To make the world's information universally accessible and useful

Android for Everyone

Accessibility in Mobile

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SierraOBryan

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If you would prefer to follow along with a copy of the slides

As Google Slides : bit.ly/androidww-doc

As a PDF (on Github) : bit.ly/androidww-pdf

Make Tech Inclusive.
Make Inclusive Tech.

Kim Arnett @kaydacode

It’s a team effort.

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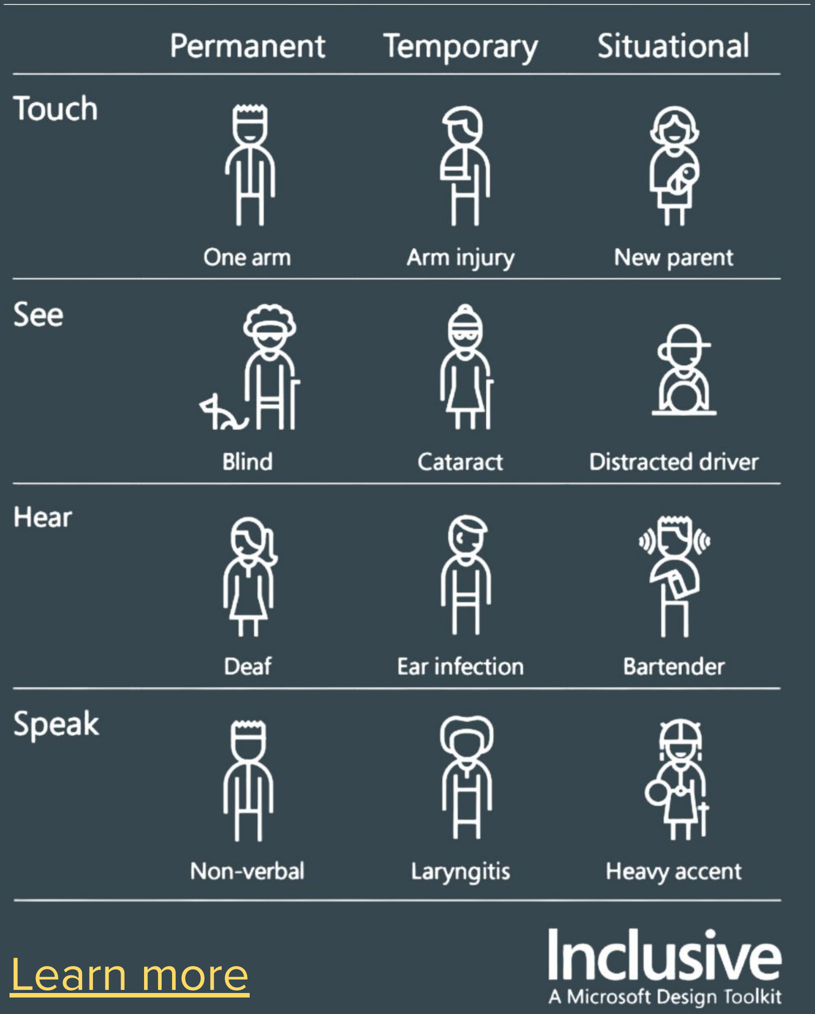
Types of Disabilities

- Motor Impairments
    - May use a hardware device - Accessibility Switch - to control the app or accessibility menu
- Cognitive Impairments
    - May use Action Blocks to set up routines
- Visual Impairments
    - May use increased text size, Braille keyboard, or TalkBack
- Deaf and Hard of Hearing
    - May use Closed Captioning, Live Transcribe or Live Captioning

If you open your accessibility settings, you'll find even more options that folks might use on their device



	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

Inclusive
A Microsoft Design Toolkit

Learn more

Sierra

I don’t want to touch my phone when I’m trying to “cook”

I forget to blink when I’m wearing contacts

I like to stay up too late watching TV while everyone else is sleeping

I mumble

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What are the Web Content Accessibility Guidelines and why do they matter for mobile?

Learn more

Modifiers and Semantics

in Jetpack Compose

Modifiers

- Decorate or add behavior to Compose UI elements
- Categories include actions, animations, focus, behaviors, size, shape, etc
- Order of modifiers matters

View All Modifiers

```
MostComposables(
    specificArg = value,
    modifier = Modifier
        .size( .. )
        .shape( .. )
)
```

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Semantics

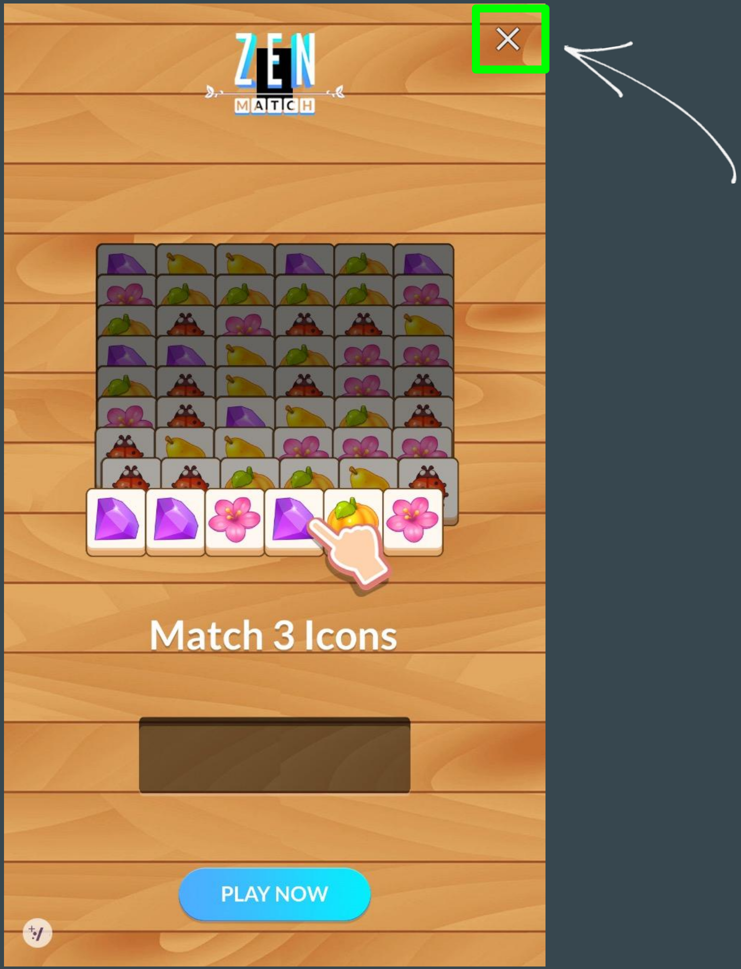
Compose uses semantics properties to pass information to accessibility services. Semantics properties provide information about UI elements that are displayed to the user.

Semantics Documentation

```
Modifier.semantics(
        mergeDescendants: Boolean,
        properties: SemanticsPropertyReceiver.() -> Unit
    )
```

Why do I care about touch target size?

Have you ever played an free mobile game...



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Touch Targets Learn More

The recommended size for each interactive UI element's focusable area, or **touch target size**, is at least 48px by 48px (focusable != visible)

```
<EditText
    android:id="@+id/element_id"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:minHeight="48dp"
    ...
/>
```

Touch Targets Learn More

The recommended size for each interactive UI element's focusable area, or **touch target size**, is at least 48px by 48px (focusable != visible)

Setting minimums allows the UI to be flexible for different screen sizes, localization, and changing text sizes.

```
TextField(
    value = value,
    modifier = modifier
        .fillMaxWidth()
        .heightIn(min = 48.dp)
)
```

```
heightIn(min : Dp, max: Dp)
```

Touch Targets Learn More

The recommended size for each interactive UI element's focusable area, or **touch target size**, is at least 48px by 48px (focusable != visible)

```
<ImageView
   android:layout_width="48dp"
   android:layout_height="48dp"
   android:padding="8dp"
   android:onClick="onClick"
   ...
/>
```

Touch Targets Learn More

The recommended size for each interactive UI element's focusable area, or **touch target size**, is at least 48px by 48px (focusable != visible)

```
Icon(
    imageVector = icon,
    contentDescription = contentDescription,
    modifier = Modifier
        .clickable { ... }
        .padding(8.dp)
        .size(36.dp)
)
```

Different order, same result

```
Modifier
    .clickable { }
    .size(48.dp)
    .padding(8.dp)
```

Touch Targets Learn More

The recommended size for each interactive UI element's focusable area, or **touch target size**, is at least 48px by 48px (focusable != visible)

```
IconButton(
   onClick = { onClick() },
   modifier = Modifier
) { content() }
```

```
modifier.clickable(...).then(IconButtonSizeModifier)
```

```
val IconButtonSizeModifier = Modifier.size(48.dp)
```

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Taking it further Learn More

Adding custom click labels

Replace “**double tap to activate**” with “**double tap to navigate home**”

```
Row(
    modifier = Modifier
        .fillMaxWidth()
        .clickable (
            onClickLabel = "navigate home",
            role = Role.Button
         ) { onClick() }
) { content() }
```

Role is a **Semantic Property**.

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```
Row(
    modifier = Modifier
        .clickable { openEmail() }
        .semantics {
            customActions = listOf(
                CustomAccessibilityAction(
                    label = "Mark as read",
                    action = { markAsRead() }
                ),
                CustomAccessibilityAction(
                    label = "Delete Email",
                    action = { deleteEmail() }
                )
            )
        }
) { content() }
```

Adding Custom Actions

Learn More

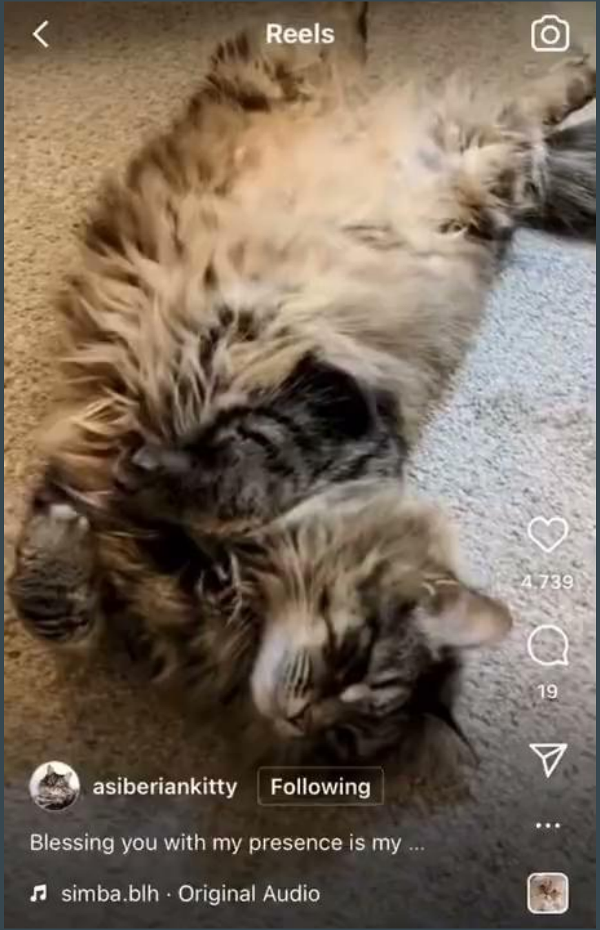
```
Row(
    modifier = Modifier
        .clickable { openEmail() }
        .semantics {
            customActions = listOf(... )
        }
) {
    Button(
        onClick = { ... }
        modifier = Modifier.clearAndSetSemantics {   }
    ) { }
}
```

Although action is defined in the semantics, we also need the same action in the Button args

Adding Custom Actions Learn More

Why do I care about content descriptions?

You might be already using them without thinking about it!


Reels
4,739
19
asiberiankitty
Following
Blessing you with my presence is my ...
simba.blh · Original Audio

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Accessibility Labels Learn more

Unique, Localized, Concise, Descriptive

```
@Composable
fun Image(
    painter: Painter,
    contentDescription: String?,
    modifier: Modifier = Modifier,
    alignment: Alignment = Alignment.Center,
    contentScale: ContentScale = ContentScale.Fit,
    alpha: Float = DefaultAlpha,
    colorFilter: ColorFilter? = null
)
```

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There’s a lot to think about with Labels

Does it need a label? It depends but generally...

Text: No

TextField: Include a hint

Button: No

ImageButton: Yes

Image: Maybe

Is it a decorator?

Can it be skipped?

Should it be grouped?

Do they make more sense together?

How will it be read?

Does it include numbers or abbreviations?

Accessibility Labels Learn more

Localized, Concise, descriptive

```
Text(
    text = "WCAG",
    modifier = Modifier.semantics {
        contentDescription =
            "Web content Accessibility Guidelines"
    }
)
```

A TtsSpan can help! A TtsSpan is a special type of span that can pass in metadata to give contextual information about the string. This information can help Text to Speech correctly pronounce a text element

Accessibility Labels Learn more

Unique, Localized, Concise, Descriptive

```
Column(
    modifier = Modifier.weight(1f)
        .semantics(mergeDescendants = true) {}
) {
   Text(text = commit.commitMessage)
   Text(text = "Author: ${commit.author}")
   Text(text = "Date: ${commit.date}")
}
```

We can also change the focus order by using the FocusRequester with the FocusOrder Modifier.

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Accessibility Labels Learn more

Unique, Localized, Concise, Descriptive

```
Column(modifier = Modifier
    .fillMaxWidth()
    .semantics {
        contentDescription = "Container"
    }
) {
    Text(text = "Text")
    TextField(label = { Text(text = "Label") })
}
```

Accessibility Labels Learn more

Unique, Localized, Concise, Descriptive

```
Text(
    text = "WCAG Overview",
    modifier = Modifier.semantics {
        heading()
    }
)
```

Accessibility Labels Learn more

Unique, Localized, Concise, Descriptive

```
TextField(
    ...
    placeholder = { Text(text = "Placeholder") },
    label = { Text(text = "Label") },
    ...
)
```

We should only use placeholder
OR label on a single TextField

Color Contrast Learn more

AA Compliance requires at least a requires **4.5 : 1** for regular text and **3 : 1** for large text

Slides: 5.88 : 1

7.62 : 1 **3.92 : 1** **2.38 : 1**

How do I meet these requirements and stick to my theme?
Use Material Color Palettes!
How do I check my colors? There are lots of tools online!

WCAG 3 will use a new color contrast method called the Advanced Perceptual Contrast Algorithm.

Learn More

I’m accessible text!

I am also accessible text!

But I am not accessible text

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Testing Learn more

```
@RunWith(AndroidJUnit4::class)
@LargeTest
class MyWelcomeWorkflowIntegrationTest {
    init {
        AccessibilityChecks.enable()
    }
}
```

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Testing [Learn more]

In Jetpack Compose, semantics are used for both accessibility and testing.

We can use SemanticsMatcher to build our UI tests.

Consistency

What’s next?

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The Web Content Accessibility Guidelines v3 are set to be published in 2023

what does that mean for mobile?

Draft 1 was published in late Jan 2021 and continues to have updates

where do I learn more?

Android Accessibility by Tutorials! by Victoria Gonda

I’m just getting started with Accessibility + Compose

what should I do next?

Jetpack Compose: Accessibility and the new Code Lab

Thank you!

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Where to find me?

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