



# The tech behind a design system that scales

BrazilJS 2018



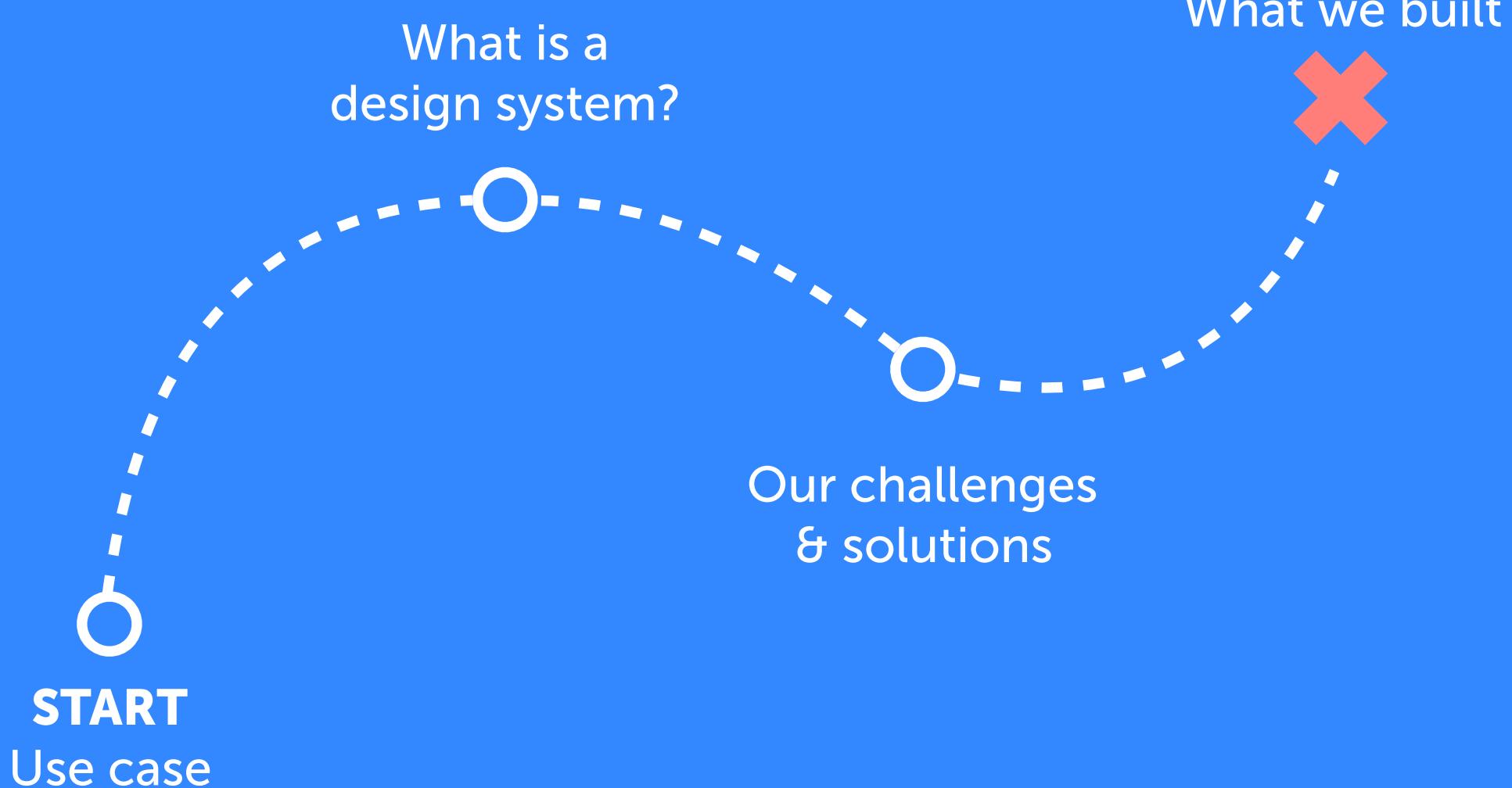


## Monica Lent

Lead Frontend Engineer - SumUp

@monicalent

# Where we're going today



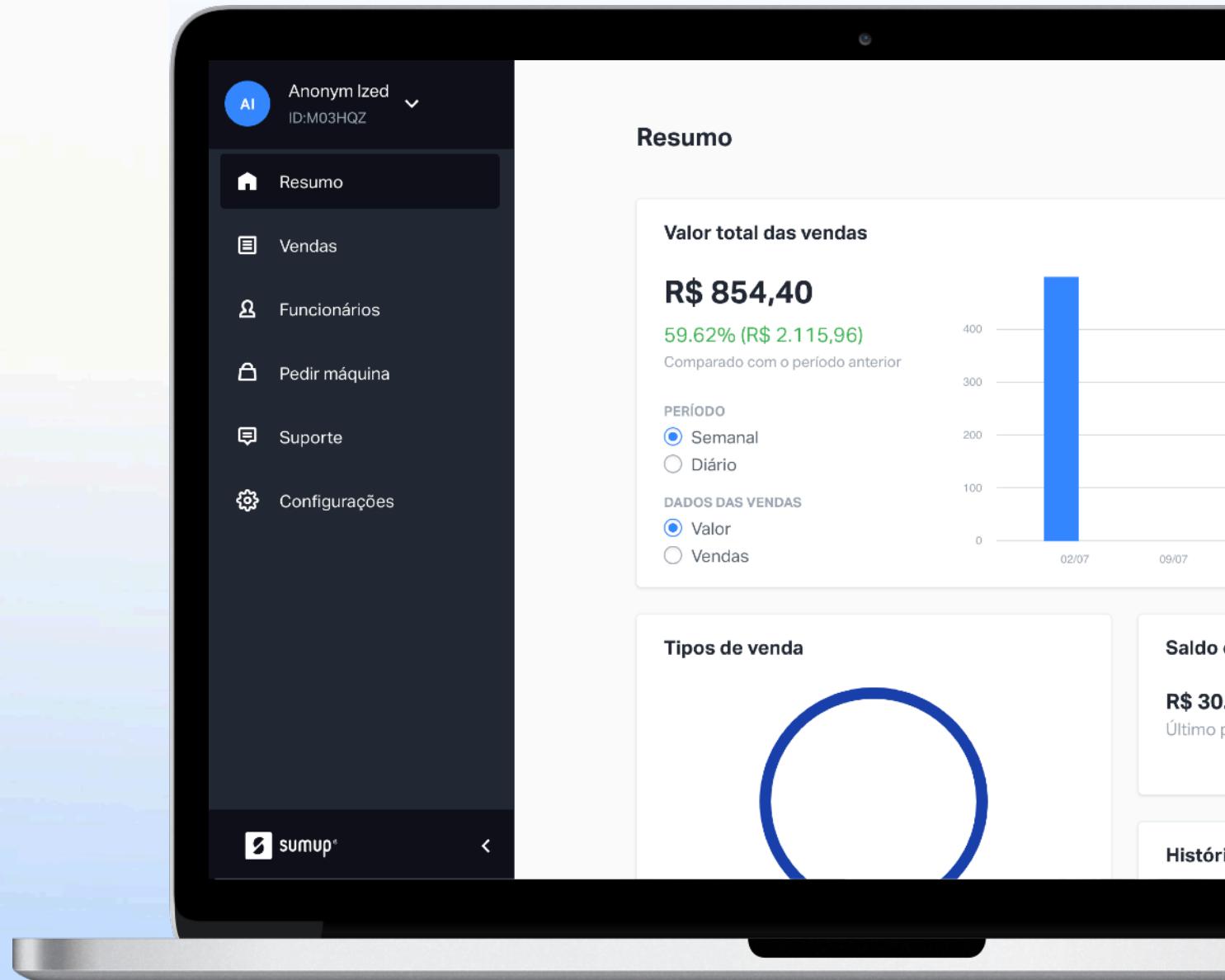


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**Resumo**

**Valor total das vendas**  
**R\$ 854,40**  
59.62% (R\$ 2.115,96)  
Comparado com o período anterior

**PERÍODO**  
 Semanal  
 Diário

**DADOS DAS VENDAS**  
 Valor  
 Vendas

**Tipos de venda**

**Saldo**  
**R\$ 30**  
Último p

**Históri**

# Use case

# Once upon a time...



This currency input I'm building is really tricky

Wait, what?

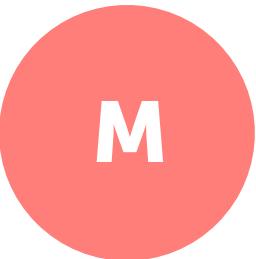


There are all these edge cases and...

# Once upon a time

No, I mean why are you building a currency input?

I made that like six months ago.



# A tale of two inputs

New Payment

Amount

0,00 €

Description (Optional)

Description

Refund up to €50.00

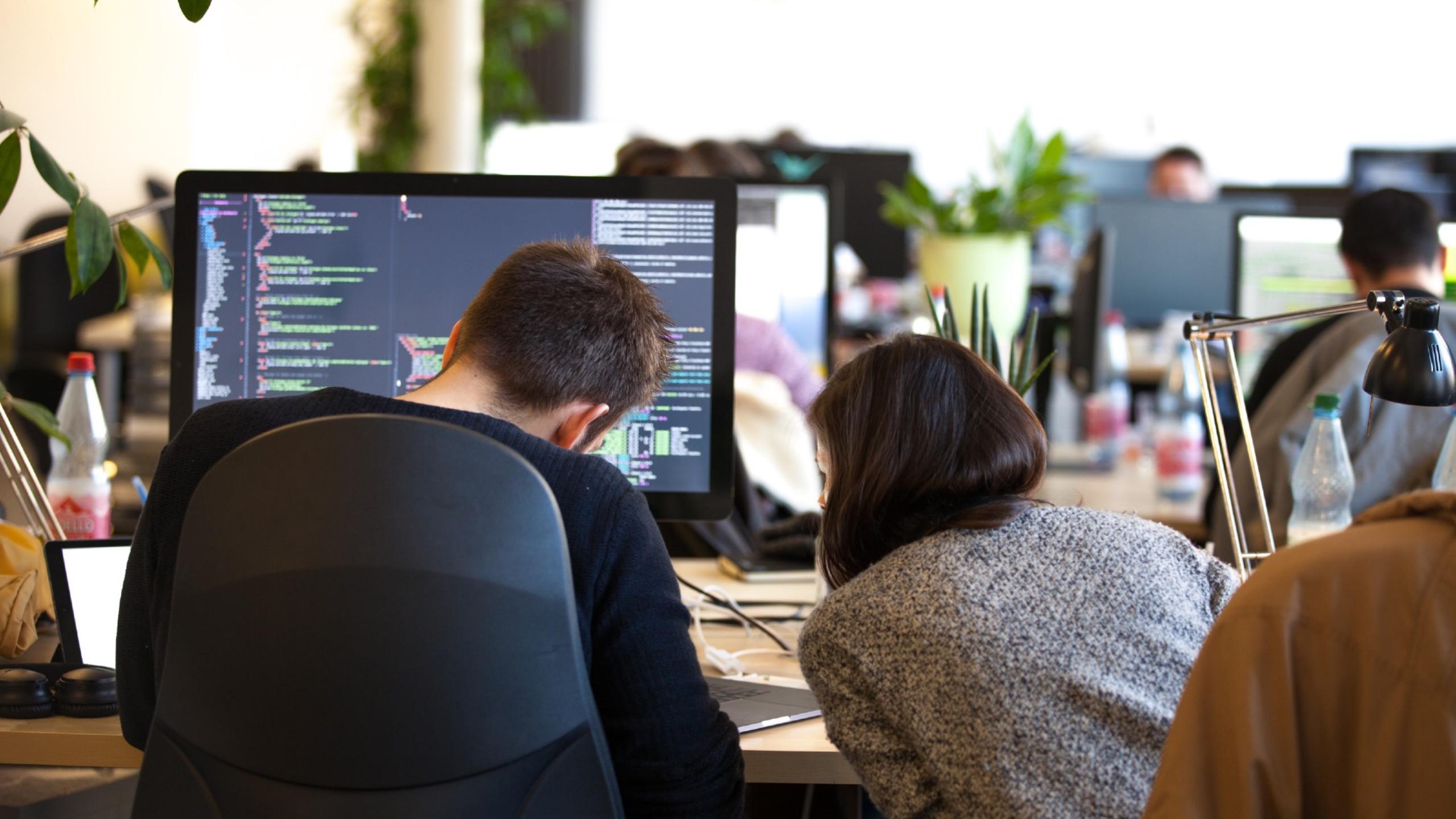
✓ €58.50  
03/16/2017 - 18:24 VISA 1010

€8.50  
03/24/2017 - 15:41

Continue with full refund or input partial refund amount

€ 22.80

Cancel Next



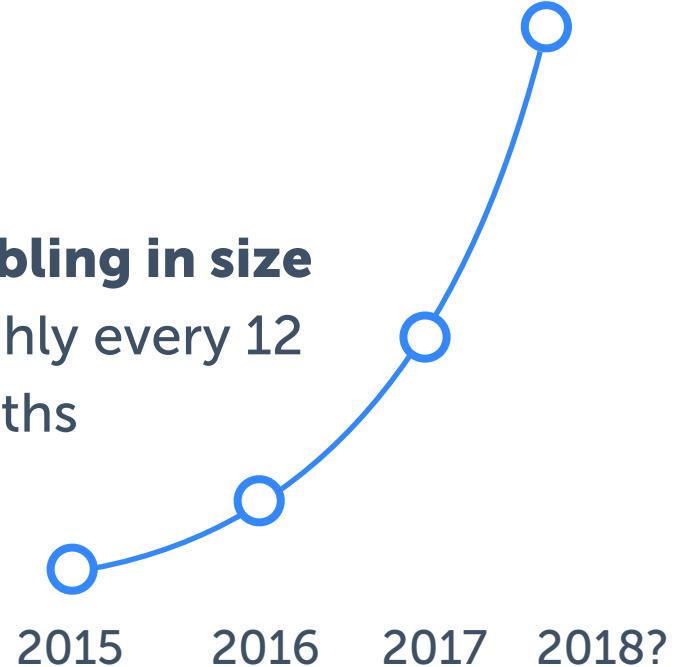
# Now imagine



**Engineering teams in  
three countries and  
timezones**



**Doubling in size**  
roughly every 12  
months



How can we **scale the team** and  
**product offering** while increasing  
**developer efficiency** and providing a  
**consistent user experience?**

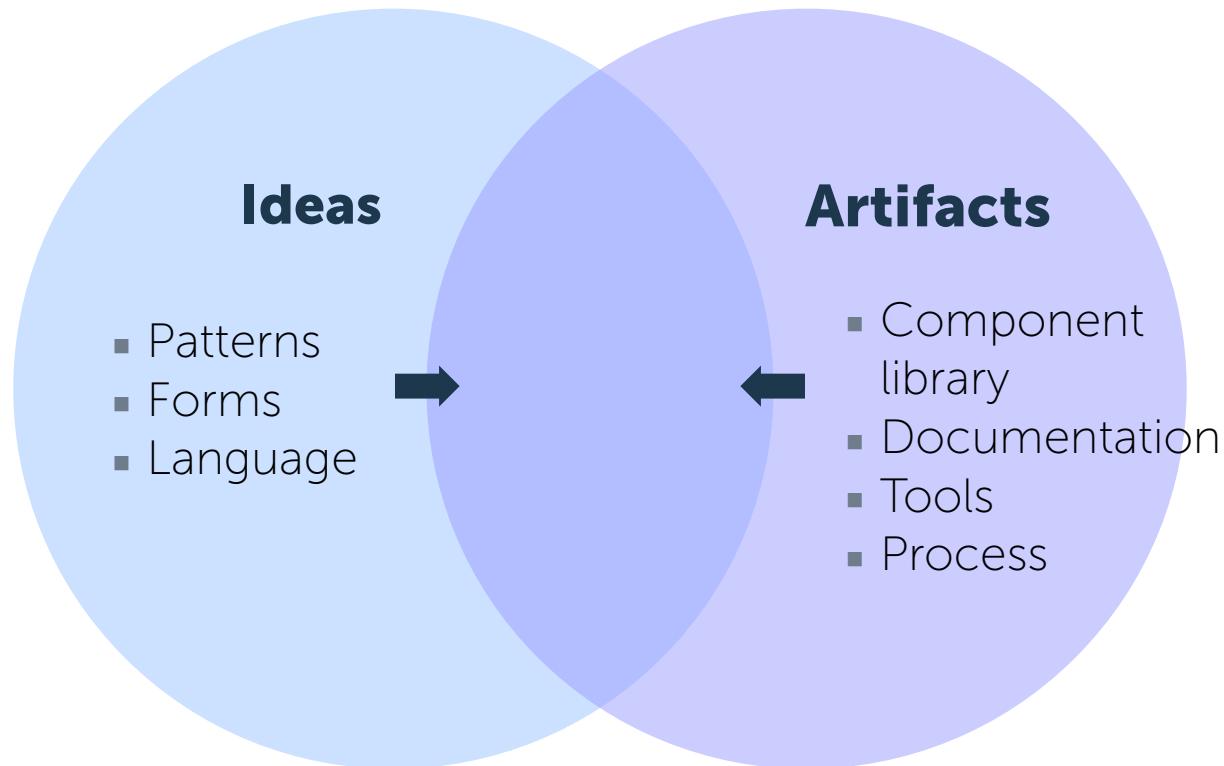
We need a  
system.

A  
**design system.**

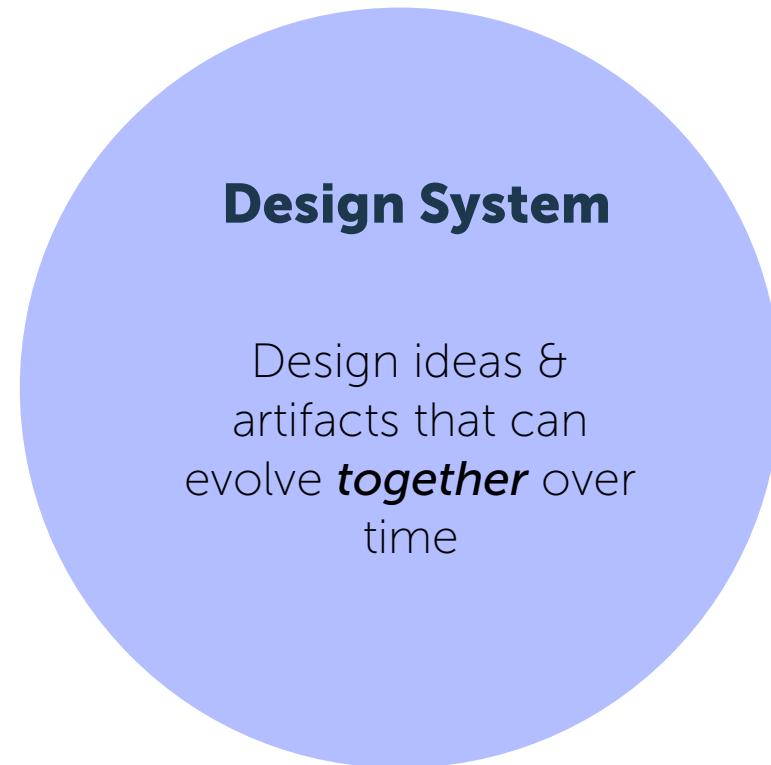
“ A design system is a collection of **reusable components**, guided by **clear standards**, that can be assembled together to build **any number of applications**. ”

- Will Fanguy, Invision

# Elements of a design system



# Elements of a design system



# How a design system helps you scale

- Component library ➔ Stop solving solved problems.
- Documentation ➔ Help people answer their own questions.
- Tools ➔ Make it easy to evolve & create a single source of truth.
- Process ➔ Allow many contributions while keeping quality high.

# Our (frontend) scaling challenges

## People



Growing & distributed team in three countries.

## Products



Expanding product offering and diverse tech stack.

## Processes



More and more teams working in parallel.

# Our scaling solutions

## People



Growing & distributed team in  
three countries:

**Component library workbench  
& documentation**

## Products



Expanding product offering and  
diverse tech stack:

**Enable theming & static CSS  
extraction**

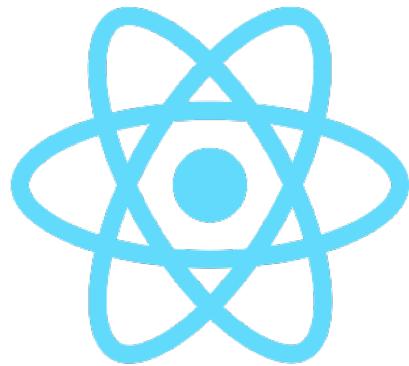
## Processes



More and more teams working in  
parallel:

**Automated documentation &  
tests for regressions**

# Why React?



React JS

# A brief history of web development



**HTML**  
for structure

`templates/*.html`



**Javascript**  
for behavior

`scripts/*.js`



**CSS**  
for design

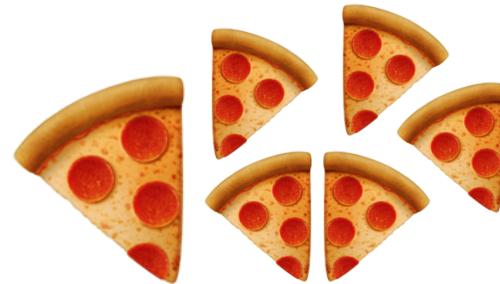
`styles/*.css`

# A brief history of web development



**HTML**  
for structure

templates/\*.html



**Javascript**  
for behavior

scripts/\*.js

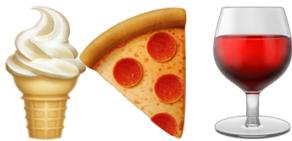


**CSS**  
for design

styles/\*.css

```
<div class="my-global-name"></div>  $('.'my-global-name') .my-global-name { color: red; }
```

# A brief history of web development



## COMPONENT A

structure, behavior, design

`ComponentA.js`

`<ComponentA />`



## COMPONENT B

structure, behavior, design

`ComponentB.js`

`<ComponentB />`



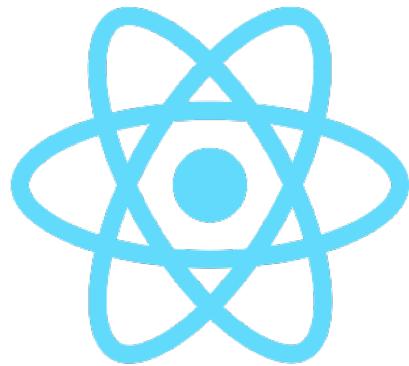
## COMPONENT C

structure, behavior, design

`ComponentC.js`

`<ComponentC />`

# Why React?



React JS

# Our scaling solutions

## People



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Expanding product offering and  
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**Enable theming & static CSS  
extraction**

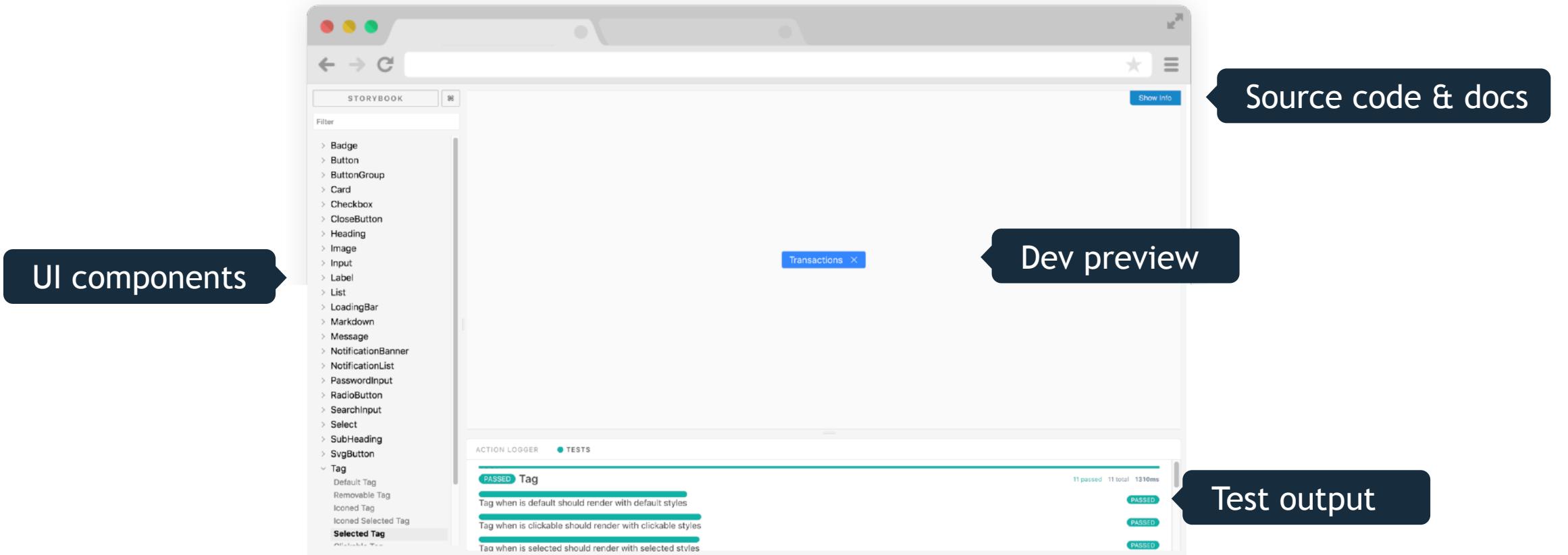
## Processes



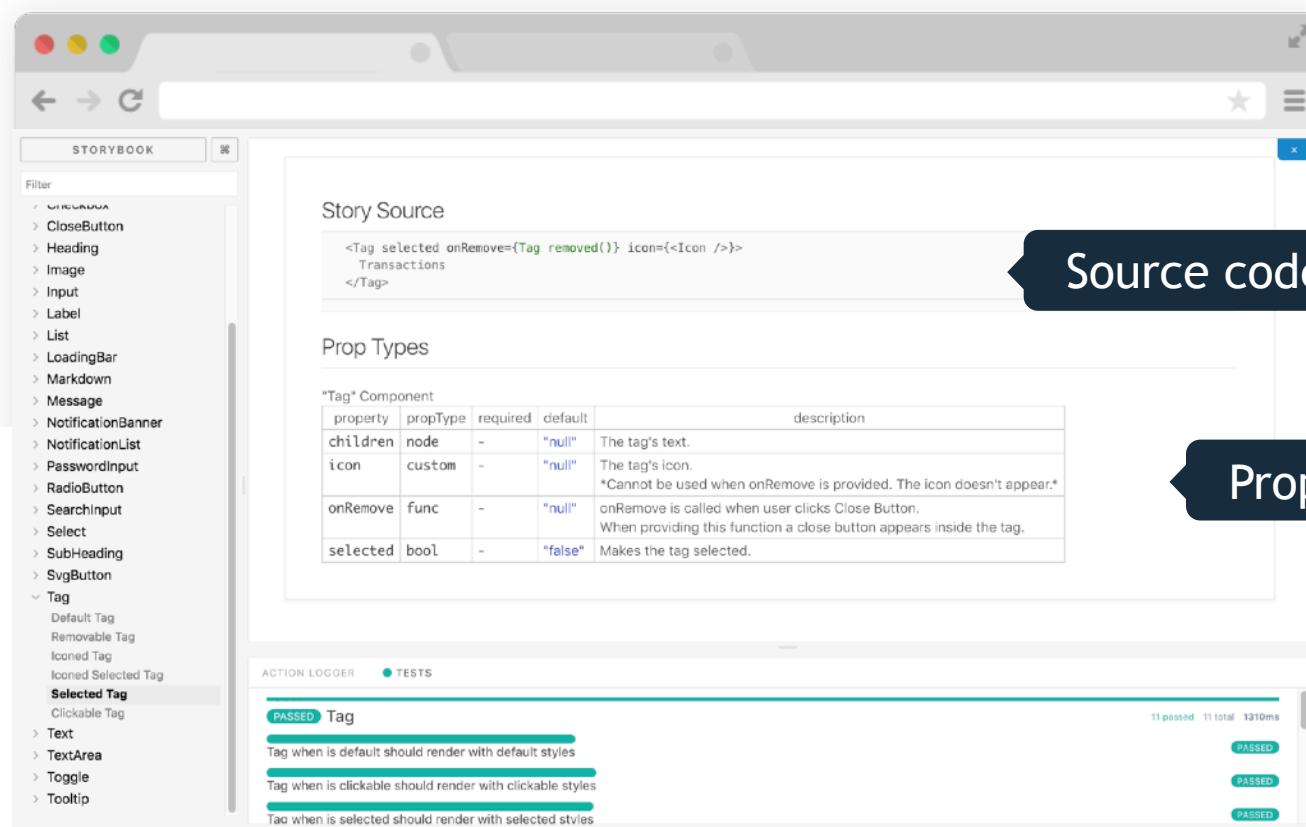
More and more teams working in  
parallel:

**Automated documentation &  
tests for regressions**

# Component library workbench



# In-context documentation



Source code & docs

Source code

Props and proptypes

# What does this give us?

- A productive developer experience ➔ Efficiency!
- Keeps our UI components free of application logic ➔ Reusability!
- Easy to find what components are available ➔ Discoverability!

# Our scaling solutions

# People



# Growing & distributed team in three countries:

# Component library workbench & documentation

## Products



Expanding product offering and  
diverse tech stack:

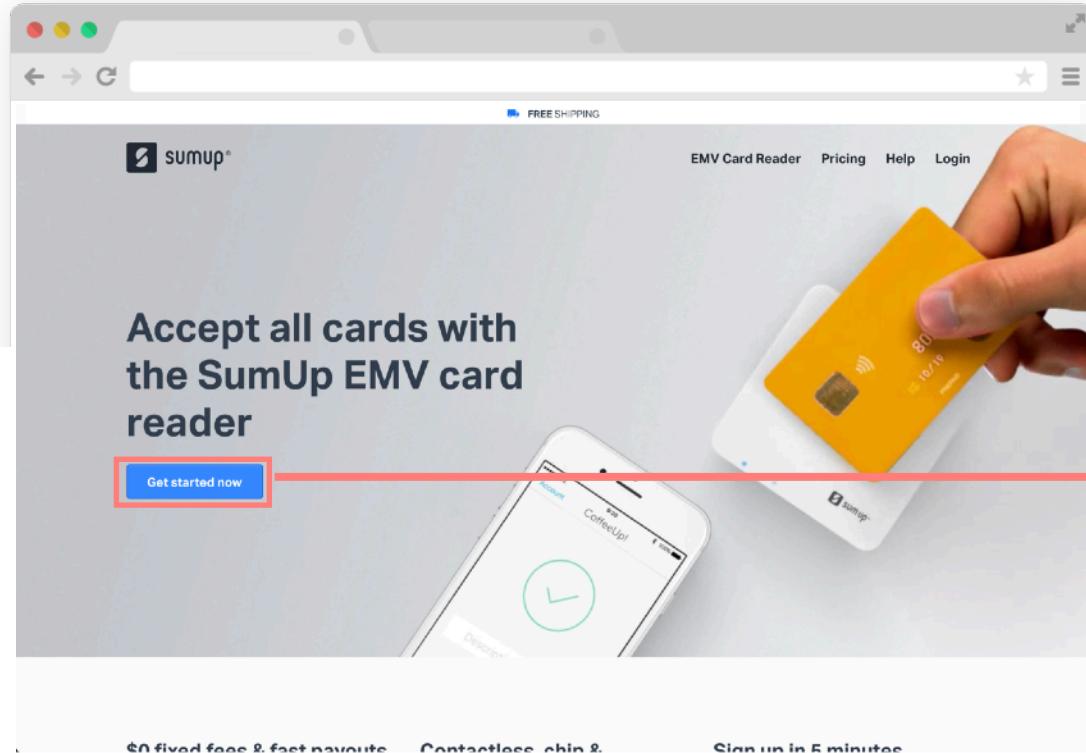
# Enable theming & static CSS extraction

# Processes

More and more teams working in parallel:

# Automated documentation & tests for regressions

# What do I mean by theme?



[sumup.com](https://sumup.com)

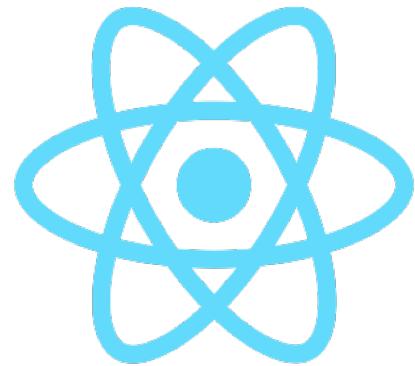


SumUp. A better way to get paid



[compraqui.cl](https://compraqui.cl)

# The tech we use



**React JS**

View library



**Emotion**

css-in-js

# Scaling for more products with themes

CSS

```
const styles = ({ theme }) => css`  
  label: tag;  
  background-color: ${theme.colors.white}  
`;
```

HTML

```
const Tag = styled('span')(styles);  
  
export default Tag;
```

# Scaling for more products with themes

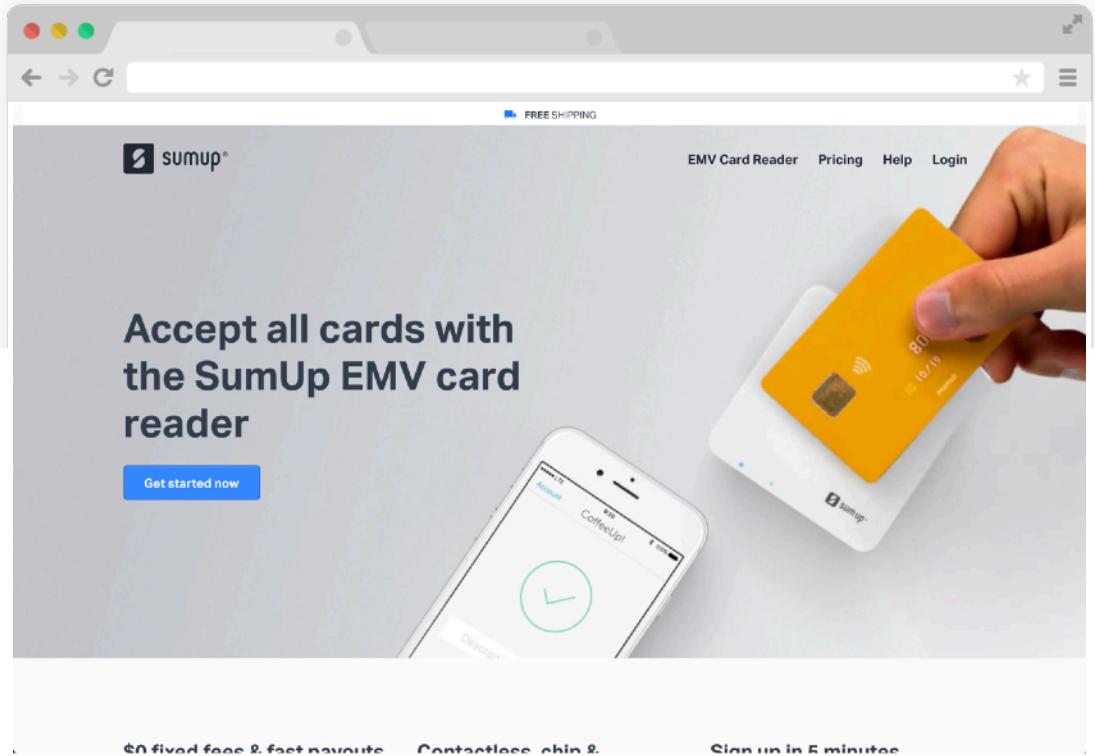
Theme

```
export const theme = {  
  colors: {  
    primary: 'cornflower',  
    white: '#FFF',  
    black: '#111'  
  }  
};  
  
/—————/
```

CSS

```
const styles = ({ theme }) => css`  
  label: tag;  
  background-color: ${theme.colors.white}  
`;
```

# Using themes on our website



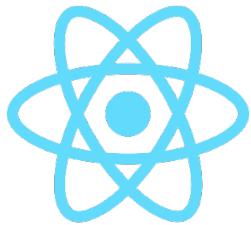
[sumup.com](https://sumup.com)



[compraqui.cl](https://compraqui.cl)

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# Our diverse (web) tech stack



## React JS

Javascript view library



## Next JS

React server-side rendering framework



## Elm

Compiles to Javascript



## Jekyll

Static-site generator



## Riot JS

React-like microframework



## Ruby on Rails

Traditional web app



marketing cloud

## Marketing cloud

Emails & landing pages

# Scaling a design system across tech stacks

<Tag/>

Transactions

<Tag selected/>

Transactions X

Relies on both parameters  
("selected") and theme  
("primary color")

# Scaling a design system across tech stacks

<Tag/>

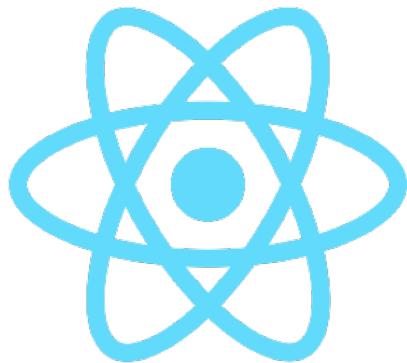
Transactions

<Tag selected/>

Transactions X

CSS = (n \* theme) \* params!

# The tech we use



**React JS**

View library



**Emotion**

css-in-js



**Node**

CSS generation  
script

# Scaling a design system across tech stacks

Base CSS

```
const styles = ({ theme }) => css`  
  label: tag;  
  background-color: ${theme.colors.white}  
`;
```

Modifying CSS

```
const selectedStyles = ({ theme, selected }) =>  
  selected &&  
  css`  
    label: tag--selected;  
    background-color: ${theme.colors.primary}  
`;
```

```
const Tag = styled('span')(styles, selectedStyles);  
  
export default Tag;
```

# Scaling a design system across tech stacks

React apps

```
import { Tag } from 'our-library';

<Tag selected onRemove={fn}>
  Transactions
</Tag>
```

Transactions X

Plain CSS

```
<link rel="stylesheet" href="https://static.sumup.com/
our-library.1.0.css">

<span class="tag tag--selected" onclick="myFn">
  <span class="tag__content">
    Hi
  </span>
</span>
```

# The best of both worlds



Modern CSS & easy  
theming



Ability to style older or  
3rd party apps

# Our scaling solutions

## People



Growing & distributed team in  
three countries:

**Component library workbench  
& documentation**

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diverse tech stack:

**Enable theming & static CSS  
extraction**

## Processes



More and more teams working in  
parallel:

**Automated documentation &  
tests for regressions**

# Automatically-generated documentation

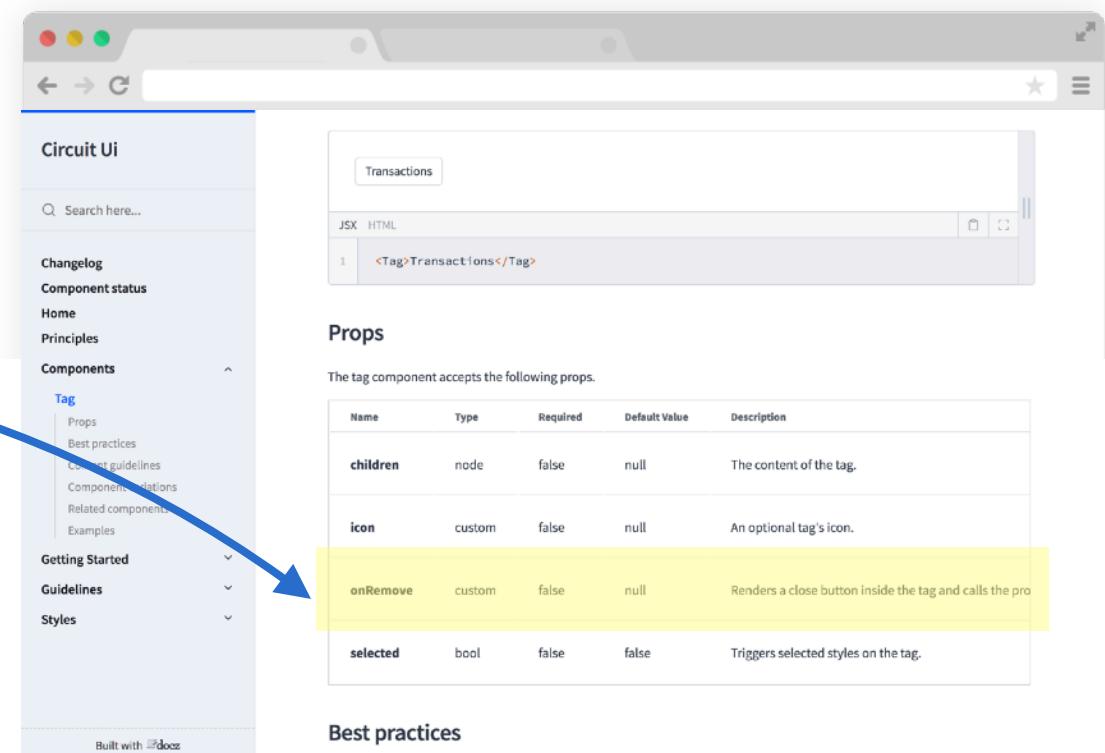
The screenshot shows a web browser window displaying a documentation page for the 'Tag' component within the 'Circuit UI' project. The left sidebar contains links for 'Changelog', 'Component status', 'Home', 'Principles', 'Components' (with 'Tag' selected), 'Props', 'Best practices', 'Content guidelines', 'Component variations', 'Related components', and 'Examples'. Under 'Getting Started', there are sections for 'Guidelines' and 'Styles'. At the bottom of the sidebar, it says 'Built with docz'. The main content area has a title 'Tag' with an 'EDIT PAGE' button. Below the title is a code editor showing a JSX snippet: `<Tag>Transactions</Tag>`. The 'Props' section is expanded, showing the following table:

| Name            | Type   | Required | Default Value | Description   |
|-----------------|--------|----------|---------------|---|
| <b>children</b> | node   | false    | null          | The content of the tag.                                 |
| <b>icon</b>     | custom | false    | null          | An optional tag's icon.                                 |
| <b>onRemove</b> | custom | false    | null          | Renders a close button inside the tag and calls the pro |
| <b>selected</b> | bool   | false    | false         | Triggers selected styles on the tag.                    |



# Automatically-generated documentation

```
/**  
 * A tag component.  
 */  
const Tag = styled('span')(styles);  
Tag.propTypes = {  
  /**  
   * Renders a close button inside  
   * the tag and calls the prop onClick.  
   */  
  onRemove: PropTypes.func  
};  
  
/**  
 * @component  
 */  
export default Tag;
```



The screenshot shows a browser window displaying the automatically-generated documentation for the `Tag` component. The left sidebar contains navigation links for `Circuit UI`, `Changelog`, `Component status`, `Home`, `Principles`, `Components` (with `Tag` selected), `Getting Started`, `Guidelines`, and `Styles`. The main content area has a header "Transactions" and a breadcrumb trail "JSX > Transactions > Tag". Below this, the "Props" section lists the following properties:

| Name                  | Type   | Required | Default Value | Description   |
|-----------------------|--------|----------|---------------|---|
| <code>children</code> | node   | false    | null          | The content of the tag.                                 |
| <code>icon</code>     | custom | false    | null          | An optional tag's icon.                                 |
| <code>onRemove</code> | custom | false    | null          | Renders a close button inside the tag and calls the pro |
| <code>selected</code> | bool   | false    | false         | Triggers selected styles on the tag.                    |

The "onRemove" row is highlighted with a yellow background. A blue arrow points from the explanatory comment in the code sample to this row in the documentation.

# Tests for regressions

```
describe('Tag', () => {
  it(
    'should render selected styles',
    () => {
      const component = create(
        <Tag selected>SomeTest</Tag>
      );
      expect(component).toMatchSnapshot();
    }
  );
});
```

# Tests for regressions

## Our component

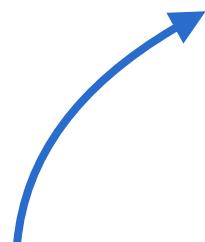
Tag.js

## Our tests

Tag.spec.js

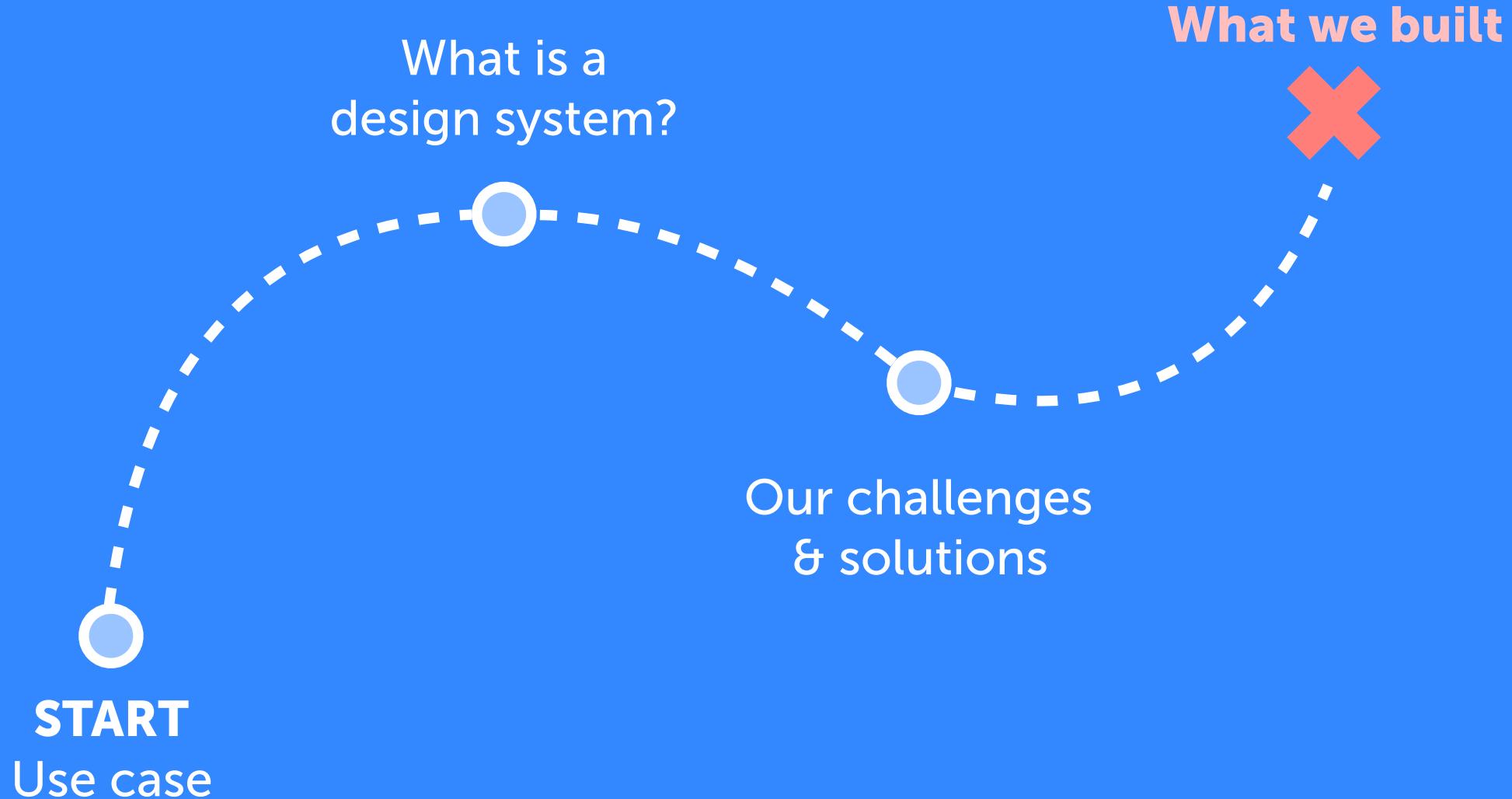
## Our snapshots

\_snapshots\_/Tag.spec.js.snap



```
exports[`Tag when is selected should render with selected styles 1`] = `  
.circuit-0 {  
  padding: 4px 12px;  
  border-radius: 4px;  
  border: 1px solid #D8DDE1;  
  font-size: 15px;  
  line-height: 24px;  
  cursor: default;  
- background-color: #3388FF;  
+ background-color: #EEE;  
  color: #FFFFFF;  
}  
  
<span  
  className="circuit-0 circuit-1"  
  selected={true}  
>  
  SomeTest  
</span>  
`;
```

# Where we've been today



**Get started now**

**Get started now**

**Get started now**

**CONTINUE**

**Chip & PIN**

**CHARGE**  
3

 1 2 > »

**CHARGE**

**DONE**

**CHANGE**

 **Sign Up**

**Learn more**

**Learn more**

✓ Yes ✘ No



**Get started now**

**Get started now**

**Get started now**

■ Block A

**Disable employee**

🔥 Chargeback ▾

**Cancel**

**Cancel**

**Send**



**Apply**

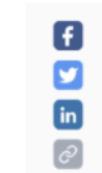
**Apply**

Place your order

 **Live Support**

**LOGIN**

Don't have an account? [Sign up](#)



Dublin, IE  
Dublin, IE

**NO TIP** 10%  
1.29€

**NO TIP** 10%  
1.29€

**21%**

**17%**

**Receipt** ▾

**Receipt** ▾

Emailed (HTML)  
Printed (PNG)

 **Search**

 **Filter**

 **Submit**

 **Edit**

**Review selected**

**New DCS Merchant Id**

**How can we help?**

Search

Popular articles: [Introducing EKA](#), [Associated cards](#), [Compatibility](#)

**Getting Started**  
Find out everything you need to know before signing up.

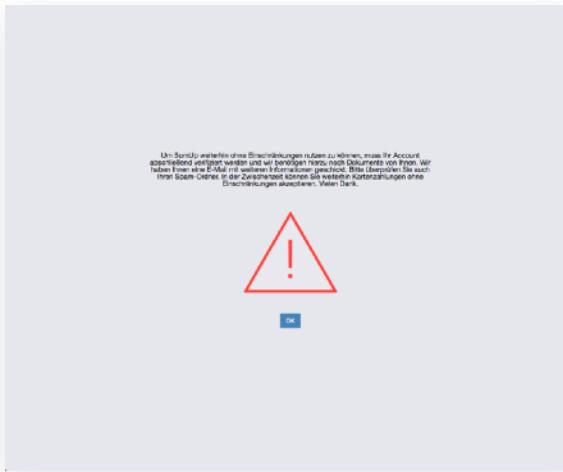
**Using SumUp**  
Need help while using SumUp Networks, we've got you covered.

**See all articles** **See all articles**

**Promoted articles**

[Pricing and fees](#) [Accept card payments](#) [Payouts](#)  
[Payment Reports](#) [Change bank account](#) [Troubleshooting Card Reader](#)  
[My SumUp Account](#) [Activate account](#) [Sales History](#)

**Help**



**eCom Checkout API**

Extend your integration to include our Checkout API to accept payments in your website or app. Both, stand-alone or as omnichannel in combination with the mPOS integration.

[View checkout documentation](#)

**Omnichannel**  
Allow your merchant base to get paid whether or not the cardholder is present.

**Marketplace solution**  
Keep your marketplace compliant with our digital IVC process.

**Complete portfolio**  
Full suite of card-not-present solutions, incl. eCheck-out, Accept SDK over the phone / MOTO, mobile payments and card on file functionality.

**Accept all cards with the SumUp EMV card reader**

**Get started now**

**Contactless, chip & magstripe**  
Connects via Bluetooth. Compatible with iOS/Android smartphones and tablets.

**\$0 fixed fees & fast payouts**  
Only pay 2.75% per transaction. Direct payout to your bank account. No paperwork.

**Sign up in 5 minutes**  
100% online. No additional contract. No paperwork.

**SumUp SDK & API Integration**

Connect your app to the most powerful payment platform and card terminals in the world.

**Terminal Payment**  
To integrate SumUp's proprietary Card Terminal into your app, we provide you with mobile Payment SDKs and API.

**Checkouts**  
Integrate SumUp Checkouts in your mobile or web applications.

**REST API**  
The REST API and SDKs identify SumUp applications and users using OAuth.

**OAuth**  
The REST API and SDKs provide programmatic access to manage merchant accounts and their resources.

**Manage Apps**

**Login**

Your email address  Your password   
**Login**

[Forgot your password?](#) [Create an account](#)

**Check Compatibility**

Does your phone support the SumUp Air Card Reader?

We are sorry, but we have not tested SumUp Air with your device yet. Find out [here](#) about the general compatibility requirements for using the SumUp Card Reader.

**Overview**

09/21/2017 - 11/22/2017

**Total sales revenue**  
321.17 €  
Total sales revenue  
This is a 28.48% increase over the 256.00 € of the previous period.

**Amount / Count**

**Current payout**  
2.55 €

**Highest sales revenue**  
Thursday 09/28/2017 124.45 €

**Lowest sales revenue**  
Multiple occurrences 0,00 €

**Transactions**

**Shop**

**Employees**

**Virtual Terminal**

**Refer a friend**

**Support**



sumup®

CIRCUIT

|       |         |
|-------|---------|
| Green | #62DE76 |
| 700   | #49B858 |
| 900   | #2F903E |

Zetta Heading 42/48

Exa Heading 36/44

Peta Heading 28/32

Tera Heading 24/32

Giga Heading 22/24

Mega Heading 19/24

Kilo Heading 17/24

MEGA SUBHEADING 14/18 UPPERCASE

KILO SUBHEADING 12/20 UPPERCASE

Giga Text 18/28

Mega Text 15/24

Kilo Text 13/20

Giga Text 18/28

Mega Text 15/24

Kilo Text 13/20

|         |         |
|---------|---------|
| 100     | #FAFBFC |
| 300     | #D8DDE1 |
| Neutral | #9DA7B1 |
| 700     | #5C656F |
| 900     | #212933 |

|        |         |
|--------|---------|
| 100    | #F2E5CB |
| 300    | #F7DA9F |
| Yellow | #FFC859 |
| 700    | #D4A546 |
| 900    | #AB8433 |

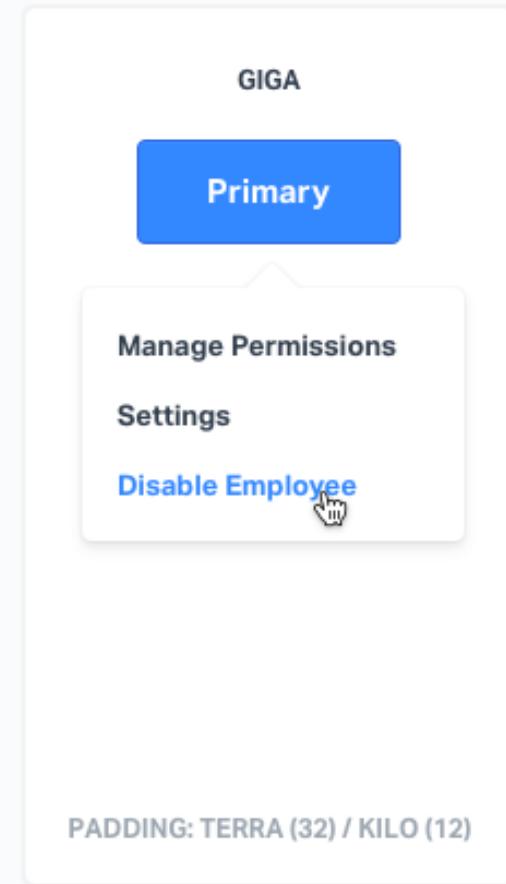
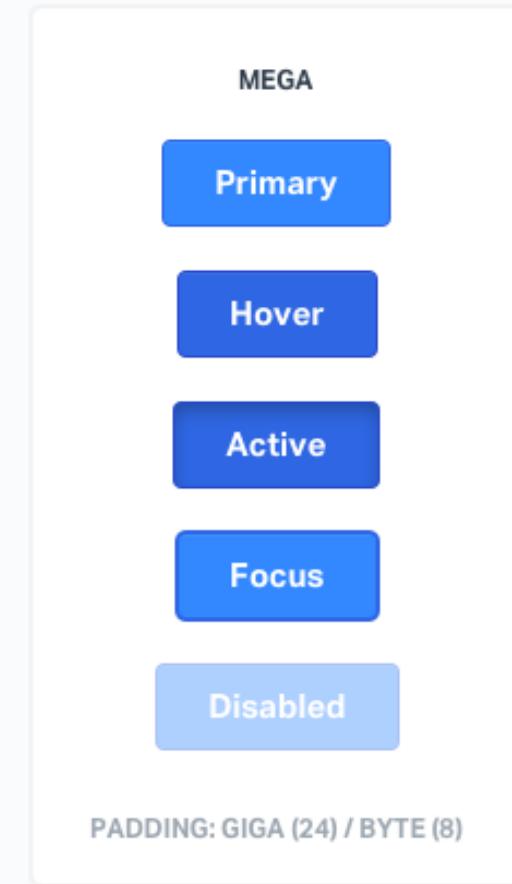
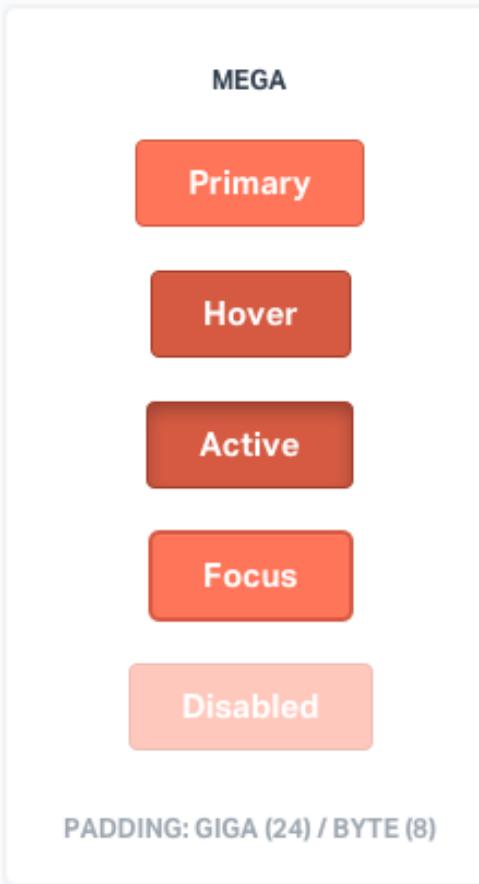
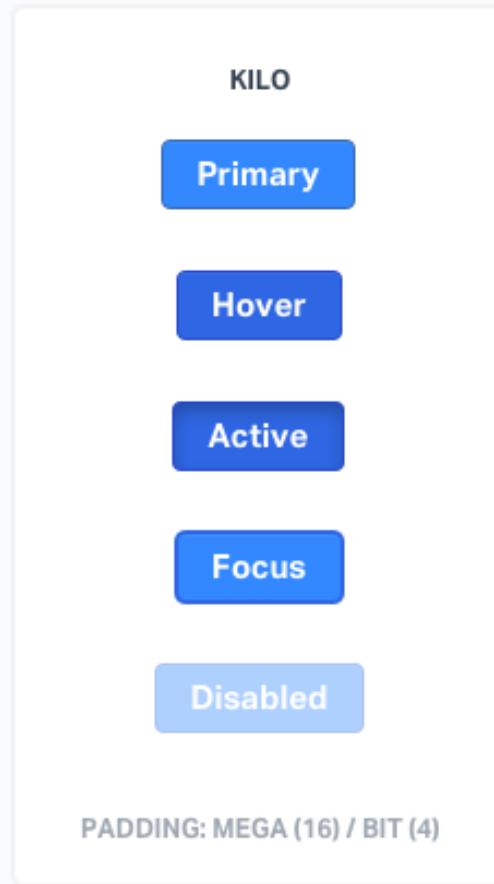
|      |         |
|------|---------|
| 100  | #DAEAFF |
| 300  | #7FB5FF |
| Blue | #3388FF |
| 700  | #2567D8 |
| 900  | #1641AC |

|     |         |
|-----|---------|
| 100 | #FFE6E1 |
| 300 | #FFAF9F |
| Red | #FF7559 |
| 700 | #D55A41 |
| 900 | #A73D28 |

|       |         |
|-------|---------|
| 100   | #C6E5CB |
| 300   | #97E2A3 |
| Green | #62DE76 |

|       |         |
|-------|---------|
| White | #FFFFFF |
| Black | #0F131A |





[Overview](#)[Transactions](#)[Virtual Terminal](#)[Employees](#)[Shop](#)[Support](#)[Settings](#)

## Virtual Terminal

Enter your customer's card data to process the payment. For more information regarding Virtual Terminal fees, please refer to this [Support Centre article](#).

Amount

123.45 €

Description

Name on card



Card number

Expiration date

Verification code ⓘ

MM/YY

123

Continue

```
import { Heading, Text, etc } from '@sumup/circuit-ui';
```

## P.s. It's open source

<https://github.com/sumup/circuit-ui>

# Thank you.