LeanCode

State Management

How to wrap it up in my app?

Ephemeral vs global

- Local
- Has my button been touched?
- Short-living in terms of a feature
- Selected tab in bottom navigation
- Current page in the IndexedStack

- Global
- Am I signed in?
- Long-living in terms of a feature, business process or the whole app
- User Authentication state
- Cart items state

We already know about ephemeral state

Ephemeral state

```dart
class _MyHomePageState extends State<MyHomePage> {
  int _counter = 0;

  void _incrementCounter() {
    setState(() {
      _counter++;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text(widget.title),
      ),
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [
            const Text(
              'You have pushed the button this many times:',
            ),
            Text(
              '$_counter',
              style: Theme.of(context).textTheme.headline4,
            ),
```

```dart
class _DraggableCardState extends State<DraggableCard>
    with SingleTickerProviderStateMixin {
  AnimationController? _controller;
  Alignment _dragAlignment = Alignment.center;
  Animation<Alignment>? _animation;

  void _runAnimation(Offset pixelsPerSecond, Size size) {
    _animation = _controller!.drive(
      AlignmentTween(
        begin: _dragAlignment,
        end: Alignment.center,
      ),
    );

    final unitsPerSecondX = pixelsPerSecond.dx / size.width;
    final unitsPerSecondY = pixelsPerSecond.dy / size.height;
    final unitsPerSecond = Offset(unitsPerSecondX, unitsPerSecondY);
    final unitVelocity = unitsPerSecond.distance;

    const spring = SpringDescription(
      mass: 30,
      stiffness: 1,
      damping: 1,
    );

    final simulation = SpringSimulation(spring, 0, 1, -unitVelocity);

    _controller!.animateWith(simulation);
  }

  @override
  void initState() {
    super.initState();
    _controller = AnimationController(vsync: this);

    _controller!.addListener(() {
      setState(() {
        _dragAlignment = _animation!.value;
      });
    });
  }
```

Things that are tightly coupled with our UI

What about our current pizza order in the app?

Do we want to keep it in some widget?

Is it connected to UI?

Is it connected to UI? Somehow it is, because we need it as long as we are in the process.

ChangeNotifier

```dart
class Counter with ChangeNotifier {
  int _count = 0;

  int get count => _count;

  void increment() {
    _count++;
    notifyListeners();
  }
}
```

```dart
MultiProvider(
  providers: [
    ChangeNotifierProvider(create: (context) => Counter()),
  ],
  child: const MyApp(),
),
```

```dart
floatingActionButton: FloatingActionButton(
  onPressed: () => context.read<Counter>().increment(),
  child: const Icon(Icons.add),
),
```

```dart
class Count extends StatelessWidget {
  const Count({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return Text(
      '${context.watch<Counter>().count}',
      key: const Key('counterState'),
      style: Theme.of(context).textTheme.headline4,
    );
  }
}
```

Pretty simple, huh?

It’s just a class so we can do whatever we like

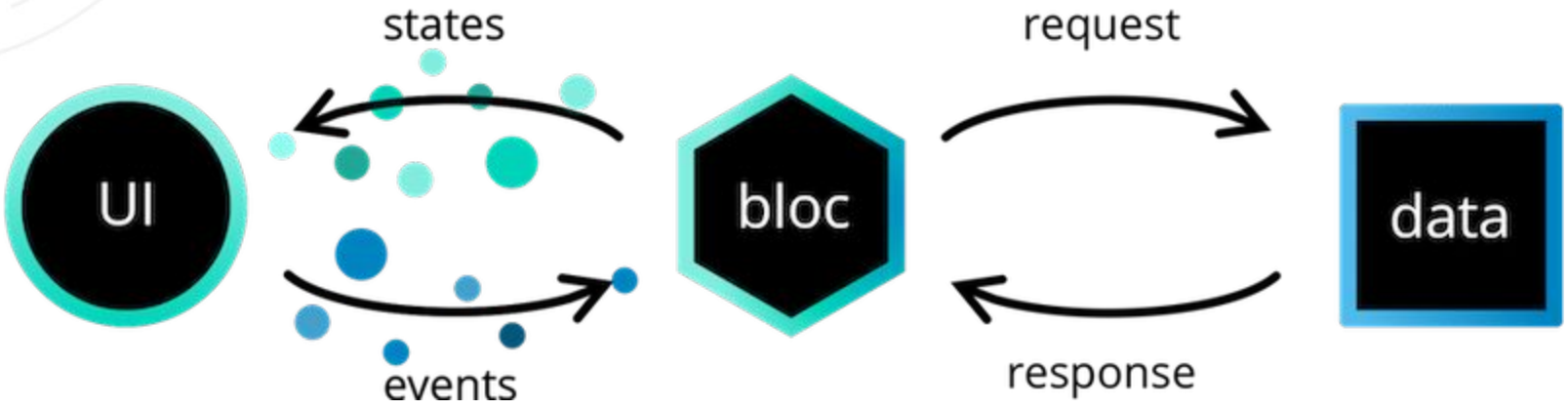
What if…?

```
class Counter with ChangeNotifier {
  int _count = 0;

  int get count => _count;

  void increment() {
    _count++;
  }
}
```

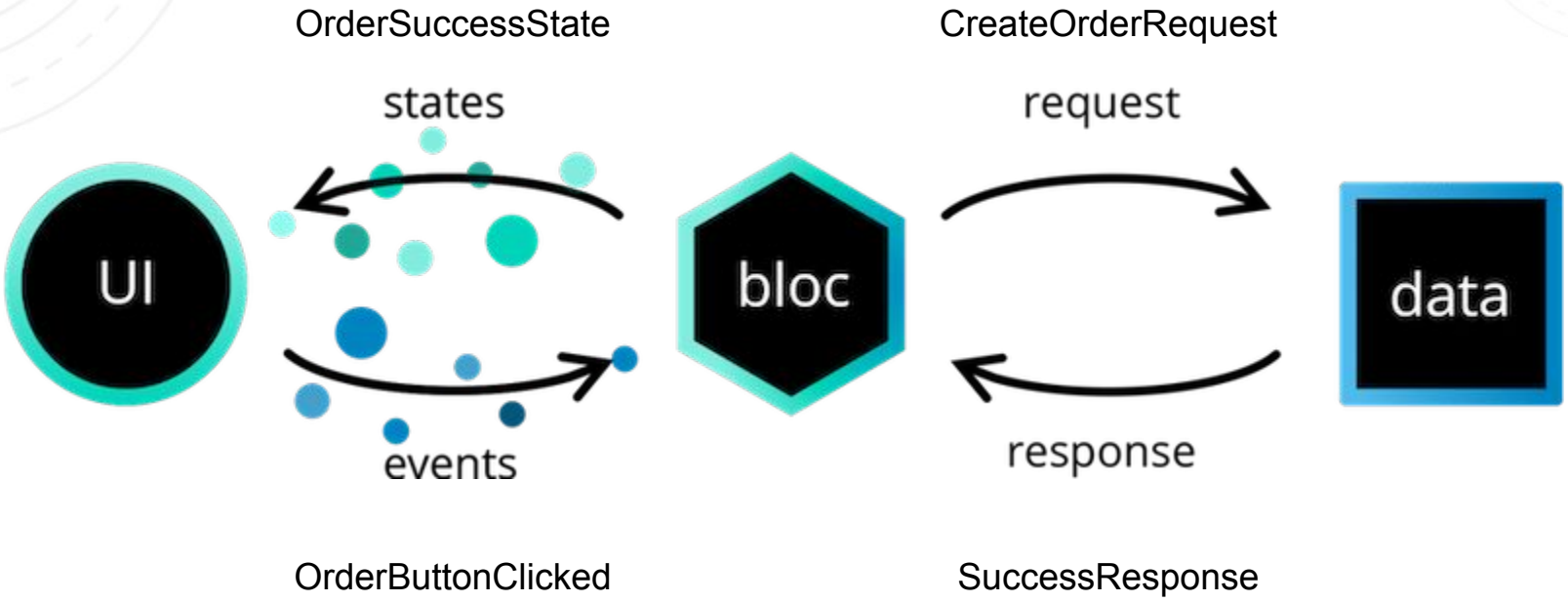
Doesn’t standardize

```dart
class ValueNotifier<T> extends ChangeNotifier implements ValueListenable<T> {
  /// Creates a [ChangeNotifier] that wraps this value.
  ValueNotifier(this._value);

  /// The current value stored in this notifier.
  ///
  /// When the value is replaced with something that is not equal to the old
  /// value as evaluated by the equality operator ==, this class notifies its
  /// listeners.
  @override
  T get value => _value;
  T _value;
  set value(T newValue) {
    if (_value == newValue)
      return;
    _value = newValue;
    notifyListeners();
  }

  @override
  String toString() => '${describeIdentity(this)}($value)';
}
```

Bloc



Bloc



UI = f(state)

Bloc

```dart
abstract class CounterEvent {}
class Increment extends CounterEvent {}
class Decrement extends CounterEvent {}
```

```dart
class CounterBloc extends Bloc<CounterEvent, int> {
  CounterBloc() : super(0) {
    on<Increment>((event, emit) => emit(state + 1));
    on<Decrement>((event, emit) => emit(state - 1));
  }
}
```

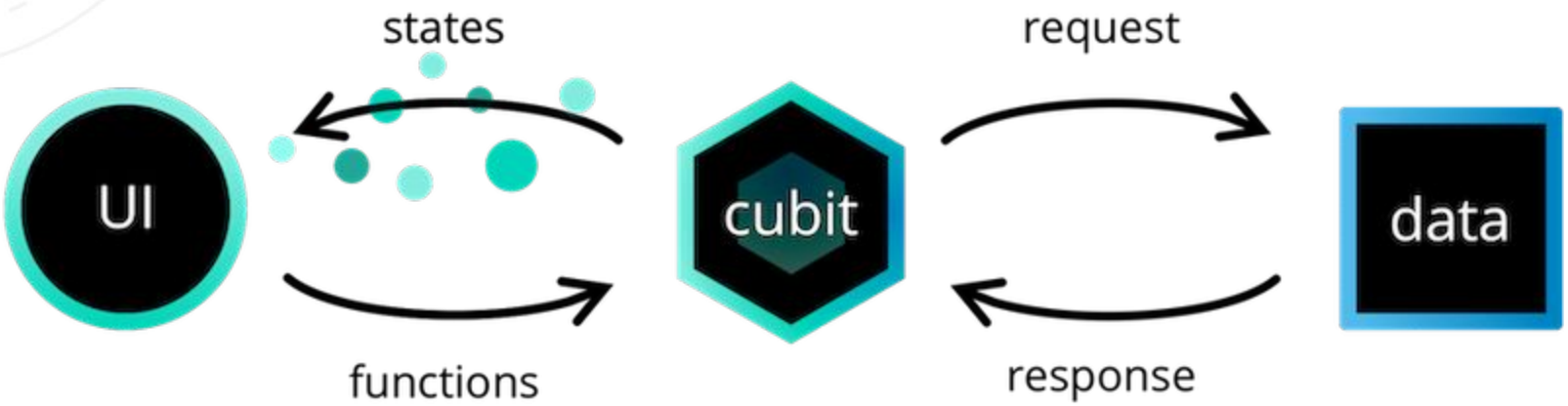
Bloc

```
Padding(
  padding: const EdgeInsets.symmetric(vertical: 5.0),
  child: FloatingActionButton(
    child: const Icon(Icons.add),
    onPressed: () =>
        context.read<CounterBloc>().add(Increment()),
  ),
),
```

```
return MaterialApp(
  theme: theme,
  home: BlocProvider(
    create: (_) => CounterBloc(),
    child: CounterPage(),
  ),
);
```

```
child: BlocBuilder<CounterBloc, int>(
  builder: (context, count) {
    return Text(
      '$count',
      style: Theme.of(context).textTheme.headline1,
    );
  },
),
```

Cubit



Cubit

```
class CounterCubit extends Cubit<int> {
  CounterCubit() : super(0);

  void increment() => emit(state + 1);
  void decrement() => emit(state - 1);
}
```

What if we need our counter to remember the count?

hydrated_bloc

```dart
void main() async {
  WidgetsFlutterBinding.ensureInitialized();
  HydratedBloc.storage = await createStorage();
  runApp(const MyApp());
}

Future<Storage> createStorage() async => HydratedStorage.build(
    storageDirectory: await getApplicationDocumentsDirectory(),
  );
```

HydratedCubit

```dart
class CounterHydratedCubit extends HydratedCubit<int> {
  CounterHydratedCubit() : super(0);

  void increment() => emit(state + 1);
  void decrement() => emit(state - 1);

  @override
  int? fromJson(Map<String, dynamic> json) => json['count'];

  @override
  Map<String, dynamic>? toJson(int state) => {'count': state};
}
```

provider + bloc vs riverpod

Riverpod

```dart
final counterProvider = StateNotifierProvider<CounterStateNotifier, int>(
  (_) => CounterStateNotifier(),
); // StateNotifierProvider

class CounterStateNotifier extends StateNotifier<int> {
  CounterStateNotifier() : super(0);

  void increment() => state++;

  void decrement() => state--;
}
```

```dart
final countProvider = StateProvider((ref) => 0);
```

Riverpod

```
runApp(
  const ProviderScope(
    child: MyApp(),
  ), // ProviderScope
);
```

```
class MyHomePage extends ConsumerWidget {
  const MyHomePage({
    super.key,
    required this.title,
  });

  final String title;

  @override
  Widget build(BuildContext context, WidgetRef ref) {
    final counter = ref.watch(counterProvider.notifier);
    final count = ref.watch(counterProvider);
```

Last but not least, alternative from JS world

redux

```
enum CounterAction { increment, decrement }

class CounterStore extends Store<int> {
  CounterStore() : super(counterReducer, initialState: 0);

  static int counterReducer(int state, dynamic action) {
    if (action == CounterAction.increment) {
      return state + 1;
    }
    if (action == CounterAction.decrement) {
      return state - 1;
    }
    return state;
  }
}
```

redux

```
StoreConnector<int, int>(
  converter: (store) => store.state,
  builder: (_, value) => Text(
    '$value',
    style: Theme.of(context).textTheme.headline4,
  ), // Text
), // StoreConnector
```

```
StoreConnector<int, VoidCallback>(
  converter: (store) => () => store.dispatch(CounterAction.increment),
  builder: (_, callback) => FloatingActionButton(
    onPressed: callback,
    child: const Icon(Icons.add),
  ), // FloatingActionButton
), // StoreConnector
```

Sources

https://flutter.dev
https://dartpad.dev
https://bloclibrary.dev