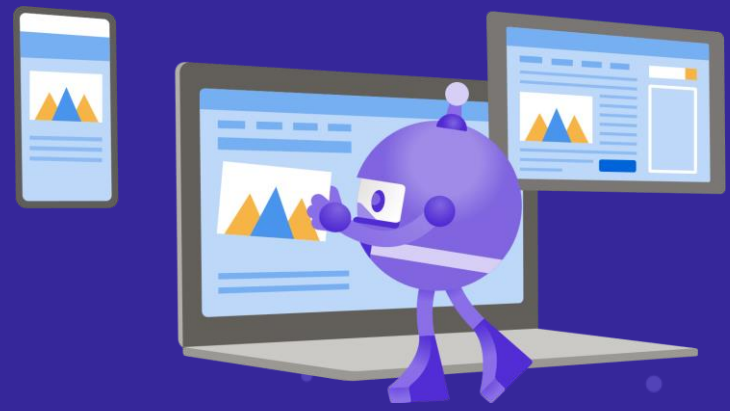
The Journey to Accessible Apps with .NET MAUI

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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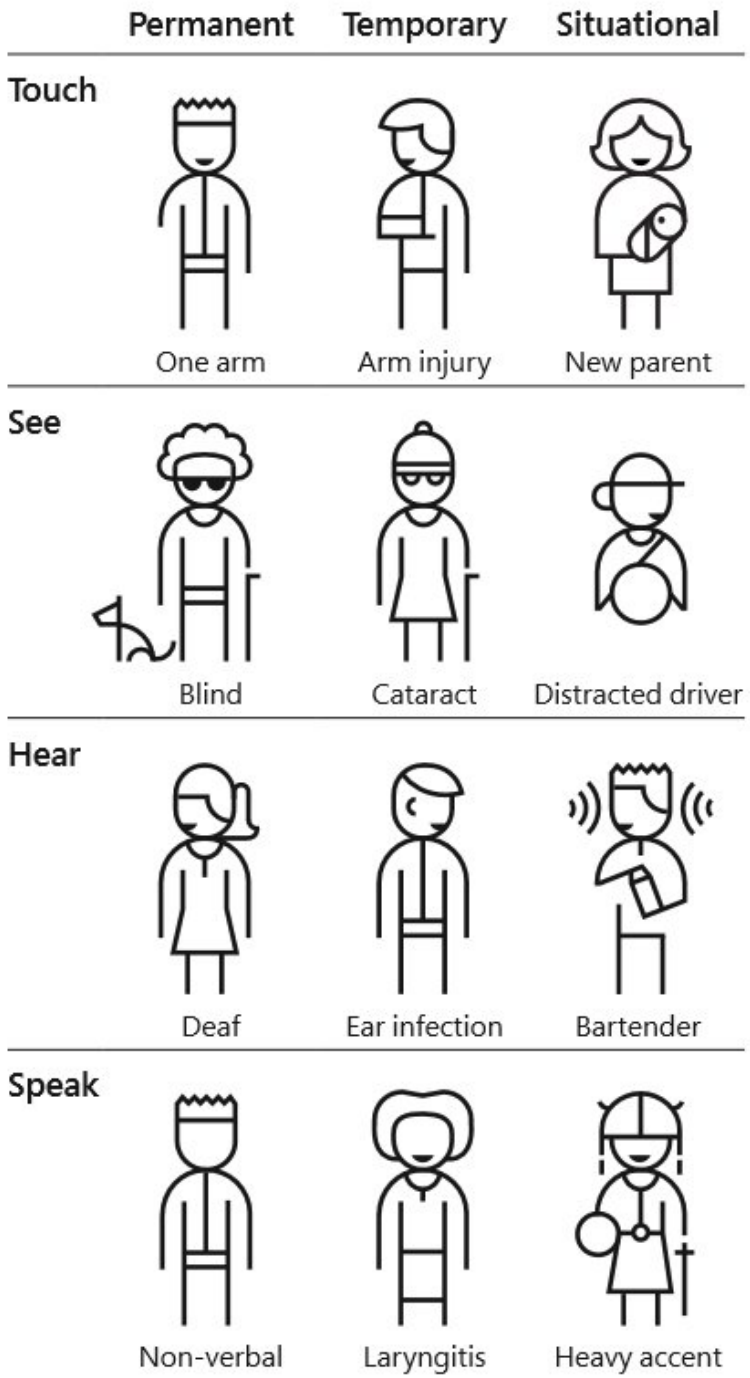
Over 1 billion people currently experience some form of disability



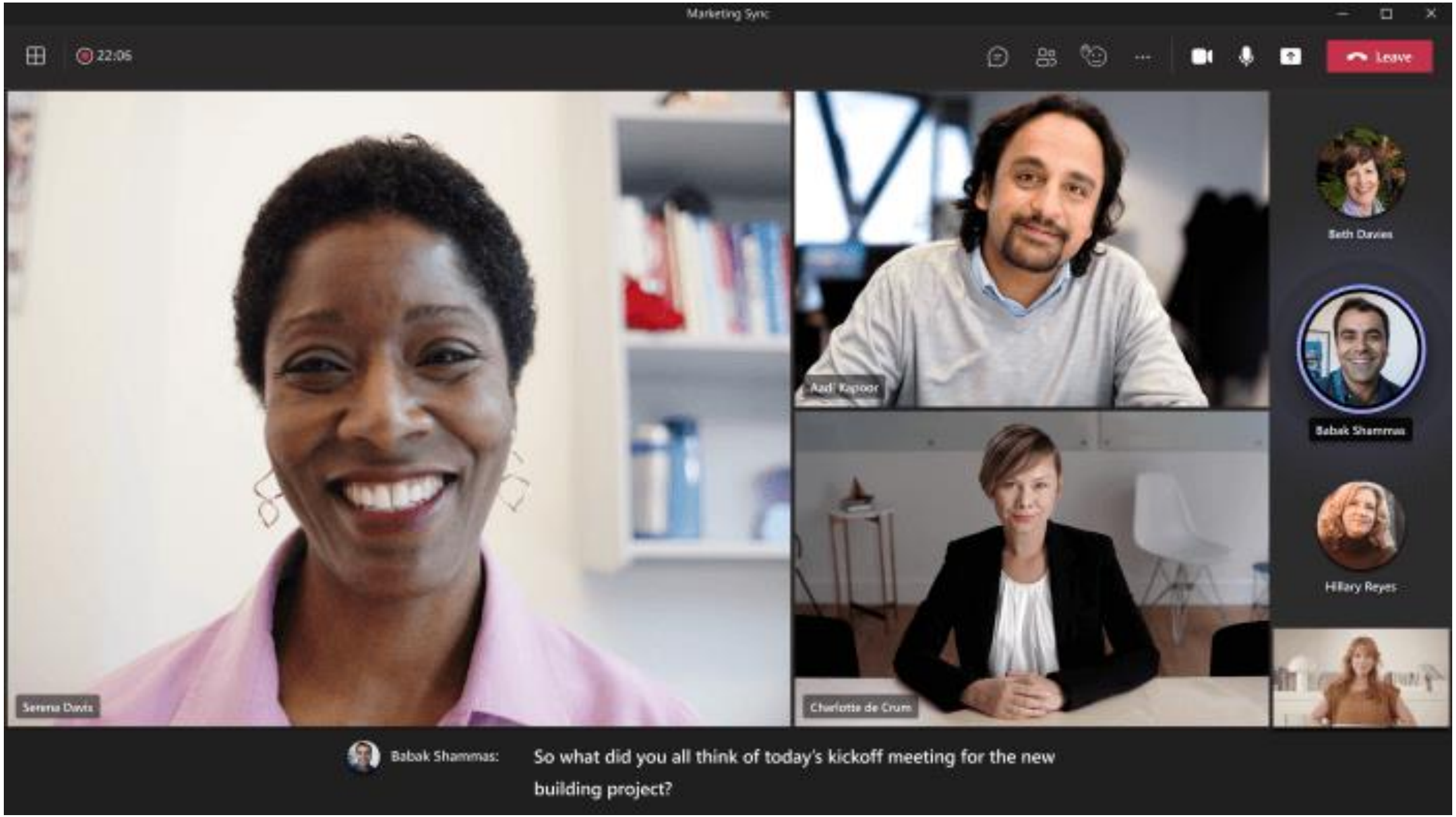
The Persona Spectrum

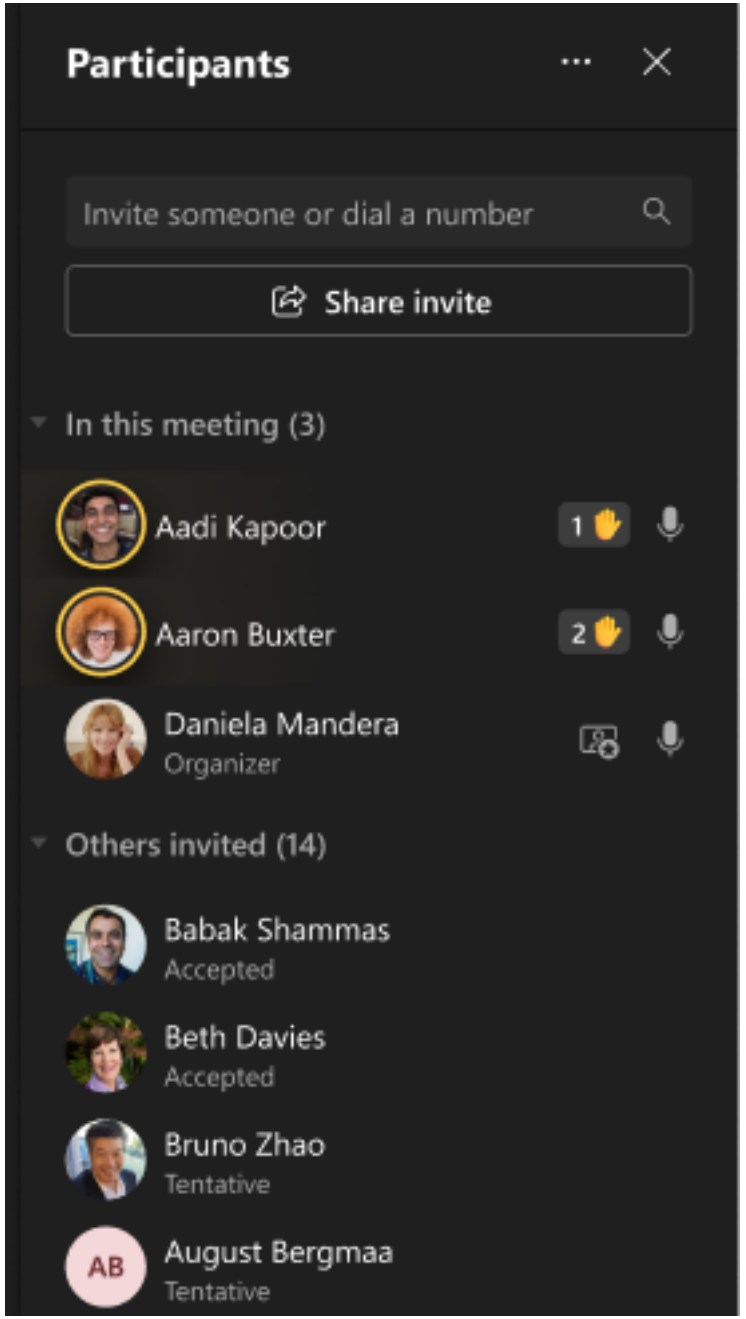
We use the Persona Spectrum to understand related mismatches and motivations across a spectrum of permanent, temporary, and situational scenarios. It's a quick tool to help foster empathy and to show how a solution scales to a broader audience.

https://www.microsoft.com/design

Designing for accessibility is not limited to people experiencing disabilities

The best solutions benefit everyone


Marketing Sync
22:06
Leave
Serena Davis
Aadi Kapoor
Charlotte de Crum
Seth Davies
Babak Shammas
Hillary Reyes
Babak Shammas:
So what did you all think of today's kickoff meeting for the new building project?


Participants
Invite someone or dial a number
Share invite
In this meeting (3)
Aadi Kapoor
1
Aaron Buxter
2
Daniela Mandera
Organizer
Others invited (14)
Babak Shammas
Accepted
Beth Davies
Accepted
Bruno Zhao
Tentative
AB
August Bergmaa
Tentative

Settings

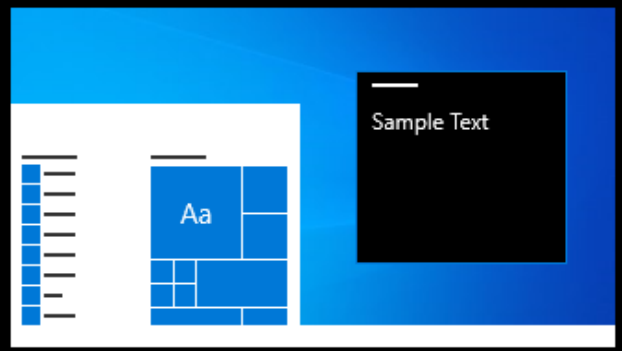
Home

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 | UPDAT

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

FOOD // WINE, BEER & SPIRITS

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

Esther Mobley

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

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

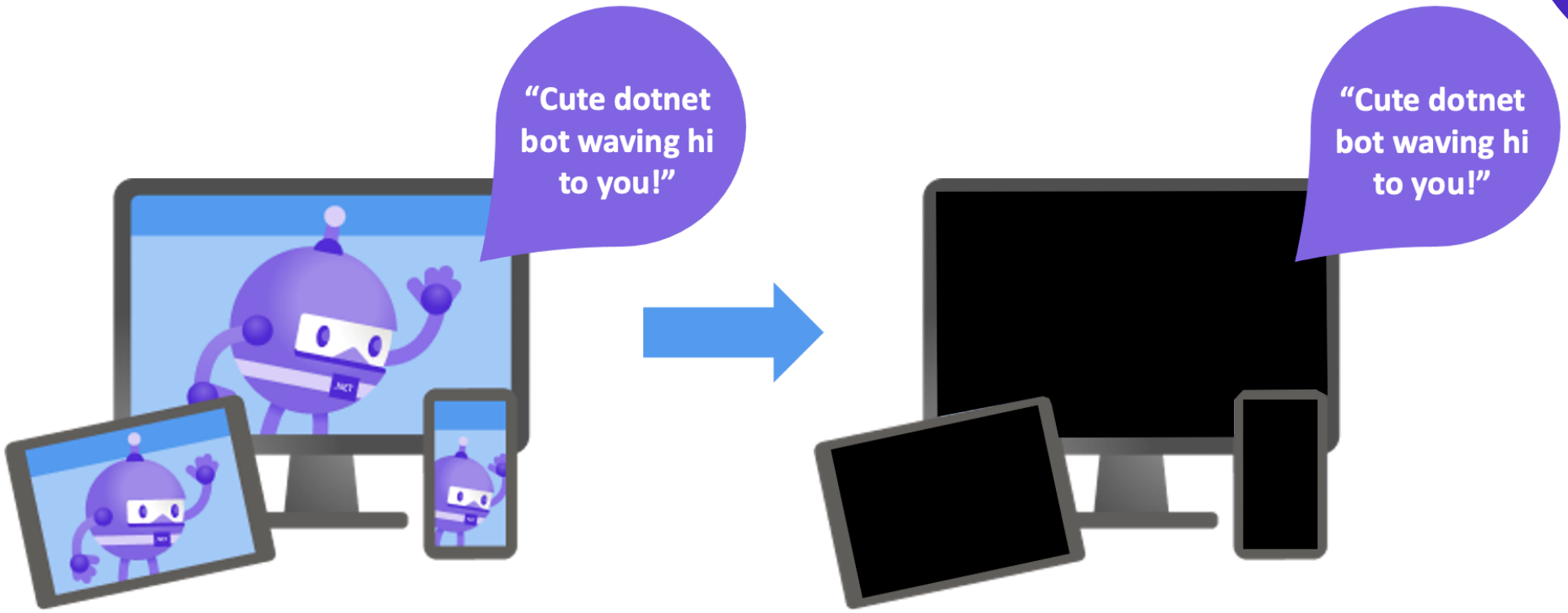
- Fix SearchBar semantics ✓ area/a11y area/controls 🎮 control-entry
  #7802 by rachelkang was merged on 8 Jun • Approved 6.0-sr2
- [Windows] Set WinUI picker description to title ✓ area/a11y area/controls 🎮 control-picker platfo
  #6970 by rachelkang was merged on 9 May • Approved
- Only set AccessibilityTraits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

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

2

```
SetSemanticFocus()
Announce()
```

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

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

Community Toolkit

3

SemanticEffects

SemanticOrderView

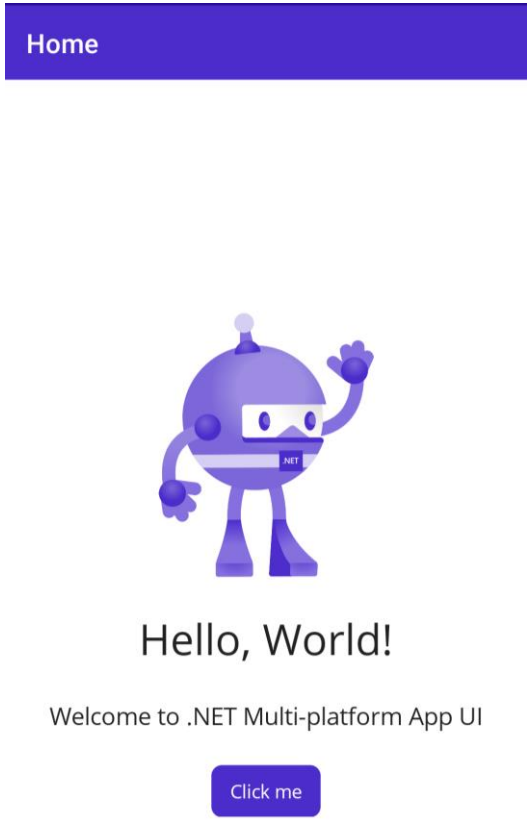
```
<xct:SemanticOrderView x:Name="sov">
    <StackLayout>
        <Label x:Name="second" Text="Second control" />
        <Button x:Name="third" Text="Third control" />
        <Label x:Name="fourth" Text="Fourth control" />
        <Button x:Name="fifth" Text="Fifth control" />
        <Button x:Name="first"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

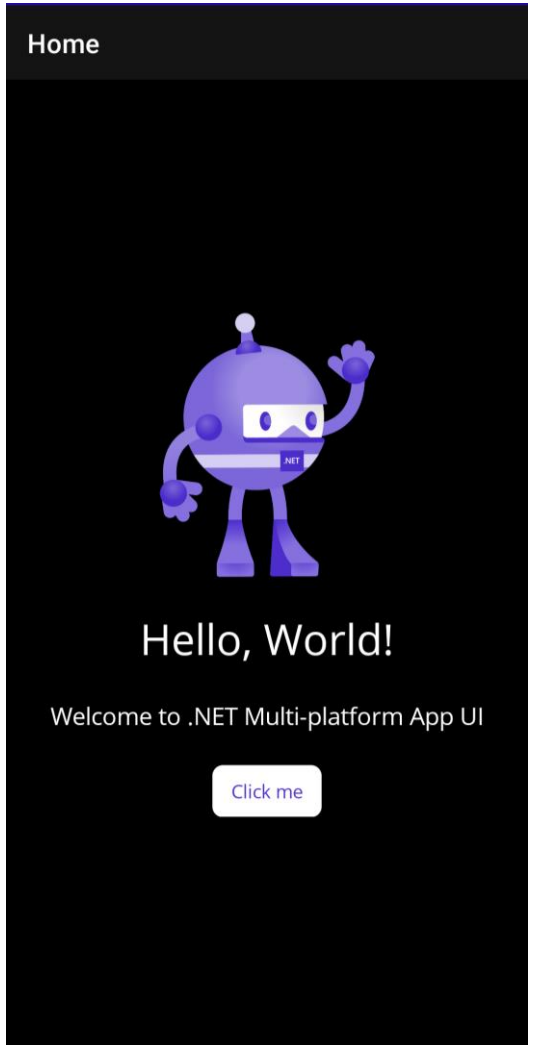
```
sov.ViewOrder = new List<View> { first, second, third, fourth, fifth };
```

https://github.com/CommunityToolkit/Maui

App Theming

4



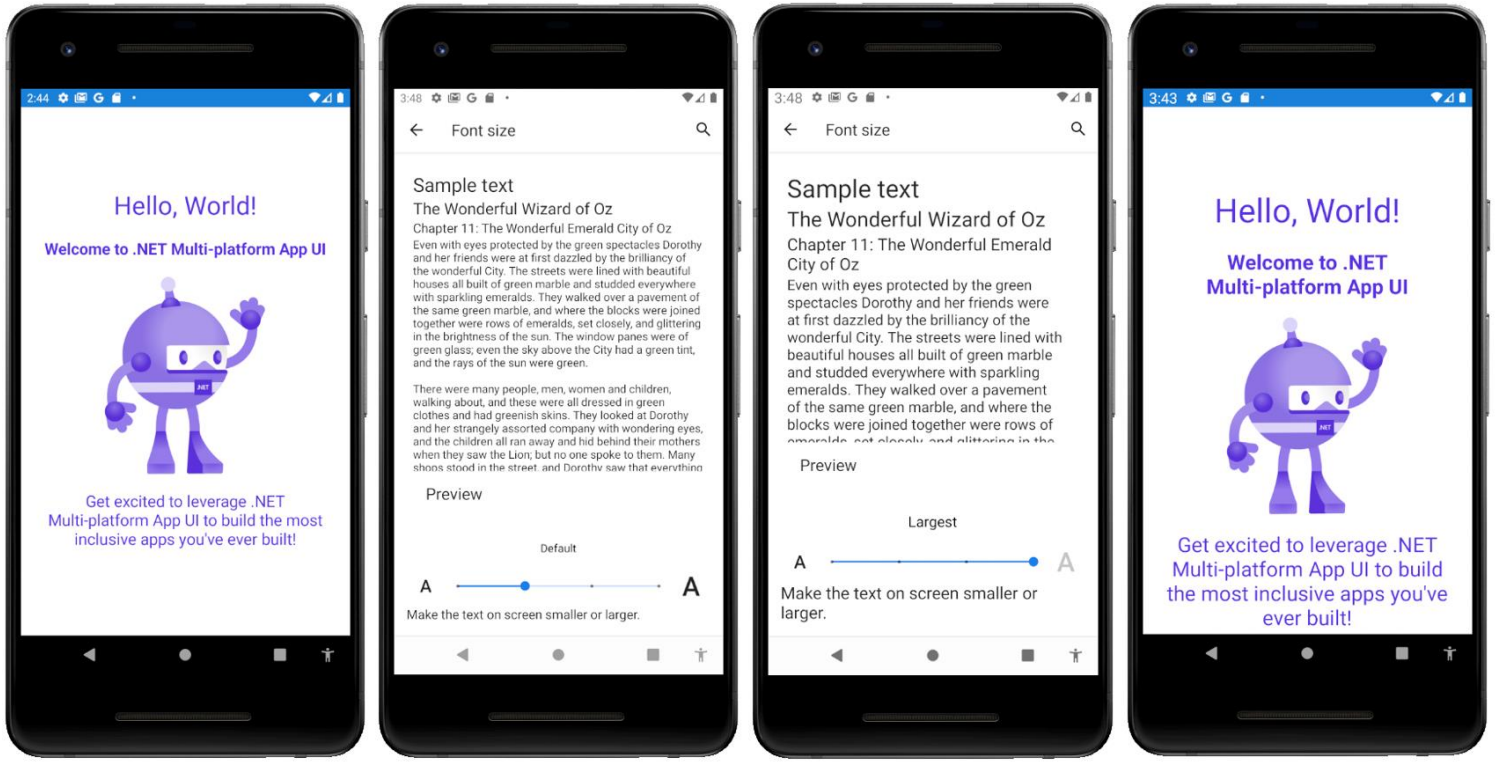



```
<Setter
    Property="BackgroundColor”
    Value="{AppThemeBinding
        Light={StaticResource White},
        Dark={StaticResource Black}}" />
```

Font Autoscaling

5

`FontAutoScalingEnabled`



Cross-Platform Controls

6

Apply Accessibility traits to controls that have TapGestureRecogniz

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

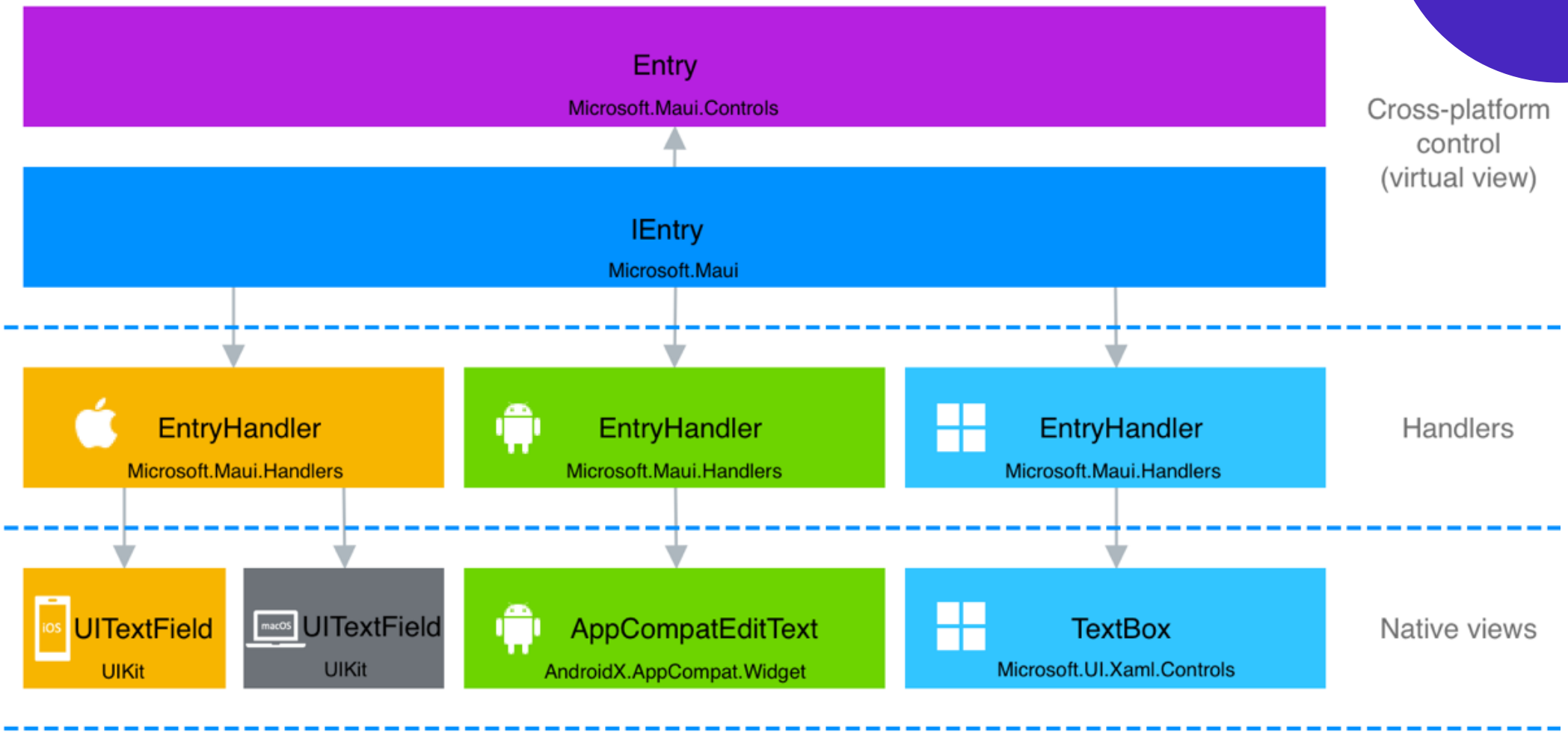
PureWeen commented on 27 Jul 2021 • edited — Member

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

7

```
    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

8

- 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

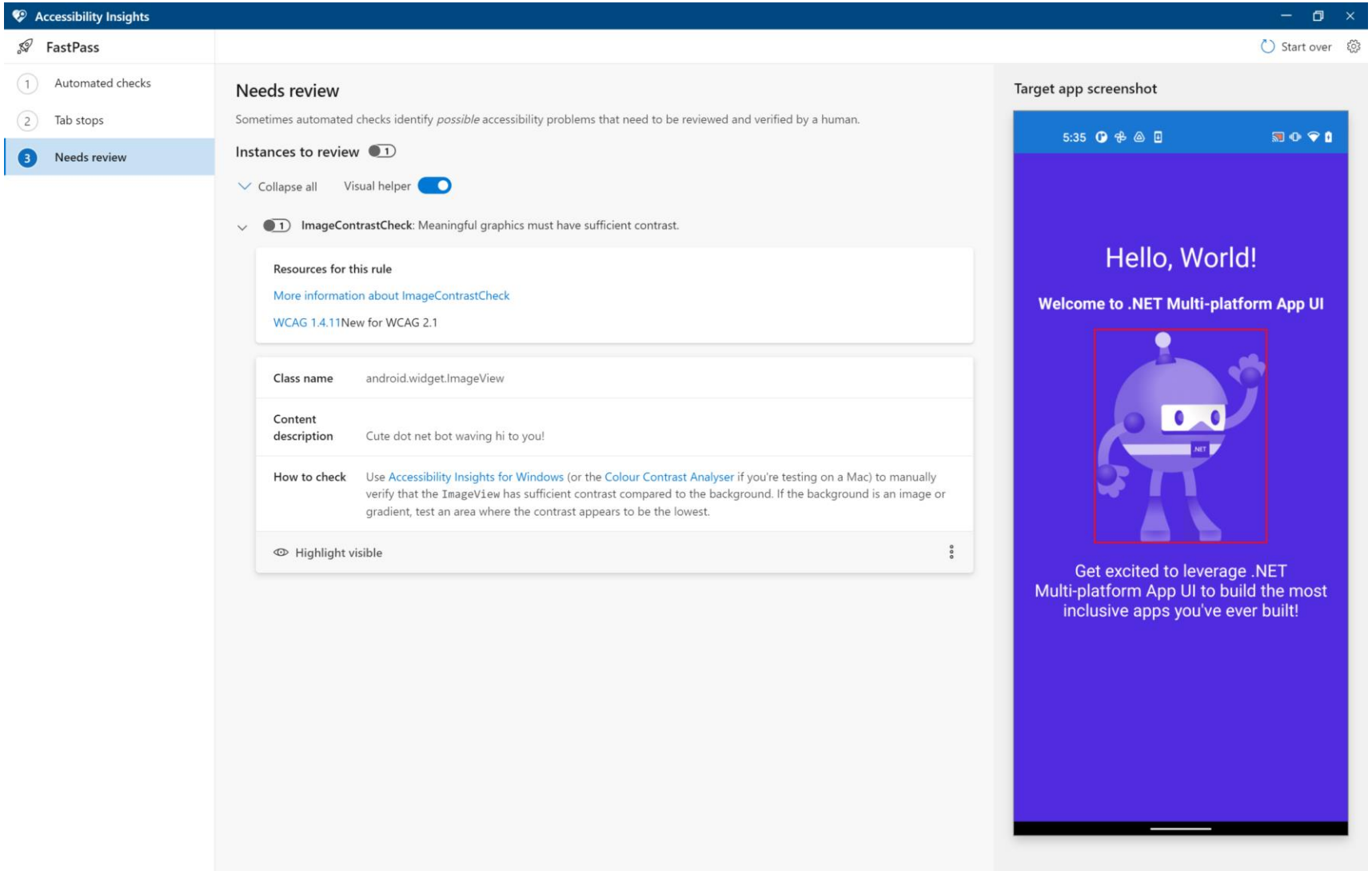
Content must be robust enough that it can be interpreted by …assistive technologies.

- Compatible

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

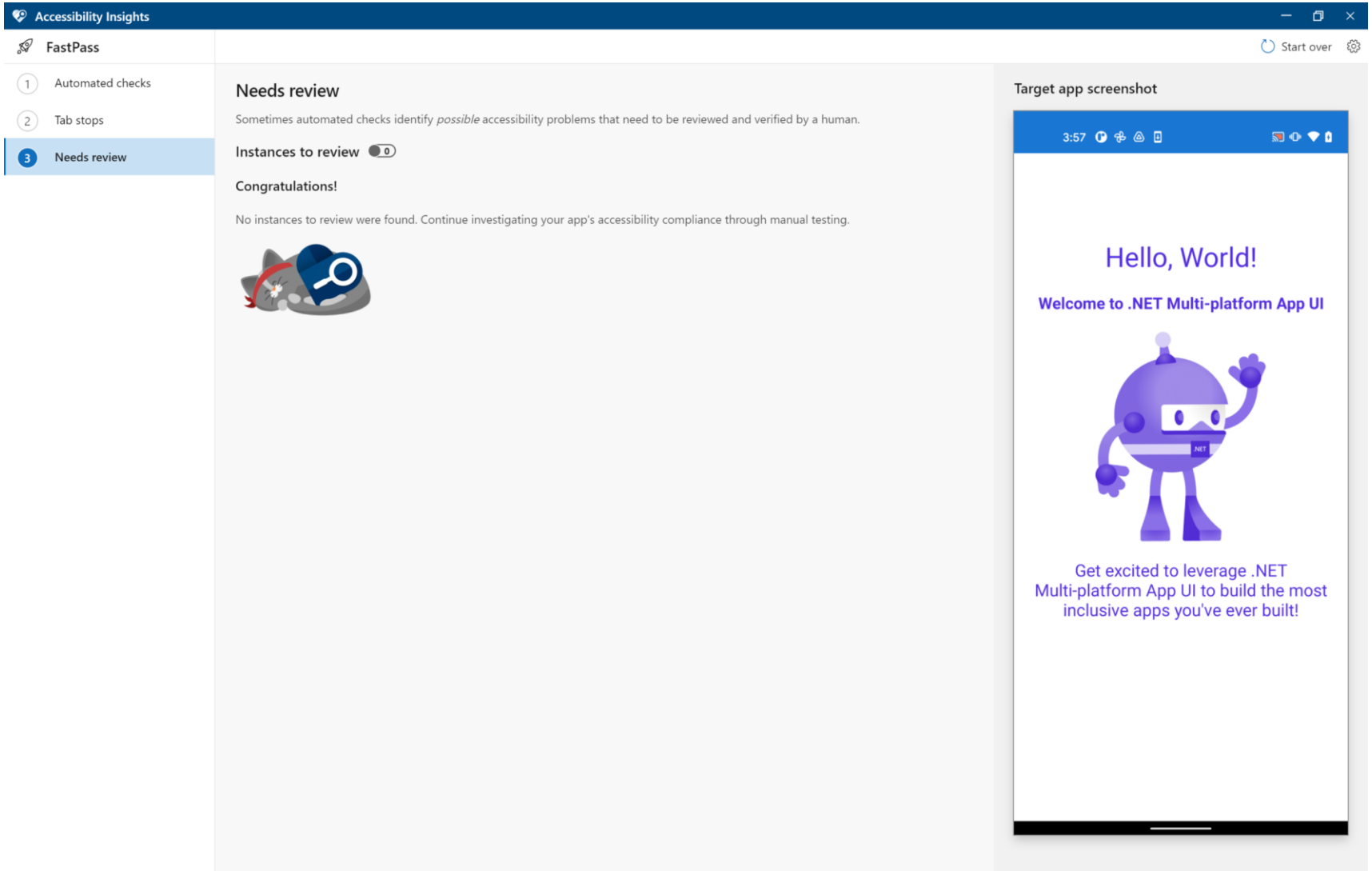
Accessibility Insights

9



Accessibility Insights

9



Accessibility Insights

9

"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

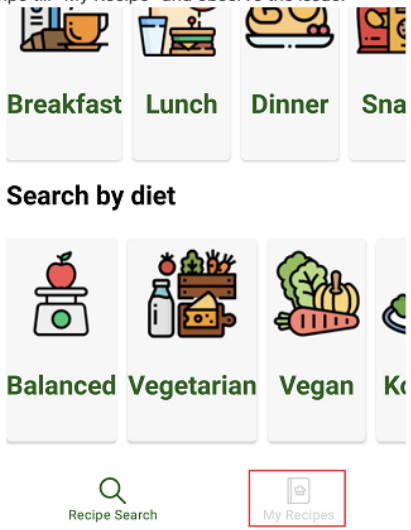
GitHubTags:
#A11yUsable; #.NET MAUI; #AILimited; #A11ySev4; #A11yTCS; #Android; #AndroidPhone;#GH_.NETMAUI_Android_Apr2022;

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.



Assignees
PureWeen
rachelkang

Labels
a11y/recipes-app | a11y-resolved | area/a11y | t/bug

Projects
None yet

Milestone
6.0-servicing

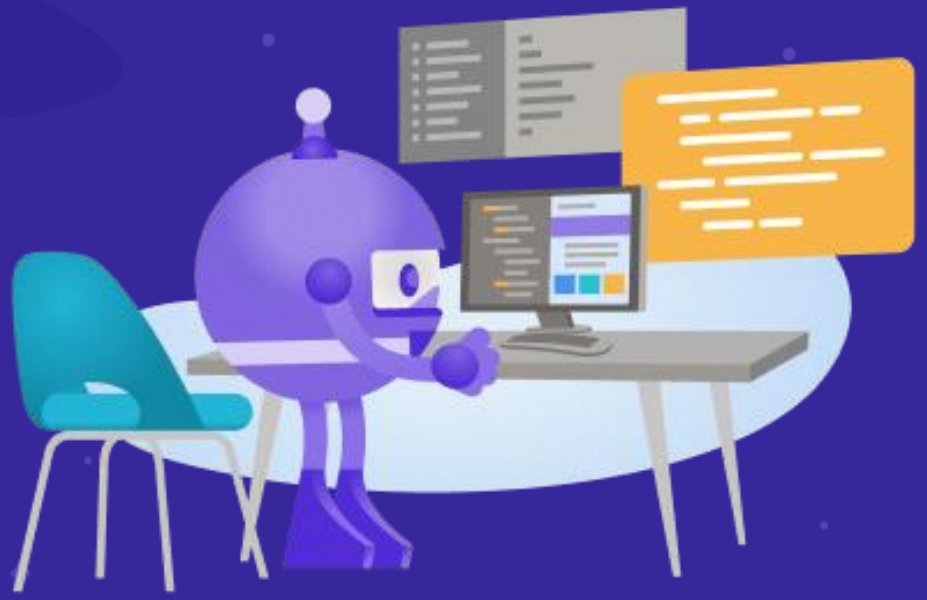
Development
Create a branch for this issue or link a pull request.

Notifications Customize
Unsubscribe
You’re receiving notifications because you were assigned.

5 participants

Unlock conversation

DEMO TIME!



The Journey Continues!

10

Docs / .NET / .NET MAUI /

Build accessible apps with semantic properties

Article • 24/08/2022 • 15 minutes to read • 3 contributors

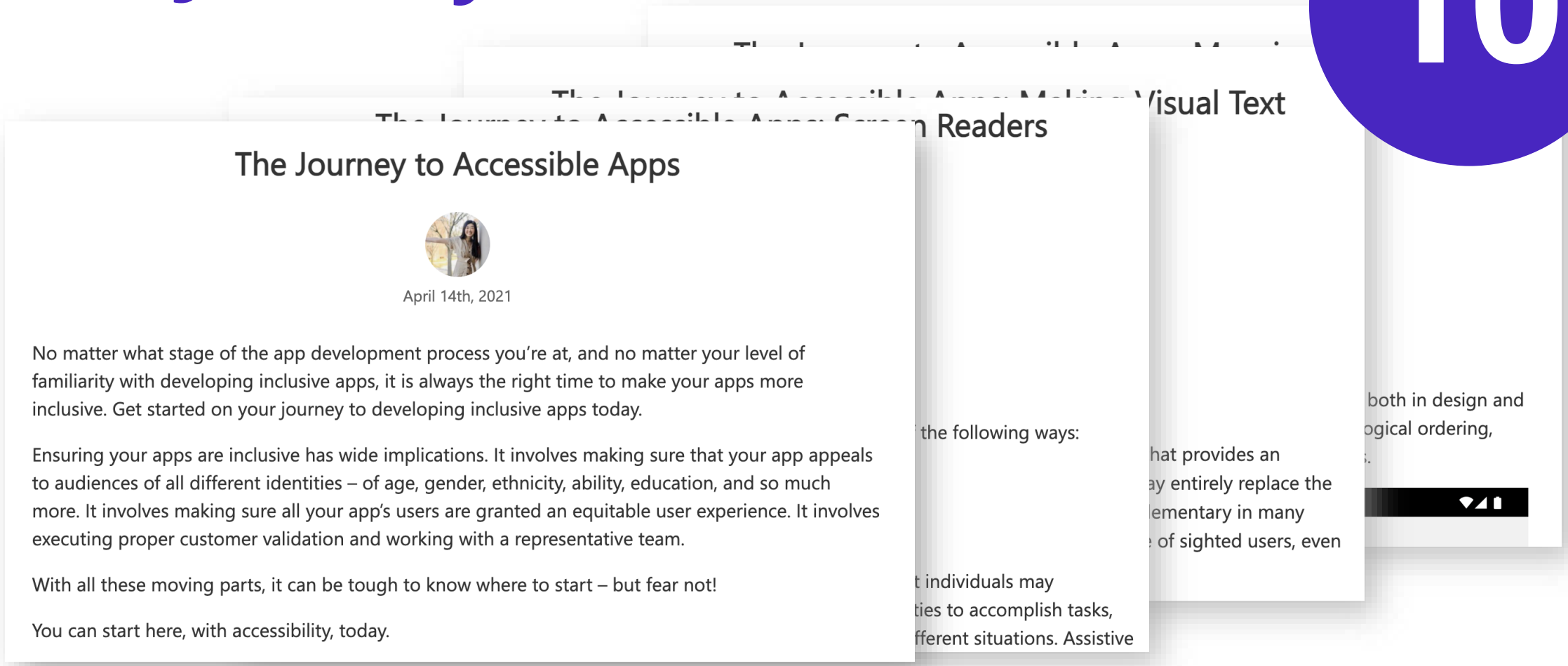
Semantics for accessibility is concerned with building experiences that make your apps inclusive for people who use technology in a wide range of environments and approach your UI with a range of needs and experiences. In many situations, legal requirements for accessibility may provide an impetus for 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



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