



February 2019

# ***Building a design system with (p)react***

~ Bart Waardenburg – Front-End Lead @ ANWB



# *Topics*

1. What is a design system?
2. The process we have in place.
3. The technical choices we had to make.

*Design system?*



“

**A design system offers a library of visual style, components, and other concerns documented and released by an individual, team or community as code and design tools so that adopting products can be more efficient and cohesive.**

~ Nathan Curtis – Founder & Designer @ Eightshapes

# *Why use a Design System?*



## Better consistency

All products use the same design & development standards.



## Ship faster

Teams can design & develop products more quickly.



## Higher quality

Hard design & development challenges are solved together and do not need to be repeated.

## *The Great Divide*

The list of skills required for building web applications is getting longer and longer.

# *Our design system*



# *Organization structure*

**14**

Teams

**30**

Front-end developers

**121**

Front-end applications

*Poncho*



# *What does Poncho include?*



## Documentation

Everything needed to explain the visual language (colors, typography, tone and voice, etc.).



## Sketch Symbols

Symbols for User Experience designers to mock up applications and the rationales for using them.



## Preact Components

Components build using Preact which developers can use to assemble their products.

# *Shipping products*

The screenshot shows a web browser window for the ANWB Search Application. The URL is `localhost:8081/?q=wegenwacht`. The page has a blue header with the ANWB logo and navigation links like 'files', 'Routeplanner', 'Winkels', 'Contact & service', 'Mijn ANWB', 'Wegenwacht', 'Verzekeringen', 'Verkeer', 'Auto', 'Vrije tijd', 'Vakantie', 'Webwinkel', 'Lidmaatschap', and a search bar with the text 'Zoek' and a magnifying glass icon.

**ANWB Search Application**

**Thema's**

- Vakantie (1785)
- Auto (1171)
- Over ANWB (530)
- Fietsen (416)
- Kamperen (331)
- Vrije Tijd (320)
- Verkeer (302)
- Wandelen (285)
- Wegenwacht (197)
- Zakelijk (56)

**wegenwacht** Zoek

**11357 resultaten op 'wegenwacht'**

**Kampioen Editie**

Word lid van de Wegenwacht en u krijgt altijd pechhulp op maat →

Staat u nu met pech? Bel 088 2692 888 of bezoek deze pagina →

A sidebar on the right side of the search results contains a user profile picture of a woman and text: "Je wilt meer informatie over de (pechhulp van) Wegenwacht Service. Waar wil je meer over weten?" followed by several links: "Ik heb al pechhulp →", "Ik wil graag pechhulp →", "Ik heb nu pechhulp nodig →", and "Ik ben op zoek naar Wegenwacht miniaturen →".

# Search on anwb.nl

Build within only a single day, because all UI components were already there.

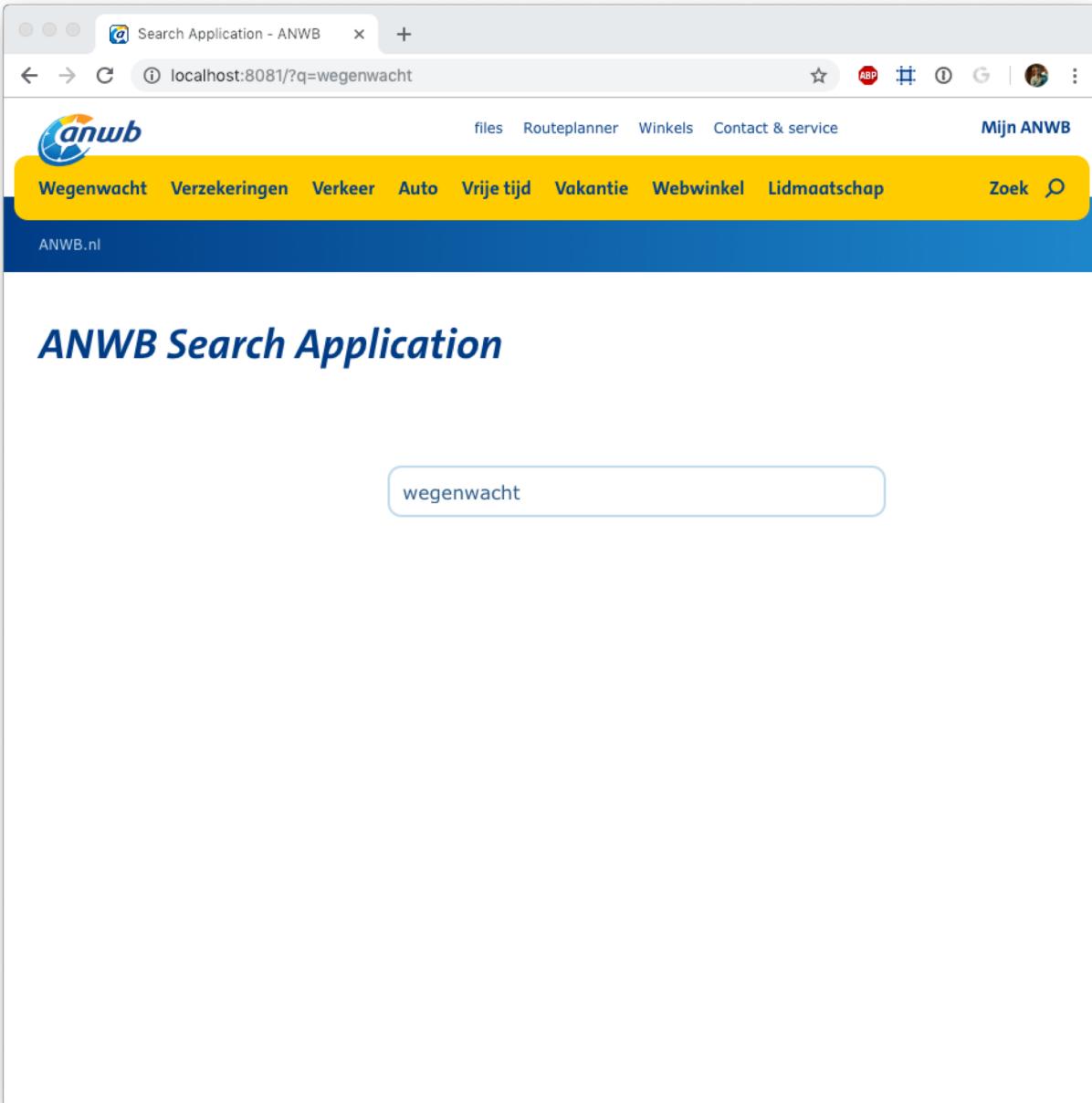


A screenshot of a web browser window titled "Search Application - ANWB". The URL is "localhost:8081/?q=wegenwacht". The page displays a search interface with a sidebar on the left containing categories like "Thema's" (Vacantie, Auto, Over ANWB, etc.) and "Kampioen Editie". The main area shows a search bar with "wegenwacht" and a "Zoek" button. Below the search bar, there is a message from a user profile picture: "Je wilt meer informatie over de (pechhulp van) Wegenwacht Service. Waar wil je meer over weten?". Below this are four links: "Ik heb al pechhulp →", "Ik wil graag pechhulp →", "Ik heb nu pechhulp nodig →", and "Ik ben op zoek naar Wegenwacht miniaturen →". A large section below is titled "11357 resultaten op 'wegenwacht'" and contains promotional text: "Word lid van de Wegenwacht en u krijgt altijd pechhulp op maat →" and "Staat u nu met pech? Bel 088 2692 888 of bezoek deze pagina →". At the bottom, there is a link to "Wegenwacht Service →" with the URL "https://www.anwb.nl/wegenwacht/actie".

# Search on anwb.nl

Build within only a single day, because all UI components were already there.





A screenshot of a web browser window titled "Search Application - ANWB". The URL in the address bar is "localhost:8081/?q=wegenwacht". The page header includes the ANWB logo, a navigation menu with links like "files", "Routeplanner", "Winkels", "Contact & service", "Mijn ANWB", and a yellow search bar with the text "Zoek" and a magnifying glass icon. Below the header is a blue banner with the text "ANWB.nl". The main content area is titled "ANWB Search Application" and features a search input field containing the word "wegenwacht".

# Search on *anwb.nl*

Build within only a single day, because all UI components were already there.



# Search on anwb.nl

The screenshot shows a Storybook interface for the "FormFieldAutosuggest" component. At the top, there's a header with tabs for "Storybook" and a URL bar showing "localhost:9001/?selectedKind=Forms%7CFields%2FFormFieldAutosuggest&selectedStory=Default&full=0&ad...". Below the header, there's a section titled "Autosuggest (optioneel)" with a text input field. Underneath, there's a "Story Source" section containing the code "<Form/>" and a "Copy" button. A "Prop Types" section follows, featuring a table for the "FormFieldAutosuggest" component:

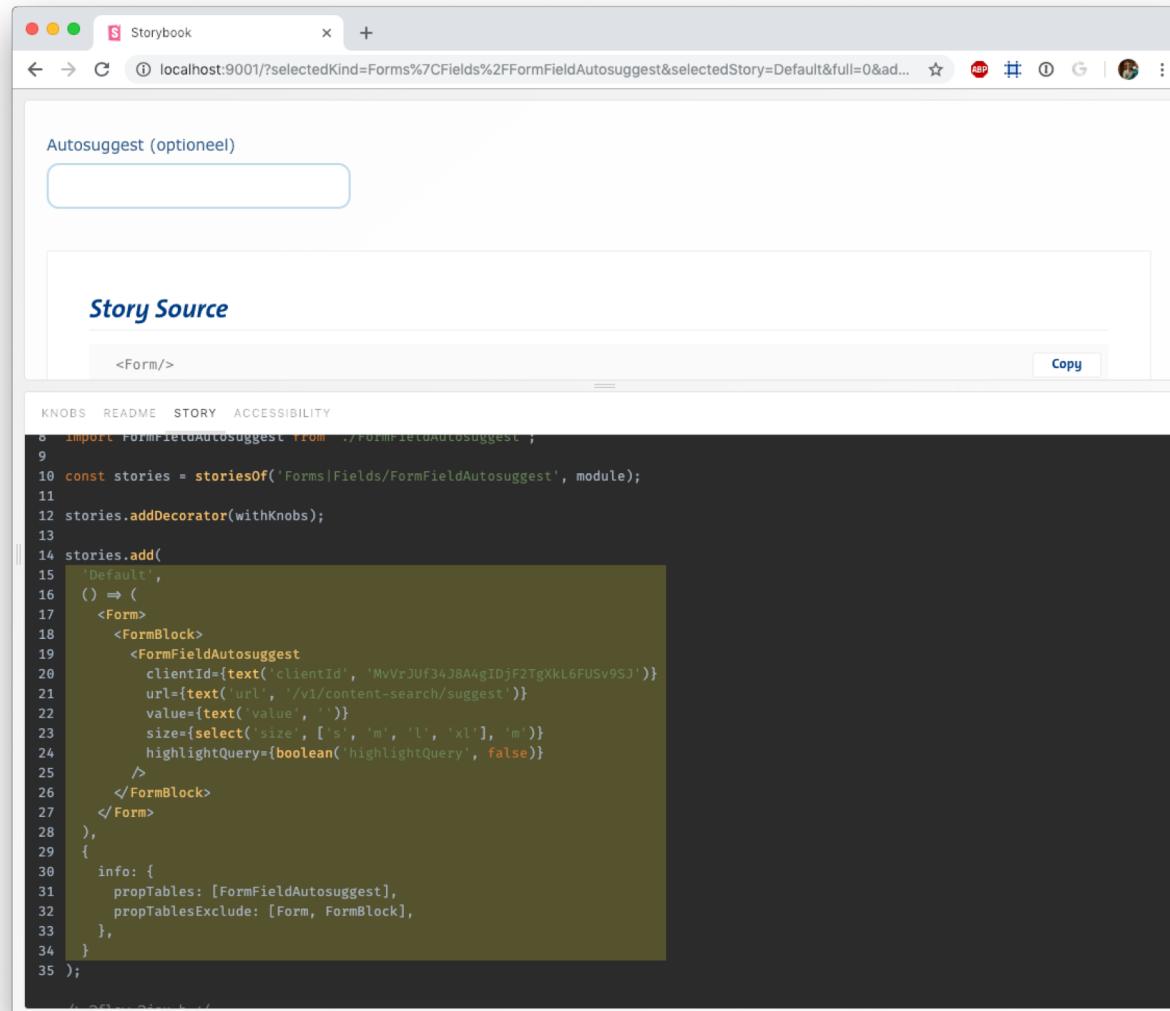
property	propType	required	default	description
size	's'   'm'   'l'   'xl'	-	undefined	The size of the component
reference	string	-	'autosuggest'	A unique reference to the input element
name	string	-	'autosuggest'	The name of the element
label	string	-	'Autosuggest'	The label for the element
value	string	-	" "	The value of the element
required	boolean	-	false	Whether the element is required

At the bottom, there's a "KNOBS" section with fields for "clientId" (containing "MvVrJUf34J8A4gIDjF2TgXkL6FUSv9SJ"), "url" (containing "/v1/content-search/suggest"), "value" (empty), "size" (set to "m"), and "highlightQuery" (with a checked checkbox). There are also "COPY" and "RESET" buttons.

Build within only a single day, because all UI components were already there.



# Search on anwb.nl



The screenshot shows a Storybook interface for a search component. At the top, there's a header with tabs for 'Storybook' and a URL bar pointing to 'localhost:9001/?selectedKind=Forms%7CFields%2FFormFieldAutosuggest&selectedStory=Default&full=0&ad...'. Below the header, a search input field is displayed with the placeholder 'Autosuggest (optioneel)'. To the right of the input field is a 'Copy' button. Underneath the input field, the heading 'Story Source' is visible, followed by a code block. The code is a JavaScript file showing how the search component is implemented using React components like `<Form>`, `<FormBlock>`, and `<FormFieldAutosuggest>`. The code also includes props such as `clientId`, `url`, `value`, `size`, and `highlightQuery`.

```
8 import FormFieldAutosuggest from './FormFieldAutosuggest';
9
10 const stories = storiesOf('Forms|Fields/FormFieldAutosuggest', module);
11
12 stories.addDecorator(withKnobs);
13
14 stories.add(
15   'Default',
16   () => (
17     <Form>
18       <FormBlock>
19         <FormFieldAutosuggest
20           clientId={text('clientId', 'MvViJUf34j8A4gIDjf2TgXkL6FUSv9SJ')}
21           url={text('url', '/v1/content-search/suggest')}
22           value={text('value', '')}
23           size={select('size', ['s', 'm', 'l', 'xl'], 'm')}
24           highlightQuery={boolean('highlightQuery', false)}
25         />
26         <FormBlock>
27       </Form>
28     ),
29   {
30     info: {
31       propTables: [FormFieldAutosuggest],
32       propTablesExclude: [Form, FormBlock],
33     },
34   },
35 );
```

Build within only a single day, because all UI components were already there.



A screenshot of a web browser window titled "Search Application - ANWB". The URL in the address bar is "localhost:8081/?q=wegenwacht". The page header includes the ANWB logo, navigation links for "files", "Routeplanner", "Winkels", "Contact & service", and "Mijn ANWB". A yellow navigation bar contains links for "Wegenwacht", "Verzekeringen", "Verkeer", "Auto", "Vrije tijd", "Vakantie", "Webwinkel", and "Lidmaatschap", along with a search bar labeled "Zoek" and a magnifying glass icon. Below the header is a blue banner with the text "ANWB.nl". The main content area is titled "ANWB Search Application" and features a search input field containing "wegenwacht" and a blue "Zoek" button.

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



The screenshot shows a web browser window for the ANWB Search Application. The URL is `localhost:8081/?q=wegenwacht`. The page has a blue header bar with the ANWB logo and navigation links: files, Routeplanner, Winkels, Contact & service, Mijn ANWB, Wegenwacht, Verzekeringen, Verkeer, Auto, Vrije tijd, Vakantie, Webwinkel, Lidmaatschap, and a search bar labeled 'Zoek' with a magnifying glass icon. Below the header is a blue banner with the text 'ANWB.nl'. The main content area is titled 'ANWB Search Application'. It features a sidebar on the left with a heading 'Thema's' and a dropdown menu containing the following items:

- Vakantie (1785)
- Auto (1171)
- Over ANWB (530)
- Fietsen (416)
- Kamperen (331)
- Vrije Tijd (320)
- Verkeer (302)
- Wandelen (285)
- Wegenwacht (197)
- Zakelijk (56)

Below the sidebar is a section titled 'Kampioen Editie' with a dropdown arrow.

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



The screenshot shows a web browser window for 'Search Application - ANWB' at 'localhost:8081/?q=wegenwacht'. The page has a blue header with the ANWB logo and navigation links like 'files', 'Routeplanner', 'Winkels', 'Contact & service', 'Mijn ANWB', and a search bar. Below the header is a yellow navigation bar with links for 'Wegenwacht', 'Verzekeringen', 'Verkeer', 'Auto', 'Vrije tijd', 'Vakantie', 'Webwinkel', and 'Lidmaatschap'. A 'Zoek' button is also in the yellow bar. The main content area is titled 'ANWB Search Application'. On the left, there's a sidebar titled 'Thema's' with a list of categories: Vakantie (1785), Auto (1171), Over ANWB (530), Fietsen (416), Kamperen (331), Vrije Tijd (320), Verkeer (302), Wandelen (285), Wegenwacht (197), and Zakelijk (56). The main search input field contains 'wegenwacht' and has a 'Zoek' button next to it. To the right of the input field, a callout box appears with a profile picture of a woman and the text: 'Je wilt meer informatie over de (pechhulp van) Wegenwacht Service. Waar wil je meer over weten?'. It lists four options: 'Ik heb al pechhulp →', 'Ik wil graag pechhulp →', 'Ik heb nu pechhulp nodig →', and 'Ik ben op zoek naar Wegenwacht miniaturen →'.

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



The screenshot shows the ANWB Search Application interface. At the top, there's a navigation bar with links for files, Routeplanner, Winkels, Contact & service, Mijn ANWB, and a search bar labeled 'Zoek'. Below the navigation is a yellow header bar with links for Wegenwacht, Verzekeringen, Verkeer, Auto, Vrije tijd, Vakantie, Webwinkel, and Lidmaatschap. The main content area has a blue header 'ANWB.nl'.

## ANWB Search Application

**Thema's**

- Vakantie (1785)
- Auto (1171)
- Over ANWB (530)
- Fietsen (416)
- Kamperen (331)
- Vrije Tijd (320)
- Verkeer (302)
- Wandelen (285)
- Wegenwacht (197)
- Zakelijk (56)

**Kampioen Editie**

wegenwacht

Zoek

**11357 resultaten op 'wegenwacht'**

*Word lid van de Wegenwacht en u krijgt altijd pechhulp op maat →*

*Staat u nu met pech? Bel 088 2692 888 of bezoek deze pagina →*

A sidebar on the right displays a message from a user named Gina, accompanied by a small profile picture of a woman with blonde hair:

Je wilt meer informatie over de (pechhulp van) Wegenwacht Service. Waar wil je meer over weten?

[Ik heb al pechhulp →](#)

[Ik wil graag pechhulp →](#)

[Ik heb nu pechhulp nodig →](#)

[Ik ben op zoek naar Wegenwacht miniaturen →](#)

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



Search Application - ANWB

localhost:8081/?q=wegenwacht

Wegenwacht het vaakst laten uitrukken. Maar zo ver willen we het natuurlijk niet laten komen! Hier dus praktische tips, om uit de wegenwachtstatistieken te blijven.

**ANWB - Wegenwacht KeuzeHulp →**  
<https://www.anwb.nl/wegenwacht/service/keuzehulp>  
Hulp nodig bij het kiezen van de juiste Wegenwacht Service? Wij helpen u bij het maken van een goede keuze. Doe de keuzeHulp!

**Wegenwacht Carmen | Wegenwacht® van ANWB →**  
<https://www.anwb.nl/wegenwacht/informatie/ledenervaringen/wegenwacht-carmen>  
Kijk mee met Carmen die opweg is om pechhulp te verlenen. De wegenwacht is behalve monteur ook EHBO opgeleid en weet alles van brandbeveiliging.

**Contact & Service**

- Contact met ANWB
- ANWB Alarmcentrale
- ANWB Experts
- ANWB Verzekeringen
- ANWB Winkels
- Pechhulp
- Juridisch advies
- Lidmaatschap opzeggen

**Over ANWB**

- Belangenbehartiging
- ANWB Vandaag
- Vereniging en bedrijf
- Voor de pers
- Werken bij de ANWB
- Vrijwilligerswerk
- ANWB voor de Zaak

**Volg ons**

- Nieuwsbrieven
- ANWB Apps
- ANWB Community
- Facebook
- Twitter
- Youtube
- LinkedIn

**Word lid**



15,50

Word lid →

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



Search Application - ANWB

localhost:8081/?q=wegenwacht

Wegenwacht het vaakst laten uitrukken. Maar zo ver willen we het natuurlijk niet laten komen! Hier dus praktische tips, om uit de wegenwachtstatistieken te blijven.

**ANWB - Wegenwacht KeuzeHulp →**  
<https://www.anwb.nl/wegenwacht/service/keuzehulp>  
Hulp nodig bij het kiezen van de juiste Wegenwacht Service? Wij helpen u bij het maken van een goede keuze. Doe de keuzeHulp!

**Wegenwacht Carmen | Wegenwacht® van ANWB →**  
<https://www.anwb.nl/wegenwacht/informatie/ledenervaringen/wegenwacht-carmen>  
Kijk mee met Carmen die opweg is om pechhulp te verlenen. De wegenwacht is behalve monteur ook EHBO opgeleid en weet alles van brandbeveiliging.

1 2 ... 25 Volgende >

Contact & Service

- Contact met ANWB
- ANWB Alarmcentrale
- ANWB Experts
- ANWB Verzekeringen
- ANWB Winkels
- Pechhulp
- Juridisch advies
- Lidmaatschap opzeggen

Over ANWB

- Belangenbehartiging
- ANWB Vandaag
- Vereniging en bedrijf
- Voor de pers
- Werken bij de ANWB
- Vrijwilligerswerk
- ANWB voor de Zaak

Volg ons

- Nieuwsbrieven
- ANWB Apps
- ANWB Community
- Facebook
- Twitter
- Youtube
- LinkedIn

Word lid



15,50

Word lid →

# Search on anwb.nl

Build within only a single day, because all UI components were already there.



# *Poncho components*

```
"@anwb/api": "^2.0.5",
"@anwb/browser": "^0.4.0",
"@anwb/button": "^2.2.0",
"@anwb/checkbox": "^1.6.0",
"@anwb/form": "^3.7.3",
"@anwb/form-block": "^1.4.2",
"@anwb/form-field-autosuggest": "^0.3.8",
"@anwb/form-field-button": "^0.1.1",
```

```
"@anwb/iris": "^2.0.7",
"@anwb/pagination": "^0.5.0",
"@anwb/panel": "^2.4.0",
"@anwb/results": "^0.6.0",
"@anwb/spinner": "^0.7.0",
"@anwb/structure": "^2.3.0",
"@anwb/tabbox": "^4.4.0",
```



# *Our process*

# *Ownership*

## How do we handle ownership of Poncho



### Platform team

A central team holds ownership over the platform and tooling.



### Design together

All design changes are reviewed and decided on together.



### Code together

Every new feature or refactor goes through a code review process.



### Shared responsibility

Everyone is allowed to make changes and take ownership over components they create.



### Source of truth

The design for a component is the source of truth. Initial changes are always made at the design level and synced to the component.

*A design system is a product*



# *Adaption*

## How did we motivate people to use Poncho



### Ease of use

Using Poncho should have been easier than not using Poncho.



### Dogfooding

Every team using components should also create them where needed and take ownership.



### Show & Tell

Designers and developers have to show each other changed or new components every week.

# Guidelines

## How do we create or change Poncho components



### 1. Proposal

A team creates a proposal which is pitched by developers and designers within their respective peer groups.



### 2. Validation

The proposal is validated by doing some form of user testing either qualitative or quantitative.



### 3. Development

The developers of the requesting team create a merge request and start developing the component.



### 4. Review

The merge request is being reviewed visually and technically by the Poncho team.



### 5. Release

The component is being released and available for use by developers and UX designers.



### 6. Show & Tell

The developers and designers pitch the component within their respective peer groups.

# *Poncho usage*

**78**

Components

**35**

Applications

# *Technical choices*

# Preact



## Familiar

The React api is the most popular component model out there.



## Small

Preact is smaller in bundle size compared to React and the differences were barely noticeable for developers.



## Future

The future is slightly foggy when comparing the firepower of the React team with that of Preact.

# *Invidual versioning*



## Flexible upgrade path

Applications should be able to mix and match their components and versions to make working with them as easy as possible.



## Component freedom

Individual versioning and gradual adoption allows for more freedom when developing (breaking changes have less of an impact).



## Updating

Making sure all applications are up-to-date has been proven hard.

# *Quality Assurance*



## **Snapshot testing**

Every component is rendered in every state so deterministic html output is ensured.



## **Analytics & error monitoring**

We have analytics set up for component usage statistics and runtime error monitoring to detect bugs.



## **Screenshots**

We are going to start storing visual screenshots of components to ensure visual consistency.

# Specifics



## CSS-in-JS

We have to keep the styling for our CMS output in sync with the output of our other applications.



## Hooks

Not yet, stability and ease-of-use are highest priority.



## TypeScript

We are using Flow but we might switch to Flow based on overall developer usage statistics.

# *Thanks!*

## Questions?

 @bartwaardenburg

