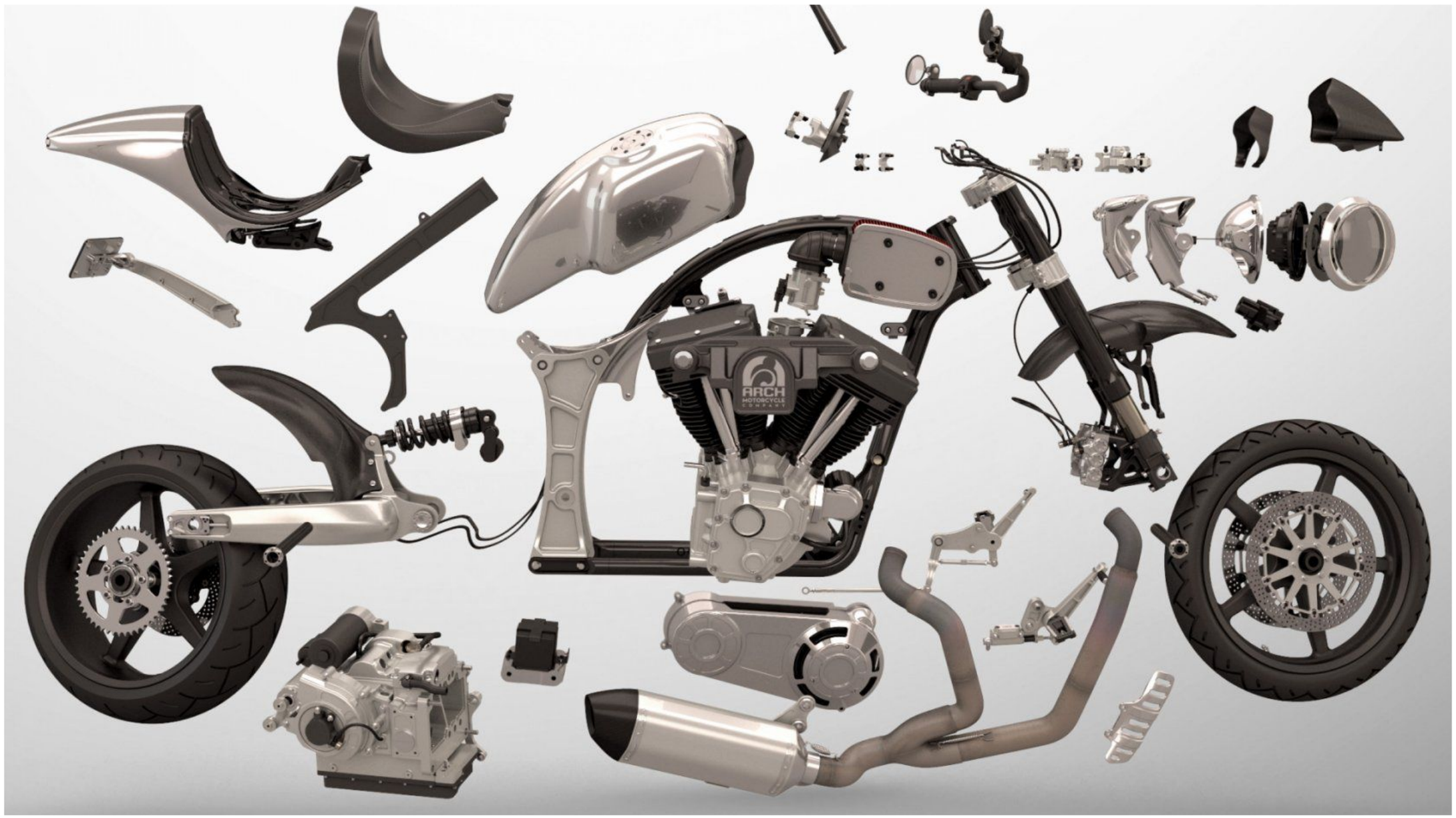
Kickstarting libraries of shared React components for multiple teams

👋 Hi!

Me 👨🏼‍🦰: Xavier Lefèvre
Job 👨‍💻: Team leader of React and React Native projects
Company 🏢: BAM, a tech consulting and development agency
Passion 🤩: I love tech as much as I love travelling which means I’m super happy to be here! I do also love motorcycles.

Making reusable components across projects...



Contents

It started with a wish

"It would be awesome if we could finally and successfully create shareable components in order to re-use them on different apps, give them to other departments or even one day sell them outside!”

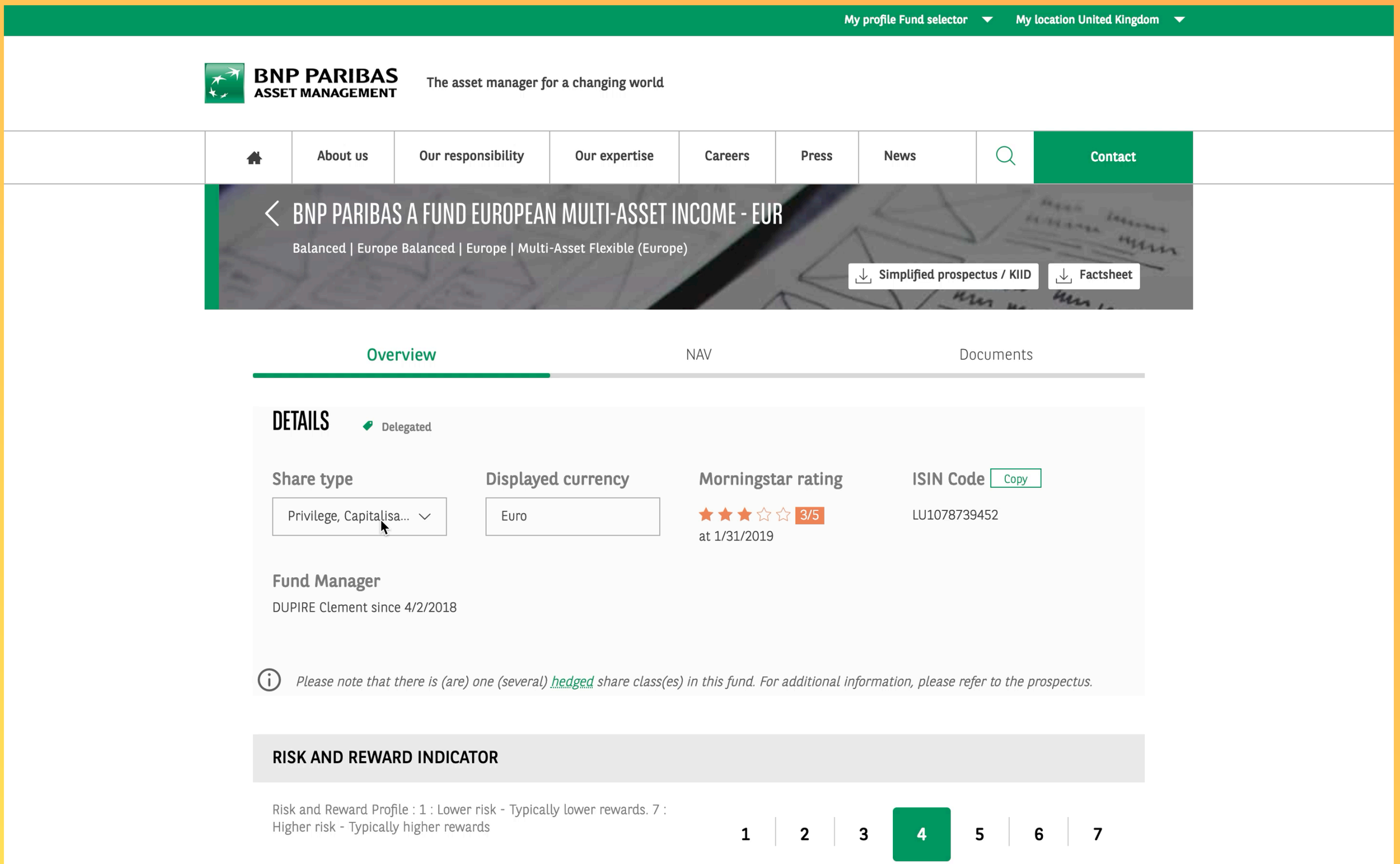
Quote from our client in April 2018

Why?

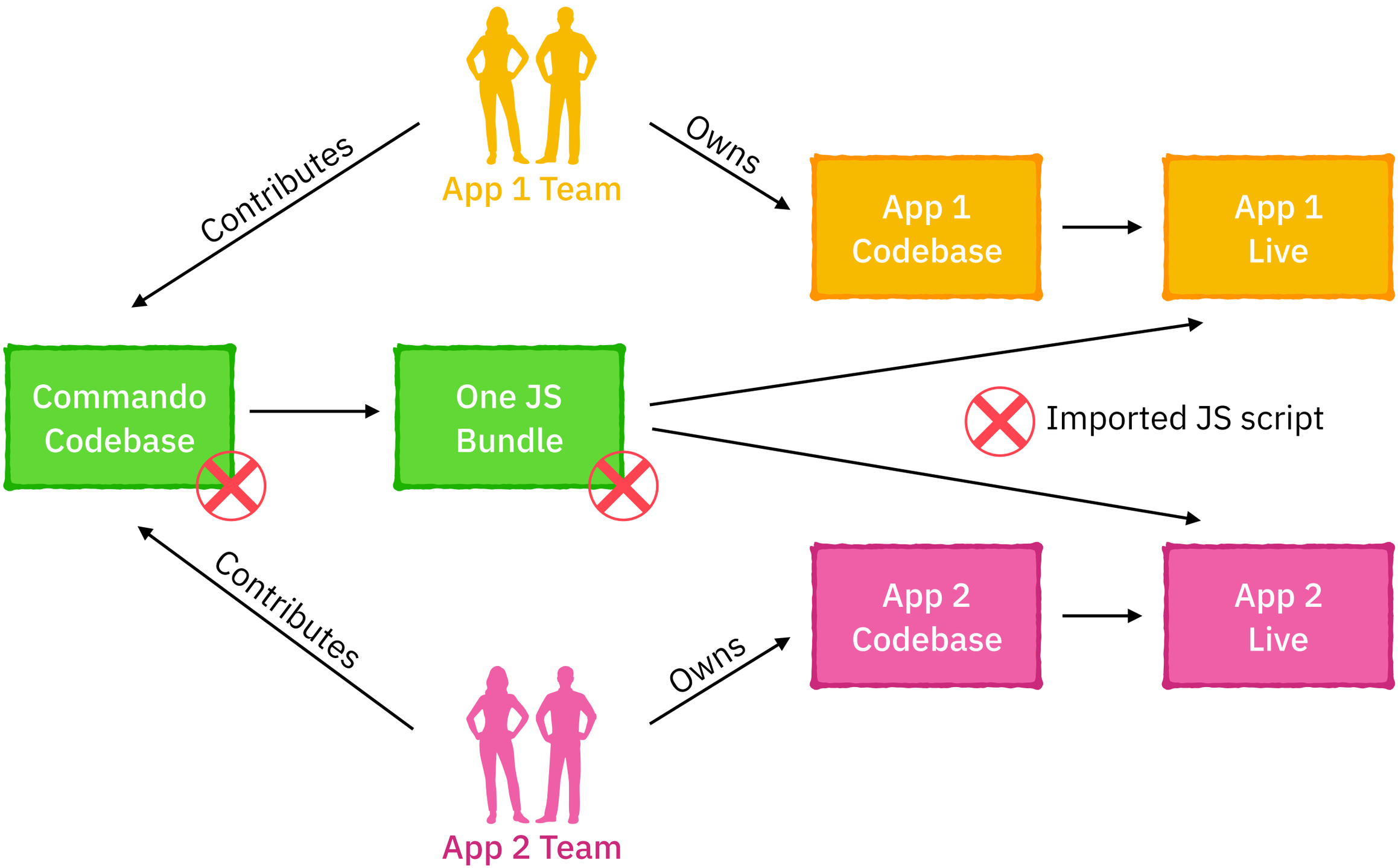
With our client, we produce several web apps per year for different targets but with the same business behind.

So very similar components were remade from scratch many times.

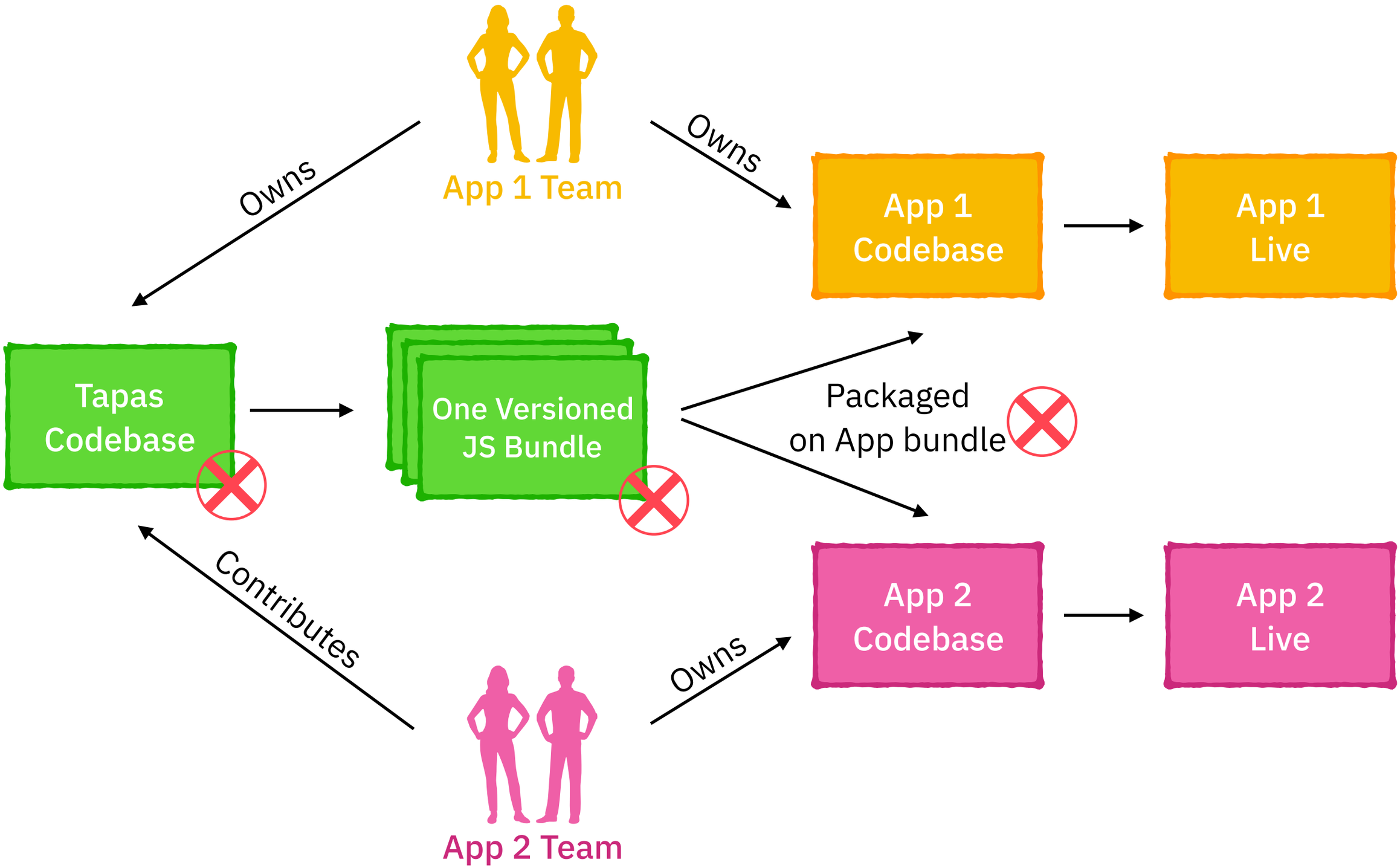
Let's see what our client means 🤔



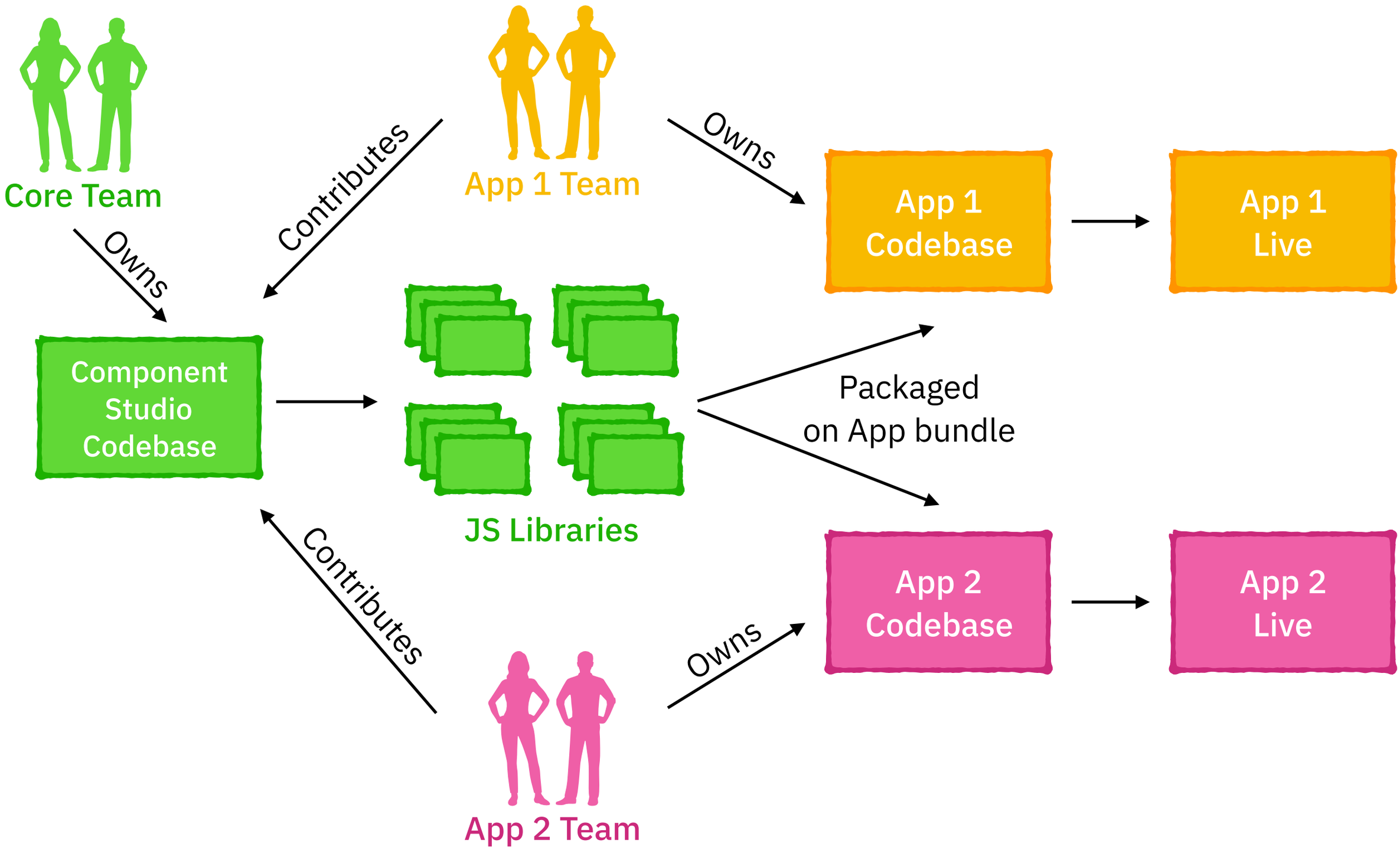
First attempt: Commando 🔫



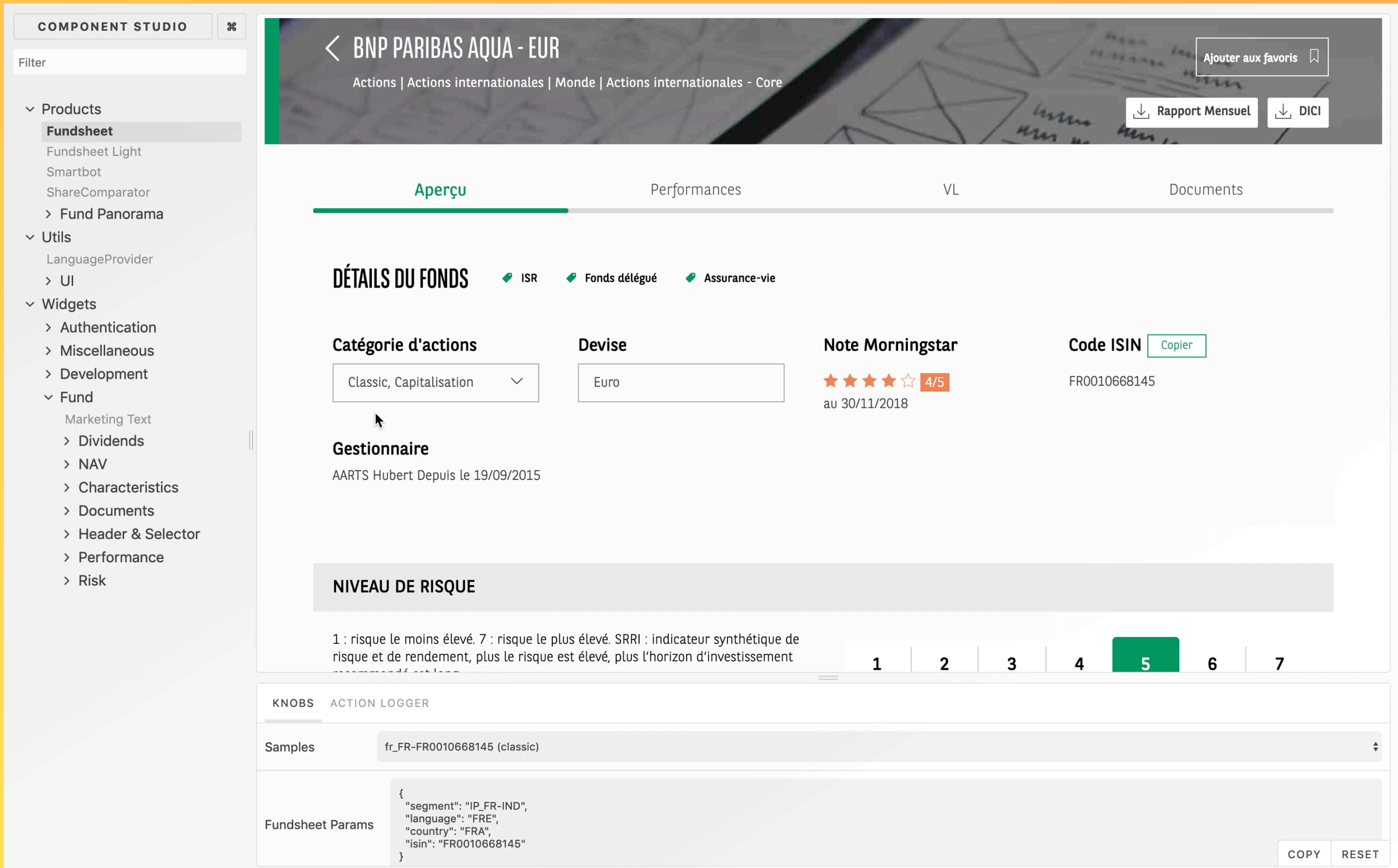
Second attempt: Tapas 🌮



Latest attempt: Component Studio

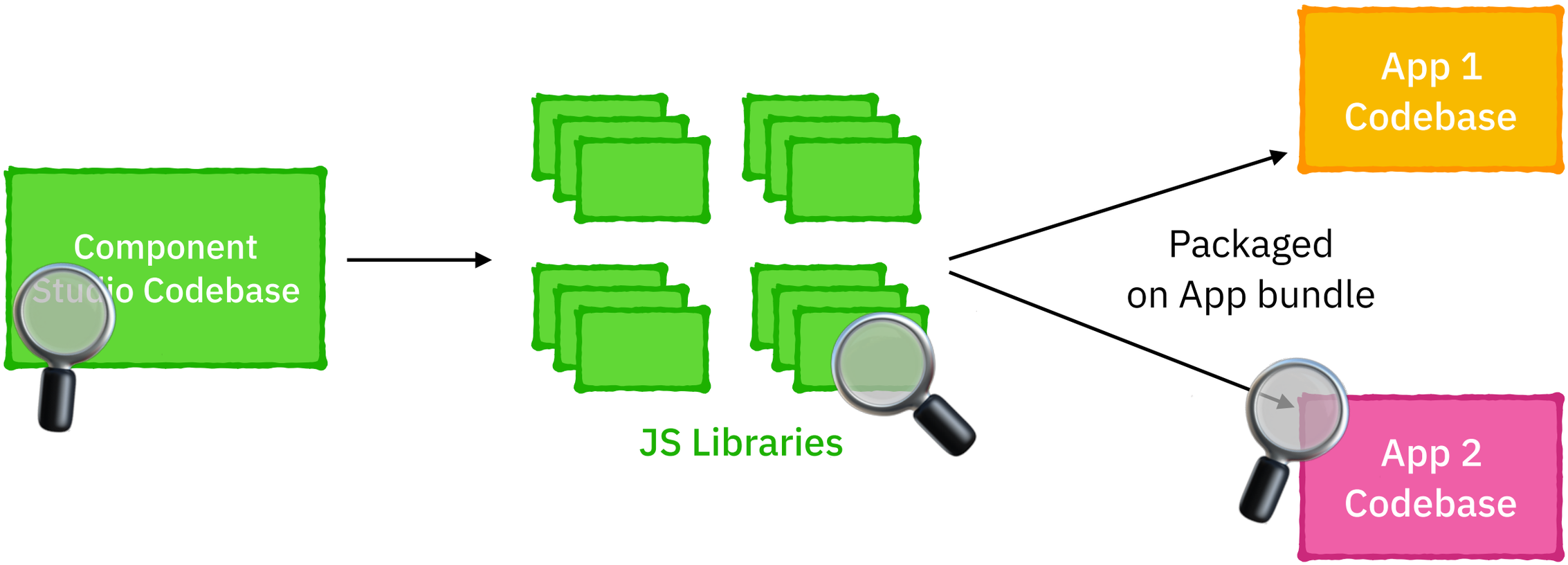


Demonstration time



Let’s dive in for some tips!

Let’s zoom in 3 interesting aspects



1. Packages and components organisation

2. Components code structure

3. How to limit the impact of breaking changes

We follow Atomic Design principles

Organism

PARVEST AQUA - EUR

Equity | Global Equity | Global | Global Sector

Add to favorites

Factsheet

Overview | Performance | NAV | Documents

Molecule

DETAILS

SRI

Delegated

Share type Atom

Classic, Capitalisation

Displayed currency

Euro

Morningstar rating

NR

ISIN Code Copy

LU1165135440

Fund Manager

AARTS Hubert since 1/7/2015

RISK AND REWARD INDICATOR

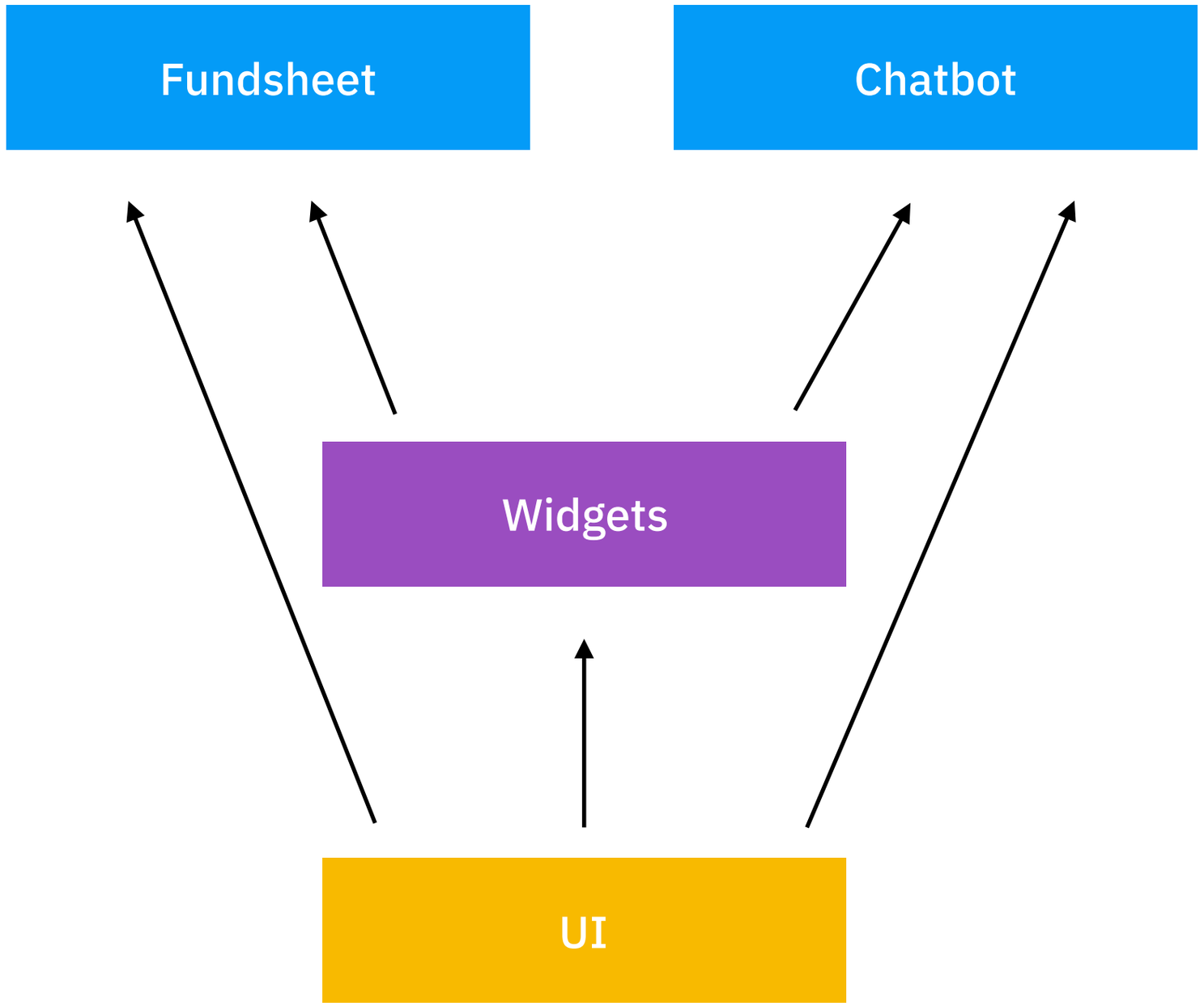
Risk and Reward Profile : 1 : Lower risk - Typically lower rewards. 7 : Higher risk - Typically higher rewards

1 | 2 | 3 | 4 | **5** | 6 | 7

Lower risk
Typically lower reward

Higher risk
Typically higher reward

The impact on our code organisation



Organisms

Full page feature - Satisfies a user need

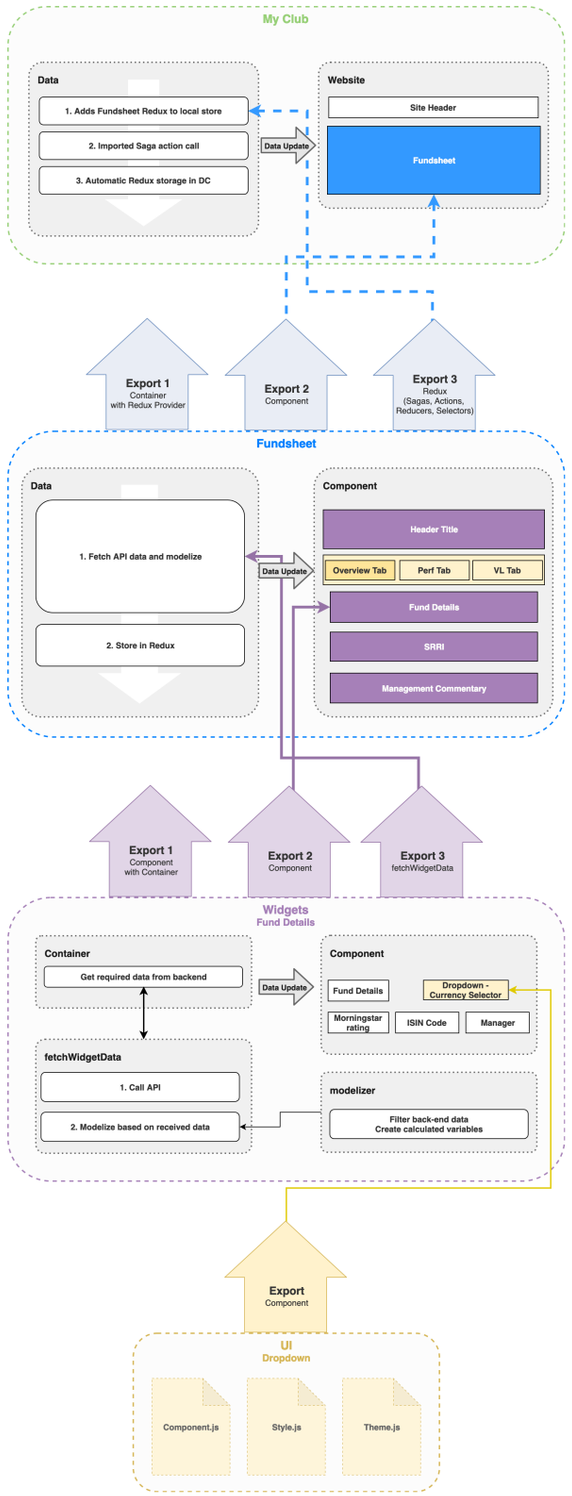
Molecules

Business connected - Composable when sharing a common business purpose

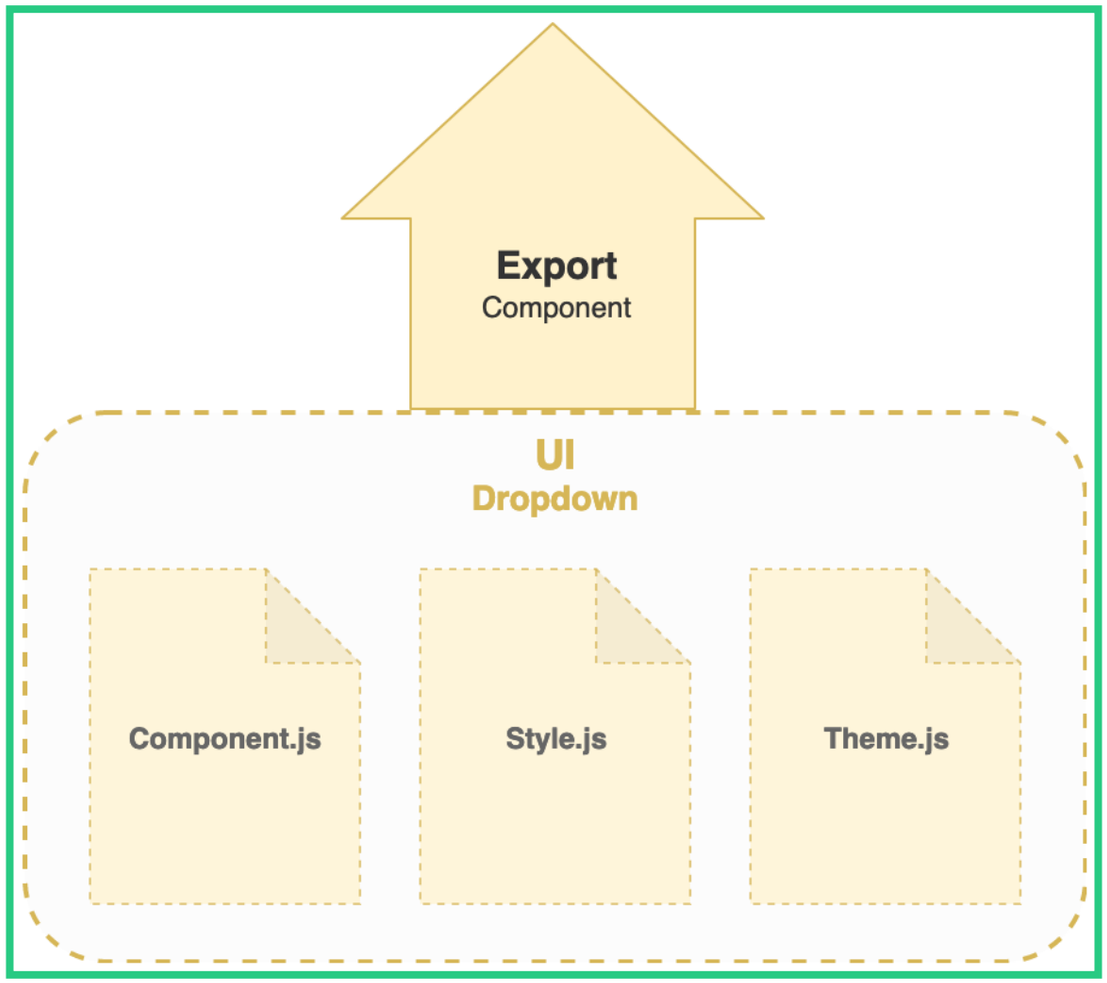
Atoms

Pure UI - No business - Totally Customisable and Composable

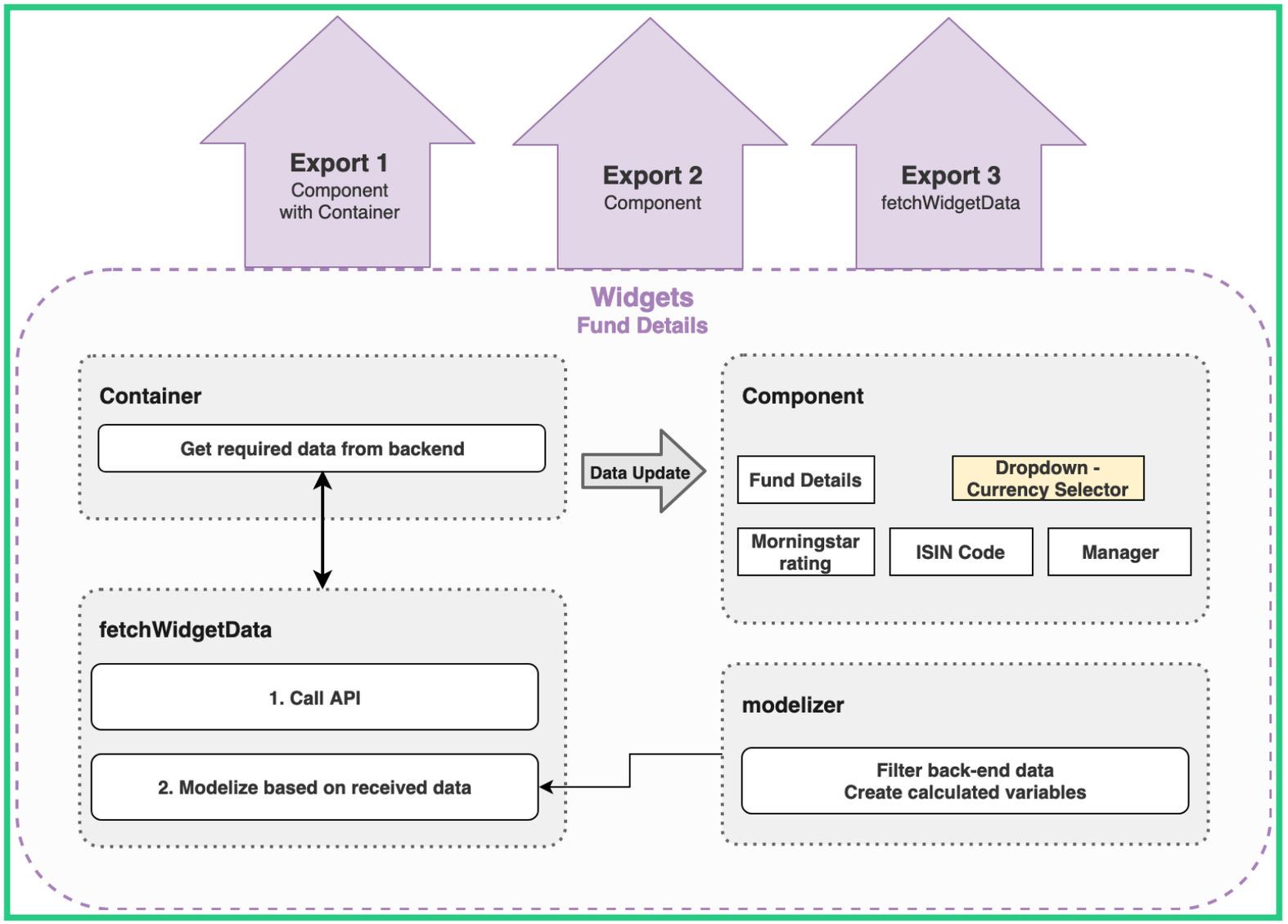
A deeper look at the components code



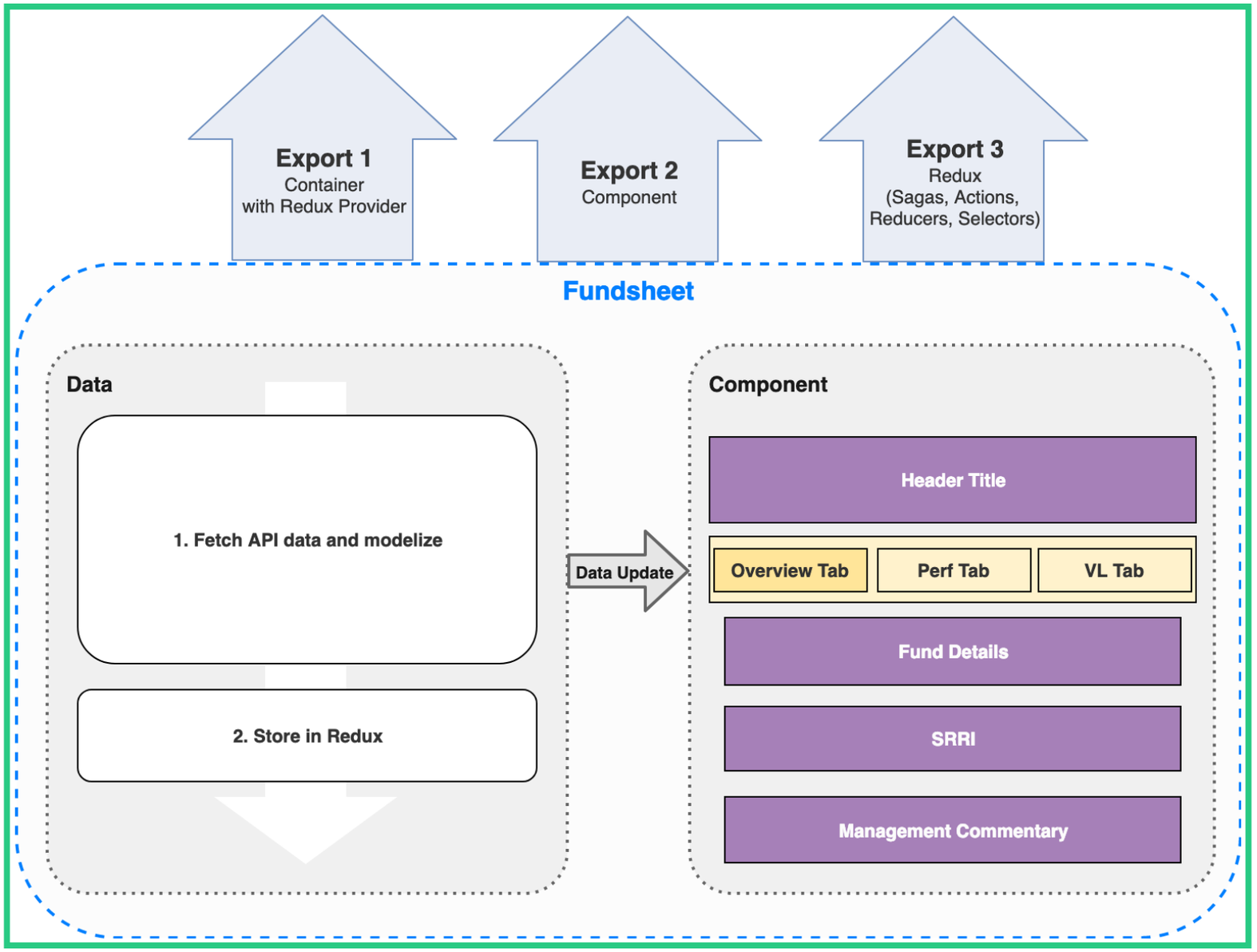
A deeper look at the UI code



A deeper look at the Widgets code



A deeper look at the Products code



What is a breaking change?

A **breaking change** is a change in one part of a software system that causes other parts to fail.

Which happens when you change the existing API of a library without warning your users.

What should I pay attention to?

- Exposed components and functions names
- Components props or function parameters
- The component style, but more risky its taken space (height, width...)
- An upgrade in a peer dependency which has breaking changes

```
export const Button = (props) => (
  <button
    disabled={props.disabled}
    onClick={props.onClick}
    type={props.type}
    className={props.className}
  >
    {props.children}
  </button>
);
```

```
export default styled(Button)`
  ${({ disabled }) => `
    border: 1px solid ${colors.green};
    border-radius: 3px;
    ${disabled ? '' : 'cursor: pointer;'}
    height: '18px';
    line-height: 17px;
  `};
`;
```

What we set-up to help developers anticipate

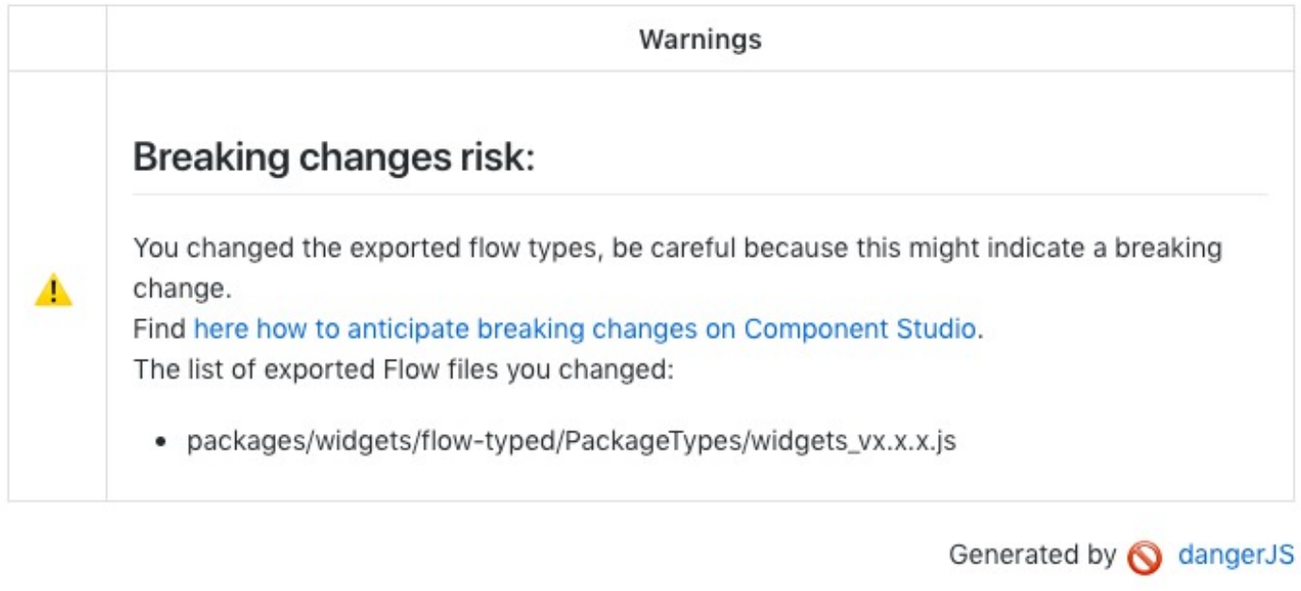
- API exposed as exported Flow types

```
declare type ButtonPropsType = {|
  children: React.Node,
  className?: string,
  disabled?: boolean,
  light?: boolean,
  onClick?: (event: EventType) ⇒ void,
  type?: string,
  small?: boolean,
|};
```

- Changes in the Flow API notified by Danger on the Pull Request

- Automatic SemVer based on commits, releasing major when breaking change

- Automatic changelog generation



How do we know our project is successful?

Our return on investment

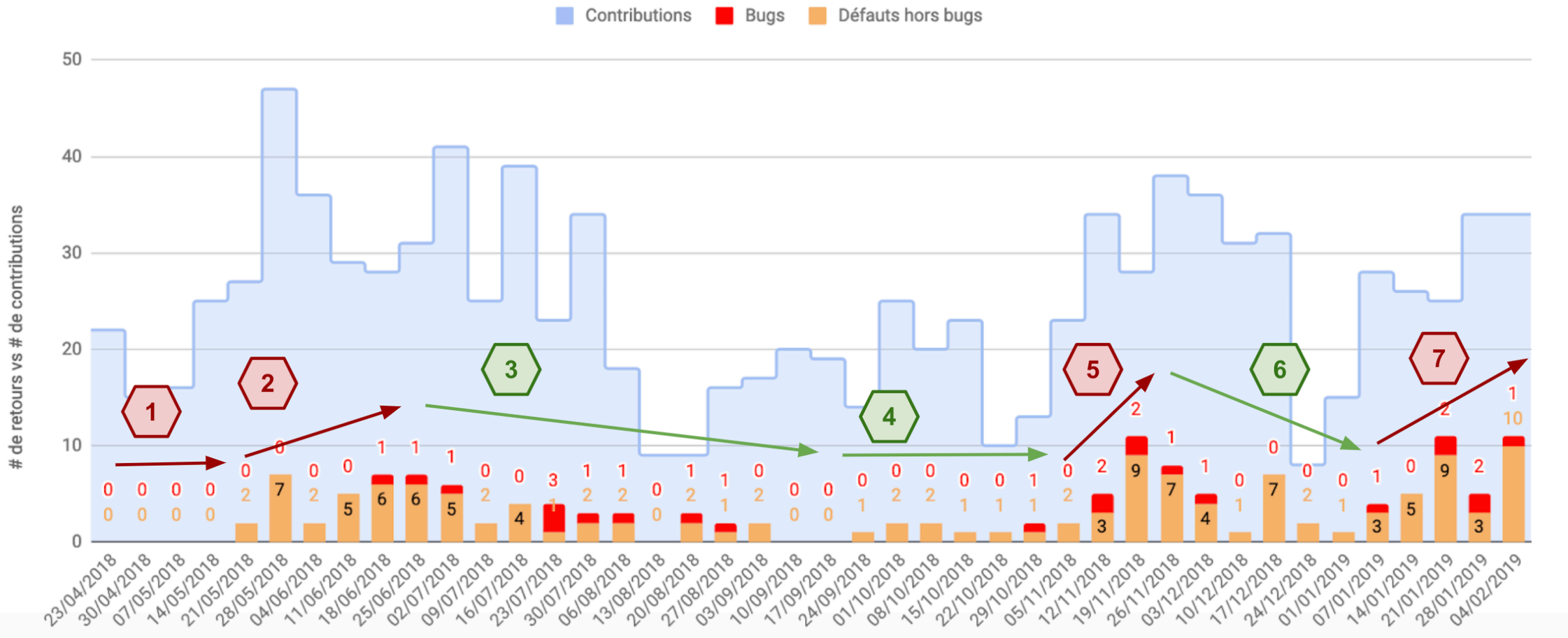
$$\sum_{\text{components}} \left(\text{Component cost if developed on “normal” project} \times \text{Number of times of reuse of the component} \right) - \text{Component Studio full cost}$$

The tech team main focus is to reduce the project cost by approaching a flawless codebase and a fast development process.

But we did not arrive to this point without struggling 🤯!

So we started tracking issues...

Number of issues VS Contributions



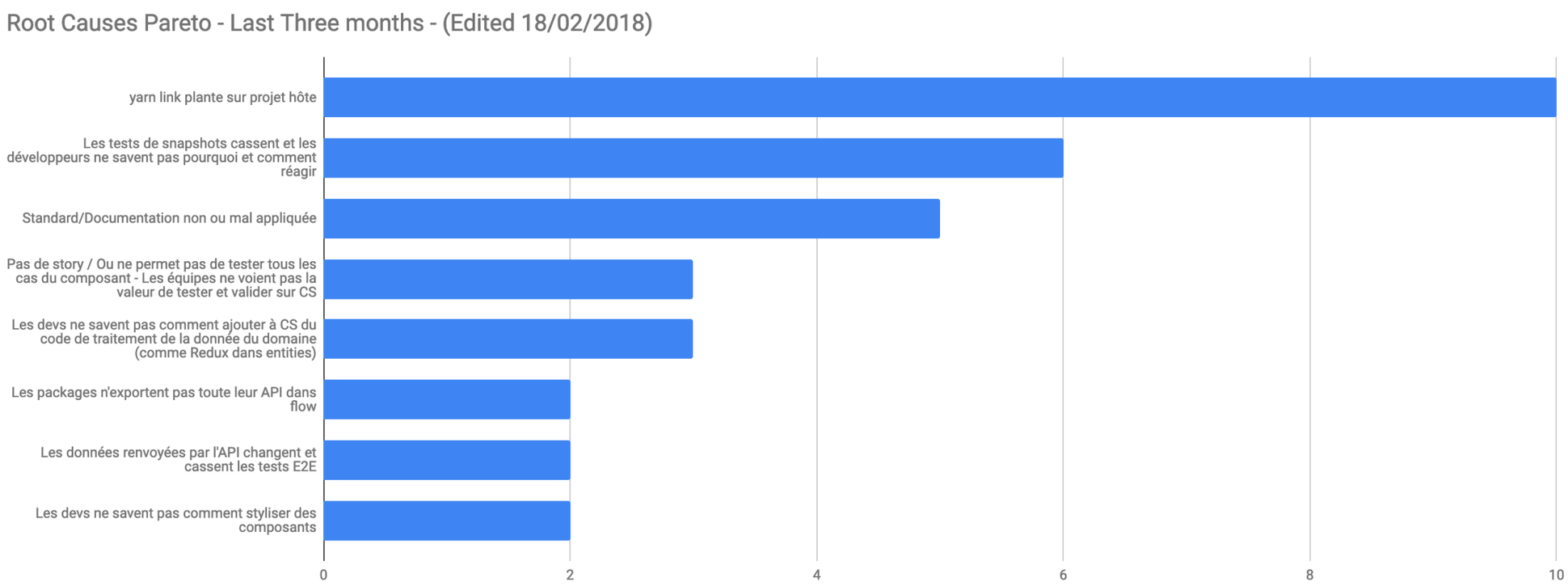
Every problem the contributors meet on the project they create an issue for the core team.

… and then tackling those issues!

1. An hour every day of issue prioritisation and solving:

- **10min:** We first take a look at the ongoing actions
- **20min:** We then prioritise based on the type of issue and the developer's lost time
- **30min:** Finally we take the most urgent issues and find their causes

2. Weekly actions to tackle the biggest root causes



So, is it worth it?

👍 or 👎

We saved around 18% of development cost since April 2018.

Now the UI is naturally more consistant across all apps.

🙏 Thanks!

Special thanks to everybody that worked on this project:

I am able to share all this because of a huge team work since day 1.

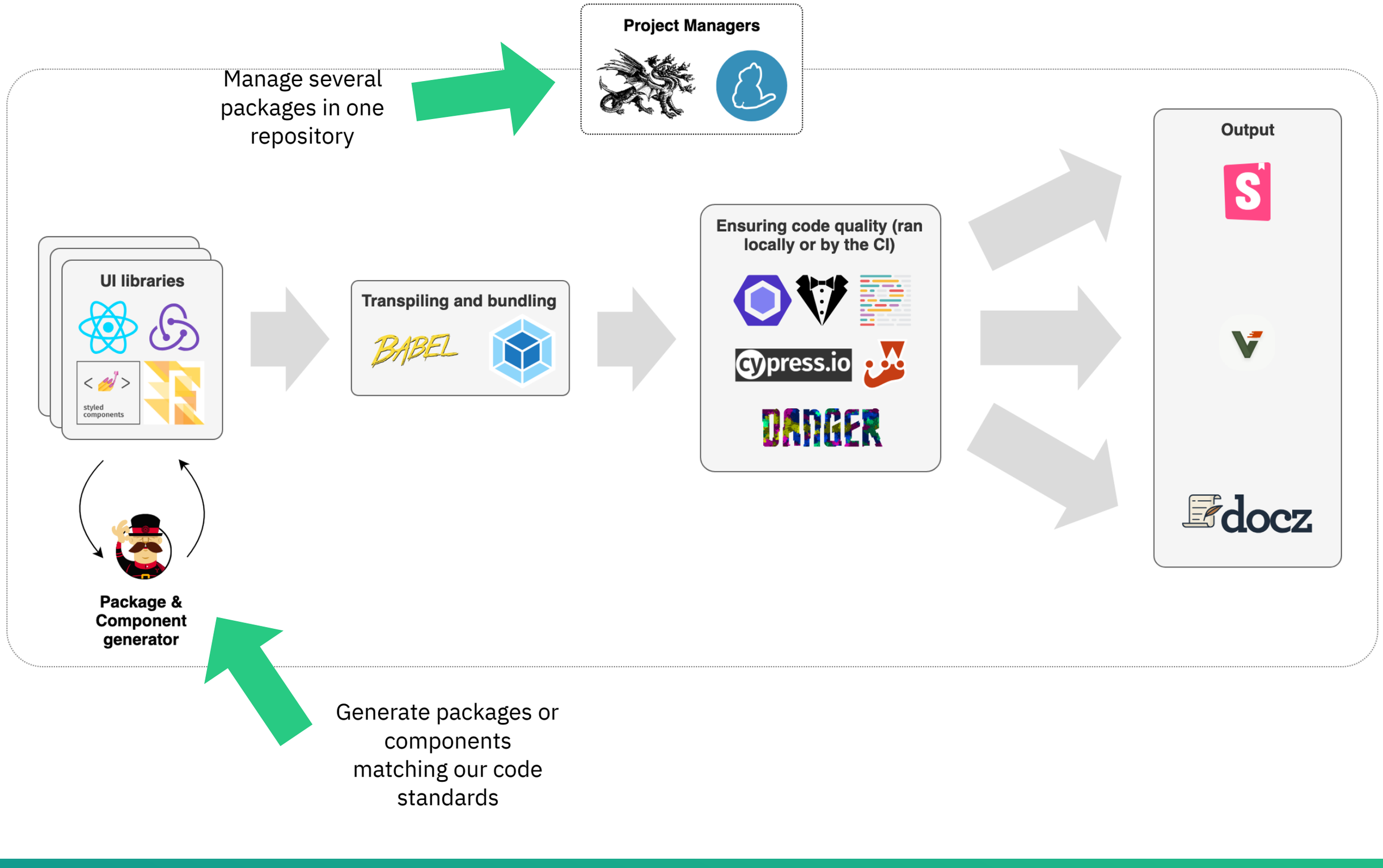
@xavi_lefevre

xavierlefevre

Appendix

- Complete project stack
- Global architecture
- Atomic Design deep dive
- Development Flow
- Our current issues
- Links

What is the project made of?



Our stack in detail

Project Managers

Lerna: Multi package mono-repository manager

Yarn: Dependency manager

UI development libraries

React

Redux

Styled Components

Package & Component generator

Yeoman

Code bundling

Babel

Webpack

Code quality and tests

ESLint

stylelint

Flow: Static type checker

Prettier

Jest

Cypress.IO

Danger.JS

Showcase, store and documentation

Storybook

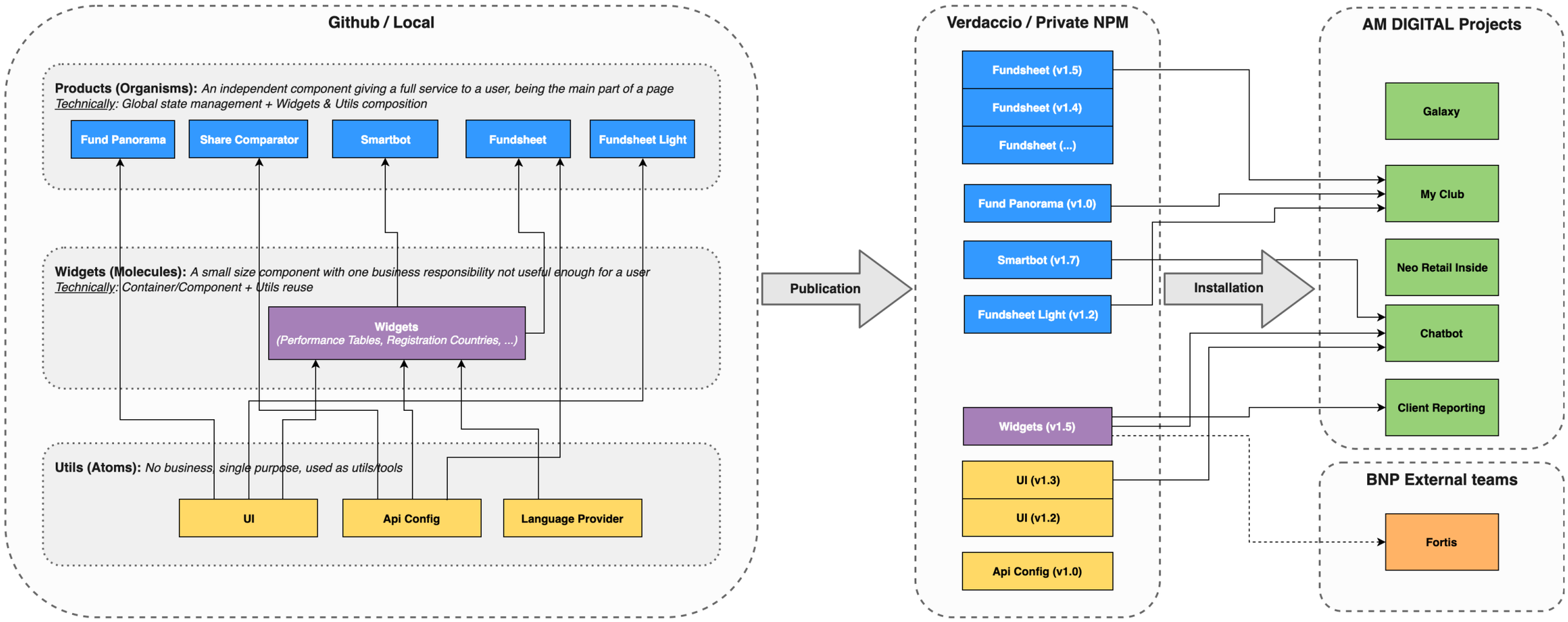
Verdaccio

docz

Global Architecture

Global Component Studio Architecture

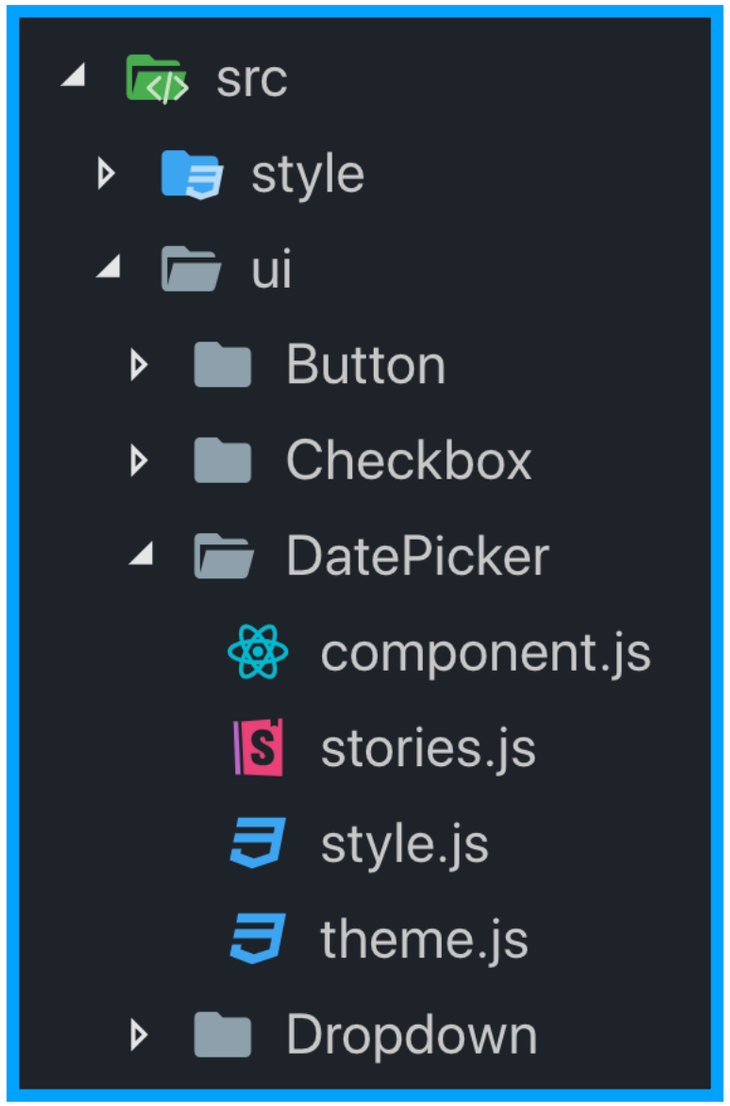
This diagram is a broad representation of Component Studio architecture, it does not show every links & uses between packages



How did we define an atom?

Our UI components:

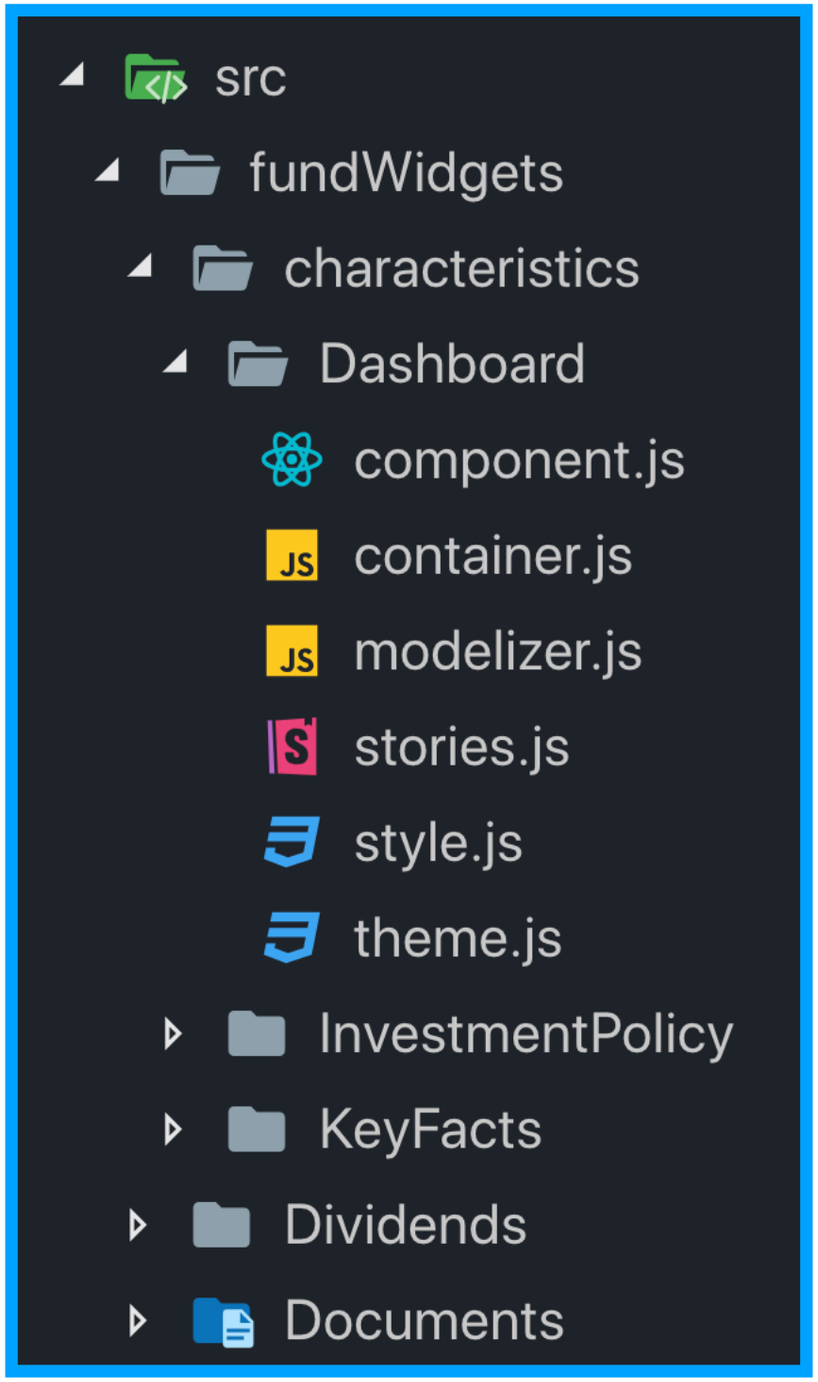
- Extremely composable
- Highly customisable
- Not connected
- Not related to the business



How did we define a molecule?

Our Widgets components:

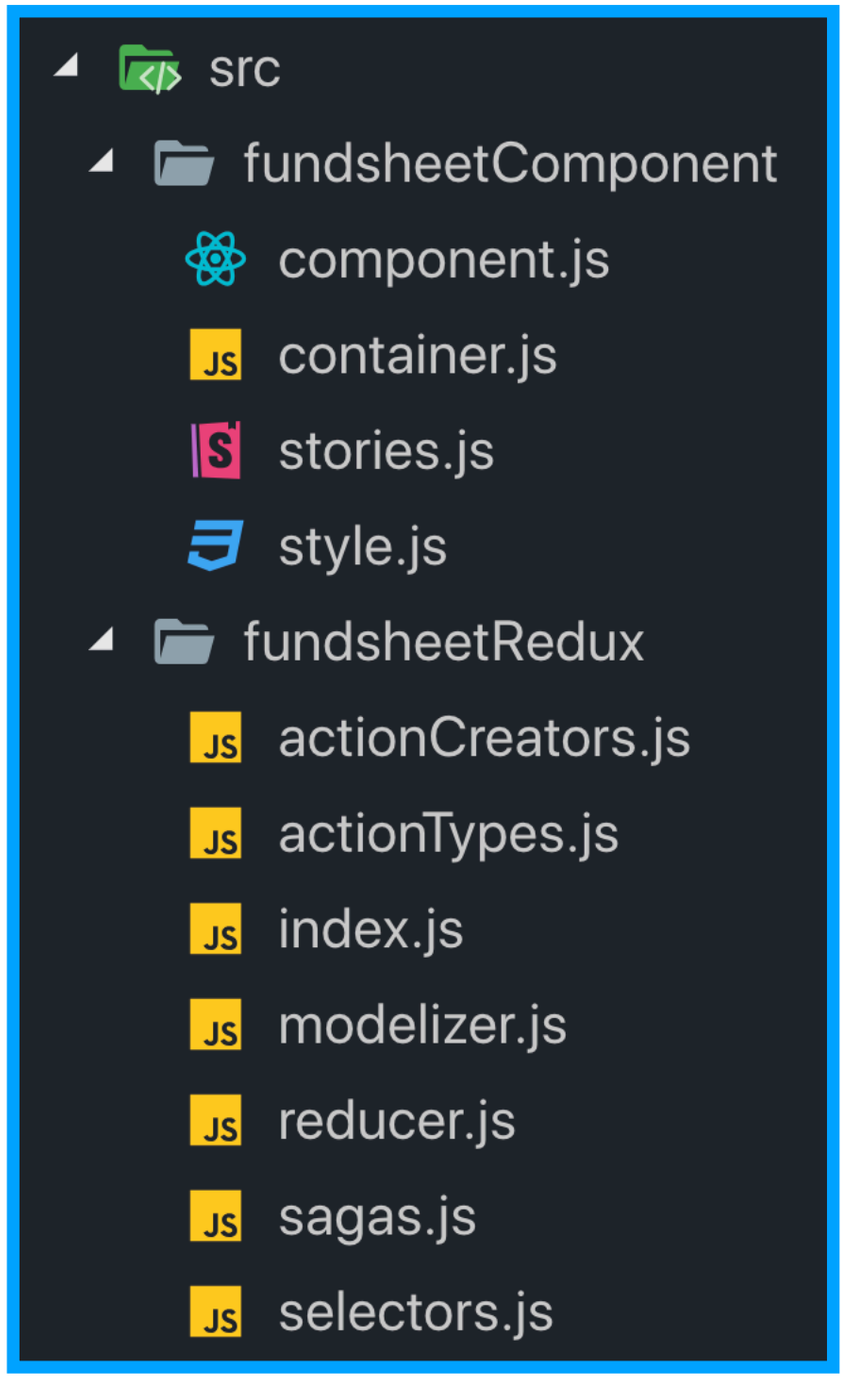
- Composable per business scope
- Reasonably customisable
- Represents one business part
- Has little to no value by itself for the final user
- Is composed of UI components
- Exported dumb or connected



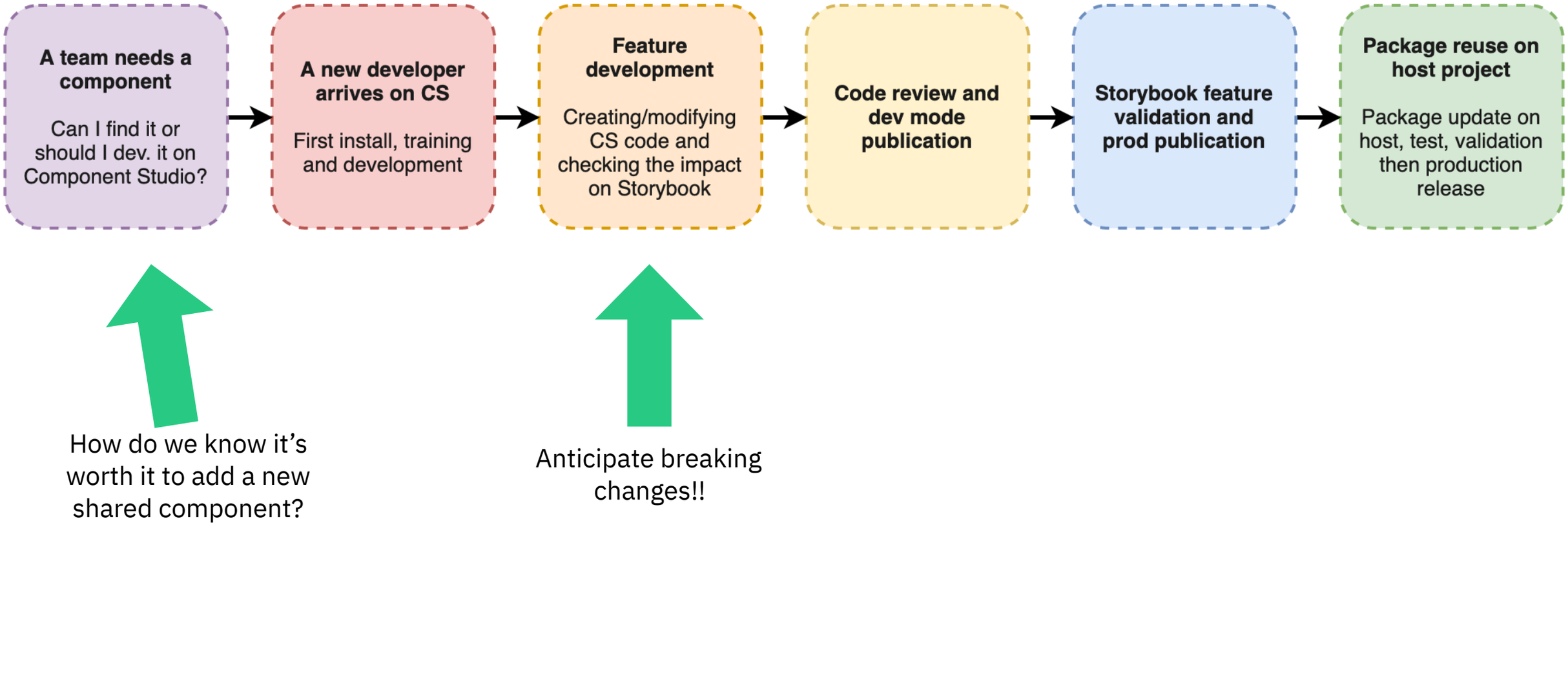
How did we define an organism?

Our Products components:

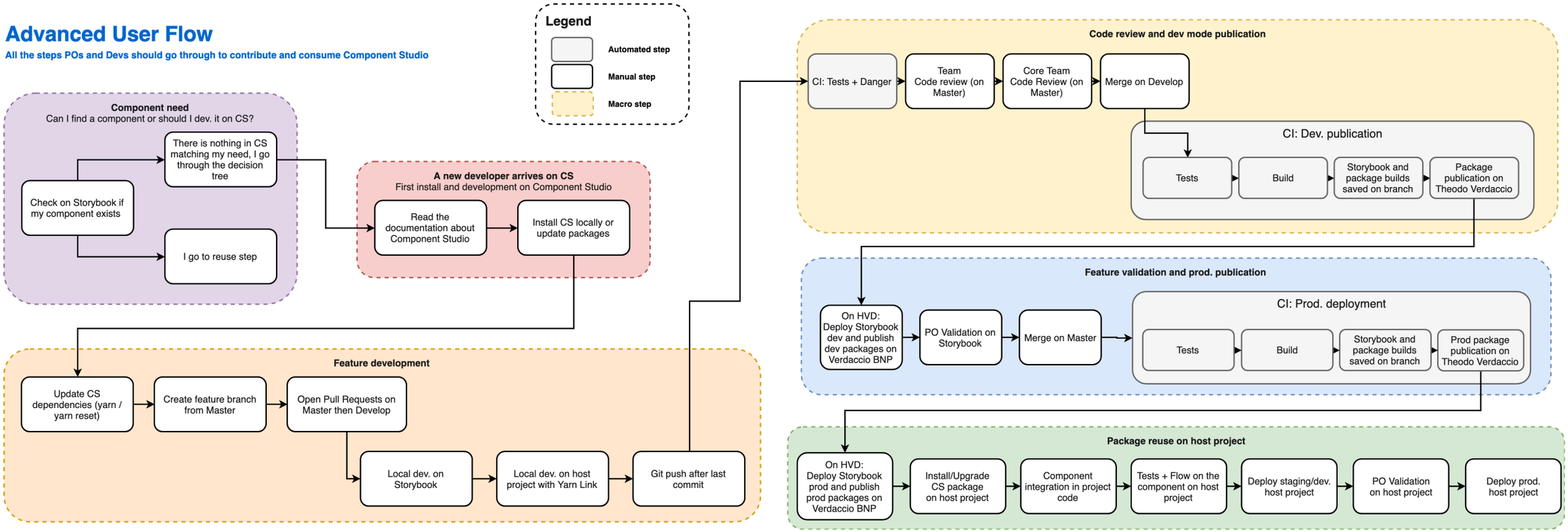
- Connected full-fledged feature
- Satisfy a user need
- Usually takes most of the page space
- Not composable
- Not customisable
- Is composed of Redux + Widgets and UI components
- Exported as a standalone or in two pieces Redux & Component



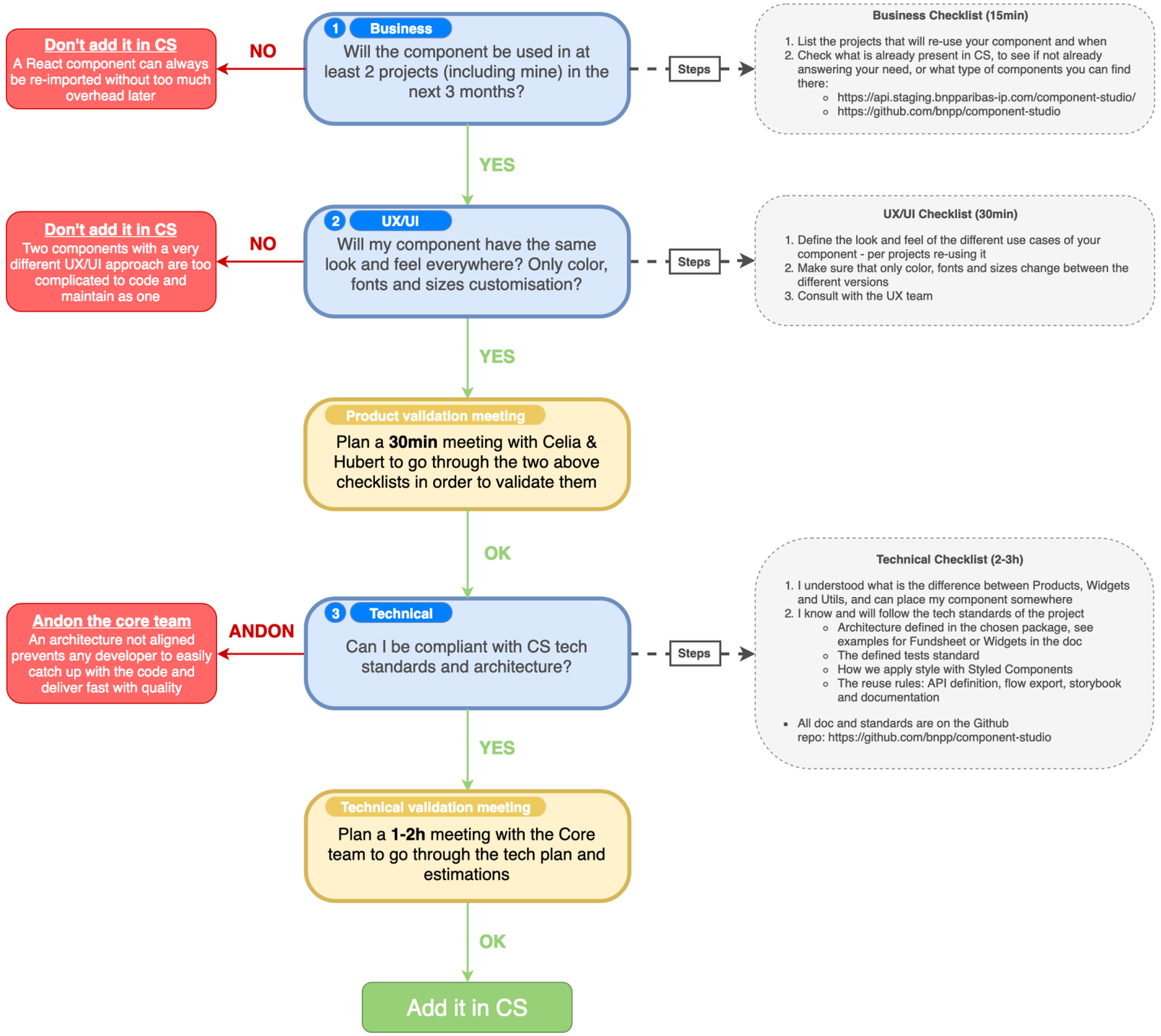
And this is our development flow



And this is our advanced development flow 🤯



Know when to add a new component!



Our current challenges

- Better onboarding and documentation
- Yarn Link
- Better Flow coverage
- Re-definition of our testing strategy
- Performance - slimmer packages

Finding other design systems

A website listing most design systems: https://adele.uxpin.co

Top design systems:

- Pinterest - Gestalt: https://pinterest.github.io/gestalt
- Ant design: https://ant.design
- Palentir - Blueprint: https://blueprintjs.com
- Segment.io - Evergreen: https://evergreen.segment.com
- Telerik - Kendo UI: https://www.telerik.com/kendo-ui
- Element (Vue): https://element.eleme.io
- Argon: https://demos.creative-tim.com/vue-argon-design-system

Links

- Atomic design: http://bradfrost.com/blog/post/atomic-web-design