</td>
<td>Login</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>
Best Practice

- **POUR** is a way of approaching mobile accessibility
  - **Perceivable**: information should be Perceivable
  - **Operable**: interfaces should be Operable
  - **Understandable**: content should be Understandable
  - **Robust**: the meaning of the content should be Robust
Best Practice - Perceivable & Operable

– **Perceivable**: Information and user interface components must be presentable to users in ways they can perceive.
  - Text Alternatives
  - Time-based Media
  - Adaptable
  - Distinguishable

– **Operable**: User interface components and navigation must be operable.
  - Keyboard Accessible
  - Enough Time
  - Seizures
  - Navigable
Best Practice - Understandable & Robust

– **Understandable**: Information and the operation of user interface must be understandable.
  
  • Readable
  • Predictable
  • Input Assistance

– **Robust**: Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.
  
  • Compatible
“A nation’s greatness is measured by how it treats its weak and disabled members”

- by Mahatma Gandhi

• By Helping the disabled people to enable access the Mobile Application, we can bring a huge change in the quality of their life.

• We call upon all the participants of this conference to pledge themselves to enable Accessibility wherever possible.

• Let us help disabled and build “Great Nation”.
Key Take away

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– Best Practices and Automation.
Thank You!

Learn more. www.baconvention.com