

# Hi! I'm Rachel ☺

- Software engineer
- Xamarin.Forms
- Eating, reading, exploring Boston
- Accessibility, mobile app development, tech for good

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# Developing inclusive mobile apps

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# Developing inclusive mobile apps



What

What does it mean?  
What makes mobile apps  
inclusive?  
What does it mean to  
develop mobile apps  
inclusively?



Why

Why does this matter?  
Why should you care?  
Why is this relevant to you  
as a mobile app developer  
/ software engineer /  
person in tech?



How

How can you achieve this?  
How can you build  
accessible and inclusive  
mobile apps on Android?  
iOS? Xamarin.Forms?

# Developing **inclusive** mobile apps

- Inclusive vs. Accessible













- **Accessible** → Inclusive of people of all **abilities**
- **Inclusive** → Inclusive of people of all **abilities, identities, and experiences**
  - ability, age, gender, education, social grouping, income, ethnicity, nationality, sexual orientation, etc.
  - *If we use our own abilities as a baseline, we make things that are easy for some people to use, but difficult for everyone else.*

— Microsoft Design

- *Great accessibility shouldn't be an obscure feature that only a small number of people use. At its best, accessibility should be a first-class citizen of the product or service you are creating and should benefit everyone.*

— Rob Whitaker,

*Developing Inclusive Mobile Apps: Building Accessible Apps for iOS and Android*

	Permanent	Temporary	Situational
Touch	 One arm	 Arm injury	 New parent
See	 Blind	 Cataract	 Distracted driver
Hear	 Deaf	 Ear infection	 Bartender
Speak	 Non-verbal	 Laryngitis	 Heavy accent

## The Persona Spectrum

We use the Persona Spectrum to understand related mismatches and motivations across a spectrum of permanent, temporary, and situational scenarios. It's a quick tool to help foster empathy and to show how a solution scales to a broader audience.

<https://www.microsoft.com/design>

# Developing **inclusive mobile apps**

- Inclusive design principles
  - Provide comparable experience
  - Consider situation
  - Be consistent
  - Give control
  - Offer choice
  - Prioritize content
  - Add value

# Developing **inclusive mobile apps**

- Inclusive design principles
  - Provide comparable experience --> i.e. content for alternatives
  - Consider situation --> i.e. color contrast
  - Be consistent --> i.e. consistent design patterns
  - Give control --> i.e. allow zoom
  - Offer choice --> i.e. accessible alternatives
  - Prioritize content --> i.e. prioritizing tasks
  - Add value --> i.e. make task completion easier

# Developing **inclusive mobile apps**

- Web Content Accessibility Guidelines (WCAG)
  - Global a11y standard and legal benchmark for both web and mobile
  - 4 principles

## 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
- Time limits
- Seizures and physical reactions
- Navigable
- Input modalities

## 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 by ...assistive technologies.*

- Compatible

<https://www.w3.org/WAI/standards-guidelines/wcag/>

<https://www.w3.org/WAI/WCAG21/quickref/>

<https://www.w3.org/TR/WCAG21/>



# Developing inclusive mobile apps

- **Empathy** is the name of the game
- Do your due diligence!
  - Accessibility settings and features
    - i.e. screen readers (TalkBack/VoiceOver), keyboard accessibility
    - Sample apps <https://github.com/rwapp>
  - Accessibility Model and APIs
    - <https://developer.android.com/guide/topics/ui/accessibility>
    - <https://developer.apple.com/accessibility/ios/>
    - <https://docs.microsoft.com/en-us/xamarin/xamarin-forms/app-fundamentals/accessibility/>
- Test and leverage available tools/resources

Let's explore together!



# Android vs. iOS Accessibility APIs



android

```
<TextView
    ...
    android:importantForAccessibility="no"
/>
```

```
textViewName.setImportantForAccessibility(
    IMPORTANT_FOR_ACCESSIBILITY_NO)
```



```
labelName.isAccessibilityElement = false
```

# Android vs. iOS Accessibility APIs



android

```
<Button  
    ...  
    android:contentDescription="Submit" />
```

```
buttonName.setContentDescription("Submit")
```



```
buttonName.accessibilityLabel = "Play"
```

# Android vs. iOS Accessibility APIs



```
<TextView
    ...
    android:labelFor="@+id/thingToLabel" />
```

```
<EditText
    ...
    android:id="@+id/thingToLabel" />
```

```
thingThatIsLabeling.setLabelFor(
    thingToLabel.id)
```

# Android vs. iOS Accessibility APIs



```
sliderName.accessibilityValue = "0"
```

# Android vs. iOS Accessibility APIs



android

```
<EditText  
    ...  
    android:hint="Email address" />
```

```
editTextName.setHint("Email address")
```



```
buttonName.accessibilityHint =  
    "Sends your message."
```

# Android vs. iOS Accessibility APIs



**android**

`importantForAccessibility`  
`contentDescription`  
`labelFor`  
`hint`



`isAccessibilityElement`  
`accessibilityLabel`  
`accessibilityValue`  
`accessibilityHint`



# Android vs. iOS Accessibility APIs



android

`importantForAccessibility`  
`contentDescription`  
`labelFor`  
`hint`



Xamarin

`AutomationProperties.`  
**`IsInAccessibleTree`**  
`AutomationProperties.`  
**`Name`**  
`AutomationProperties.`  
**`HelpText`**  
`AutomationProperties.`  
**`LabeledBy`**



`isAccessibilityElement`  
`accessibilityLabel`  
`accessibilityValue`  
`accessibilityHint`

# Demo time!



# Android vs. iOS Accessibility APIs



**android**

`importantForAccessibility`  
`contentDescription`  
`labelFor`  
`hint`



`isAccessibilityElement`  
`accessibilityLabel`  
`accessibilityValue`  
`accessibilityHint`

# Android vs. iOS Accessibility APIs



**android**

`importantForAccessibility`  
`contentDescription`  
`labelFor`  
`hint`  
`focusable`  
`accessibilityTraversalAfter,`  
`accessibilityTraversalBefore`  
`nextFocusDown, nextFocusUp,`  
`nextFocusLeft, nextFocusRight`  
`nextFocusForward`  
`isAccessibilityHeading`  
`minWidth, minHeight`  
`colorControlHighlight`



`isAccessibilityElement`  
`accessibilityLabel`  
`accessibilityValue`  
`accessibilityHint`  
`accessibilityElementsHidden`  
`accessibilityViewIsModal`  
`accessibilityElements`  
`accessibilityTraits`  
`accessibilityLanguage`  
`accessibilityViewIsModal`  
`accessibilityFrame,`  
`accessibilityActivationPoint`  
`accessibilityIncrement(),`

# Android vs. iOS Accessibility APIs



android

`importantForAccessibility`  
`contentDescription`  
`labelFor`  
`hint`  
`focusable`  
`accessibilityTraversalAfter,`  
`accessibilityTraversalBefore`  
`nextFocusDown, nextFocusUp,`  
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Xamarin




`isAccessibilityElement`  
`accessibilityLabel`  
`accessibilityValue`  
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`accessibilityElementsHidden`  
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`accessibilityElements`  
`accessibilityTraits`  
`accessibilityLanguage`  
`accessibilityViewIsModal`  
`accessibilityFrame,`  
`accessibilityActivationPoint`  
`accessibilityIncrement(),`

# Accessibility on Xamarin

- Native support
- Automation properties
  - <https://docs.microsoft.com/en-us/xamarin/xamarin-forms/app-fundamentals/accessibility/automation-properties>
- We're working on it!
  - <https://github.com/xamarin/Xamarin.Forms>
  - <https://github.com/dotnet/maui>
- Share your thoughts/ideas with us 😊
  - dotnet/maui repo
  - Monthly accessibility panel with Xamarin customers

# Thank you!

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