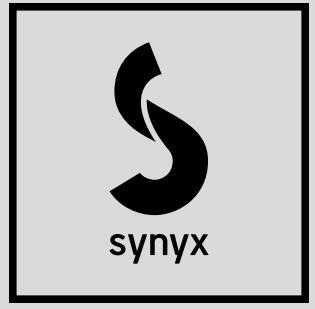


# MICRO-FRONTENDS IN REACT



**Denise Schäfer**  
[\(denise.schaefer@dm.de\)](mailto:denise.schaefer@dm.de)



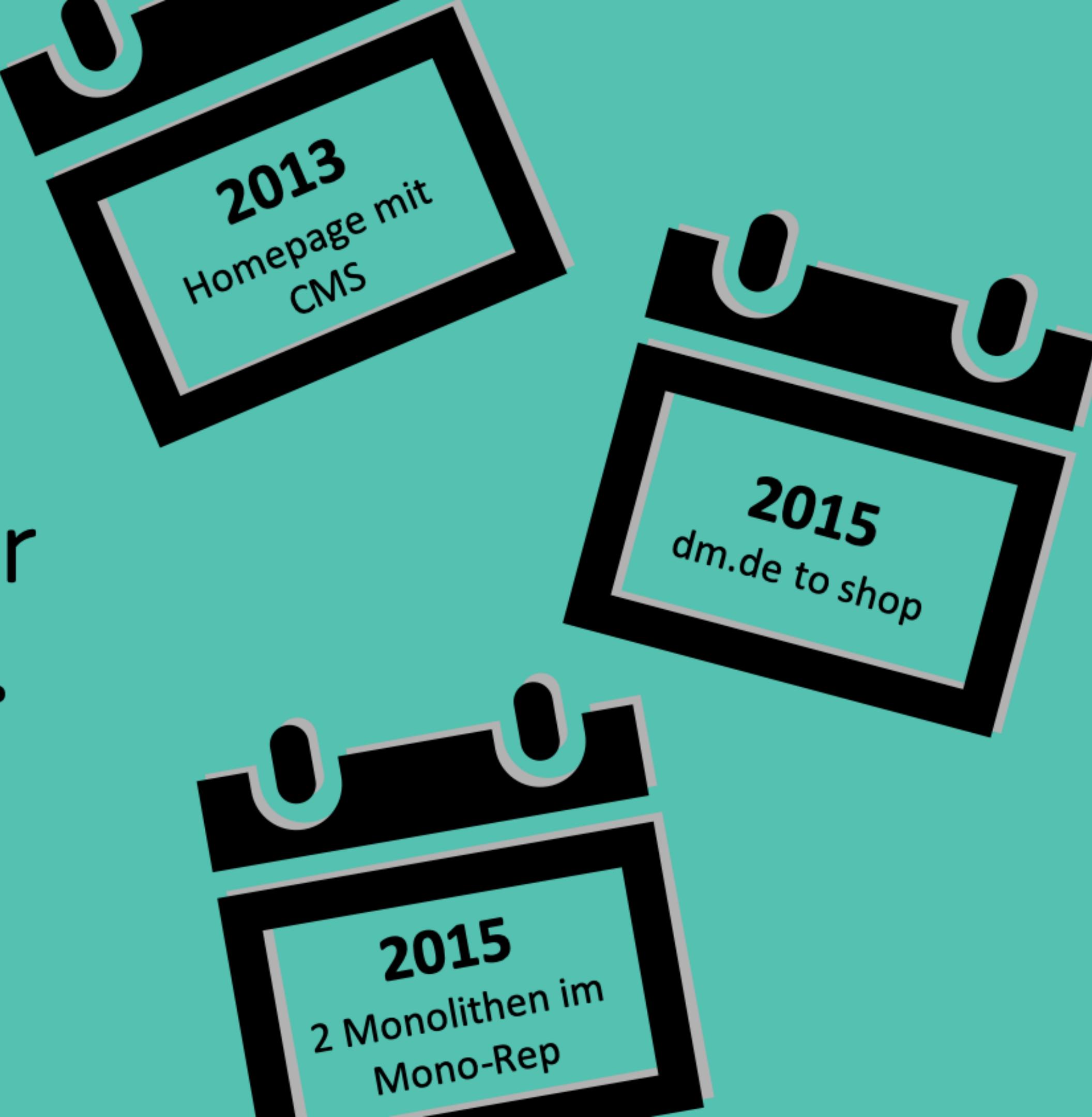
**Benjamin Seber**  
[\(@\\_seebaer\)](https://twitter.com/_seebaer)



# RÜCKBLENDE

---

# Was bisher geschah...

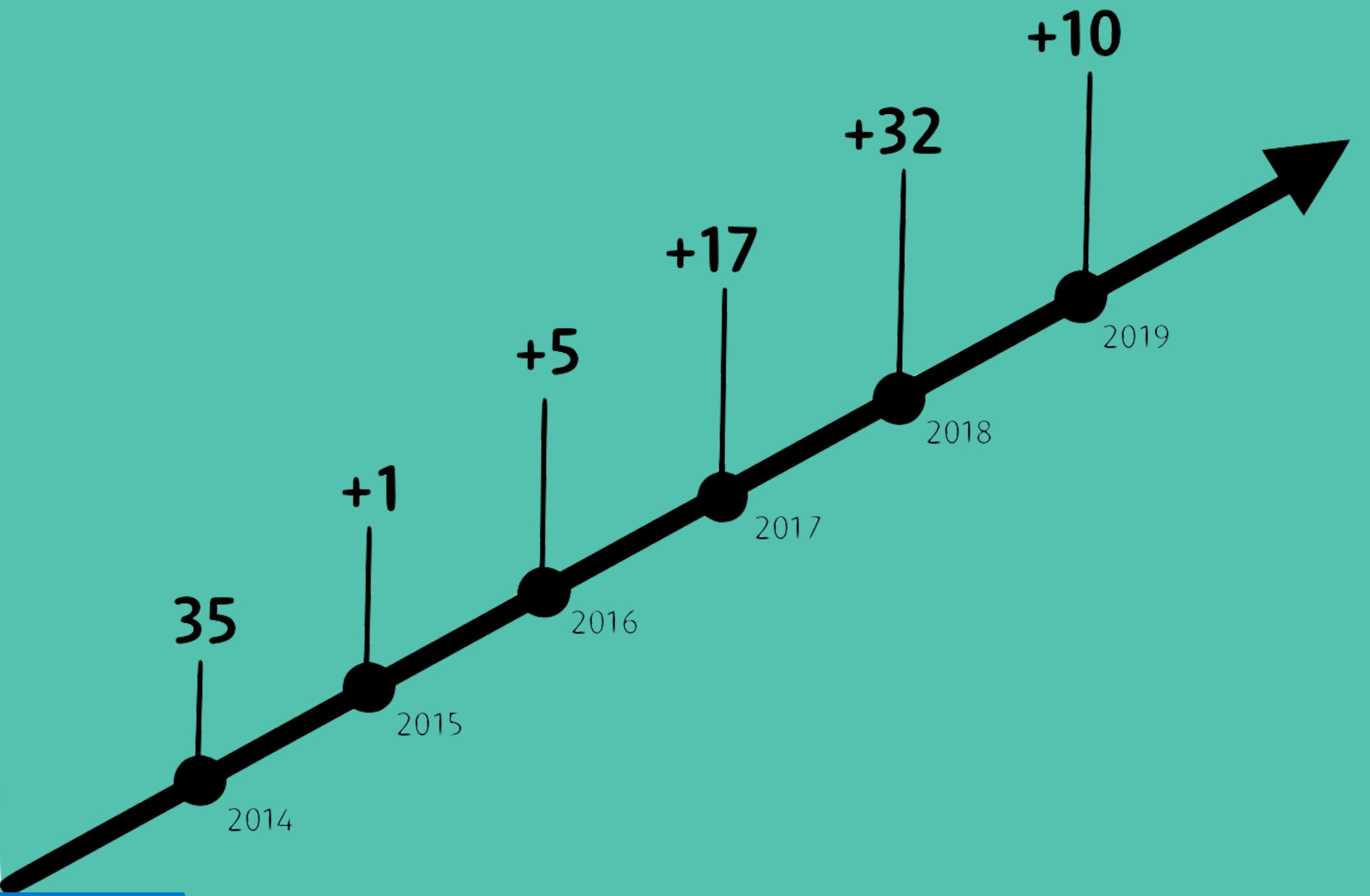


# CMS Git Historie

- 2013



2013-05-15 - 18:46 0e66126f4f0b3cf30555003  
2013-05-14 - 16:46 a6283da8901558b657cb5b20ed  
2013-05-14 - 13:17 36c12ee9120e0dcef5c43e05d0b1  
2013-05-13 - 14:28 906b6be40bc01f17fcda2673f0c93cd  
\* Mon May 2013-05-13 - 14:23 c098905fdb1c17fd8dce9593fc74a134  
\* Mon May 2013-05-13 - 06:37 7f1bddbe57f5282a9239a0baacbae7dc7b  
\* Mon May 2013-05-13 - 06:36 0e0275dd95646c9fcb1321bf93648e82494  
\* Fri May 2013-05-10 - 14:38 8964f525b9726a68428e596e55b01f081882  
\* Fri May 2013-05-10 - 14:24 074c37b8d5d5abfb364d92725a344f87e2b45  
\* Fri May 2013-05-10 - 12:40 f66bc54c46d84f6665cd276cd8e2fb9a28c1  
\* Thu May 2013-05-09 - 13:34 01a817ecf6f88d3c59aab69ac22f0a7a3f4ceb  
\* Wed May 2013-05-08 - 16:57 8d35cd896fba908835a8b5012d11966973e30a8  
\* Wed May 2013-05-08 - 09:34 2778dccadd8b015c17fd27b476fa5ea03716410  
\* Wed May 2013-05-08 - 08:26 44d132c640830dbdb0d4d94649ff0156f9410649  
\* Tue May 2013-05-07 - 18:37 82ac7fc59309fccffd87379f0e2cdbacbb7d02e8  
\* Mon May 2013-05-06 - 16:37 3b2dfae8f7c99c6b439f2b87fcaa11c885e518a0  
\* Mon May 2013-05-06 - 16:08 e3156eb80840c8577e759ab21f55455701918e9  
\* Fri May 2013-05-03 - 17:19 e8a3eea664464e0fc09ebdb604d9e9d413dbb2c  
\* Fri May 2013-05-03 - 17:16 b3d7d0c38d4ded5c56ba983ea38c07094f03202  
\* Fri May 2013-05-03 - 14:52 b8457c803b0e8430ab4838945867b16dd063bd  
\* Thu May 2013-05-02 - 17:53 4c190f4cae9346a634e6b61e118147f2d91171  
\* Thu May 2013-05-02 - 17:42 027f4f4a213b7b0e3b83dca239d5c637108b7  
\* Thu May 2013-05-02 - 14:27 d0241edc44460795ef7b1d66751f3441503  
\* Apr 2013-04-29 - 16:19 3215bc364646d79f36def6342a3eee3a6c  
\* Apr 2013-04-29 - 16:18 e58c0d746dd86130d1767fe14fc5a36  
\* Apr 2013-04-29 - 15:53 8d6bfe2415c32d9c338bad543535aff  
\* Apr 2013-04-29 - 15:00 23079093b029198af87944df37d38  
\* Apr 2013-04-29 - 14:57 dacaa810a76a1f237292a0443c0  
\* Apr 2013-04-29 - 13:05 56f83a9a9bddae49c33341b  
\* Apr 2013-04-29 - 10:05 b55583fa3f00f98f3590  
\* Apr 2013-04-21 c18407604b50b20



Anstieg der  
Contributor

# CMS Git Historie - 2016

A circular diagram with a black center and a white ring. The ring contains a list of git commit logs, each consisting of a date and time, a commit message, and a unique hash identifier. The commits are color-coded by date: blue for March, green for April, and orange for May. The commit list is as follows:

- Sat Mar 2016-03-09 - 14:10 8e0a2f3...  
Tue Mar 2016-03-08 - 17:17 dd252d1...
- Mon Mar 2016-03-07 - 15:48 3df3504089e...
- Mon Mar 2016-03-07 - 09:25 914f2148175cb...
- Mon Mar 2016-03-07 - 09:01 e5d4e4ac7db9daed...
- Fri Mar 2016-03-04 - 16:59 ed6cb2e9aa46ff6...
- Fri Mar 2016-03-04 - 16:39 6a1f69a62cddb89...
- Fri Mar 2016-03-04 - 15:51 182d1bd2f98fcfc7665...
- Fri Mar 2016-03-04 - 15:51 fb3164a570d91194ca7a...
- Thu Mar 2016-03-03 - 13:44 b4a3c3d645b064fb13ee2...
- Thu Mar 2016-03-03 - 11:06 711414ed8b11ae866d23a8...
- Thu Mar 2016-03-03 - 10:21 fced47ec618256e9f2ce299...
- Wed Mar 2016-03-02 - 17:27 f4f1bf96fb92ec2d0dc0a9f...
- Wed Mar 2016-03-02 - 16:13 cbcf39849c8f7df784831d2...
- Wed Mar 2016-03-02 - 16:09 74211b9ae198b0852b08127b...
- Tue Mar 2016-03-01 - 16:17 840745404d1a375b258ed5d1...
- Tue May 2016-05-24 - 17:33 bcf20872da0509f4b96cb526...
- Tue May 2016-05-24 - 17:26 47091090faa43d9690fb9a00...
- Tue May 2016-05-24 - 17:19 ea1541eb3703b4e71f8eb7e4...
- Tue May 2016-05-24 - 09:38 a52ef03d79036a27ba3e628f1...
- Tue May 2016-05-24 - 09:38 df886ce07c5610e4407837de...
- Mon May 2016-05-23 - 17:06 3757246b187835f62f4d399...
- Mon May 2016-05-23 - 17:06 6ac7f2a0b952394fd9bd39...
- Mon May 2016-05-23 - 14:50 09b8bcdd23c25ae2b4b50...
- Mon May 2016-05-23 - 14:12 b4b6e6361126cd3fe095...
- Fri May 2016-05-20 - 12:19 9812c58a0530e1e911...
- Fri May 2016-05-20 - 12:19 fff2fac332c0032eb...
- Fri May 2016-05-20 - 12:19 558d92606de8f66...
- Fri May 2016-05-20 - 12:19 a2db692ec7c76...
- Fri May 2016-05-20 - 09:29 3fd334436...
- Thu May 2016-05-19 - 17:00 5abbd...

# Wir brauchen mehr Features!



Was war denn  
Anfang 2016?

Einiges! Wo soll  
ich anfangen?  
Aaalso...



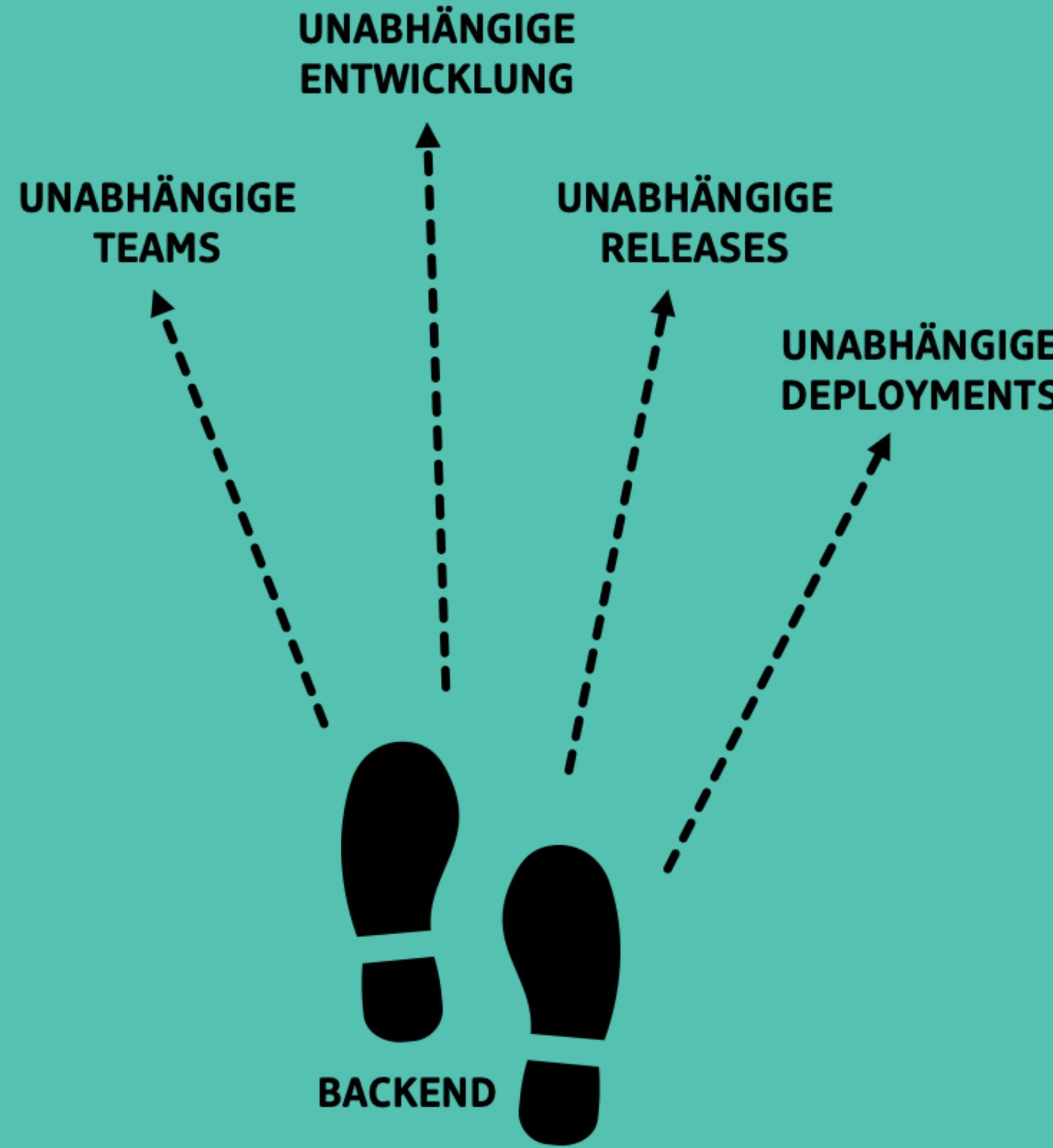


# Micro-Services im Backend



<https://kurzelinks.de/monolith2microservice>

# Unabhängigkeit nur im Backend



# Skalierung im Backend

BACKEND



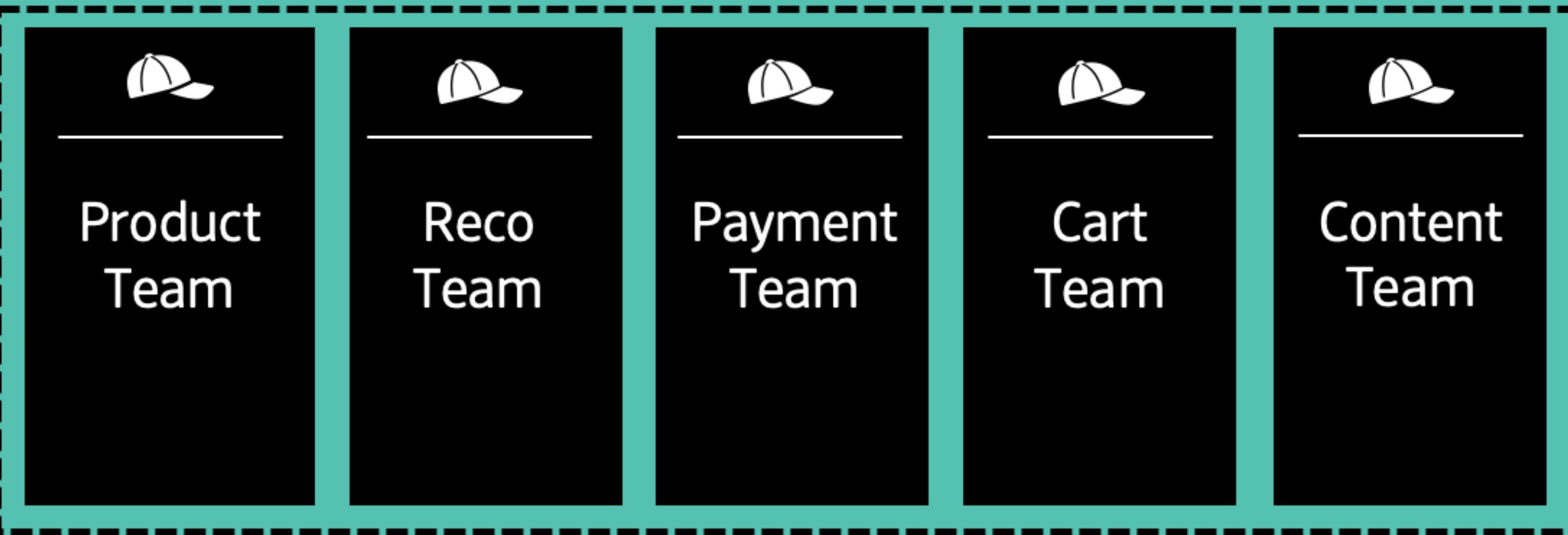
FRONTEND



Frontend-Team



Backend-Teams



# Auswirkung für den Product Owner



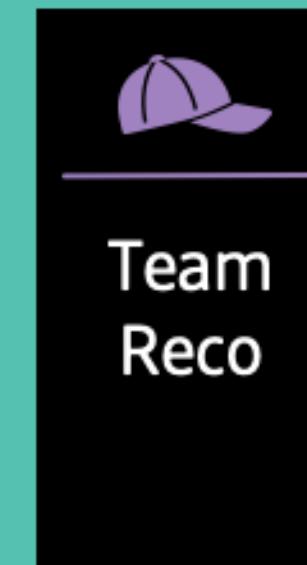


# WANTED

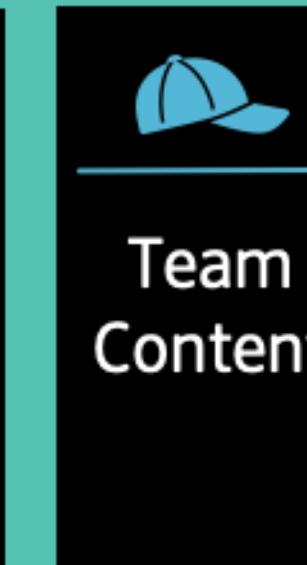
## CROSS-FUNKTIONALE TEAMS



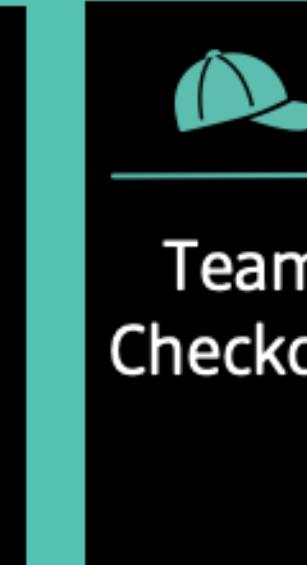
Team  
Product



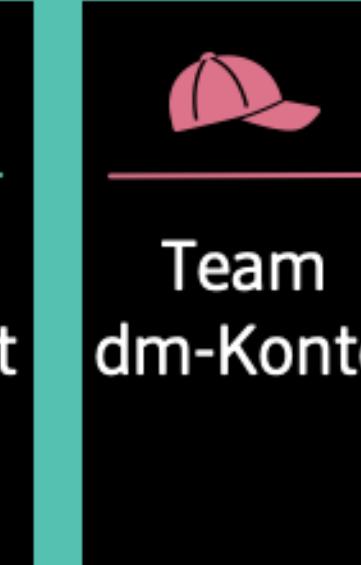
Team  
Reco



Team  
Content



Team  
Checkout

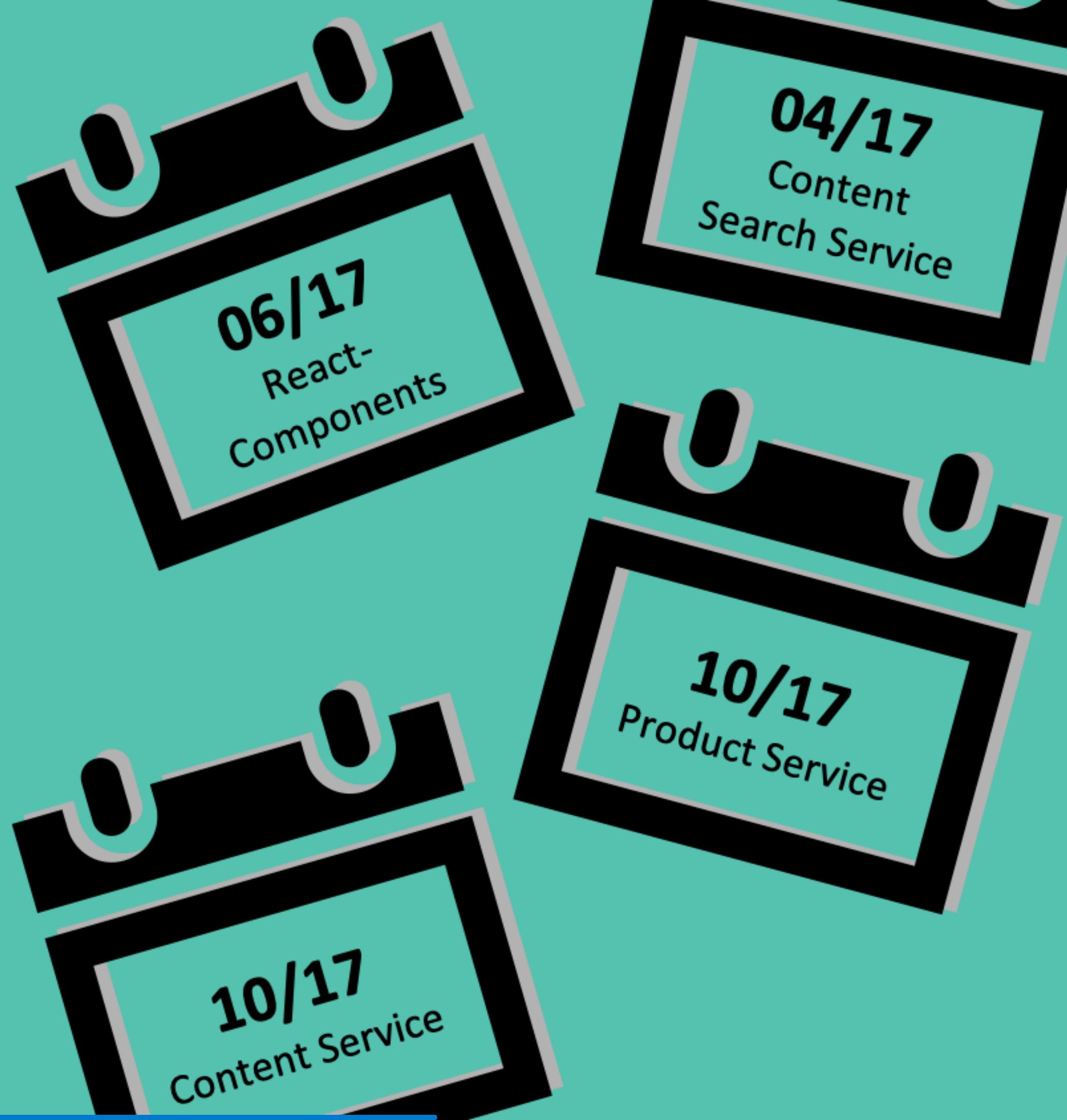


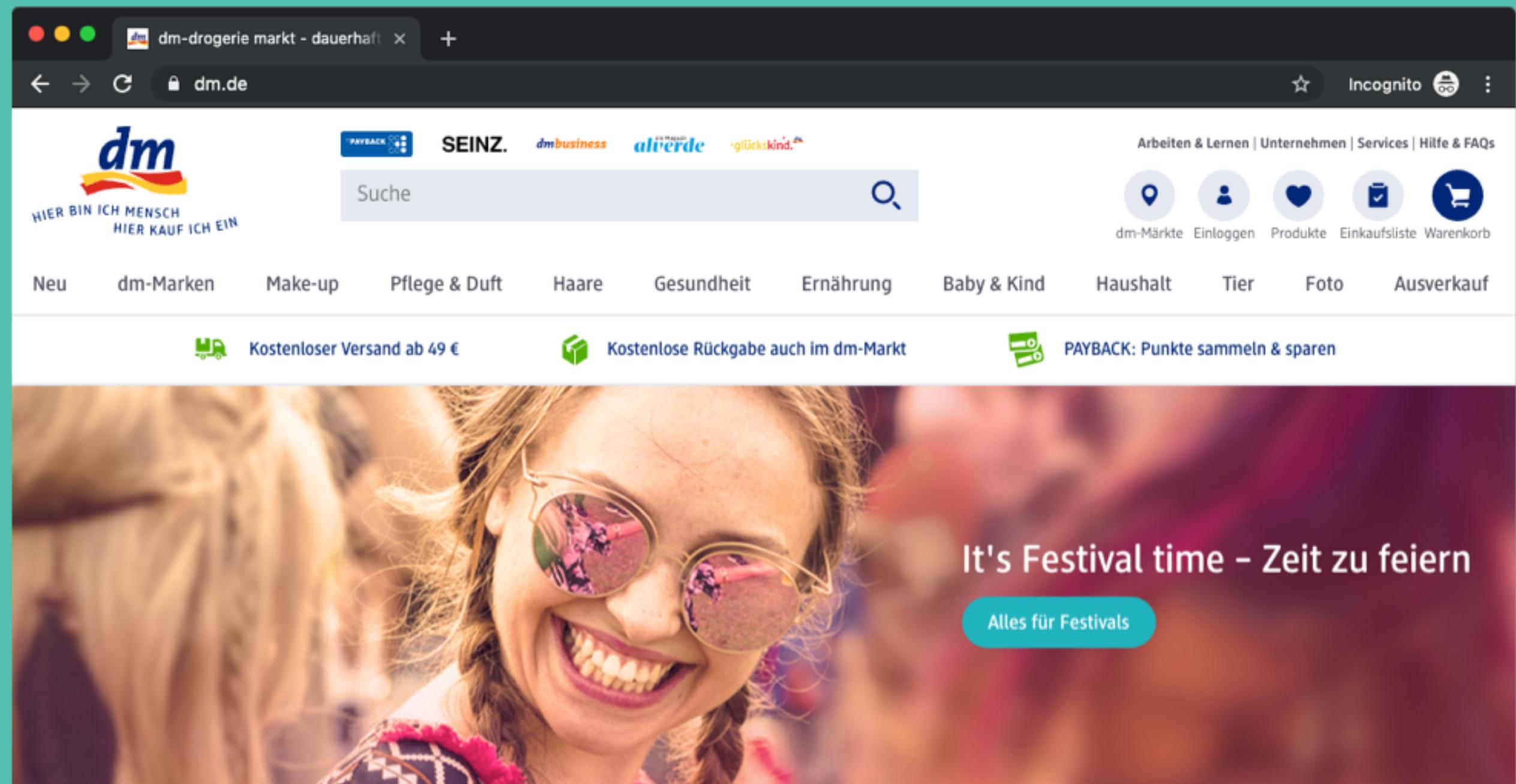
Team  
dm-Konto

## FRONT- & BACK-END



# Versuche zur Eigenständigkeit





content-service



BABEL



ESLint

product-service



BABEL



ESLint

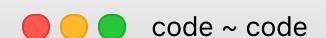
content-search-service



BABEL



ESLint



code ~ code

cms-index.jsp.html x

```
1 <script src="libraries.min.js"></script>
2 <script src="content.min.js"></script>
3 <script src="product.min.js"></script>
4
5 <div id="navigation-container"></div>
6 <script>
7   ReactDOM.render(
8     window.dm.content.Navigation,
9     document.getElementById('navigation-container')
10   );
11 </script>
12
13 <div id="product-grid-container"></div>
14 <script>
15   ReactDOM.render(
16     window.dm.product.ProductGrid,
17     document.getElementById('product-grid-container')
18   );
19 </script>
```



# React Components

GitOverride: endlich hab ich die selectbox fertig

GitOverride: e( ⌂ ⌂ )đ

GitOverride: ganz schön viele extra features wieder...

GitOverride: nativ und gut is...

Front\_Ende: was habt ihr denn gebraucht? wir hätten da was 😅

GitOverride: special styling unterschiedlich auf desktop und mobile versteht sich

The screenshot shows the homepage of the dm-drogerie markt website. At the top, there's a navigation bar with links for PAYBACK, SEINZ., dm business, alverde, and Glückskind. Below the navigation is a search bar with a magnifying glass icon. To the right of the search bar are icons for dm-Märkte, Einloggen, Produkte, Einkaufsliste, and Warenkorb. A horizontal menu bar below the search bar includes categories like Neu, dm-Marken, Make-up, Pflege & Duft, Haare, Gesundheit, Ernährung, Baby & Kind, Haushalt, Tier, Foto, and Ausverkauf. Promotional banners at the bottom of the page mention "Kostenloser Versand ab 49 €", "Kostenlose Rückgabe auch im dm-Markt", and "PAYBACK: Punkte sammeln & sparen". A large banner image features a smiling woman wearing sunglasses, with the text "It's Festival time - Zeit zu feiern" and a button labeled "Alles für Festivals".

content-service



BABEL



ESLint

product-service



BABEL



ESLint

content-search-service

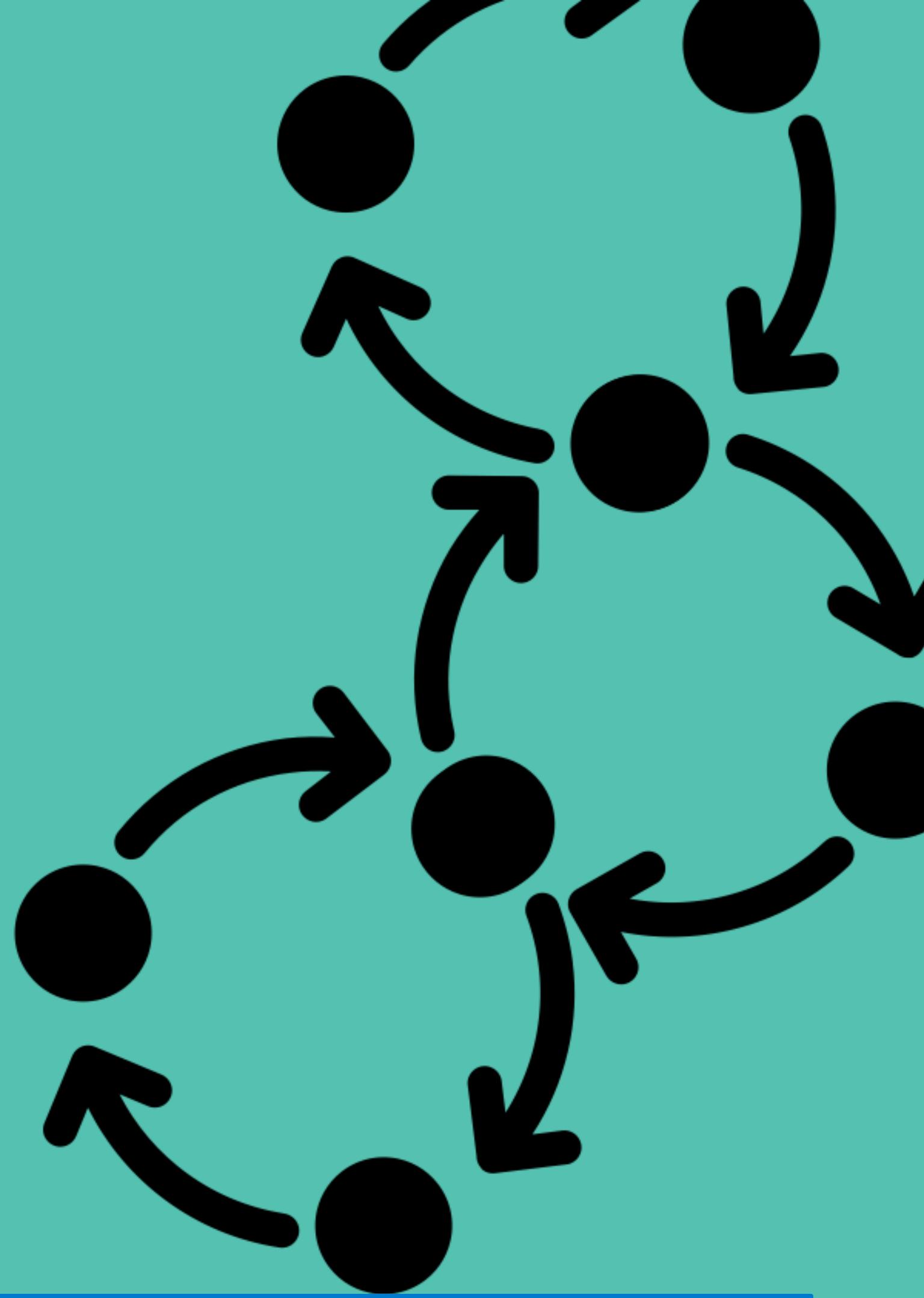


BABEL



ESLint

react-components



Aber erstes Zwischenergebnis:  
**Abhängigkeitszyklen**  
= verteilter Monolith

**321 PUSH!**



# DAS RÄTSEL

---



**WIE TEILEN WIR  
DAS FRONTEND AUF?**

- 1 Domain Produkt
- 2 Domain Shopping-List
- 3 Domain Warenkorb
- 4 Domain Suche
- 5 Domain Filial Verfügbarkeit
- 6 Domain Kundenkonto

# Schauplatz Detailseite

The screenshot shows a product detail page for a Balea MEN shower gel. The page is structured with various sections and interactive elements, each marked with a numbered callout (1 through 6) corresponding to the legend on the right.

**Product Information:**

- Image:** A large image of the product bottle is displayed, with a callout 1 pointing to it.
- Product Name:** Balea MEN Duschgel arctic fresh, 300 ml
- Rating:** ★★★★☆ 5.0 (2)
- Price:** 0,95 €
- Add to Cart:** In den Warenkorb (Callout 2)
- Buy for Later:** Auf die Einkaufsliste (Callout 3)
- Delivery Status:** Lieferbar

**Store Availability:**

In welchen Filialen ist dieses Produkt verfügbar?  
Bitte PLZ / Ort angeben

**Customer Points:**

Für jeden Euro Warenwert erhalten Sie 1 PAYBACK Punkt

**Product Description:**

Balea MEN

# Schauplatz Suche

Domain Suche (Rahmen) 1

Domain Produkt-Suche 2

Domain Content-Suche 3

1

dm SEINZ. dm business alverde glückskind.de

Balea

Arbeiten & Lernen | Unternehmen | Services | Hilfe & FAQs

dm-Märkte Einloggen Produkte Einkaufsliste Warenkorb

Neu dm-Marken Make-up Pflege & Duft Haare Gesundheit Ernährung Baby & Kind Haushalt Tier Foto Ausverkauf

Kostenloser Versand ab 49 € Kostenlose Rückgabe am Markt PAYBACK: Punkte sammeln & sparen

Alle Sortimente

Pflege & Duft (457)

Haare (162)

Baby & Kind (3)

Beliebte Filter Anzahl 24 ▾

Marke von dm 621

Vegan 379

Ohne Silikone 114

Für Männer 85

Neu 51

Medizinische Pflege 20

Sortieren nach Beliebtheit ▾

2

3

Suche nach „Balea“

Produkte (623) Beratung (206)

**Balea FUSS HORNHAUT ENTFERNER SOCKEN Feel Well**  
3,95 €

**Balea FUSSCREME UREA**  
1,25 €

**Balea DUSCHÖL**  
1,85 €

**Balea ERFRISCHENDES WASCH GEL**  
0,95 €

**Balea COLORNIQUE**  
2 St (1,98 € je 1 St)

**Balea MEN**  
★★★★★ (196)

**Balea Hornhaut**  
Balea Balea Urea Fußcreme,

**Balea Duschöl 250ml,**  
250 ml (0,74 € je 100 ml)

**Balea erfrischendes Waschgel**  
150 ml (0,63 € je 100 ml)

**Balea**  
★★★★★ (10)

**Balea**  
★★★★★ (31)

**Balea**

# Schauplatz Suche

Domain Suche (Rahmen) 1

Domain Produkt-Suche | 2

Domain Content-Suche 3

**1**

**dm**  
HIER BIN ICH MENSCH  
HIER KAUF' ICH EIN

SEINZ. dm business alverde glückskind.de

Balea 

Arbeiten & Lernen | Unternehmen | Services | Hilfe & FAQs

dm-Märkte Einloggen Produkte Einkaufsliste Warenkorb

Neu dm-Marken Make-up Pflege & Duft Haare Gesundheit Ernährung Baby & Kind Haushalt Tier Foto Ausverkauf

 Kostenloser Versand ab 49 €  Kostenlose Rückgabe  Markt  PAYBACK: Punkte sammeln & sparen

---

**Beitragstypen**

<input type="checkbox"/> Redaktionelles	93
<input type="checkbox"/> Specials	79
<input type="checkbox"/> Downloads	15
<input type="checkbox"/> Produkt-Kategorien	9
<input type="checkbox"/> dm-Marken	2
<input type="checkbox"/> Beratung & Information	1
<input type="checkbox"/> Häufige Fragen	7

Anzahl 24 

Sortieren nach Relevanz 

**2**

**3**

Suchantrag nach „Balea“

Produkte (623) Beratung (206)

---

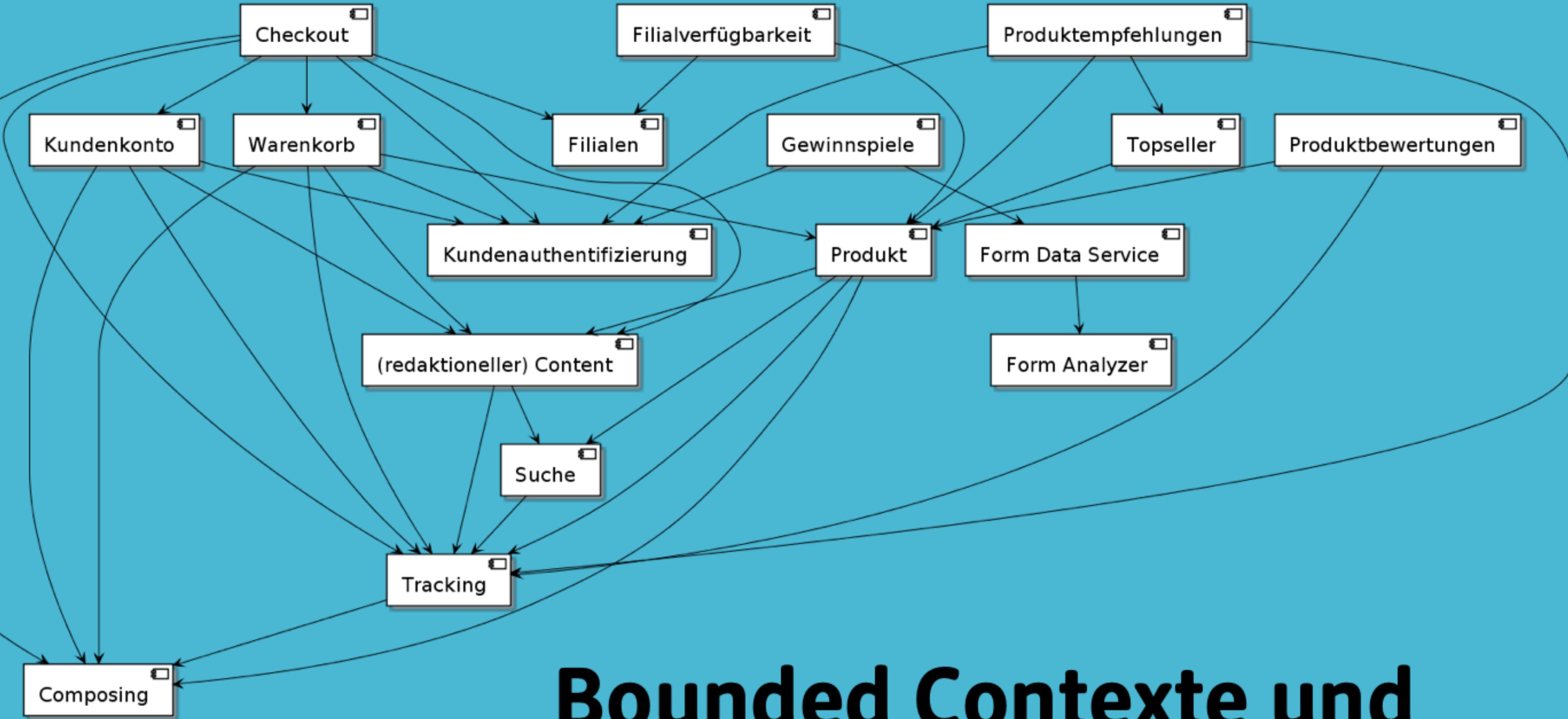
**Balea Deo**  
22.12.2017  
Pflege & Duft  
 Seite öffnen

---

**Über Balea**  
11.01.2016  
Balea  
 Seite öffnen

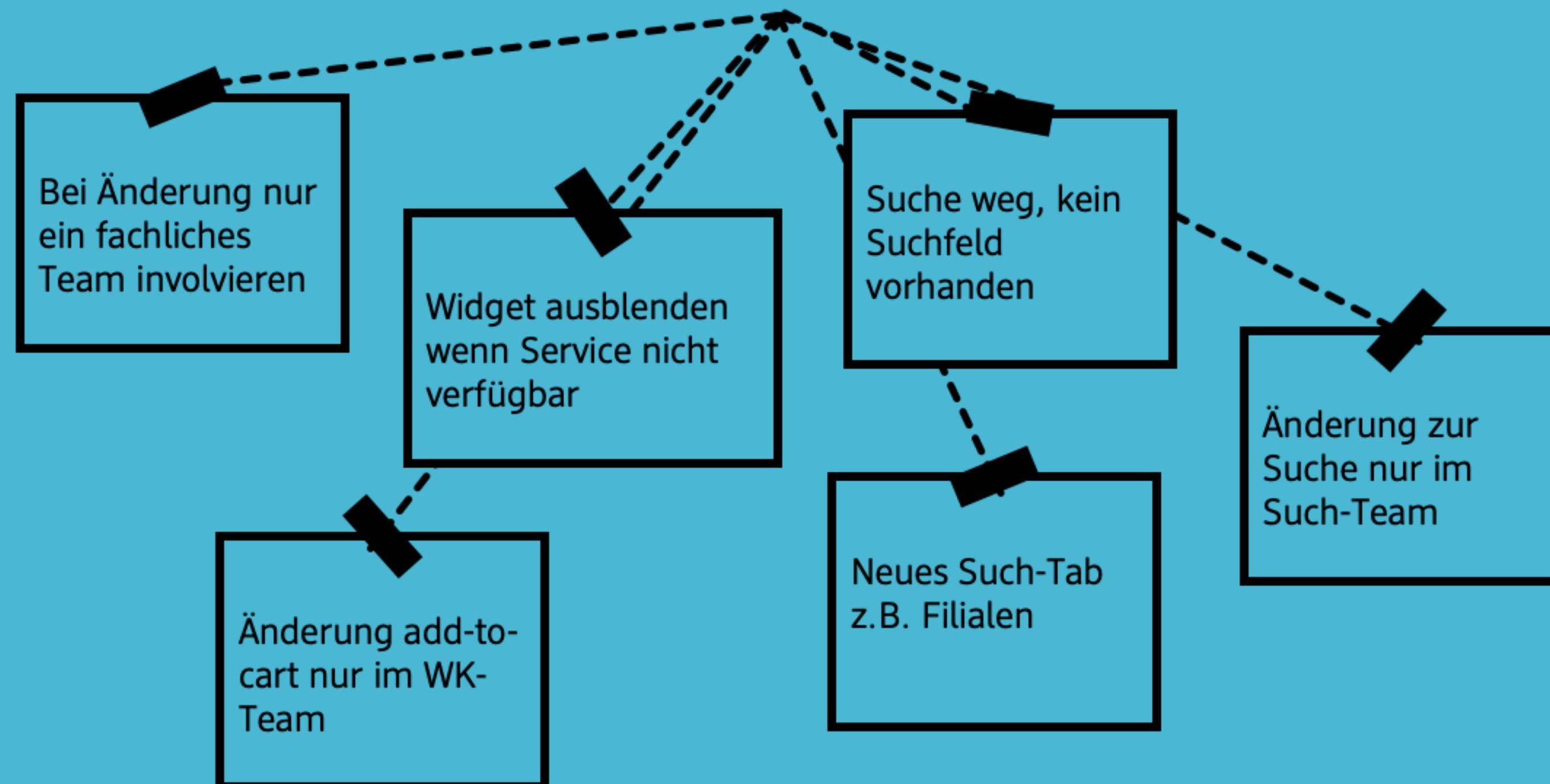
---

**Balea Winter**  
25.10.2018  
Limited Editions  
 Seite öffnen



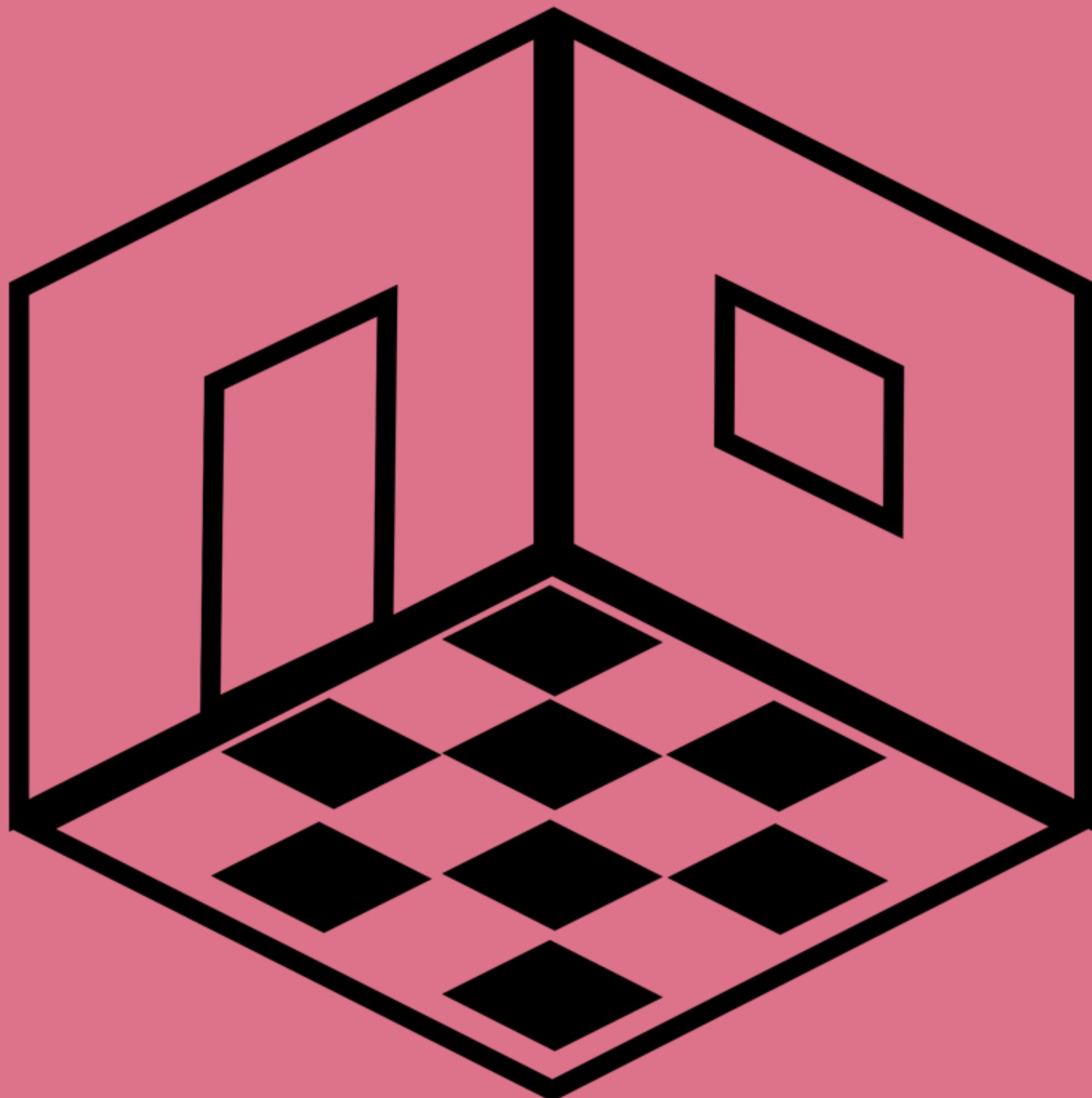
# Bounded Contexte und Abhängigkeiten bei dm.de

# Separations of Concerns



# ? ! DIE LÖSUNG

---



# Lösungs- Rahmen

Überwiegend clientseitige  
Integration

- Nur **eine** Technologie -  React
- aus Performance-Gründen nicht x Frameworks in die Seite laden
  - Synergien (Know-How, UX-Komponenten)



**Auf den  
zweiten Blick...**

Bildquelle: <https://www.sehtestbilder.de>

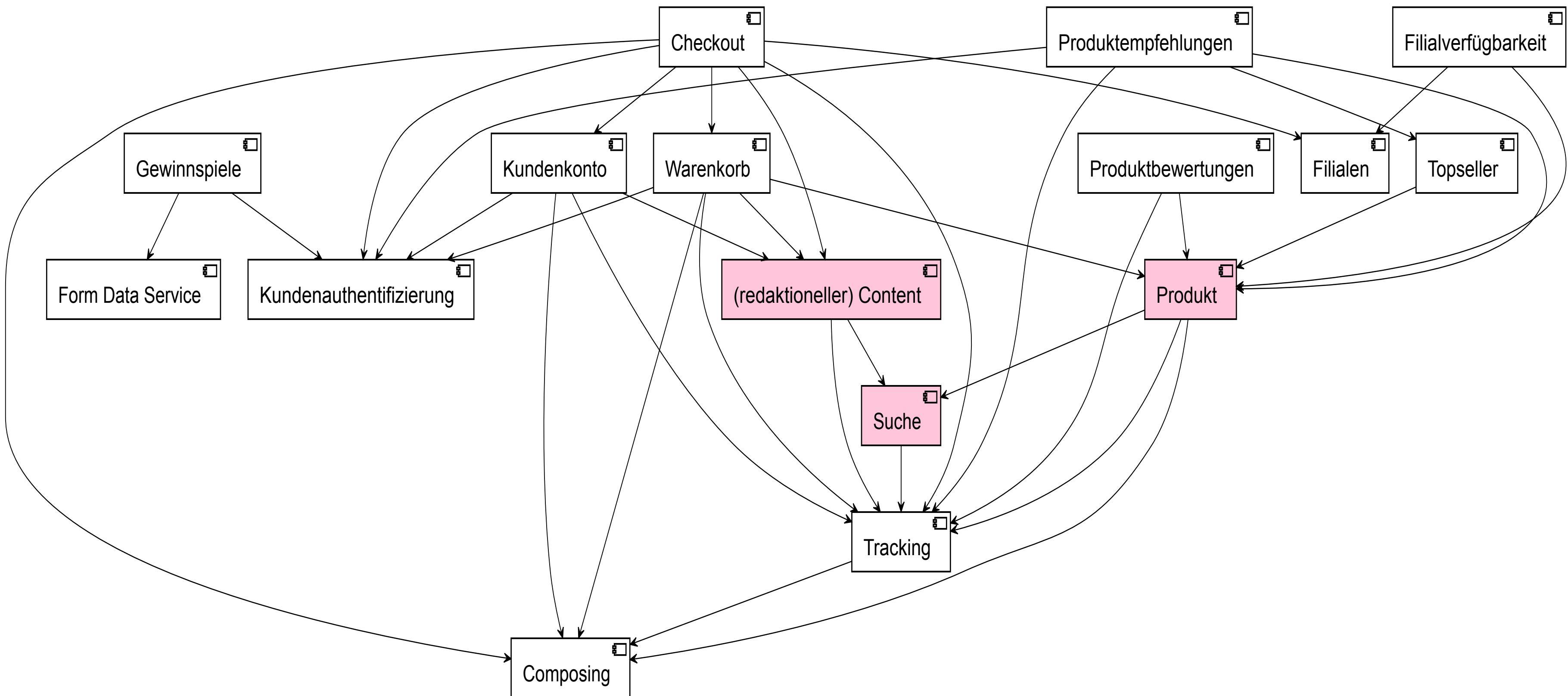


**< DEPENDENCY  
INVERSION />**

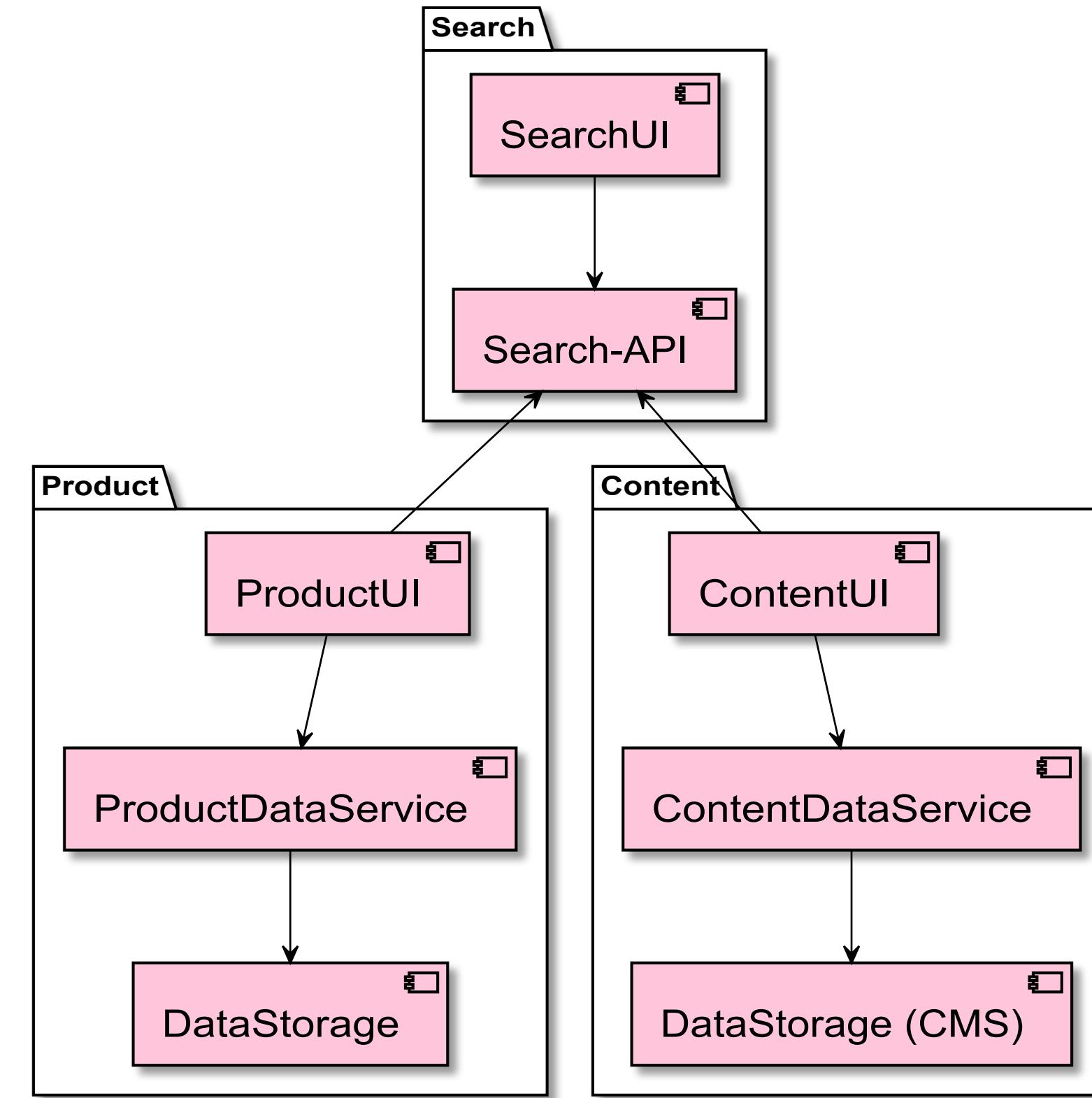
Allgemeine Module  
hängen nicht von  
speziellen Modulen  
ab.

Spezielle Module  
hängen von  
allgemeinen  
Modulen ab.

# Dependency Inversion am Beispiel der Suche auf dm.de



# Dependency Inversion - nur eine Abhängigkeitsrichtung



# Demo Suche

https://www.dm.de/search/468652.html?type=product&q=make-up

make-up 

dm-Märkte Produkte Warenkorb Menü

## Suche nach „make-up“

Produkte (2225) Beratung (4)

Sortieren Filtern

MARKE von dm EXKLUSIV

Präzisions Make-up Ei  Make-up HD Liquid Coverage Foundation Light Beige 10  Augen-Make-Up Entferner ölhaltig  Make-up Anti-Aging Foundation

2,45 € 6,95 € 1,45 € 9,95 €

We setzt technisch notwendige Cookies und Webanalyse-Technologien auf Grundlage unser berechtigten Interessen ein. Wenn Sie uns hier darüber hinaus Ihr Einverständnis geben, nutzen wir bestimmte Marketingcookies, um Ihnen personalisierte Services und Angebote anzubieten. Ausführliche Informationen finden Sie in unserer [Datenschutzerklärung](#).

http://localhost:8080/?query=make-up&searchType=product

## Suche nach "make-up"

Produkte (6)

Suche nach "make-up": 6 counts

make-up product 1  
3,95 €



Lorem ipsum dolor sit amet

make-up product 2  
1,99 €



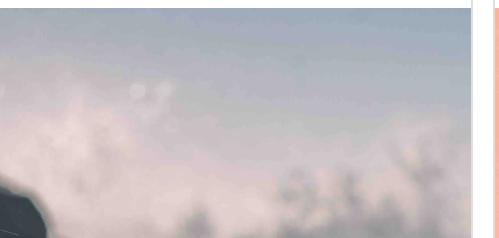
Lorem ipsum dolor sit amet

make-up product 3  
8,65 €



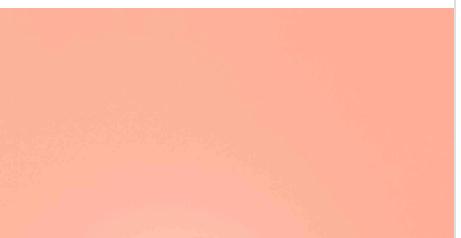
Lorem ipsum dolor sit amet

make-up product 4  
2,95 €



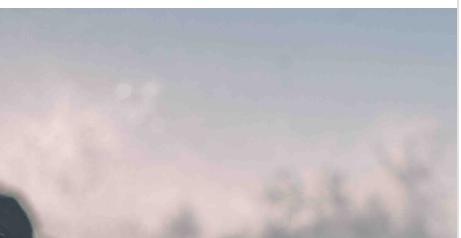
Lorem ipsum dolor sit amet

make-up product 5  
8,65 €



Lorem ipsum dolor sit amet

make-up product 6  
2,95 €



Lorem ipsum dolor sit amet

# Composition vs. Dependency Inversion

1 Domain Suche

2 Domain Produkt

3 Domain Content

red yellow green code ~ comparison

composition.js x

1

```
1 <SearchContainer>
2   <div id="search-tabs">
3     <ProductTab count="130" />
4     <ContentTab count="42" />
5   </div>
6   <ProductResult active/>
7   <ContentResult />
8 </SearchContainer>
9
10 // --- everything in one repository ---
```

2

3

2

3

red yellow green code ~ comparison

dependencyInversion.js x

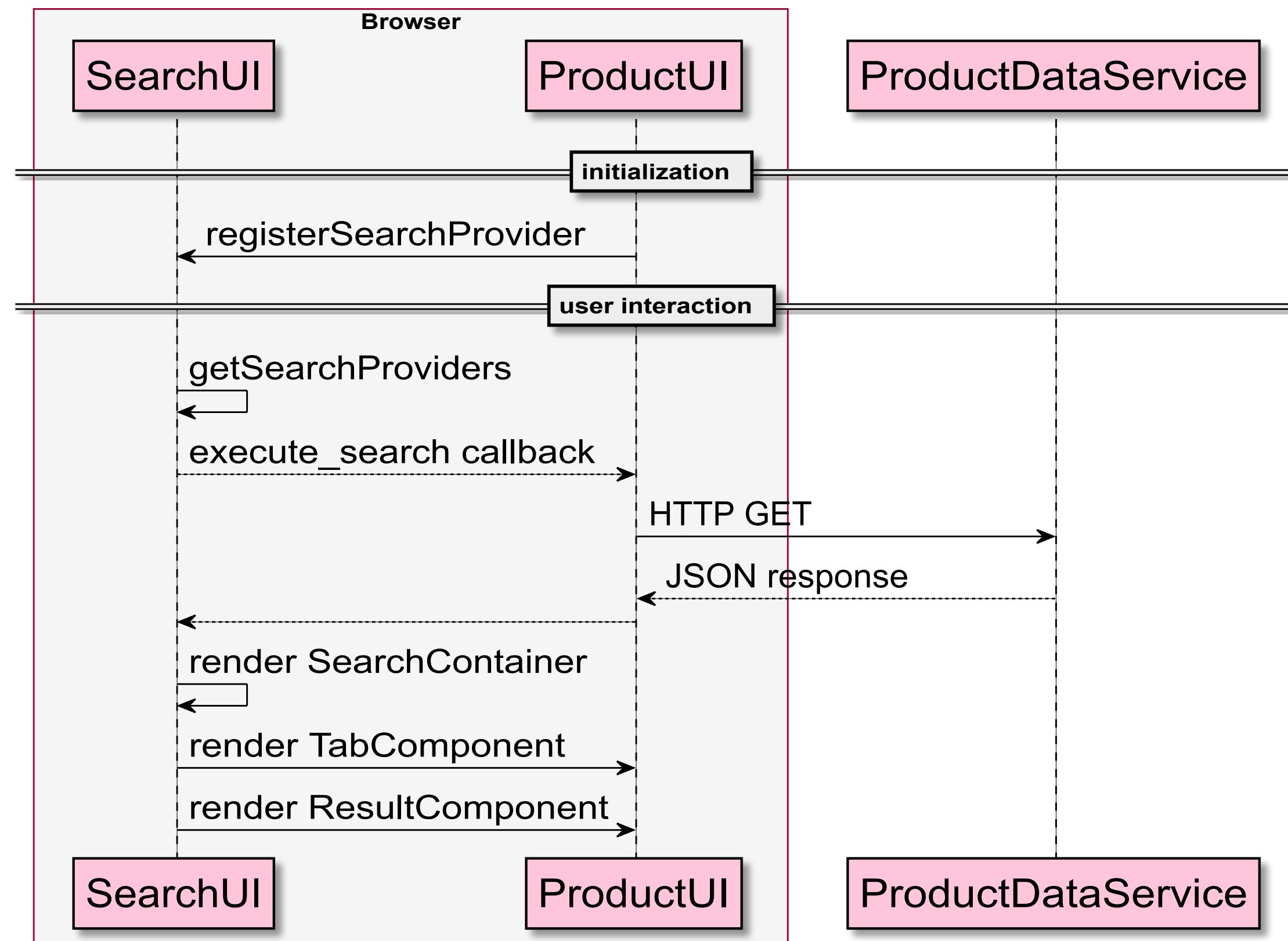
```
1 registry.registerSearchProvider({
2   ID: 'product',
3   order: 1,
4   execute_search: query => executeProductSearch(query),
5   getTabComponent: data => <ProductTab data={data} />,
6   getResultComponent: (query, data) => (
7     <ProductResult query={query} data={data} />
8   ),
9 });
10
11 // ----- ↑ Product ↑ -----  
12 // --- loosely coupled micro-frontends ---  
13 // ----- ↓ Search ↓ -----  
14
15 const searchProviders = registry.getSearchProviders()
16 <SearchContainer>
17   <div id="search-tabs">
18     {searchProviders.map(provider => getTabFor(provider))}>
19   </div>
20   {activeProvider.getResultComponent(query, data)}
21 </SearchContainer>
```

2

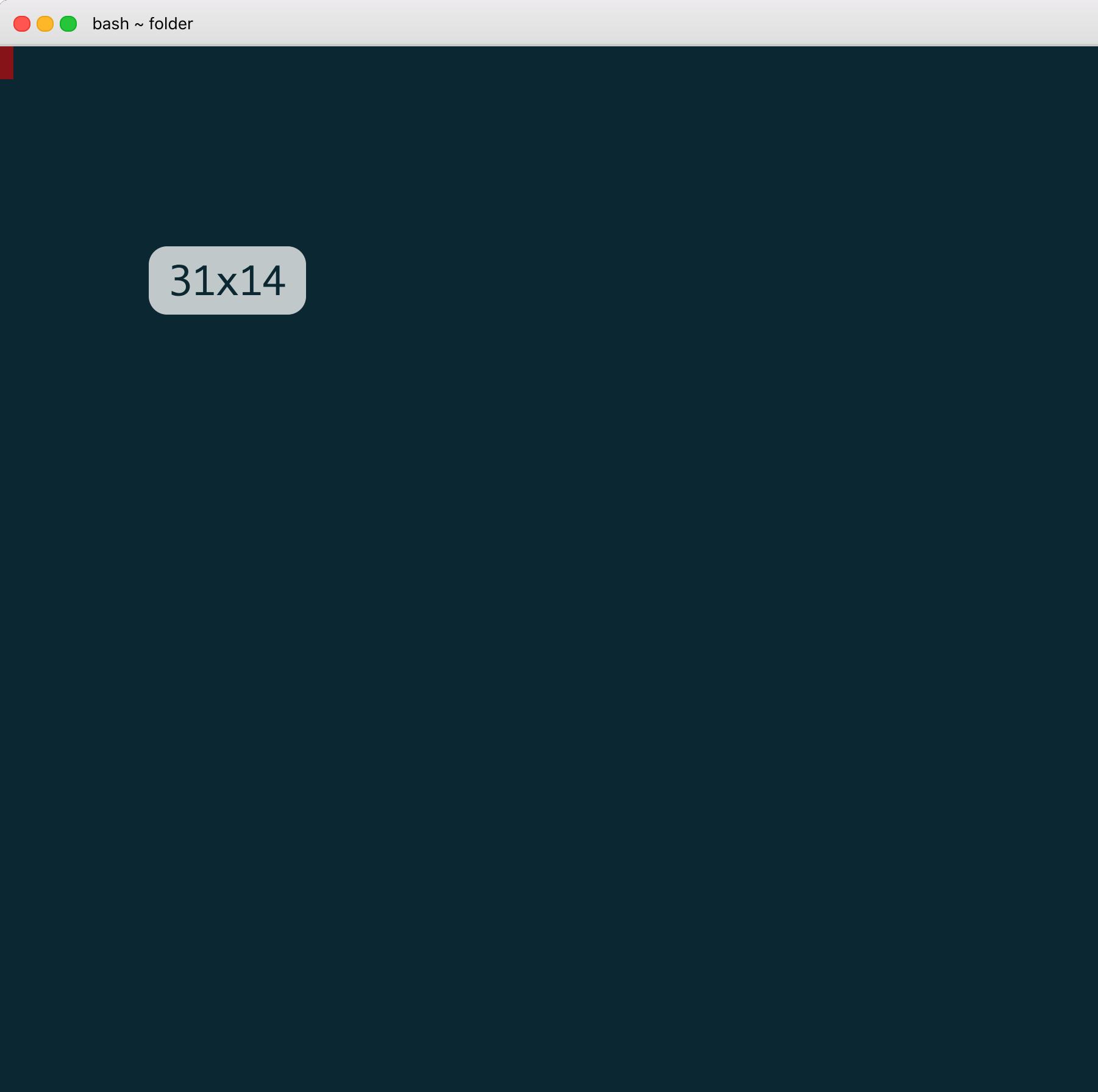
1



# Suche mit einem Provider für Produktsuche



# Suche mit einem Provider für Produktsuche



http://localhost:8080/?query=make-up&searchType=product

## Suche nach "make-up"

Produkte (6)

Suche nach "make-up": 6 counts

**make-up product 1**  
3,95 €

Lorem ipsum dolor sit amet

**make-up product 2**  
1,99 €

MOCKUP  
by rawpixel.com

Lorem ipsum dolor sit amet

**make-up product 3**  
8,65 €

Lorem ipsum dolor sit amet

**make-up product 4**  
2,95 €

Lorem ipsum dolor sit amet

**make-up product 5**  
8,65 €

Lorem ipsum dolor sit amet

**make-up product 6**  
2,95 €

Lorem ipsum dolor sit amet

# Dependency Inversion - Search-API

code ~ sources

search-api/src/api/registry.js x

```
1 import byOrder from './util/sort';
2 import isEmpty from './util/isEmpty';
3
4 const searchProviders = {};
5
6 export const registerSearchProvider = provider => {
7   searchProviders[provider.ID] = { ...provider };
8 }
9
10 export const getSearchProviders = () => {
11   if (isEmpty(searchProviders)) {
12     throw new Error('No SearchProvider registered!');
13   }
14   return Object.keys(searchProviders)
15     .map(key => searchProviders[key])
16     .sort(byOrder);
17 }
18
19 export const removeSearchProvider = ID => {
20   delete searchProviders[ID];
21 }
```

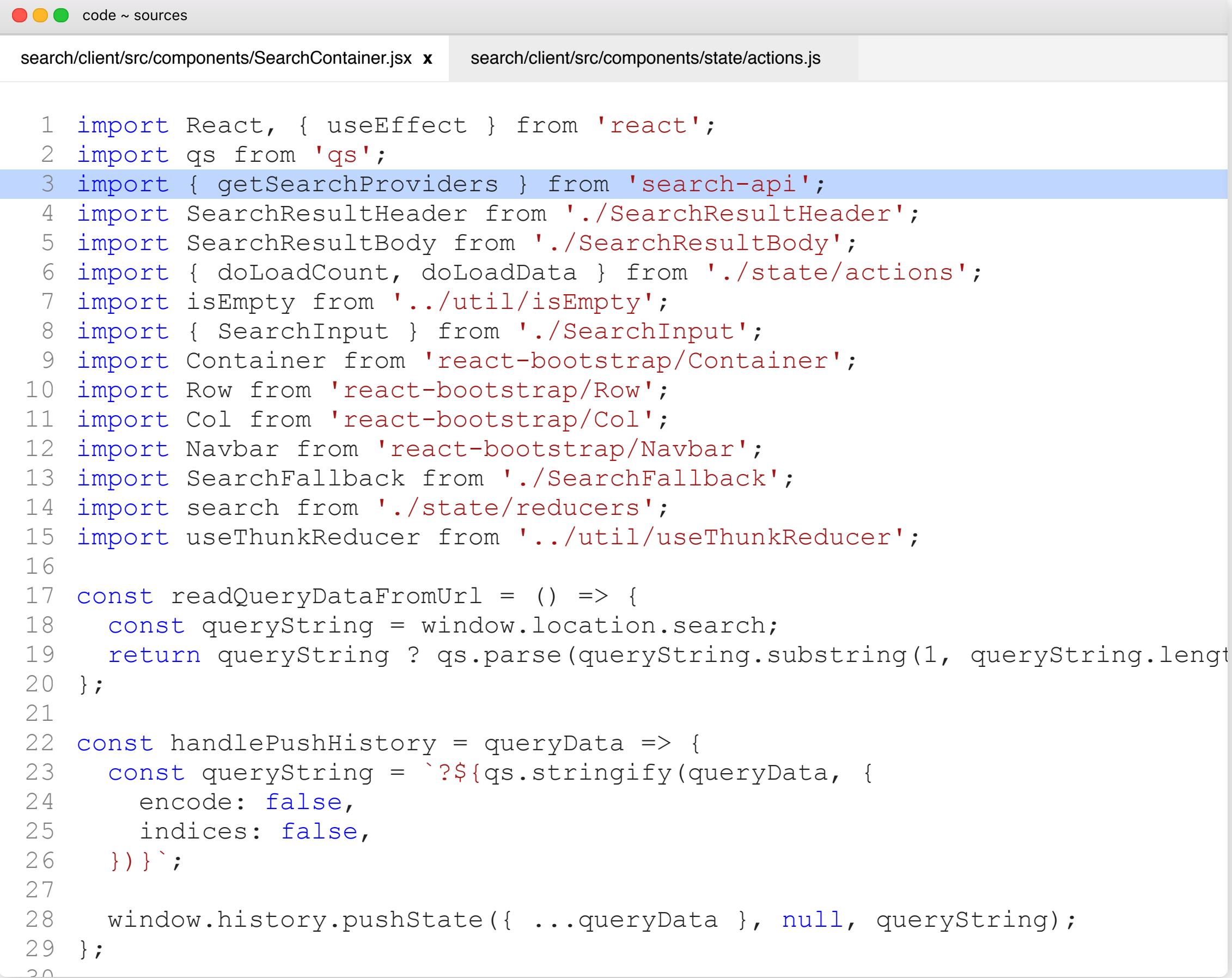
# Dependency Inversion - Produkt

code ~ sources

product/client/src/ProductSearchInitializer.jsx x

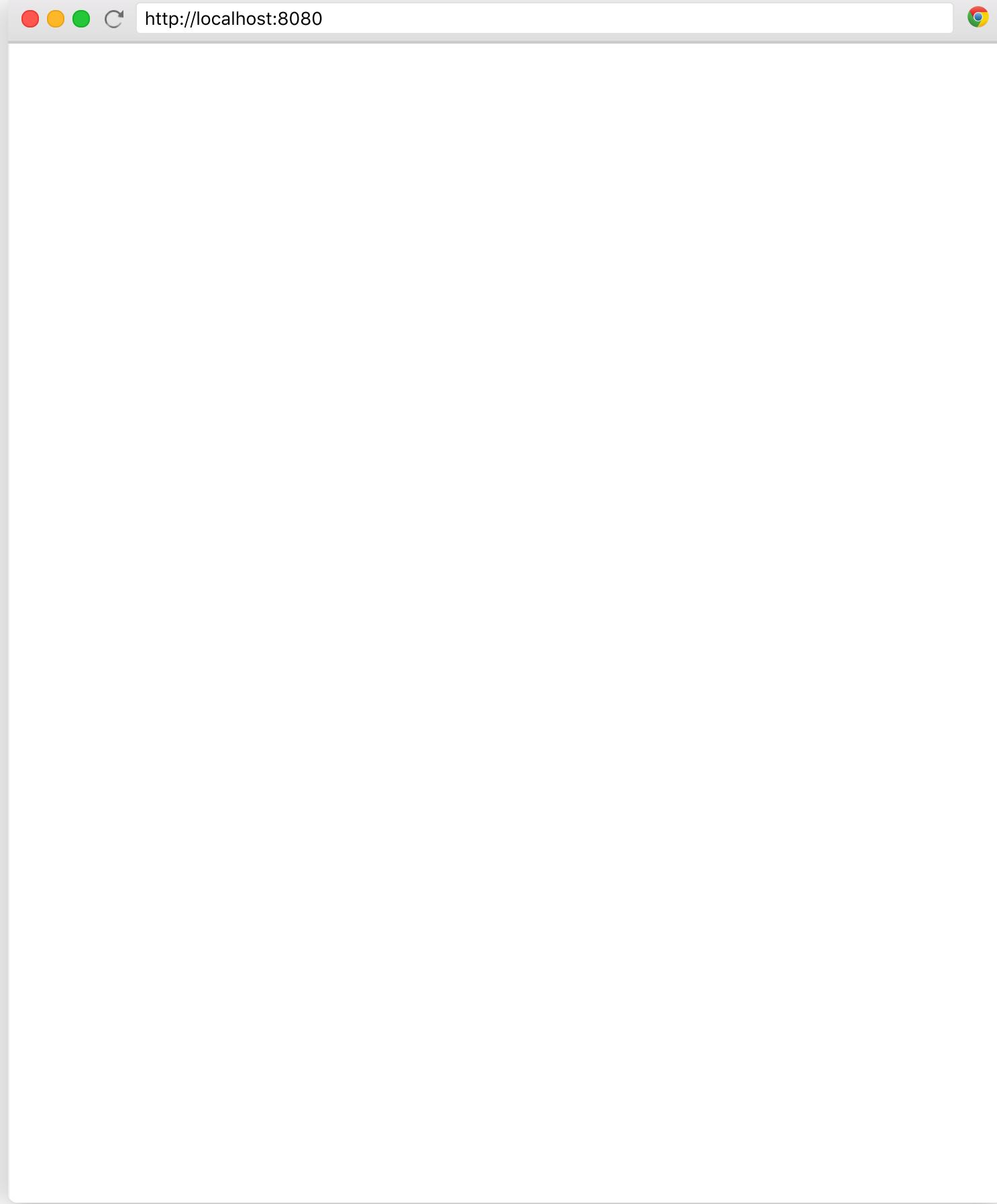
```
1 import React from 'react';
2 import { registerSearchProvider, removeSearchProvider } from 'search-api';
3 import { executeProductCount, executeProductSearch } from './search';
4 import ProductSearchTab from './ProductSearchTab';
5 import ProductSearchResult from './ProductSearchResult';
6
7 export const SEARCH_PROVIDER_ID = 'product';
8 const ORDER = 1;
9
10 export const initialize = () => {
11   registerSearchProvider({
12     ID: SEARCH_PROVIDER_ID,
13     order: ORDER,
14     execute_search: queryData => executeProductSearch(queryData),
15     execute_count: queryData => executeProductCount(queryData),
16     getTabComponent: data => <ProductSearchTab data={data} />,
17     getResultComponent: (queryData, data, fetchData) => (
18       <ProductSearchResult queryData={queryData} data={data} fetchData={fetchData} />
19     ),
20   );
21 };
22
23 // as soon we have health checks, we can remove search provider in case of errors
24 // search provider will disappear in search tabs
25 export const shutdown = () => {
26   removeSearchProvider(SEARCH_PROVIDER_ID);
27 };
```

# Dependency Inversion - Suche



The screenshot shows a code editor with two tabs: 'search/client/src/components/SearchContainer.jsx' and 'search/client/src/components/state/actions.js'. The 'SearchContainer.jsx' tab is active, displaying the following code:

```
1 import React, { useEffect } from 'react';
2 import qs from 'qs';
3 import { getSearchProviders } from 'search-api';
4 import SearchResultHeader from './SearchResultHeader';
5 import SearchResultBody from './SearchResultBody';
6 import { doLoadCount, doLoadData } from './state/actions';
7 import isEmpty from '../util/isEmpty';
8 import { SearchInput } from './SearchInput';
9 import Container from 'react-bootstrap/Container';
10 import Row from 'react-bootstrap/Row';
11 import Col from 'react-bootstrap/Col';
12 import Navbar from 'react-bootstrap/Navbar';
13 import SearchFallback from './SearchFallback';
14 import search from './state/reducers';
15 import useThunkReducer from '../util/useThunkReducer';
16
17 const readQueryDataFromUrl = () => {
18   const queryString = window.location.search;
19   return queryString ? qs.parse(queryString.substring(1, queryString.length));
20 };
21
22 const handlePushHistory = queryData => {
23   const queryString = `?${qs.stringify(queryData, {
24     encode: false,
25     indices: false,
26   })}`;
27
28   window.history.pushState({ ...queryData }, null, queryString);
29 };
30
```



The screenshot shows a browser window with the URL 'http://localhost:8080'. The page displays a search interface with a header, a search input field, and a list of search results.

# Dependency Inversion - Suche

code ~ sources

search/client/src/components/SearchContainer.jsx x search/client/src/components/SearchResultHeader.jsx search/client/src/components/Se...

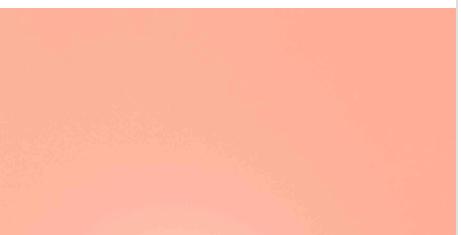
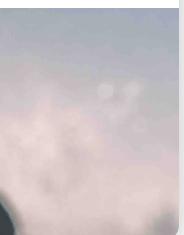
```
1 import React, { useEffect } from 'react';
2 import qs from 'qs';
3 import { getSearchProviders } from 'search-api';
4 import SearchResultHeader from './SearchResultHeader';
5 import SearchResultBody from './SearchResultBody';
6 import { doLoadCount, doLoadData } from './state/actions';
7 import isEmpty from '../util/isEmpty';
8 import { SearchInput } from './SearchInput';
9 import Container from 'react-bootstrap/Container';
10 import Row from 'react-bootstrap/Row';
11 import Col from 'react-bootstrap/Col';
12 import Navbar from 'react-bootstrap/Navbar';
13 import SearchFallback from './SearchFallback';
14 import search from './state/reducers';
15 import useThunkReducer from '../util/useThunkReducer';
16
17 const readQueryDataFromUrl = () => {
18   const queryString = window.location.search;
19   return queryString ? qs.parse(queryString.substring(1, queryString.length));
20 };
21
22 const handlePushHistory = queryData => {
23   const queryString = `?${qs.stringify(queryData, {
24     encode: false,
25     indices: false,
26   })}`;
27
28   window.history.pushState({ ...queryData }, null, queryString);
29 };
30
```

http://localhost:8080/?query=make-up&searchType=product

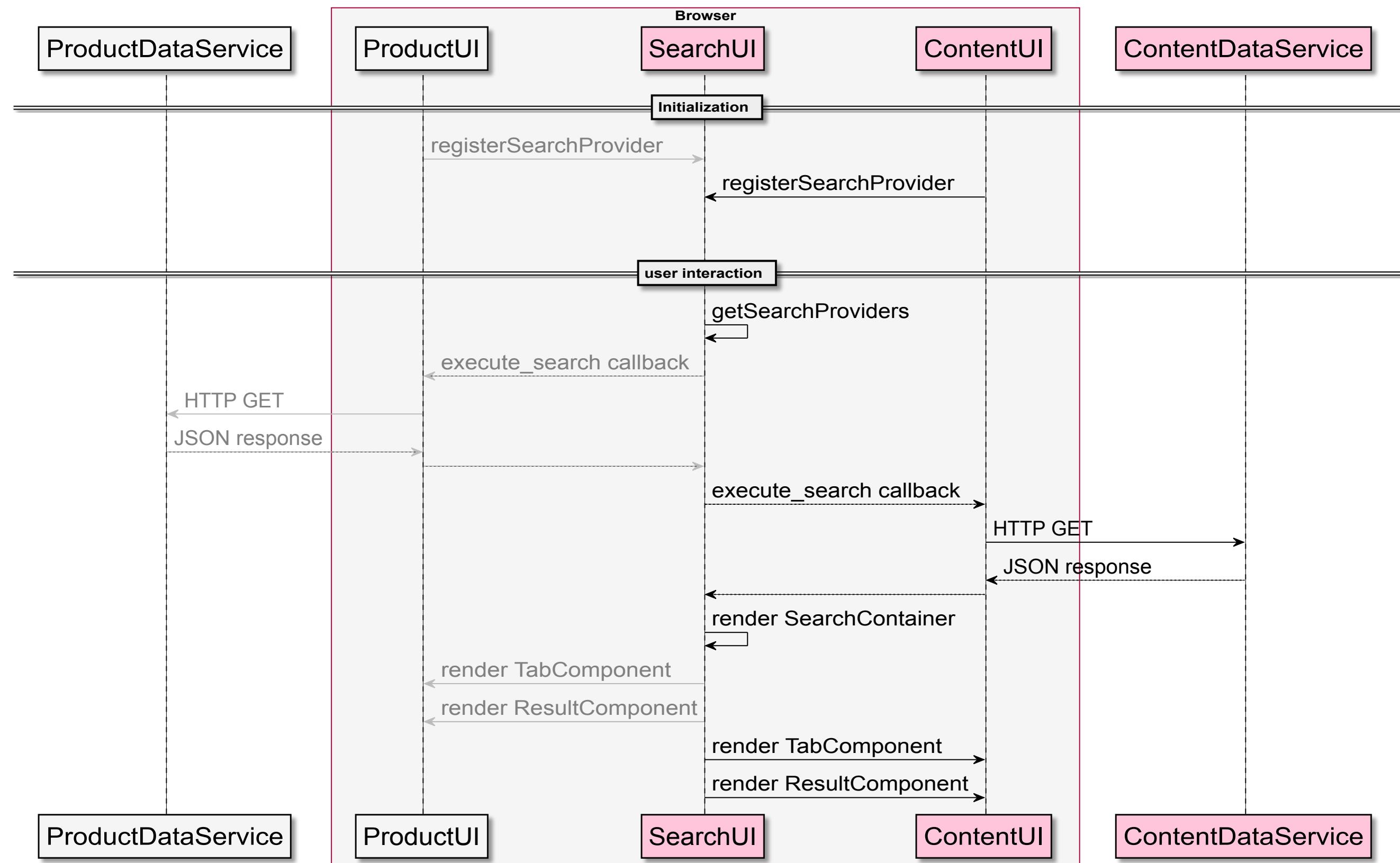
## Suche nach "make-up"

Produkte (6)

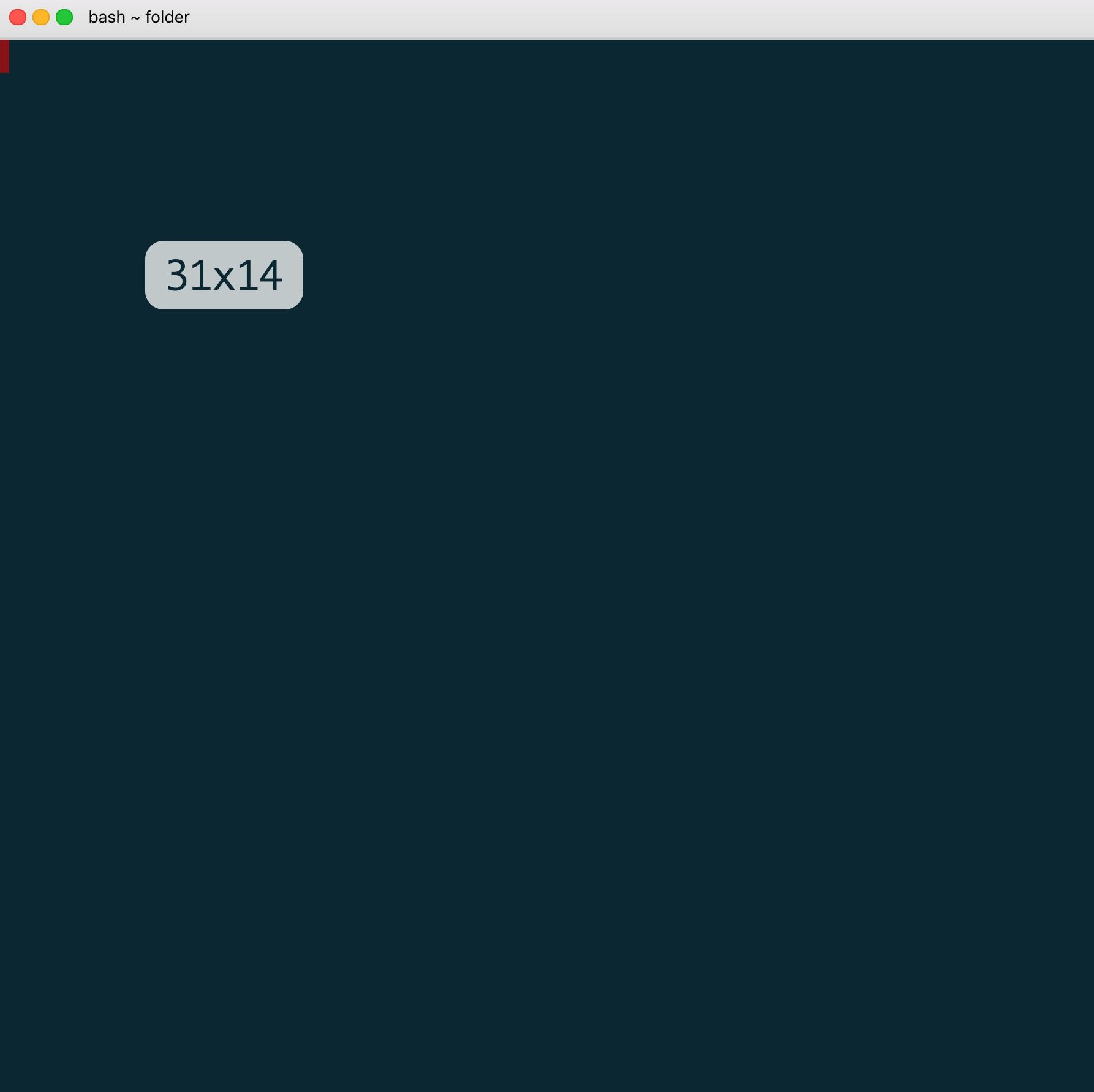
Suche nach "make-up": 6 counts

<p>make-up product 1 3,95 €</p>  <p> Lorem ipsum dolor sit amet</p>	<p>make-up product 2 1,99 €</p>  <p> Lorem ipsum dolor sit amet</p>	<p>make-up p... 8,65 €</p>  <p> Lorem ipsum</p>
<p>make-up product 4 2,95 €</p>  <p> Lorem ipsum dolor sit amet</p>	<p>make-up product 5 8,65 €</p>  <p> Lorem ipsum</p>	<p>make-up p... 2,95 €</p>  <p> &lt; &gt;</p>

## ... und jetzt noch mit Provider für Contentsuche



.. und jetzt noch mit Provider für Contentsuche



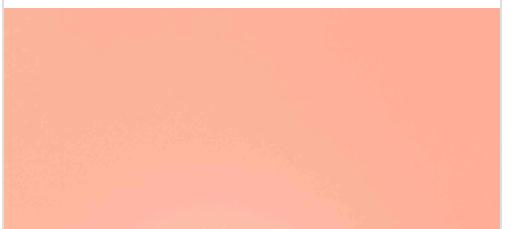
bash ~ folder

http://localhost:8080/?query=make-up&searchType=product

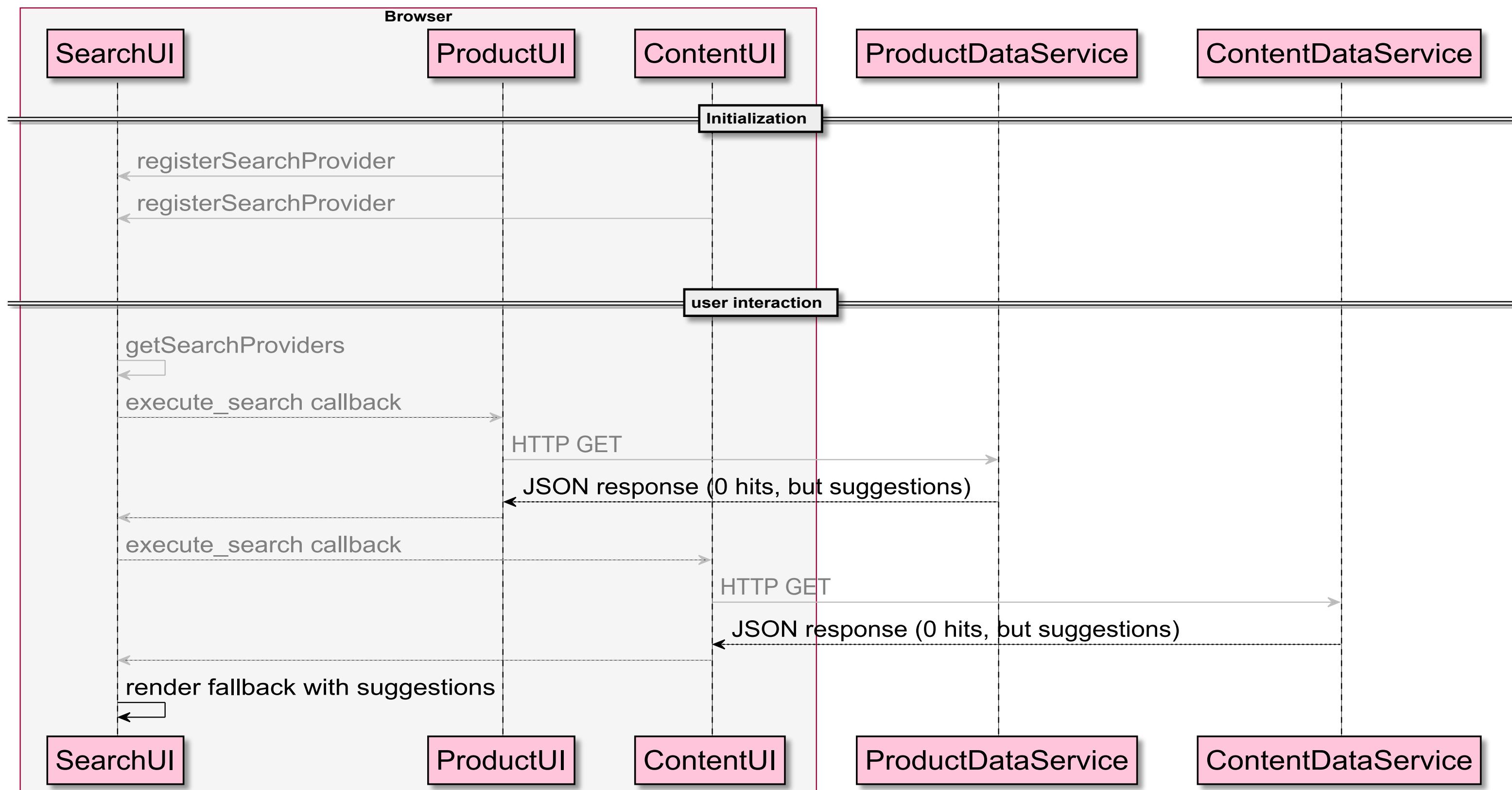
## Suche nach "make-up"

Produkte (6)

Suche nach "make-up": 6 counts

<b>make-up product 1</b> 3,95 €  Lorem ipsum dolor sit amet	<b>make-up product 2</b> 1,99 €  Lorem ipsum dolor sit amet	<b>make-up product 3</b> 8,65 €  Lorem ipsum dolor sit amet
<b>make-up product 4</b> 2,95 € 	<b>make-up product 5</b> 8,65 € 	<b>make-up product 6</b> 2,95 € 

## ... 0-Treffer -> Fallback und Suchvorschläge



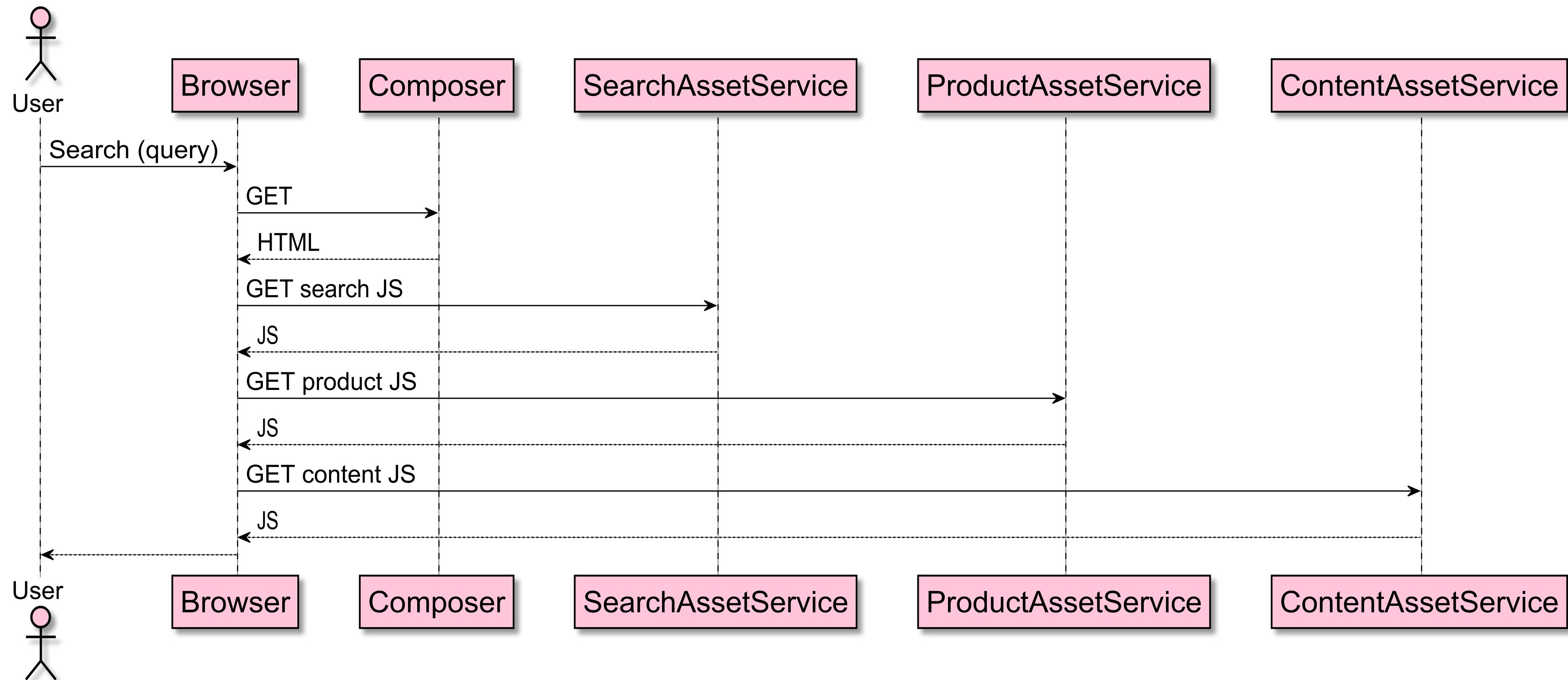
# Github Repo

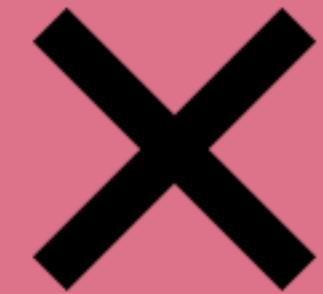
---

<https://github.com/denise-schaefer/micro-frontends>

```
.
├── composer
│   └── server
├── content
│   ├── client
│   └── server
├── product
│   ├── client
│   └── server
├── search
│   ├── client
│   └── server
└── search-api
    ├── lib
    └── src
```

## HTML und JS laden





## **Composition**

Kein unabhängiges Deployment

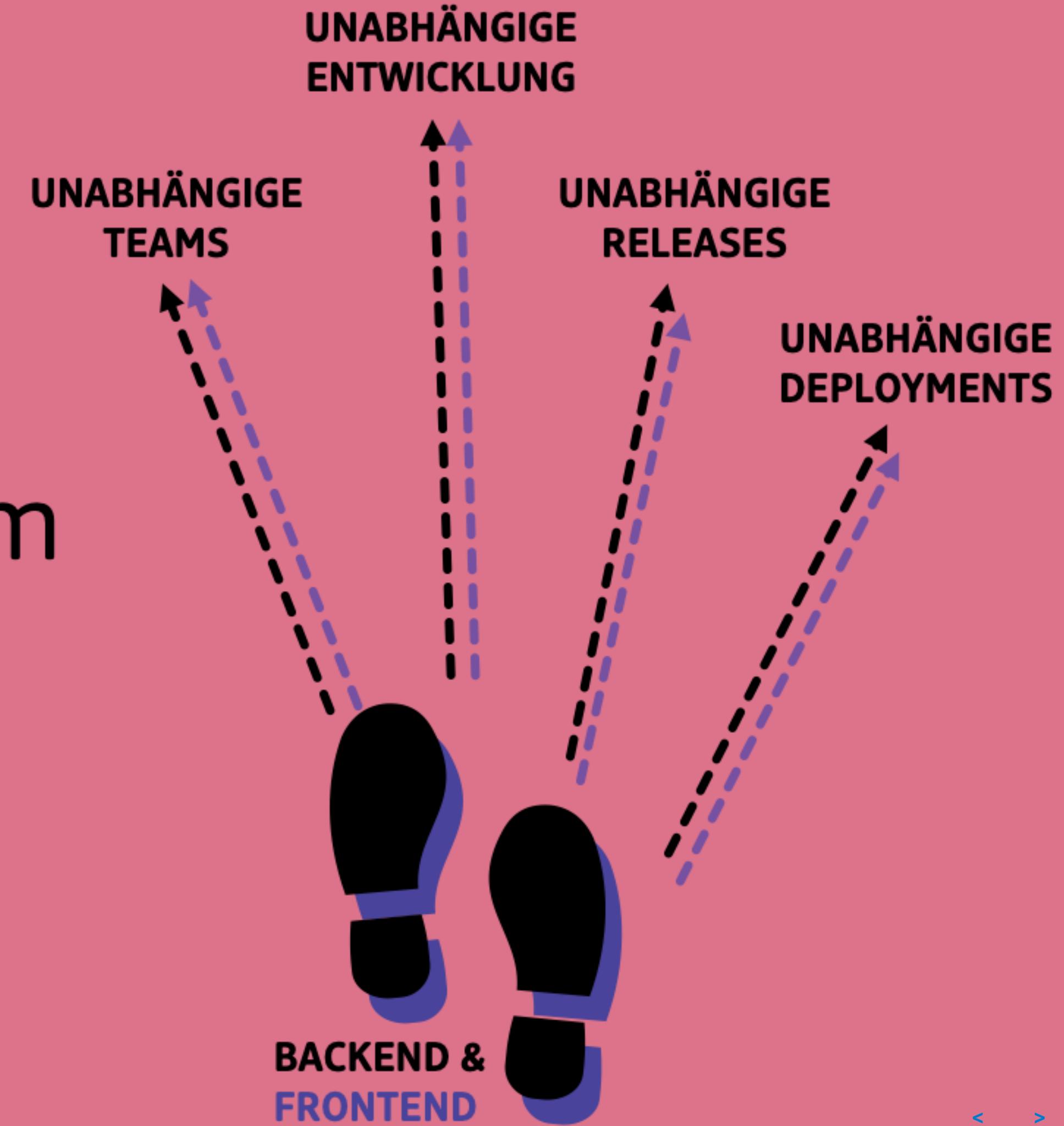


## **Dependency Inversion**

Unabhängiges Deployment

Runtime Composition

# Unabhängigkeit im Back- & Frontend





# Lessons Learned

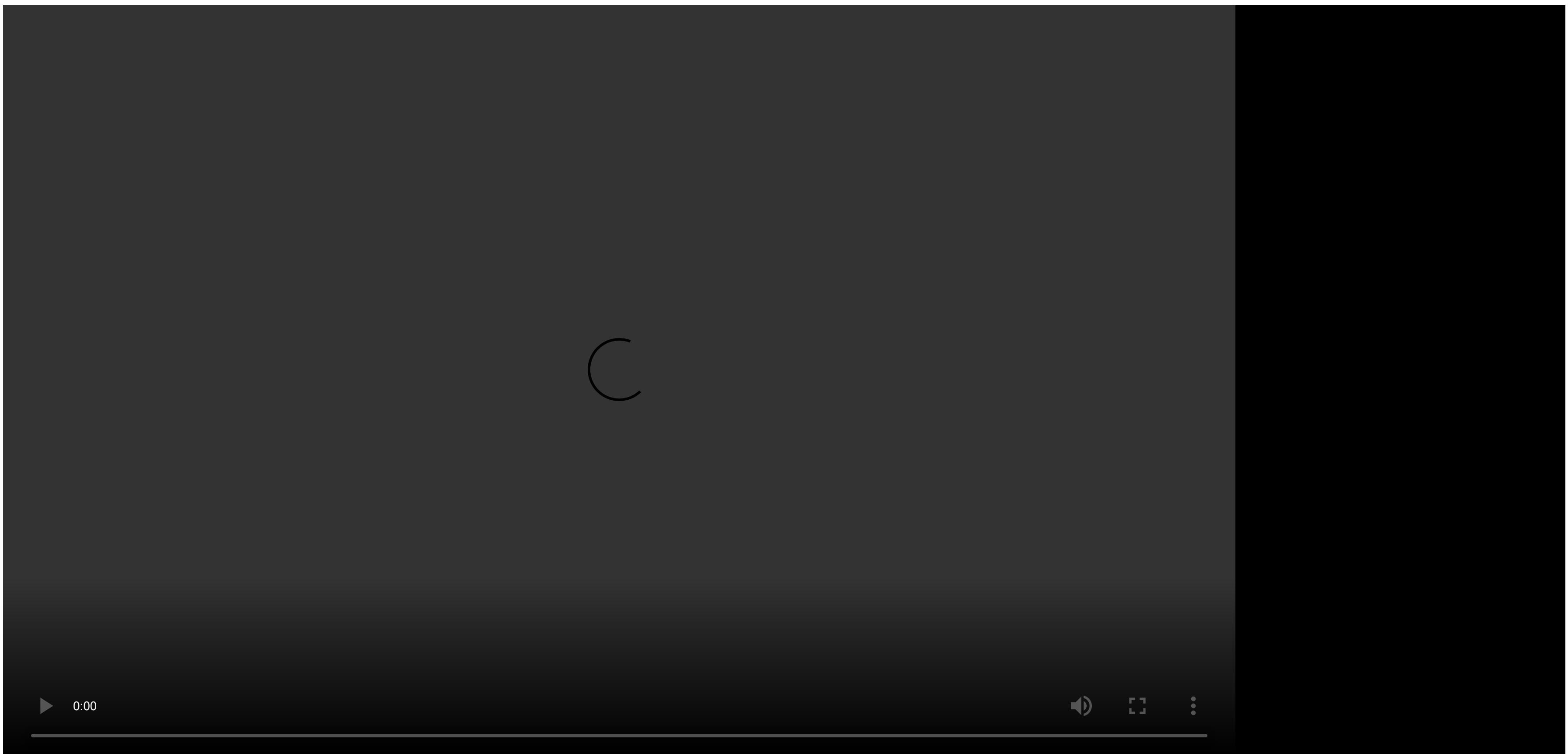
Vorteil umso größer, **je größer** das Projekt

Schnittstelle **technologiefrei** halten, z.B. kein Redux

**Umdenken** im Programmierparadigma fällt oft schwer

# Einfache Skalierung, auch für weitere Apps - SEINZ.

---



# Wie geht's weiter?

**Ablösung CMS** als Composer

**SSR** für ersten Seitenaufruf

**Frontend-seitiges Routing** für alle  
Uls von dm.de

DANKE!