Flutter

Build beautiful native apps in record time

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Flutter

What will we cover?

1. What is Flutter?
2. Getting started with Flutter?
3. Flutter in action. Building a great mobile experience.
4. A performance overview. DEMO
5. Flutter above and beyond mobile development.

Flutter is Google's UI Framework

Helping developers craft
high-quality native experiences
across multiple platforms
in record time.

Challenges of mobile development today

“To the metal” approaches

- ✓ **High-quality apps**
  Platform and system integrations
- ✓ **High-performance UIs**
  Native code, GPU accelerated
- ✗ **Must fund two apps**
  Two teams, codebases, & investments
- ✗ **Inconsistent brand, features**
  Different across devices & OEMs

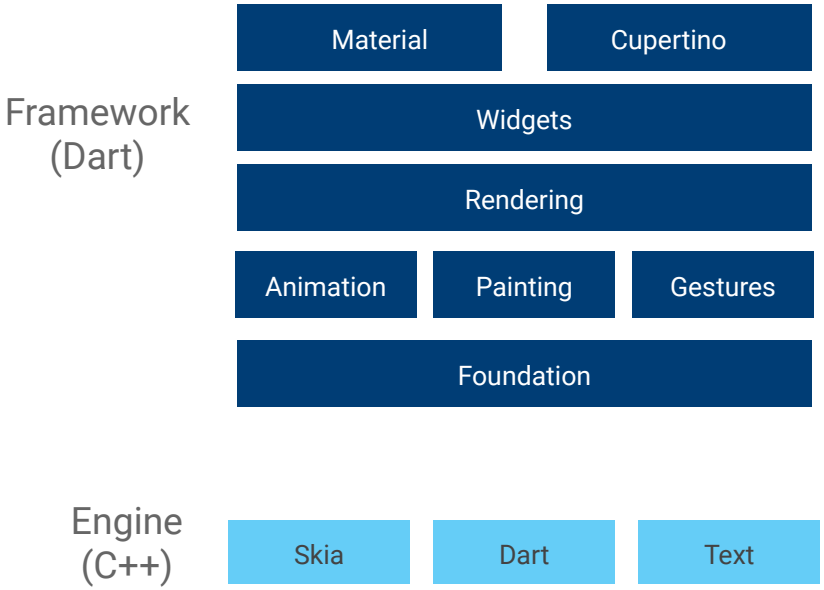
“Cross platform” approaches

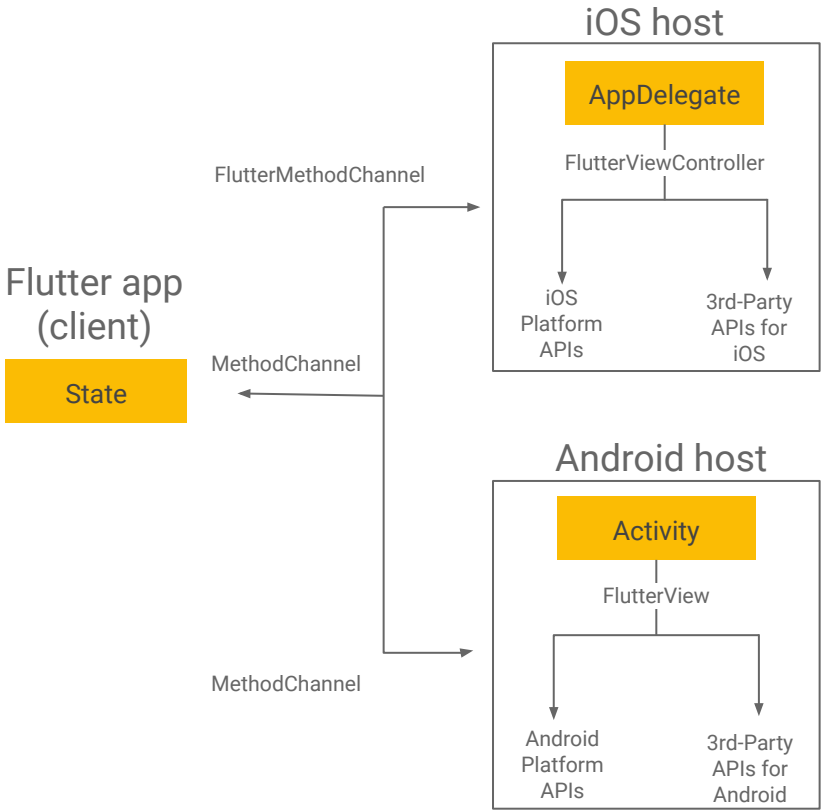
- ✓ **Fast development**
  Quick iterations, hot reload
- ✓ **Portability, reach**
  Single codebase
- ✗ **Poor Performance**
  Slow, jerky, unpredictable
- ✗ **Non-Native Look/Feel**
  Users can tell the difference

Flutter offers the best of both worlds

> Flutter combines
> **native performance and quality**
> with **high-velocity development**
> and **multi-platform reach**.

Flutter is a modern UI toolkit for native apps





High-Velocity Development

Expressive and Flexible Toolkit

Native iOS and Android App

High-velocity development

Sub-second reload times

Paint your app to life

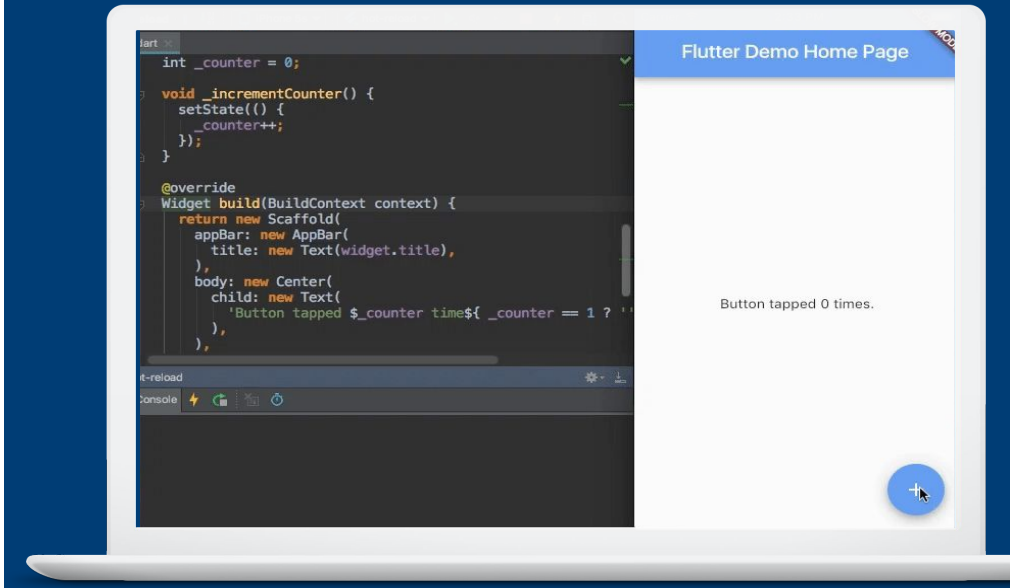
Iterate rapidly on features

Test hypotheses quicker than ever

More time to experiment & test features

Single-codebase for faster collab

3X Productivity Gains



Flexibility and Control for beautiful UI's

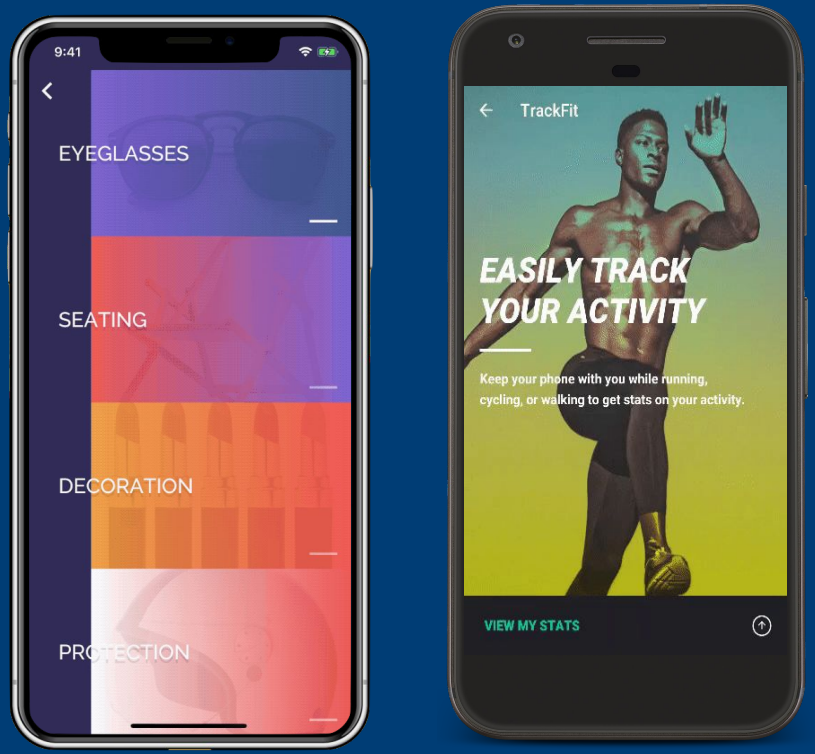
Control every pixel on the screen

Make your brand come to life

Never say "no" to your designer

Stand out in the marketplace

Win awards with beautiful UI



Natively- Apps for iOS and Android

Compiles directly to native ARM code Does not use a JavaScript bridge

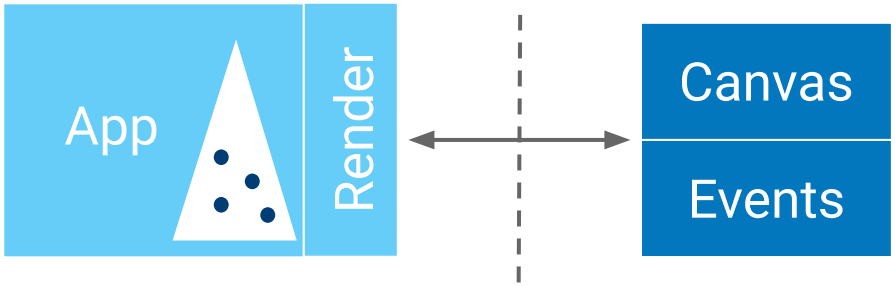
60fps, GPU accelerated

Smooth animations

Deep platform integrations

Natural look and feel

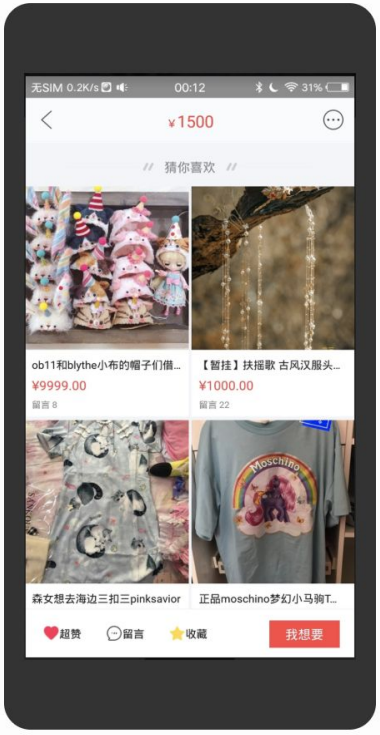
Critical platform differences (scrolling, navigation, fonts)



Compiles to ARM native code, GPU accelerated graphics

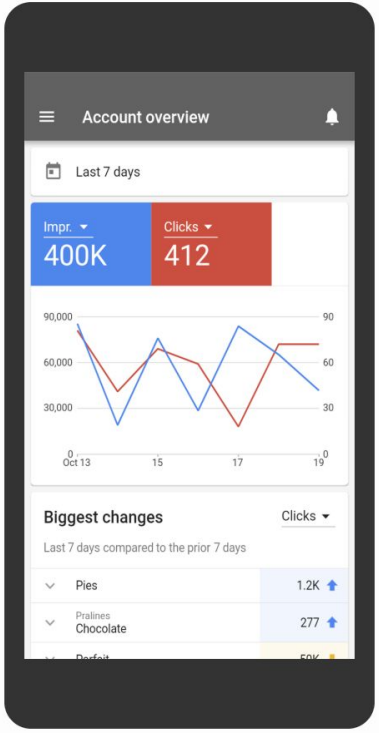
Built and used by Google, developers and companies around the world

Alibaba



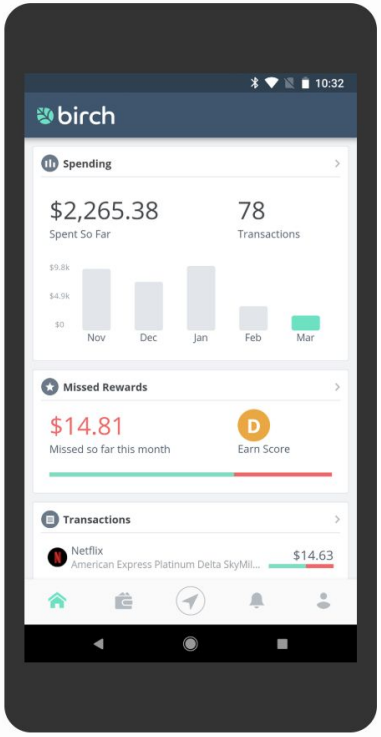
Alibaba's app incorporates Flutter to power parts of their app.

Google AdWords



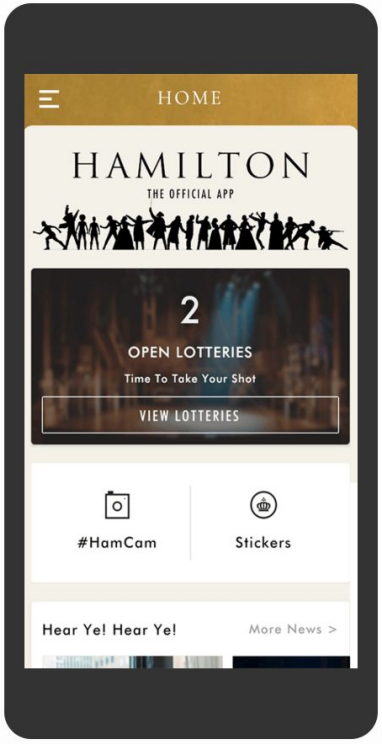
The Google AdWords app helps you keep your ad campaigns running smoothly — no matter where your business takes you.

Birch Finance



Credit card rewards app to manage and optimize your existing cards.

Hamilton Musical



Official app of the hit Broadway musical, Hamilton. Includes daily lotteries, exclusive news and videos, a trivia game, merchandise store, and more.

Graphic Horsepower

Flutter seamlessly combines user interface widgets with 60fps animated graphics generated in real time, with the same code running on iOS and Android

Works with popular tools and platforms

Android Studio

Xcode

VS Code

Firebase

3rd-party Android SDKs

Android APIs

iOS APIs

Material Design

Redux

3rd-party iOS SDKs

Rich ecosystem and community

- around 2, 500 packages
- 66,000+ Github stars
- Open source (400 core contributors), BSD license

Four ways to use Flutter today

Start a new app from scratch

Build your new idea in Flutter, and reach both iOS and Android at the same time.

Prototype a new app idea

Use Flutter to test out an app concept or idea in record time.

Bring your app to the the *other* platform

You already have an iOS or Android app? Use Flutter to build for the other platform. Combine codebases when you've proven your Flutter app.

Use Flutter for a part of your app

Test Flutter in production with one or two screens in your existing app.

Flutter

Getting started

flutter.dev

youtube.com/flutterdev

Flutter codelabs

Why Flutter is so awesome? Technical Overview

First things first!

DART!

YES! Flutter uses DART. But WHY?

WHY DART ?

1. Modern language design.
2. Adopted development patterns from modern programming languages
3. Dart is optimized for building UI. Unified layout, no additional layout languages.
4. Dart compiler, JIT & AOT

Compiling DART code

JIT (Just In Time) compilation

Faster development cycles but slower execution and startup time

AOT (Ahead Of Time) compilation

Faster execution and startup but slower development cycle

Into Flutter development!

1. Main building blocks of Flutter apps: WIDGETS
2. Inspired from ReactJS
3. Small code footprint

Here is a the SMALLEST Flutter app you will ever see.

```
void main() => runApp(Text('Hello world!', textDirection: TextDirection.ltr));
```

It’s all about WIDGETS!

> “ Writing Flutter apps, you’ll commonly create widgets that are **subclasses** of either **StatelessWidget** or **StatefulWidget** depending if the widget manages **state**. ”

A widget’s main job is to implement its *build* function, which describes (contains) it’s lower-level widgets.

It’s all about WIDGETS!

StatelessWidget vs StatefulWidget

Stateless widgets

Responsible to display other widgets.

Stateful Widgets

Manages state. Changes over time.

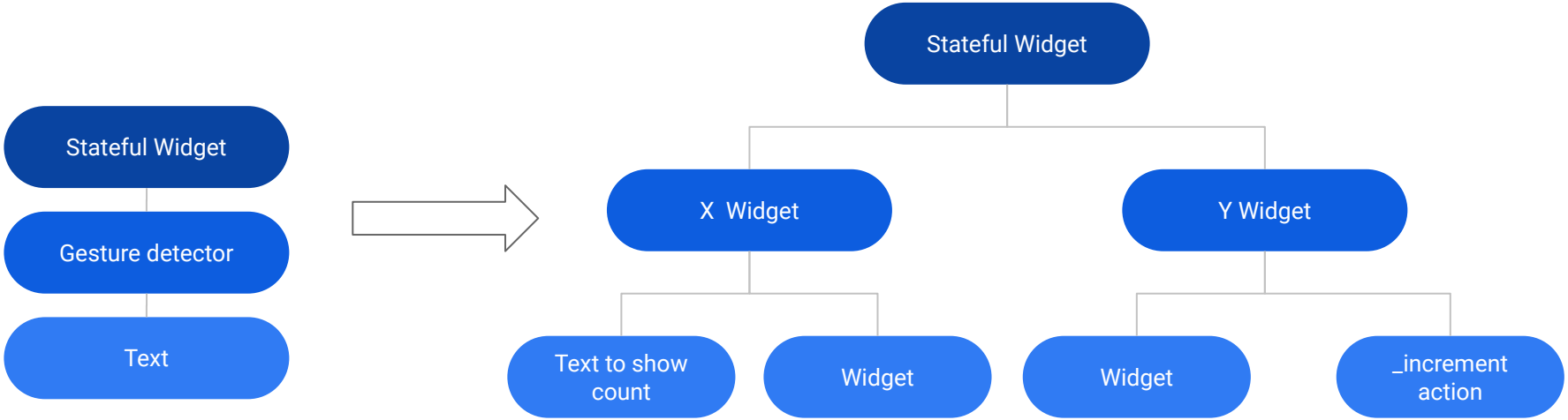
```
class Counter extends StatefulWidget {
  @override
  _itemState createState() => _itemState();
}

class _itemState extends State<Counter> {
  int count = 0;

  @override
  Widget build(BuildContext context) {
    return GestureDetector(
      onTap: () => setState(() {
            count++;
          }),
      child: Text('Count ${count}'),
    );
  }
}
```

State management

With a simple counter, we don't have a very nested widget tree. But what happens when we have a more nested tree?



State management

What if we have to make UI changes? This messes with the apps current widget tree. We need to pass again the data down the **new** tree.

- InheritedWidget - responsible to pass info down the widget tree
- Redux pattern (flutter_redux)

Handle network requests

Let's do something more than a simple counter!

1. Future
2. FutureBuilder

Flutter
Network requests!

Sure!
But we can build a widget.

Actually, FutureBuilder is a real life saver

Flutter beyond mobile development

Futter is made to run anywhere!

- Flutter for the desktop
- Flutter for the web
- Android TV
- Smart watches

Resources

dart.dev
flutter.dev/create
www.youtube.com/flutterdev
pub.dev/flutter

Widget of the week: YouTube playlist

Coming from other platforms? From: Android, iOS, React-Native, WEB.

Deep dive into Flutter:
github.com/flutter/flutter/wiki/The-Engine-architecture

GDG Tirana