

# Flutter intro / Layouting 1

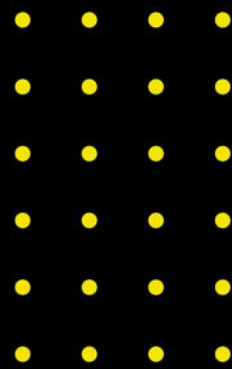
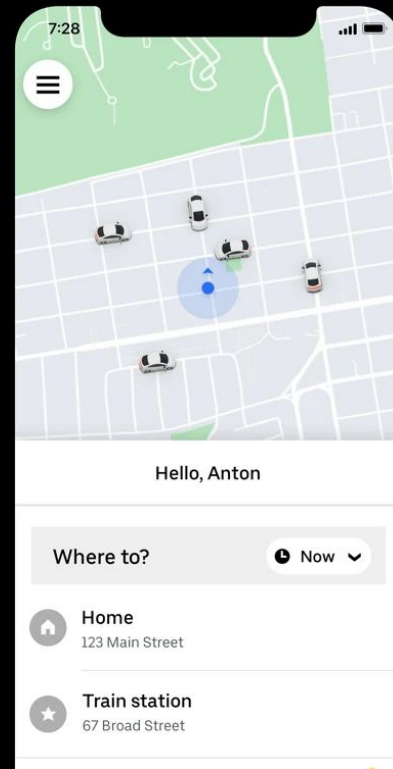
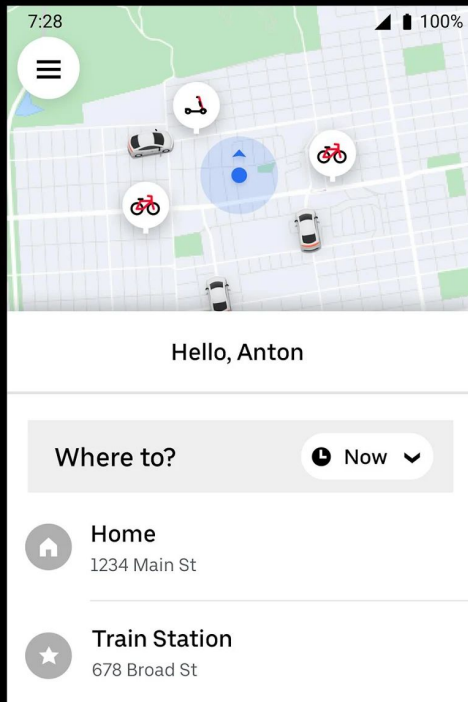
# Introduction

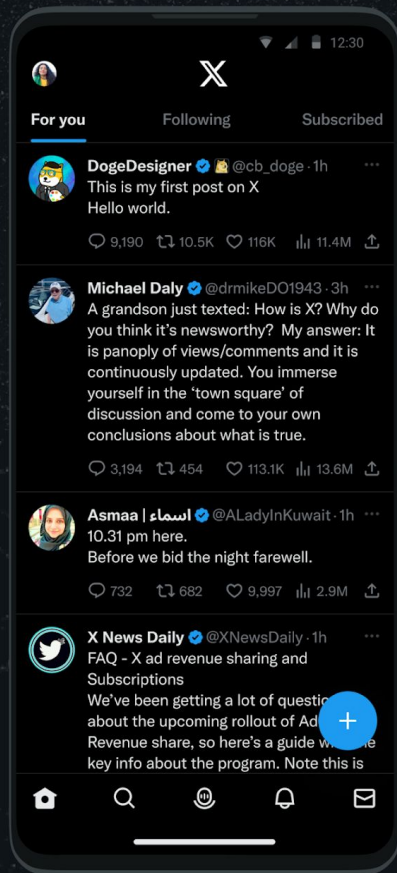


# Choose your destination

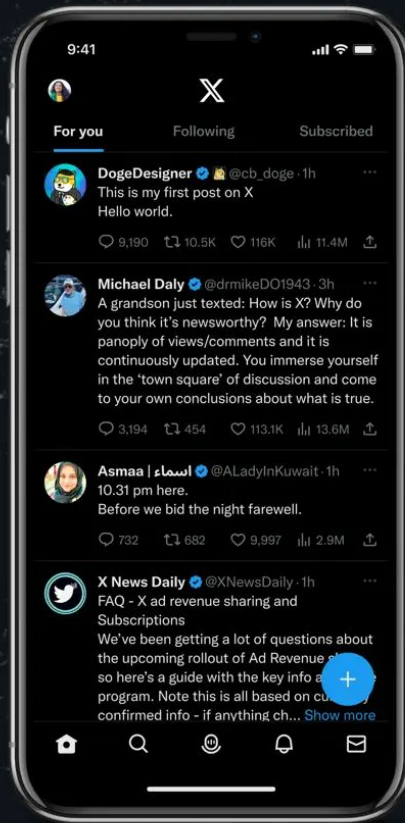


# Choose your destination





## For you



**Design systems are  
platform-independent**

# Two separate dev teams

...and separate bugs, release cycles, deployments

**It costs a lot**

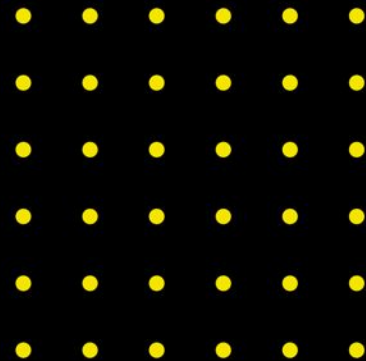


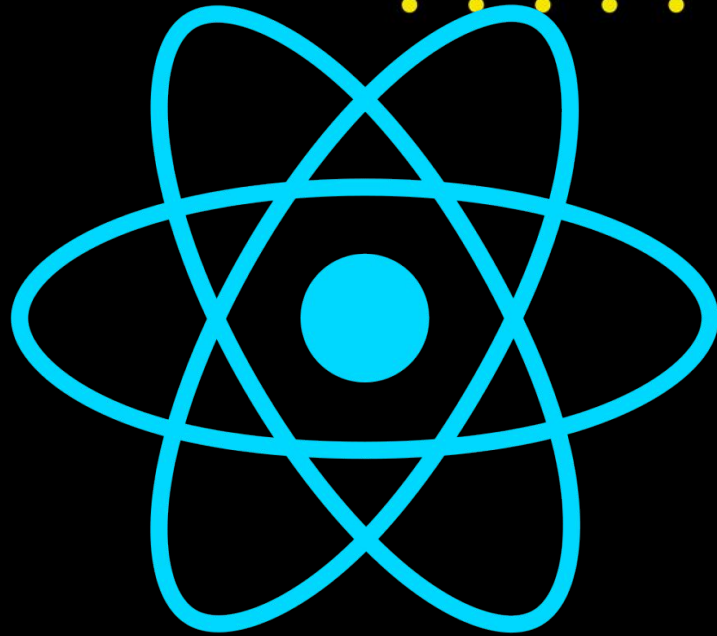
# Xamarin





APACHE  
**CORDOVA**<sup>TM</sup>





React Native



Flutter

Framework  
(Dart)

Material

Cupertino

Widgets

Rendering

Animation

Painting

Gestures

Foundation

Engine  
(C++)

Skia

Dart

Text

## Framework

Dart

Material

Cupertino

Widgets

Rendering

Animation

Painting

Gestures

Foundation

## Engine

C/C++

Service Protocol

Composition

Platform Channels

Dart Isolate Setup

Rendering

System Events

Dart Runtime Mgmt

Frame Scheduling

Asset Resolution

Frame Pipelining

Text Layout

## Embedder

Platform-specific

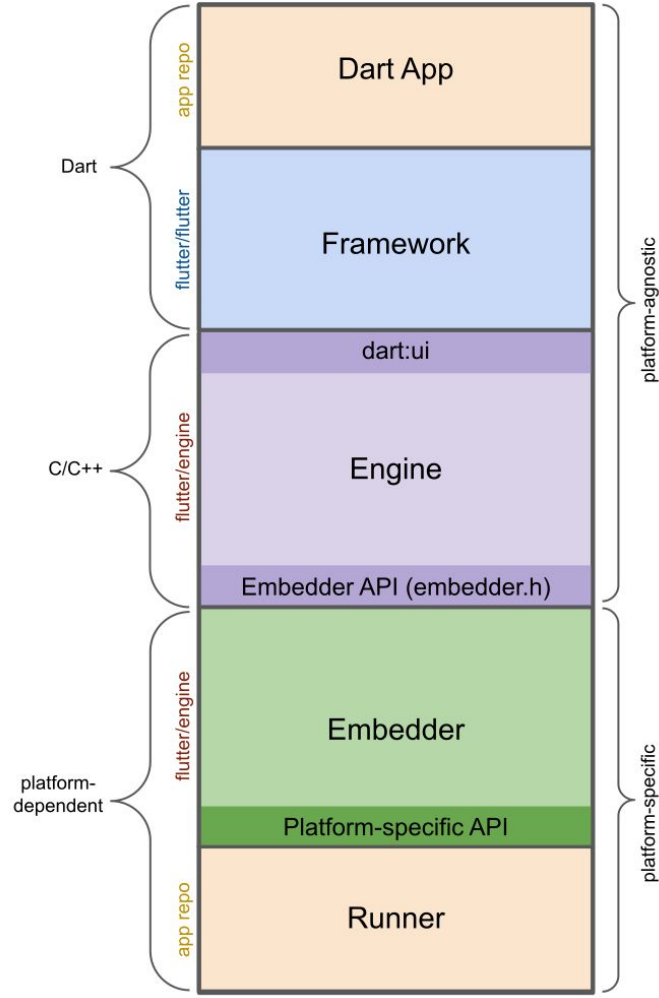
Render Surface Setup

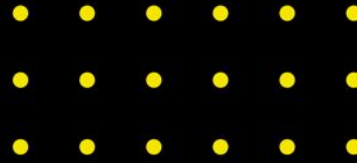
Native Plugins

App Packaging

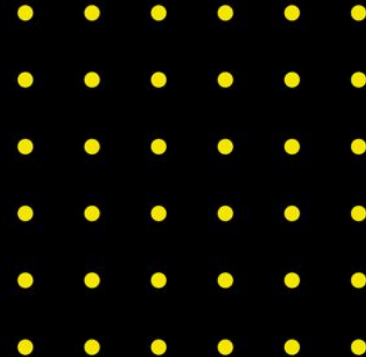
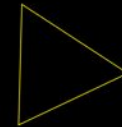
Thread Setup

Event Loop Interop





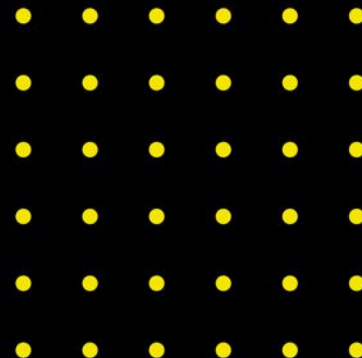
Skia is an open source 2D graphics library which provides common APIs that work across a variety of hardware and software platforms. It serves as the graphics engine for Google Chrome and Chrome OS, Android, Flutter, Mozilla Firefox and Firefox OS, and many other products.

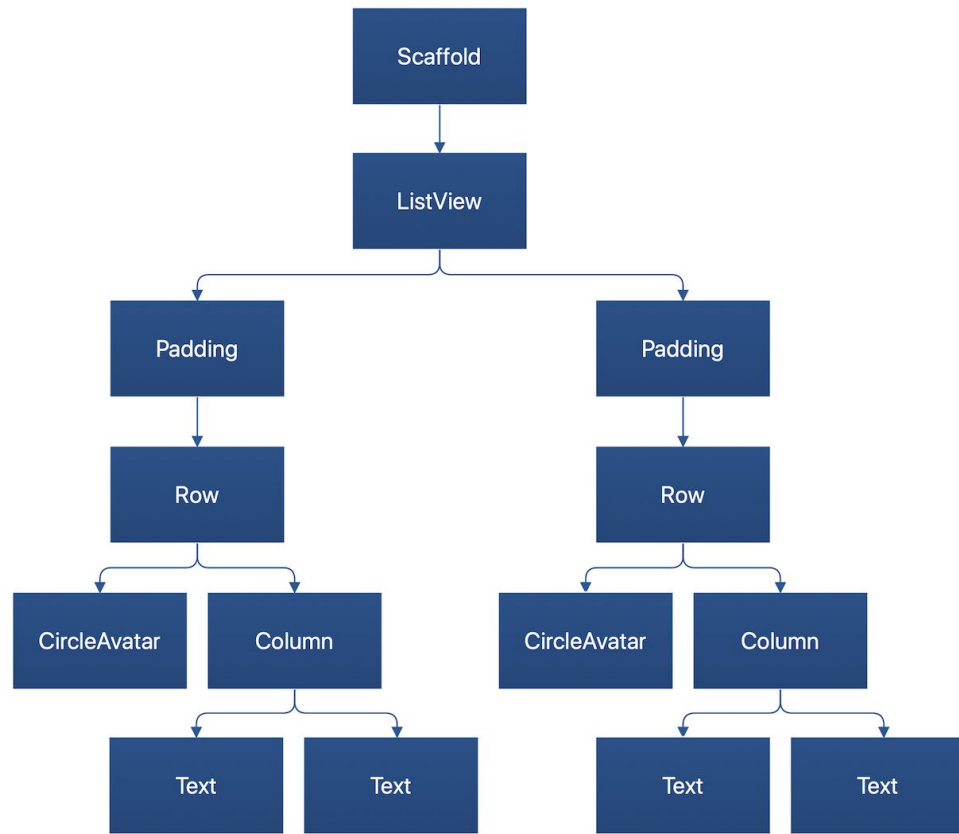


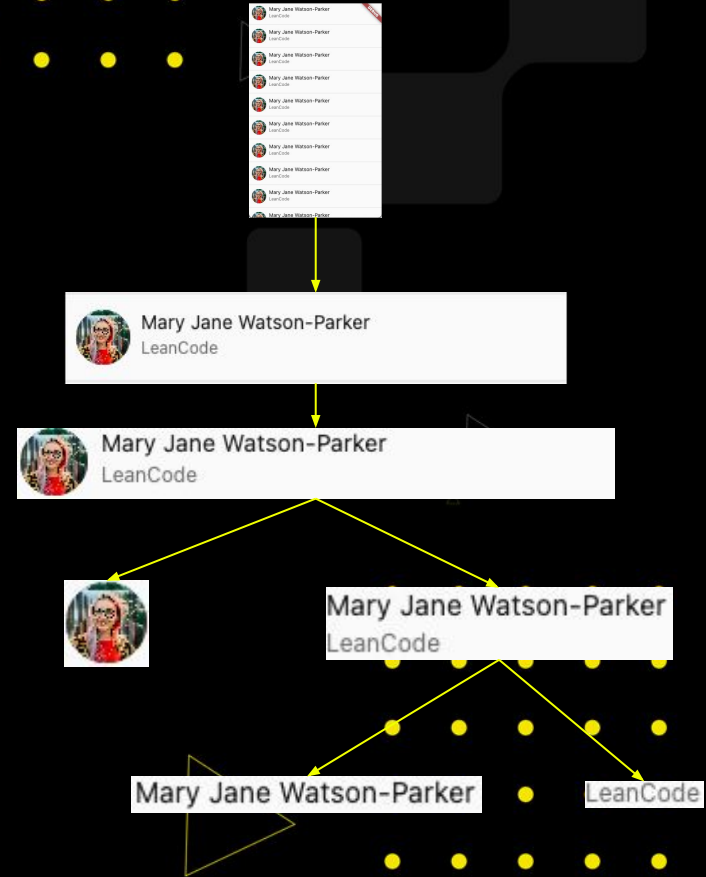
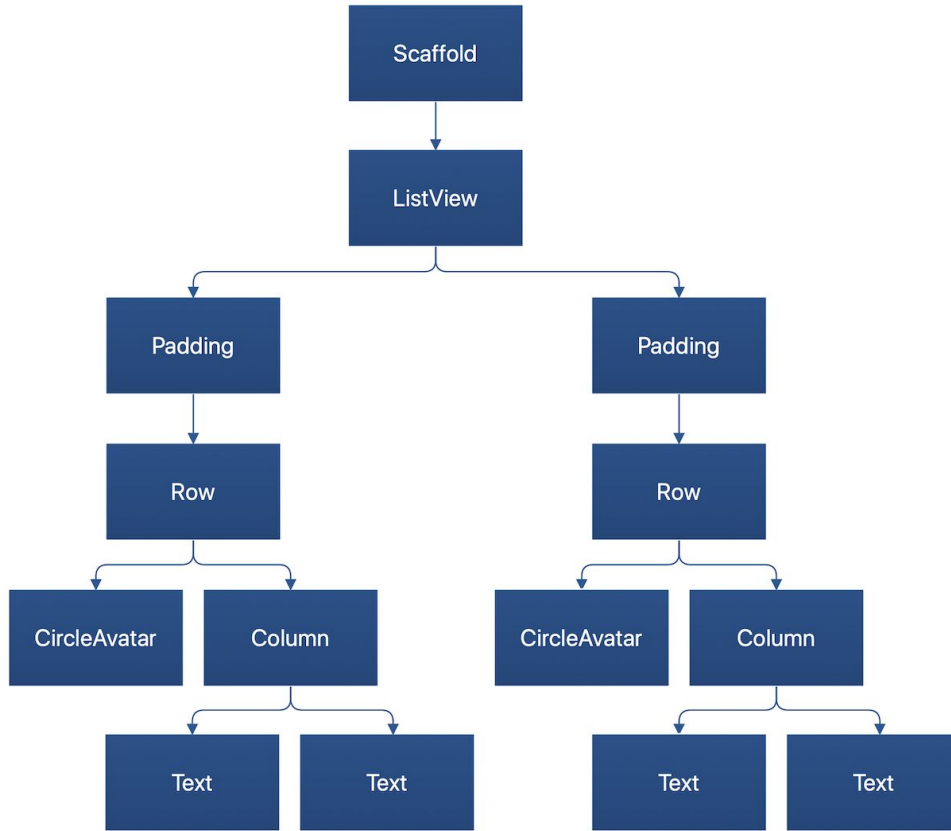
**(Almost) everything is a  
widget**



# Widget in a widget







# Flutter Desktop

macOS + Windows + Linux

# Flutter Web

# Flutter Embedded



# Imperative UI

Windows Forms / Android / iOS /  
GTK

Add callback which on change  
does:

- Set color
- Remove child
- Add child
- Set position

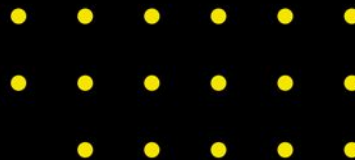




# Declarative UI

React / Flutter / Jetpack  
Compose / SwiftUI

For this state return a View with red background color and children consisting of a text message and a button.



```
final title = Text();
title.data = 'Please tap the button to finish';

final button = Button();
button.text = 'Finish';
button.onPressed = () {
  print('Button pressed!');
};

view.backgroundColor = Colors.white;
view.children = [];
view.children.add(title);
view.children.add(button);
```



```
return View(
  children: [
    Text('Please tap the button to finish'),
    Button(
      text: 'Finish',
      onPressed: () {
        print('Button pressed!');
      }
    ),
  ],
);
```



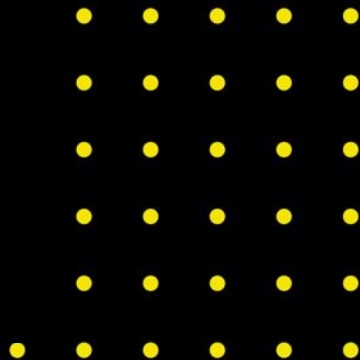


# Let's make some Hello World!



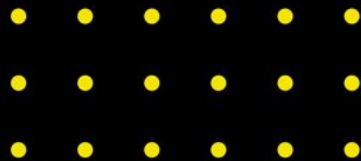
```
import 'package:flutter/material.dart';

void main() {
  runApp(
    const Center(
      child: Text(
        'Hello world!',
        textDirection: TextDirection.ltr,
      ),
    ),
  );
}
```





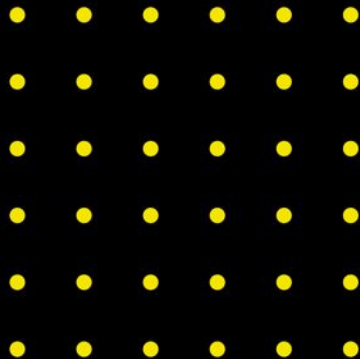
**Constraints go down. Sizes go up. Parent sets position.**



**BoxConstraints**({double minWidth, double maxWidth, double minHeight, double maxHeight})

Creates box constraints with the given constraints.

*const*



# Layout algorithm

1. Widget gets constraints from its parent
2. For every child, it requests its size within given constraints (could be different from the first constraints)
3. Knowing children sizes, now the widget positions every of them
4. Knowing children sizes and positions, now the widget can pass its own size to its parent



# Show me the code





# Thanks!