App Development with Components Part 3: User Experience

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2025 ESRI DEVELOPER & TECHNOLOGY SUMMIT

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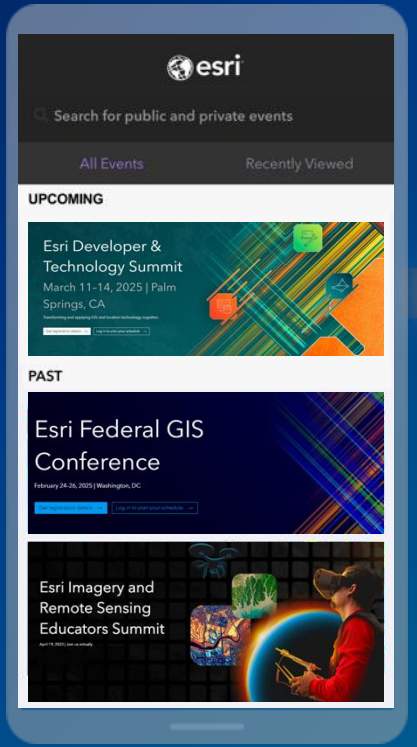

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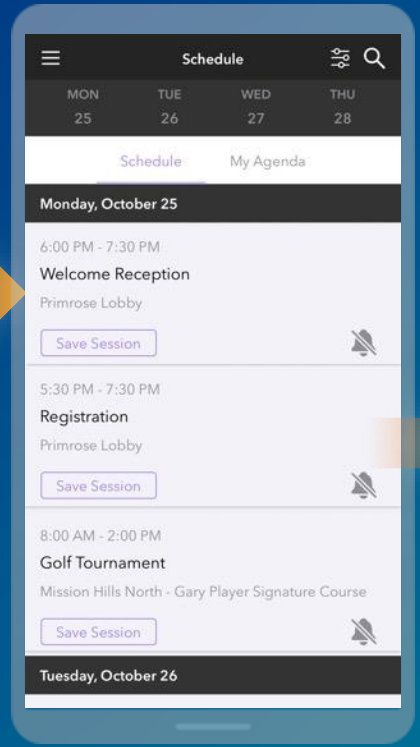

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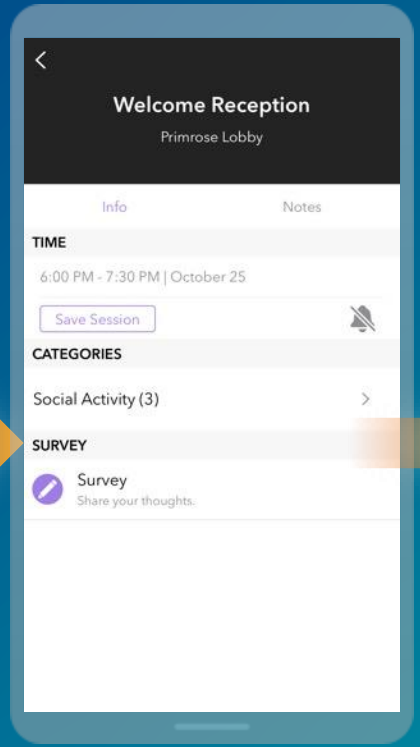

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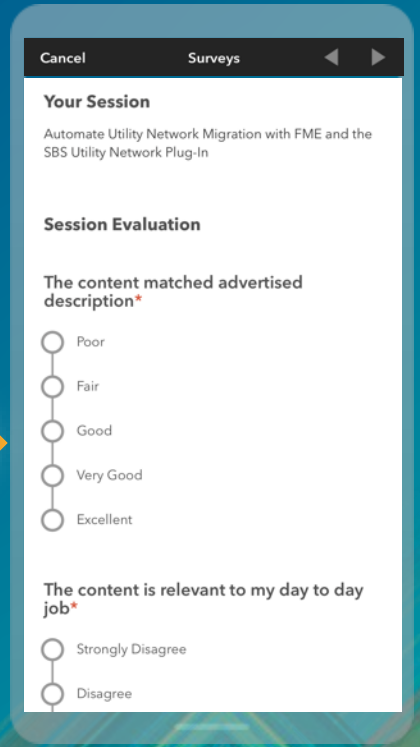
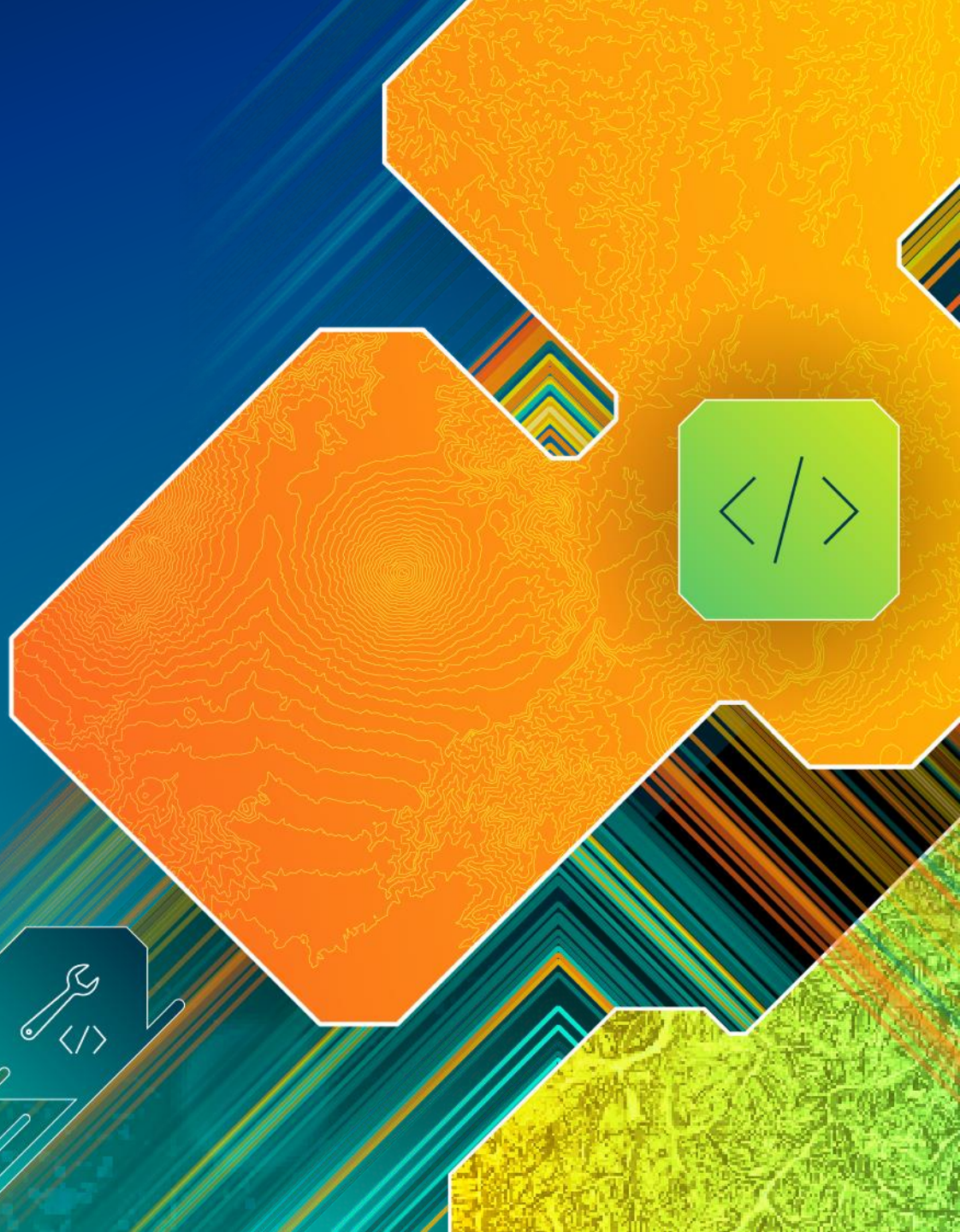


Agenda

- Building the UX in your web app
  - Calcite Design System
  - Maps SDK for JS components
- Explore example apps
- Resources
- Questions

Calcite Design System

Matt Driscoll



Calcite Design System

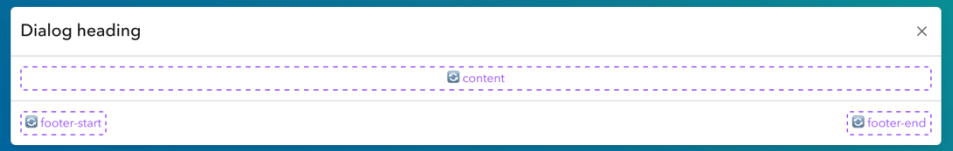
Overview

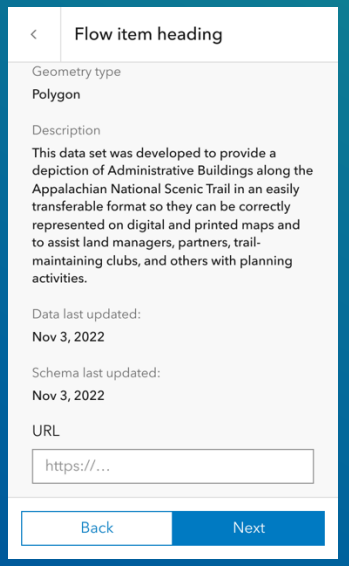
- Build User-friendly, accessible, responsive, consistent apps
- Figma Web UI Kit
- Icons (UI and point symbols)
- Web components
- Accessibility (WCAG)
  - Reduced motion support, high contrast, keyboard navigation, etc.
- Design tokens: branding, color, modes, scale, typography, etc.
- Design guidelines, best practices, tutorials & component sample playground

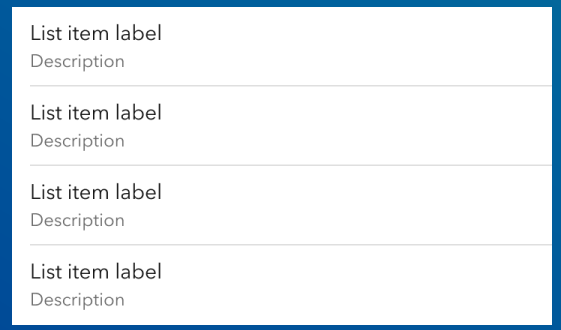
Using Calcite Design System

Build powerful user experiences

- App layout and structure
  - Shell, panel, flow, sheet, dialog, popover
- Choosing the right components
  - Popover vs Tooltip
  - Sheet vs Dialog
  - Etc.
- Customizing your app and components
  - Light and dark modes
  - Using design tokens

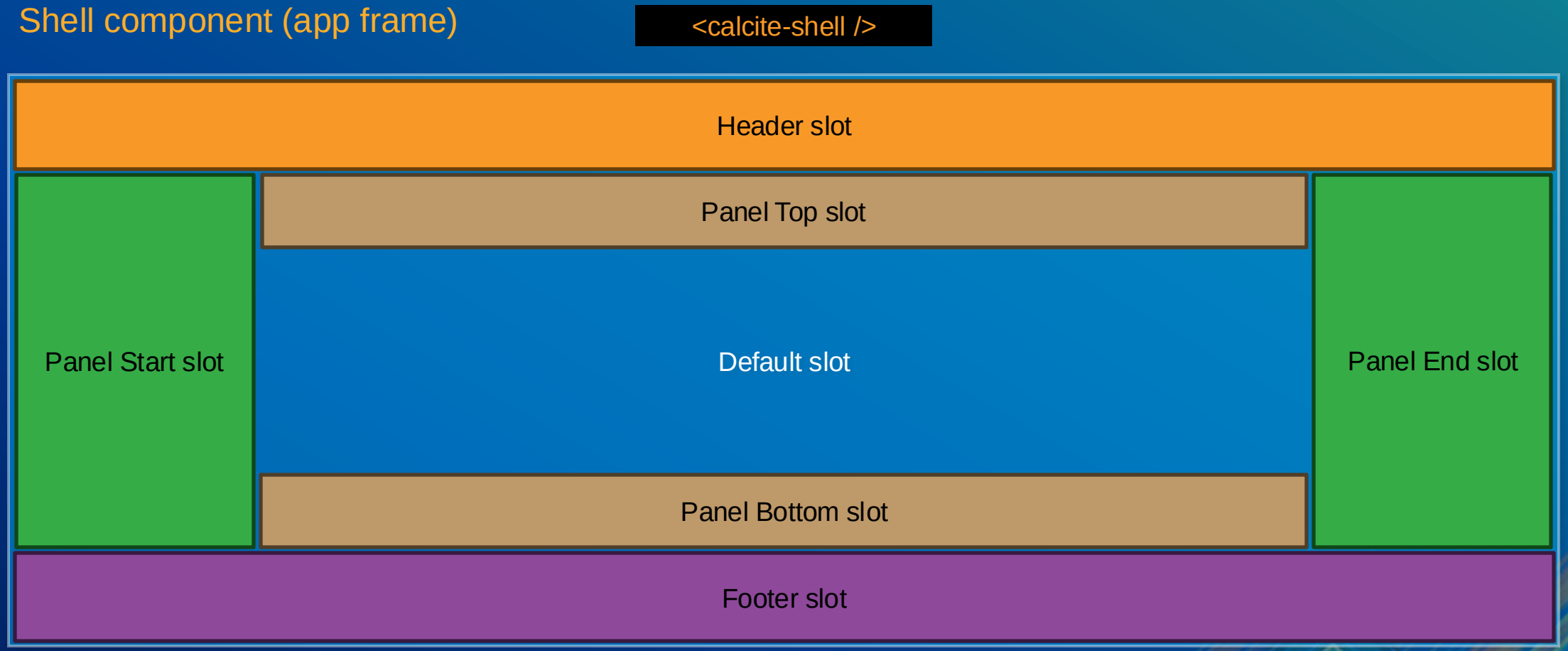






App Layout

Shell component (app frame)



Calcite Design System Tokens

What are they?

- Building blocks of all UI elements (like design DNA)
- Point to values like colors, fonts, spacing, borders, etc.
- Benefits
  - Consistency across UI
  - Helps designers and developers speak the same language
  - Opportunity for customization
- Customization
  - Component tokens: --calcite-accordion-border-color
  - Semantic tokens: --calcite-color-background
  - Core tokens (low level values): --calcite-color-dark-red-d-rr-430

Design System Tokens

Customization

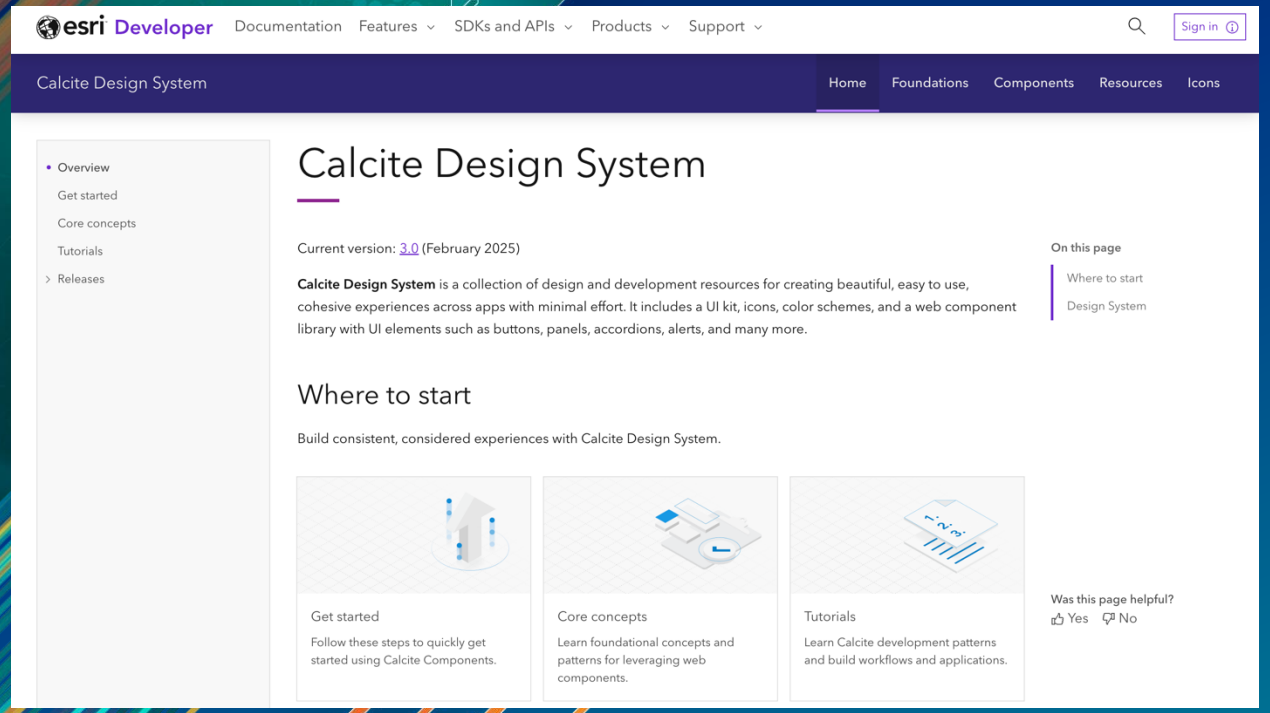
Customizing an app

```
/* Override semantic tokens to apply a custom theme across an app */
:root {
  --calcite-color-brand: #614F7F;
  --calcite-color-brand-hover: #F9EAFF;
  --calcite-color-brand-press: #00009B;
  --calcite-color-brand-underline: #00009B;
}
```

Customizing a component

```
/* Override all Dialogs with a background color */
calcite-dialog {
  --calcite-dialog-background-color: #614F7F;
}

/* Override specified Dialogs with a background color */
.example-theme-class {
  --calcite-dialog-background-color: #614F7F;
}
```



Calcite Tour

Matt Driscoll

ArcGIS Maps SDK Components

Ryan Libed

ArcGIS Maps SDK Components

Overview

- Map Components
- Chart Components
- Coding Components
- Embeddable Components

ArcGIS Maps SDK Components

Map Components

- Pre-built components for building web apps with minimal code
- From widgets to map components
  - Custom HTML elements aka Web Components
  - Encapsulation
  - Slots
  - Design tokens
  - JavaScript framework agnostic

ArcGIS Maps SDK Components

Map with Zoom and Legend

In map

```
<arcgis-map item-id="05e015c5f0314db9a487a9b46cb37eca">
  <arcgis-zoom position="top-left"></arcgis-zoom>
  <arcgis-legend position="bottom-right"></arcgis-legend>
</arcgis-map>
```

Outside of map (separate panel)

```
<calcite-shell>
  <calcite-shell-panel slot="panel-start">
    <arcgis-legend reference-element="arcgisMap"></arcgis-legend>
  </calcite-shell-panel>
  <arcgis-map id="arcgisMap" item-id="05e015c5f0314db9a487a9b46cb37eca">
    <arcgis-zoom position="top-left"></arcgis-zoom>
  </arcgis-map>
</calcite-shell>
```

ArcGIS Maps SDK Components

Charts Components (beta)

- Series of components that can be used to render charts alongside map
- 8 different chart types available, include but not limited to:
  - Bar
  - Histogram
  - Scatter plot
  - Pie
- Rendered via reference to a JSON object following the chart components specification
  - Generate charts JSON
  - Stored within a feature layer

ArcGIS Maps SDK Components

Charts Components

```
const map = document.querySelector("arcgis-map");
const chartEl = document.querySelector("arcgis-chart");
const chartLayer = map.allLayers.find(
  (layer) => layer.id === "chartLayer"
);
chartEl.view = map.view;
chartEl.layer = chartLayer;
chartEl.model = chartLayer.charts[0];
```

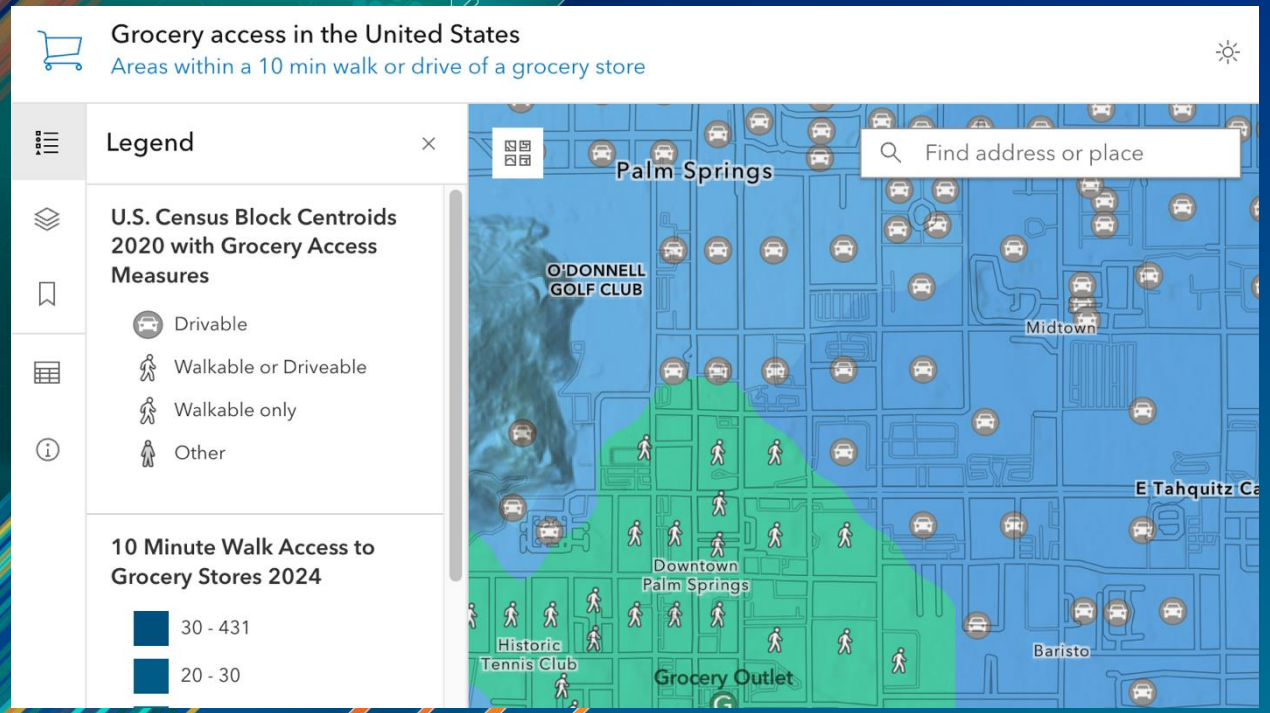
Designing & Building Apps

Matt Driscoll & Ryan Libed

Designing & Building Apps

Putting it all together

- Use components from
  - Calcite
  - Maps SDK for JS
- Build a good user experience
  - Use common layout and patterns
  - Responsiveness
- Apply customization
  - Modify CSS custom property design tokens



Building the UX

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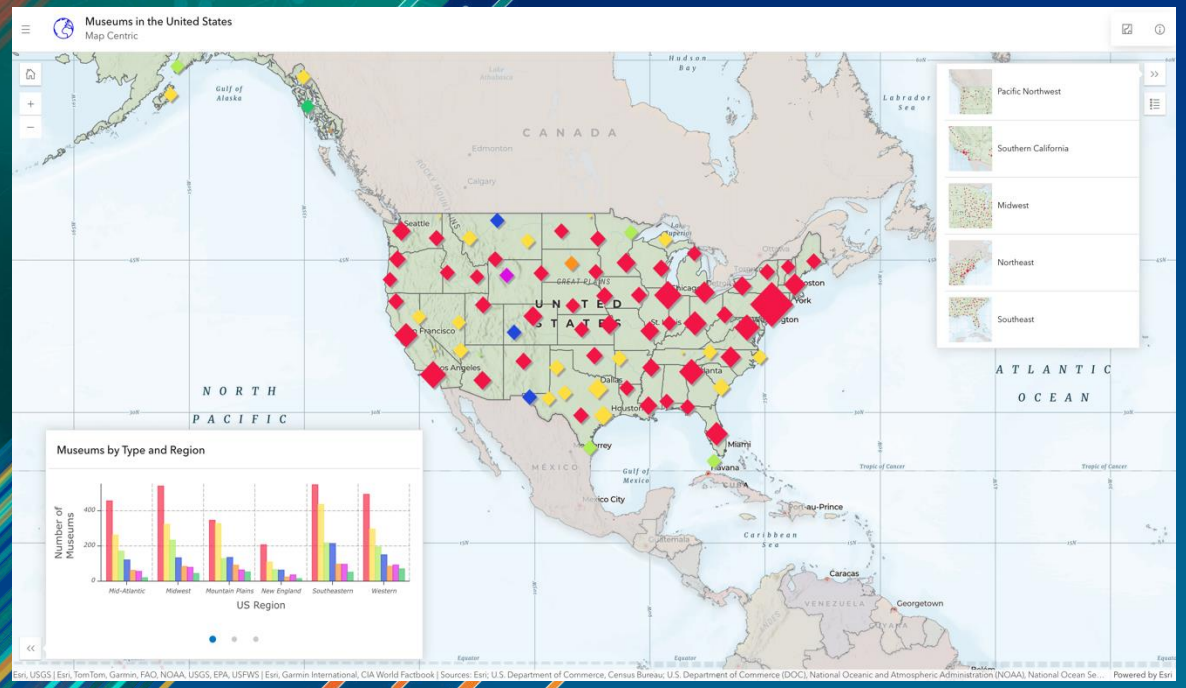
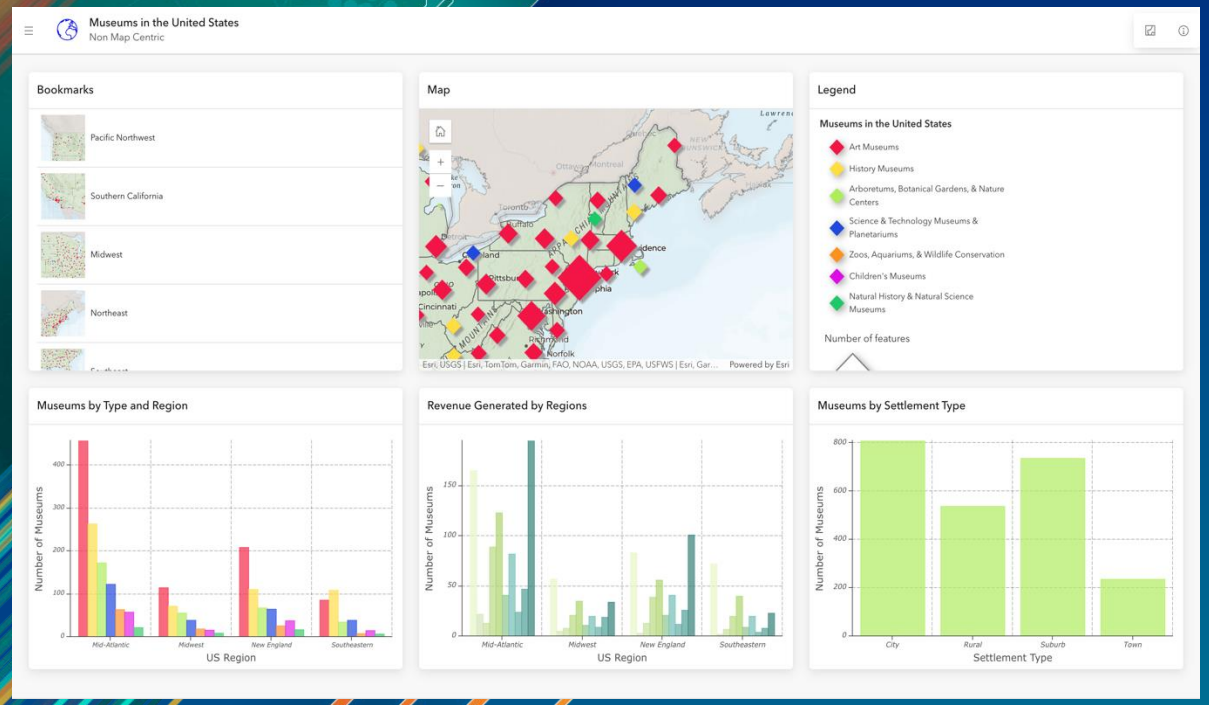


Map Centric

Ryan Libed



Non-Map Centric

Ryan Libed

Resources

- Calcite
  - Calcite resources
  - Calcite tutorials
  - Calcite community forum
- Maps SDK for JS components
  - Overview
  - Programming patterns
- ArcGIS blog posts
  - JavaScript Maps SDK: A full transition to components
  - All things Web Development at the Esri Developer and Technology Summit 2025!
- Demo source code

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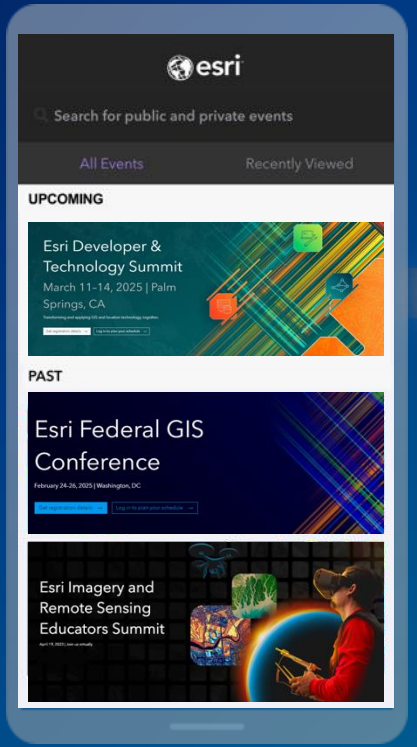

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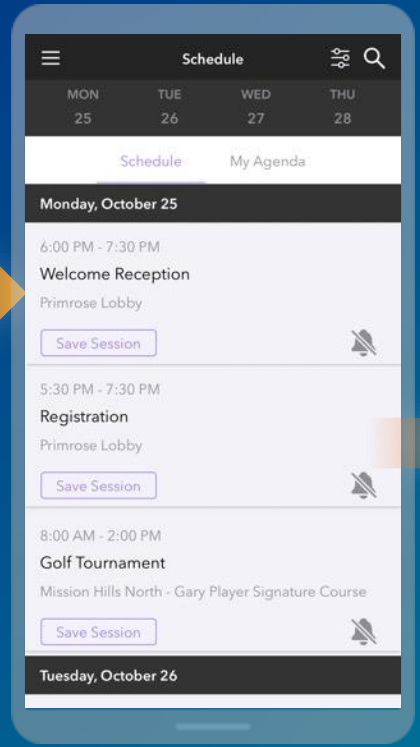

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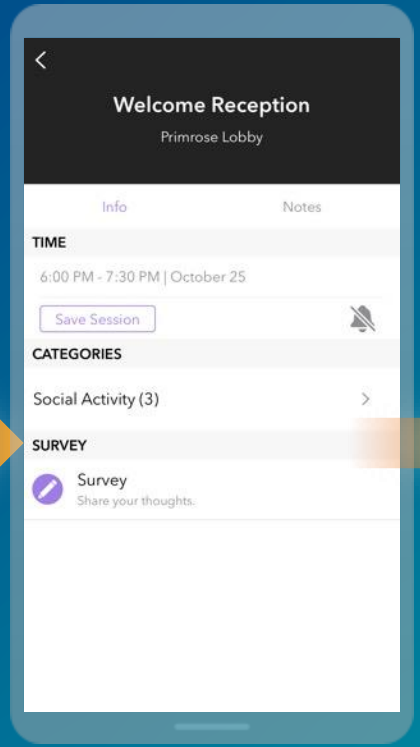

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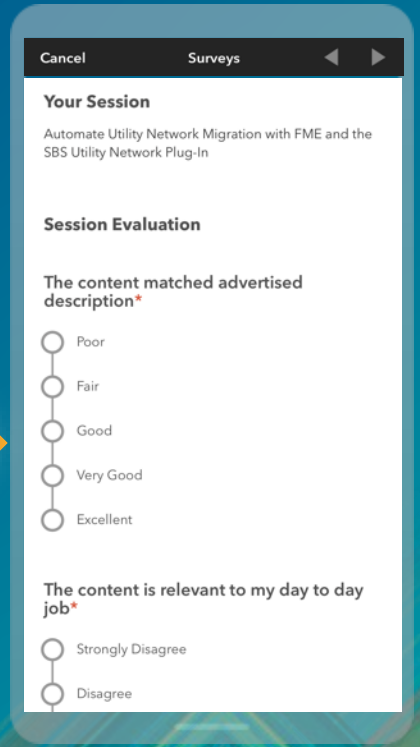

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