

The Journey to Accessible Apps with .NET MAUI

Rachel Kang (she/her)
Software Engineer @ Microsoft
DevReach 2022



Hi! I'm Rachel ☺

- Software engineer @ Microsoft
- Xamarin.Forms → .NET MAUI
- Eating, reading, exploring Boston (follow my foodstagram @nomonayum)
- Accessibility, mobile app development, tech for good

 @therachelkang

 @rachelkang

 <https://www.linkedin.com/in/rachel-j-kang>

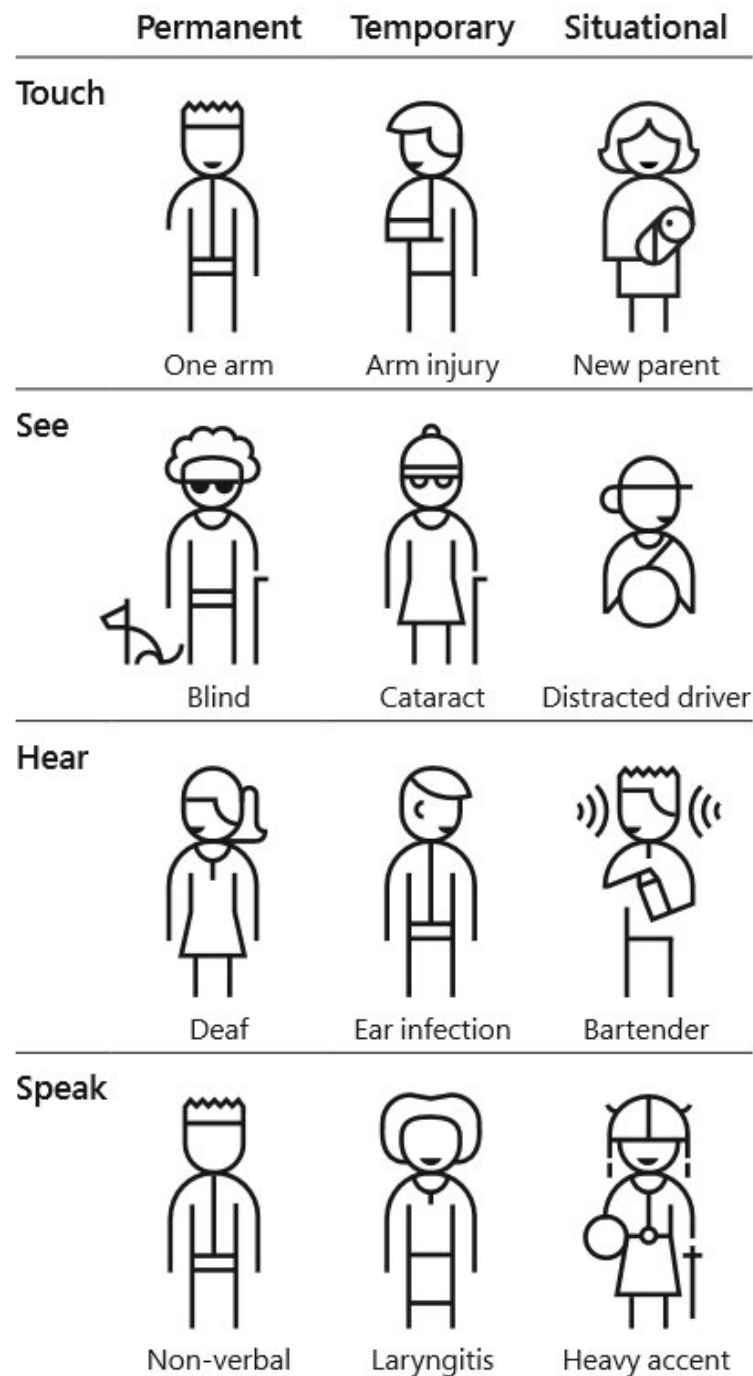


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Over 1 billion people
currently experience
some form of disability



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>

Designing for accessibility is not limited
to people experiencing disabilities

The best solutions

benefit everyone



22:06



Leave



Serena Davis



Aad' Kapoor



Charlotte de Crum



Beth Davies



Babak Shammass



Hilary Reyes



Babak Shammass:

So what did you all think of today's kickoff meeting for the new building project?



Participants

...


×

🔗

Share invite


▼


In this meeting (3)



Aadi Kapoor


1 🙋







Aaron Buxter


2 🙋






Daniela Mandera
Organizer






▼


Others invited (14)




Babak Shammass
Accepted



Beth Davies
Accepted



Bruno Zhao
Tentative



August Bergmaa
Tentative

Settings

Home

Find a setting

Personalization

Background

Colors

Lock screen

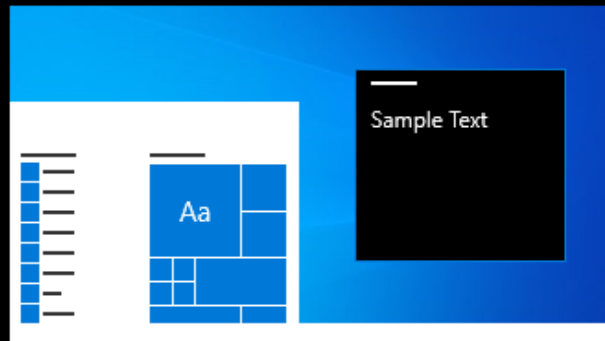
Themes

Fonts

Start

Taskbar

Colors



Choose your color

Custom

Choose your default Windows mode

☒ Light

☐ Dark

Choose your default app mode

☐ Light

☒ Dark

Transparency effects

Related Settings

[High contrast settings](#)

[Sync your settings](#)

Help from the web

[Changing desktop or background colors](#)

[Changing taskbar color](#)

[Get help](#)

[Give feedback](#)



Huge business opportunity

worth hundreds of billions



<https://wearepurple.org.uk/the-purple-pound-infographic>

Growing number of legal consequences

POLITICS

Supreme Court hands victory to blind man who sued Domino's over site accessibility

PUBLISHED MON, OCT 7 2019-9:40 AM EDT | UPDA



Tucker Higgins
@IN/TUCKER-HIGGINS-5B162295/
@TUCKERHIGGINS

ON SMALL BUSINESS

U.S. Businesses Get Hit With Record Numbers of Disability Lawsuits

By Amy Yee | Bloomberg

April 14, 2022 at 5:03 p.m. EDT

FOOD // WINE, BEER & SPIRITS

50 Bay Area wineries got hit with disability lawsuits. The winemakers say they're 'predatory'

















Esther Mobley

Approaching Accessible Apps

- **Empathy** is the name of the game
- Explore accessibility settings and features
 - Screen readers
 - Device theming
 - Font sizes
 - Color contrast
 - etc.
- Research accessibility models and APIs
- Test and leverage available tools/resources



With .NET MAUI, you'll be able to create accessible apps more seamlessly than ever before

#9557 by PureWeen was merged 18 days ago • Approved	
<input type="checkbox"/>	<div><div> Fix SearchBar semantics ✓ area/a11y area/controls control-entry</div><div>#7802 by rachelkang was merged on 8 Jun • Approved 6.0-sr2</div></div>
<input type="checkbox"/>	<div><div> [Windows] Set WinUI picker description to title ✓ area/a11y area/controls control-picker platf</div><div>#6970 by rachelkang was merged on 9 May • Approved</div></div>
<input type="checkbox"/>	<div><div> Only set AccessibilityTraits for heading when it matters ✓ area/a11y</div><div>#6749 by PureWeen was merged on 2 May • Approved</div></div>
<input type="checkbox"/>	<div><div> Tweak templates to fix accessibility bugs ✗ area/a11y area/templates</div><div>#6322 by rachelkang was merged on 20 Apr • Approved 6.0.300</div></div>
<input type="checkbox"/>	<div><div> Update template styles ✗ area/a11y area/templates area/Xaml </></div><div>#6312 by rachelkang was merged on 21 Apr • Approved 6.0.300-rc.3</div></div>
<input type="checkbox"/>	<div><div> Remove interfering keyboard focus logic ✓ area/a11y area/controls area/shell control-entry</div><div>#6246 by rachelkang was merged on 25 Apr • Approved 6.0.300-rc.3</div></div>
<input type="checkbox"/>	<div><div> Create custom Automation Peer for MauiButton ✓ area/a11y area/controls control-button</div><div>#6139 by PureWeen was merged on 18 Apr • Approved</div></div>
<input type="checkbox"/>	<div><div> Respect UserAppTheme in RequestedTheme ✓ area/a11y t/bug</div><div>#5071 by mattleibow was merged on 6 Mar • Approved 6.0.300-previe...</div></div>
<input type="checkbox"/>	<div><div> Windows FlowDirection ✓ area/a11y</div><div>#4936 by PureWeen was merged on 1 Mar • Approved 18 tasks 6.0.300-previe...</div></div>
<input type="checkbox"/>	<div><div> [iOS] Implement IsFocused property and Focus(), Unfocus() methods ✓ area/a11y platform/iOS</div><div>#4588 by jsuarezruiz was merged on 17 Feb • Approved 1 of 2 tasks</div></div>
<input type="checkbox"/>	<div><div> [Android] Implement IsFocused property and Focus(), Unfocus() methods ✓ area/a11y platform</div><div>#4587 by jsuarezruiz was merged on 17 Feb • Approved 1 of 2 tasks</div></div>
<input type="checkbox"/>	<div><div> [Windows] Implement IsFocused property and Focus(), Unfocus() methods ✓ area/a11y platf</div><div>#4562 by jsuarezruiz was merged on 19 Feb • Approved 1 of 2 tasks</div></div>
<input type="checkbox"/>	<div><div> [Android] Fix SetSemanticFocus ✗ area/a11y platform/android</div><div>#3993 by rachelkang was merged on 20 Jan • Approved 12 tasks</div></div>
<input type="checkbox"/>	<div><div> Fix keyboard navigation with modal pages ✓ area/a11y</div><div>#3631 by PureWeen was merged on 16 Dec 2021 • Approved 18 tasks</div></div>

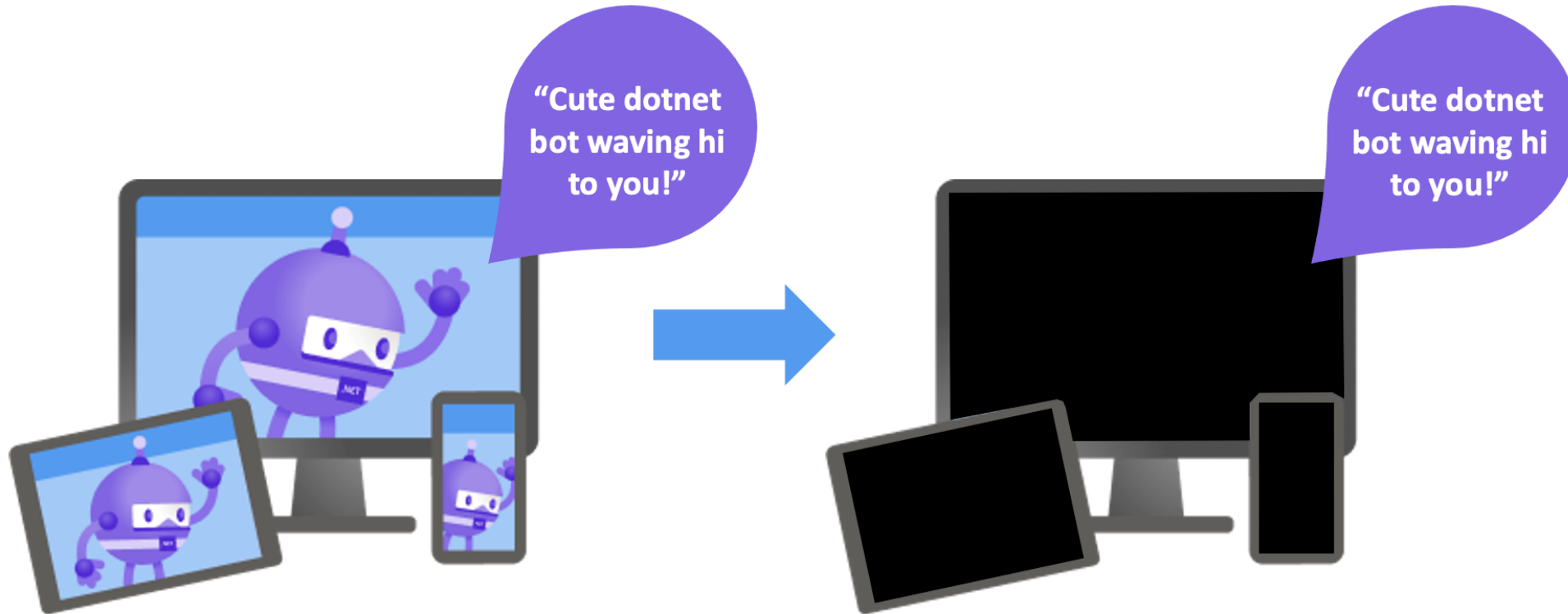
10 AWESOME THINGS

about .NET MAUI accessibility 😊



Semantic Properties

1





Semantic Properties

`SemanticProperties.Description`

`SemanticProperties.Hint`

`SemanticProperties.HeadingLevel`

```
<Image Source="logo.png"  
    SemanticProperties.Description=".NET logo" />
```

```
Image image = new Image { Source = "logo.png" }  
SemanticProperties.SetDescription(image, ".NET logo");
```

Semantic Extensions



`SetSemanticFocus()`

`Announce()`

```
Image image = new Image { Source = "logo.png" }  
image.SetSemanticFocus();
```

```
SemanticScreenReader.Announce("I am being announced!");
```

Community Toolkit

3

SemanticEffects

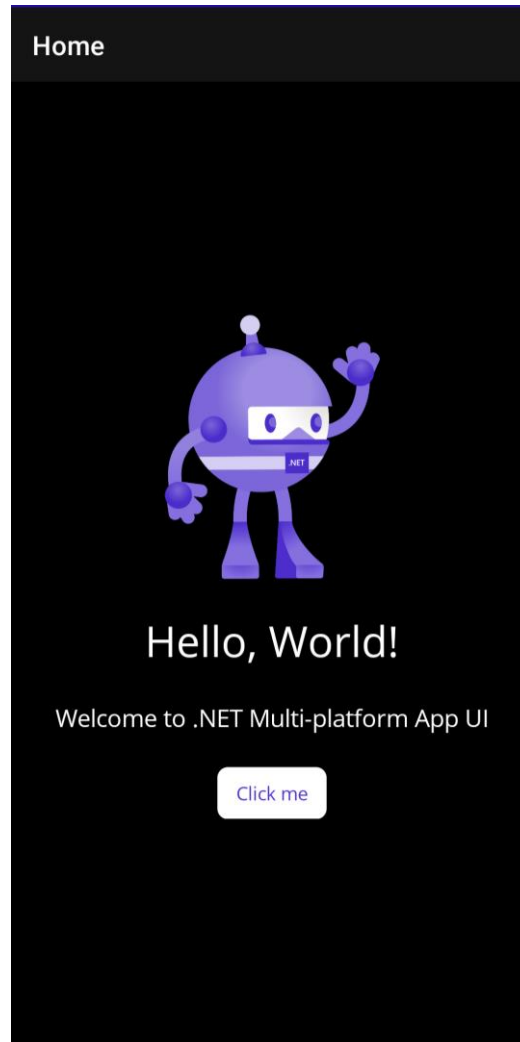
SemanticOrderView

```
<xct:SemanticOrderView x:Name="sov">
  <StackLayout>
    <Label x:Name="second" Text="Second control" />
    <Button x:Name="third" Text="Third control" />
    <Label x:Name="fourth" Text="Fourth control" />
    <Button x:Name="fifth" Text="Fifth control" />
    <Button x:Name="first" Text="First control" />
  </StackLayout>
</xct:SemanticOrderView>
```

```
sov.ViewOrder = new List<View> { first, second, third, fourth, fifth };
```

<https://github.com/CommunityToolkit/Maui>

App Theming

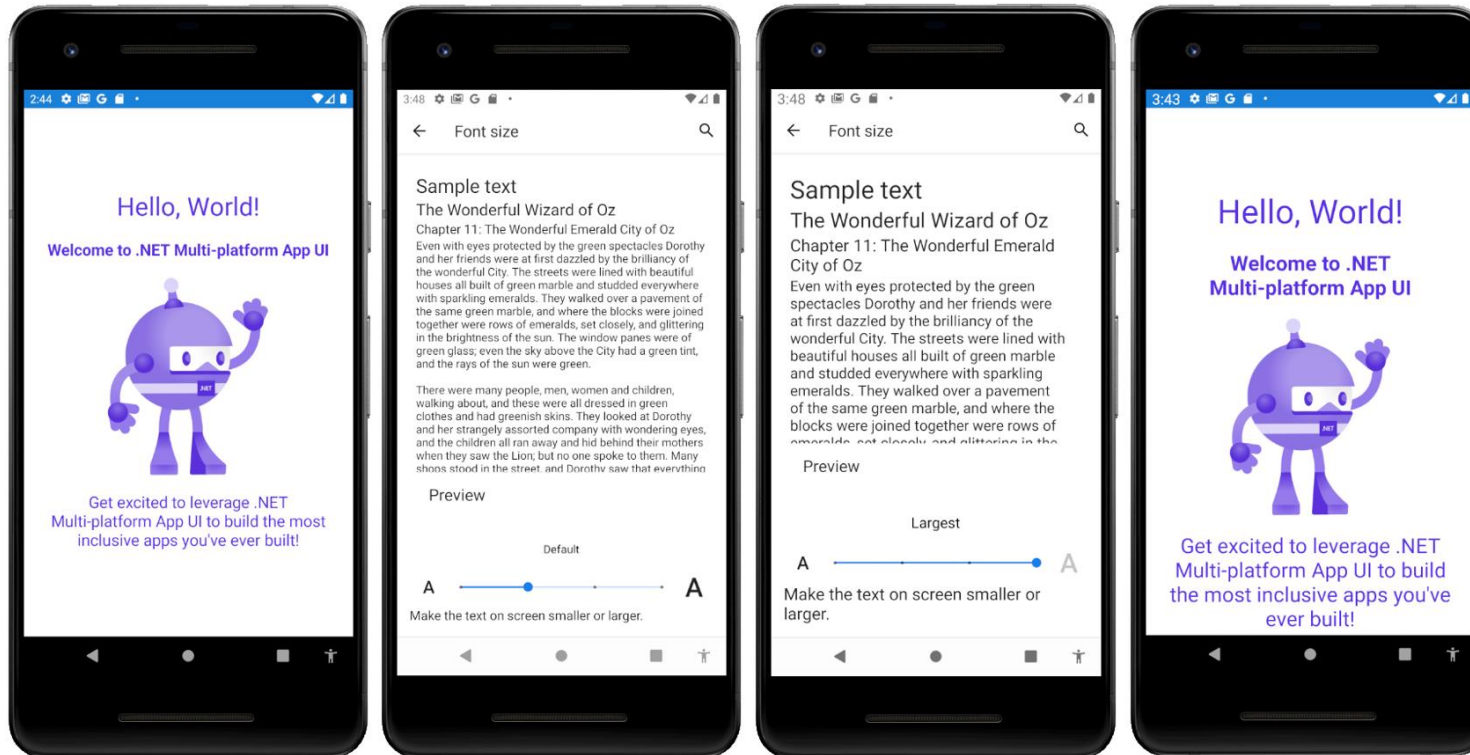


```
<Setter
    Property="BackgroundColor"
    Value="{AppThemeBinding
        Light={StaticResource White},
        Dark={StaticResource Black}}" />
```

Font Autoscaling

5

FontAutoScalingEnabled




Cross-Platform Controls



Apply Accessibility traits to controls that have TapGestureRecognizer

 Merged PureWeen merged 7 commits into [release/6.0.1xx-preview7](#) from [node_info_alternate](#) on 2 Aug 2021

 Conversation 6  Commits 7  Checks 14  Files changed 17



PureWeen commented on 30 Jul 2021 • edited ▾

Member 😊 ...

Description of Change

If users attach a touch gesture recognizer that will activate with a single touch then we add accessibility traits that will inform readers that the element is clickable.

Add traits to iOS Checkbox so it reads as Switch #1832

 Merged PureWeen merged 4 commits into [main](#) from [ios_accessible_checkbox](#) on 27 Jul 2021

 Conversation 0  Commits 4  Checks 14  Files changed 2



PureWeen commented on 27 Jul 2021 • edited ▾

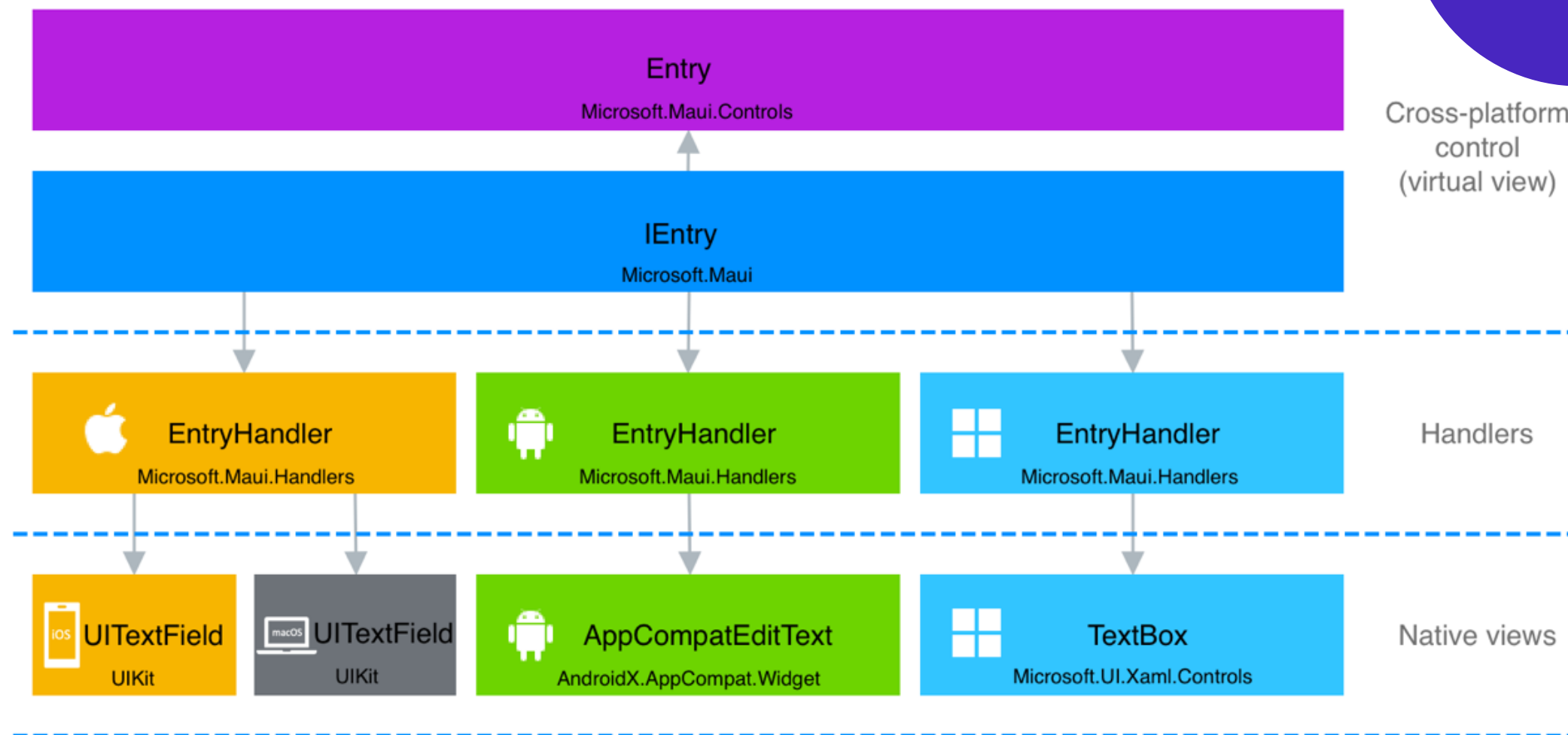
Member 😊 ...

Description of Change

iOS doesn't natively have a checkbox so to make the current checkbox more accessible we will treat it semantically like a switch

Customization via Handlers

7



Customization via Handlers



```
Microsoft.Maui.Handlers.EntryHandler.Mapper.AppendToMapping
("MyEntry", (handler, view) =>
{
#if ANDROID
    // Android code

#elif IOS || MACCATALYST
    // iOS code

#elif WINDOWS
    // WinUI code
#endif
});
```

Accessibility Standards

- Microsoft Accessibility Standards (MAS)
- Web Content Accessibility Guidelines (WCAG)

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

Accessibility Insights



The screenshot shows the Accessibility Insights application window. The title bar reads 'Accessibility Insights'. On the left is a sidebar with 'FastPass' at the top and three numbered items: '1 Automated checks', '2 Tab stops', and '3 Needs review' (which is selected). The main area is titled 'Needs review' and contains a sub-header 'Instances to review' with a toggle set to '1'. Below this, there's a section for 'ImageContrastCheck' with a description: 'Meaningful graphics must have sufficient contrast.' It includes links for 'Resources for this rule' and a table with details for the 'android.widget.ImageView' class. The table has columns for 'Class name', 'Content description', and 'How to check'. On the right, a 'Target app screenshot' shows a mobile app interface with a blue background, a robot character, and text: 'Hello, World!', 'Welcome to .NET Multi-platform App UI', and 'Get excited to leverage .NET Multi-platform App UI to build the most inclusive apps you've ever built!'. A red rectangle highlights the robot character in the app screenshot.

Accessibility Insights

Accessibility Insights

FastPass

1 Automated checks

2 Tab stops

3 Needs review


Needs review

Sometimes automated checks identify *possible* accessibility problems that need to be reviewed and verified by a human.

Instances to review ☐

Congratulations!

No instances to review were found. Continue investigating your app's accessibility compliance through manual testing.



Target app screenshot

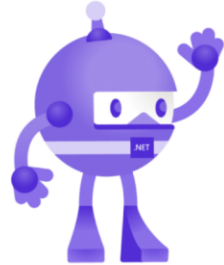
3:57

🔍 📱 🌐

🔍 📱 🌐

Hello, World!

Welcome to .NET Multi-platform App UI



Get excited to leverage .NET Multi-platform App UI to build the most inclusive apps you've ever built!

9

Accessibility Insights



"My Recipe" button looks like Disabled control but it is not. #6598

Edit

New issue

Closed

SuryacharanM opened this issue on 28 Apr · 2 comments



SuryacharanM commented on 28 Apr · edited

GitHubTags:

#A11yUsable; #.NET MAUI; #AILimited; #A11ySev4; #A11yTCS; #Android; #AndroidPhone; #GH_.NETMAUI_Android_Apr2022;

Description

"My Recipe" button looks like Disabled control but it is not disabled.

Steps to Reproduce

1. Install and open ".NET MAUI" app.
2. "Home Screen" will open.
3. Swipe till "My Recipe" and observe the issue.



Breakfast



Lunch



Dinner



Snacks

Search by diet



Balanced



Vegetarian



Vegan



Ketogenic



Recipe Search



My Recipes

Assignees

PureWeen

rachelkang

Labels

a11y/recipes-app

a11y-resolved

area/a11y

t/bug

Projects

None yet

Milestone

6.0-servicing

Development

Create a branch for this issue or link a pull request.

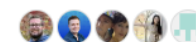
Notifications

Customize

Unsubscribe

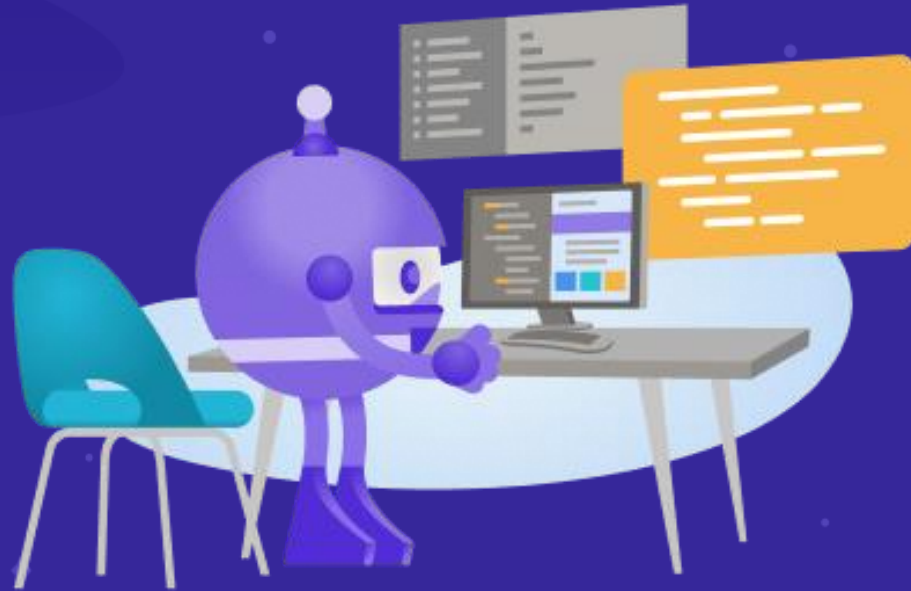
You're receiving notifications because you were assigned.

5 participants

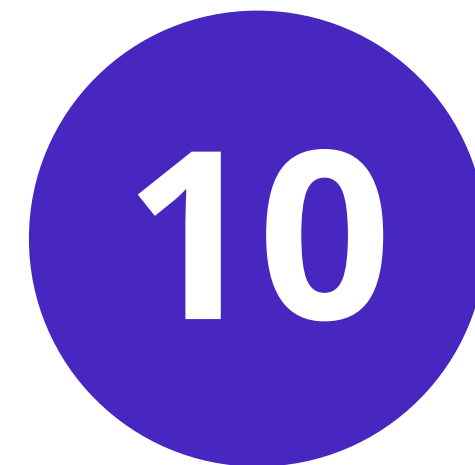


Unlock conversation

DEMO TIME!



The Journey Continues!



Docs / .NET / .NET MAUI /



Build accessible apps with semantic properties

Article • 24/08/2022 • 15 minutes to read • [3 contributors](#)



Semantics for accessibility is concerned with building experiences that make your apps inclusive for people who use technology in a wide range of environments and approach your UI with a range of needs and experiences. In many situations, legal requirements for accessibility may provide an impetus for developers to address accessibility issues. Regardless, it's advisable to build inclusive and accessible apps so that your apps reach the largest possible audience.

The [Web Content Accessibility Guidelines \(WCAG\)](#) are the global accessibility standard and legal benchmark for web and mobile. These guidelines describe the various ways in which apps can be made more perceivable, operable, understandable, and robust, for all.

<https://docs.microsoft.com/dotnet/maui/fundamentals/accessibility>

The Journey Continues!

10

The Journey to Accessible Apps



April 14th, 2021

No matter what stage of the app development process you're at, and no matter your level of familiarity with developing inclusive apps, it is always the right time to make your apps more inclusive. Get started on your journey to developing inclusive apps today.

Ensuring your apps are inclusive has wide implications. It involves making sure that your app appeals to audiences of all different identities – of age, gender, ethnicity, ability, education, and so much more. It involves making sure all your app's users are granted an equitable user experience. It involves executing proper customer validation and working with a representative team.

With all these moving parts, it can be tough to know where to start – but fear not!

You can start here, with accessibility, today.

the following ways:

Individuals may
abilities to accomplish tasks,
different situations. Assistive

that provides an
may entirely replace the
elementary in many
of sighted users, even

both in design and
logical ordering,

<https://devblogs.microsoft.com/xamarin/the-journey-to-accessible-apps>

The Journey Continues!

10



<https://aka.ms/discord-maui>
[#maui-accessibility](#)

Thank you!



@therachelkang



@rachelkang



<https://aka.ms/discord-maui> > #maui-accessibility

