



Dank HTMX ohne nodejs zum Java-Backend-lastigen Frontend

Ein Refactoring-Erfahrungsbericht

Was euch in diesem Talk erwartet



Kontext

Warum wollten wir refactorn?

HTMX in a nutshell

Ganz kurze Einführung

Buildless Frontend

Wie wir Spring und Browserfeatures nutzen, so dass wir keinen Frontend Build mehr brauchen

„deep dive“

Refactoring

Auch aus einer Projekt Perspektive



Sebastian Sprenger

Staff Software Engineer @ Breuninger



Felix Seidel

Agile Software Engineer @ andrena objects



Fashion & Lifestyle Department Store
im Premium- und Luxus-Segment

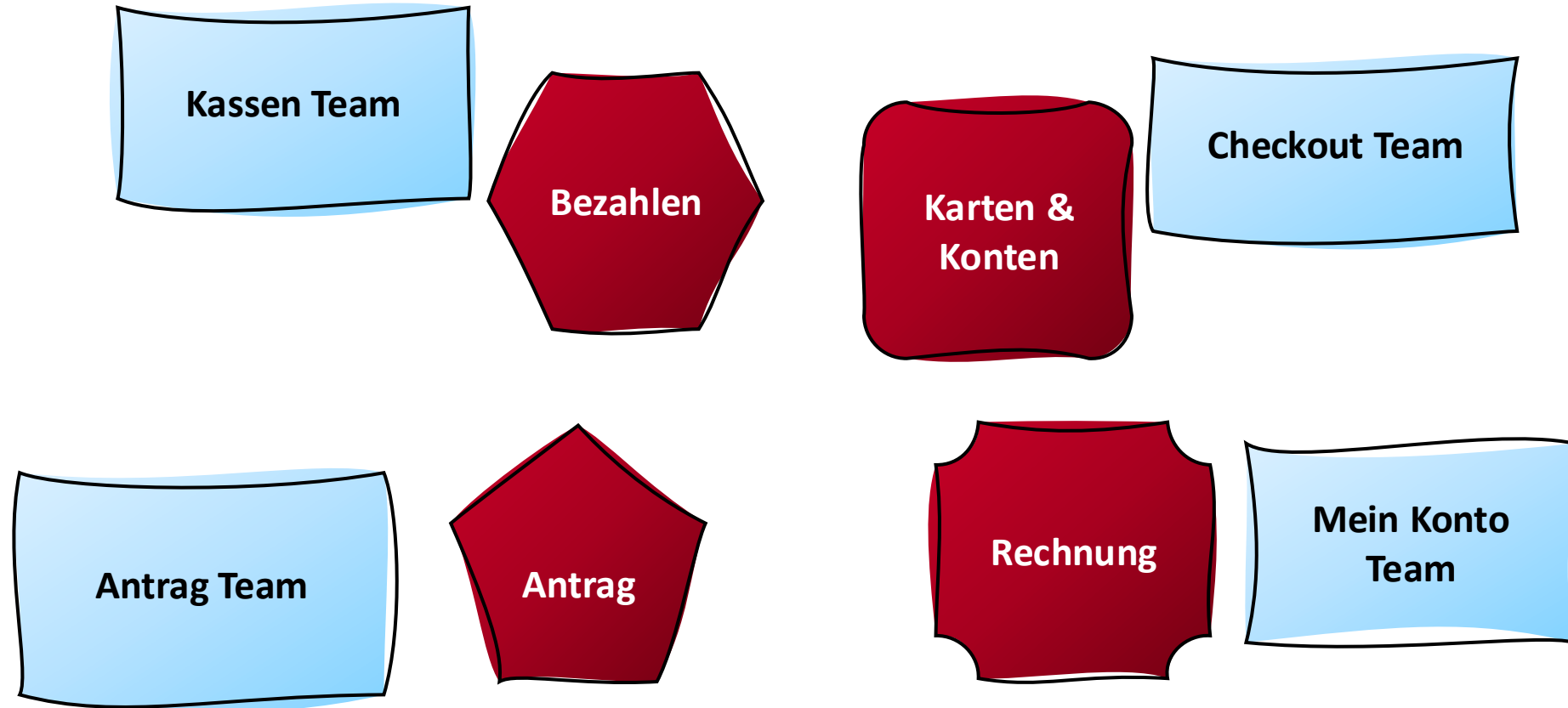
13 Häuser in Deutschland und Luxemburg
Online-Shop in 13 europäischen Ländern

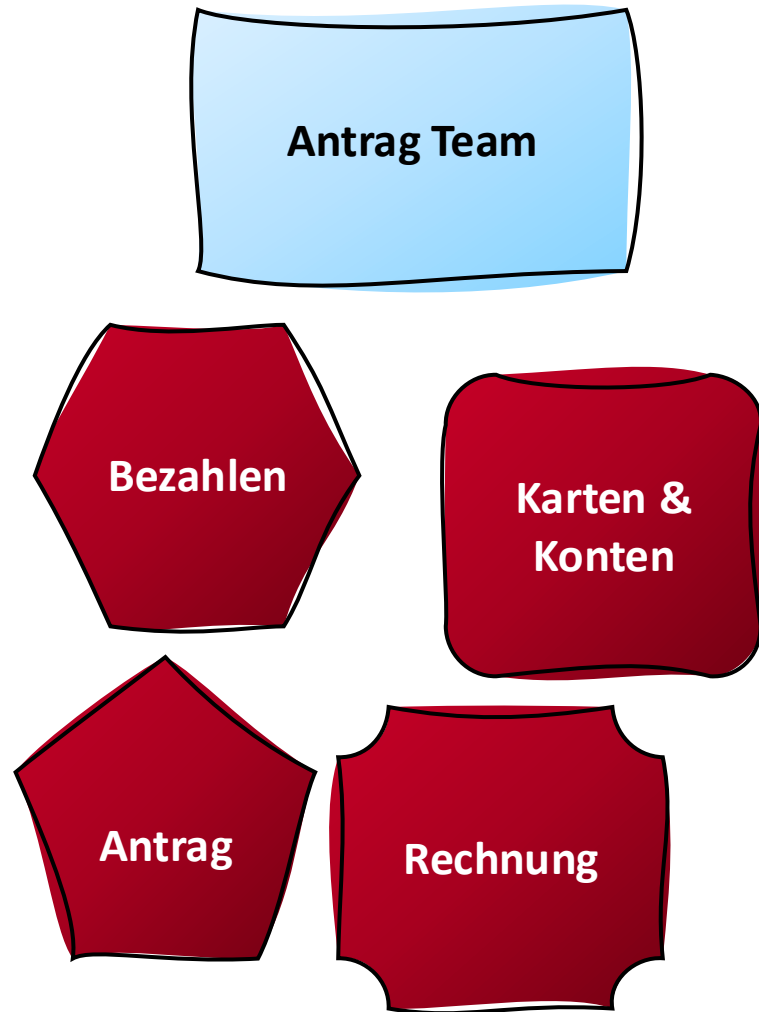


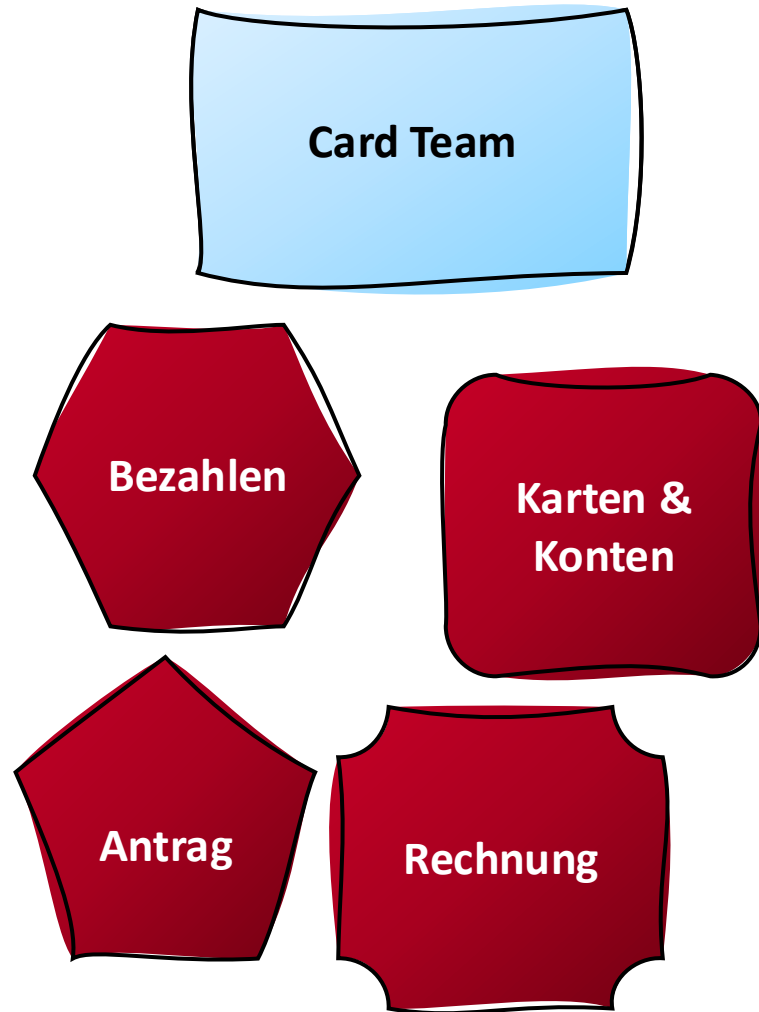
Unser eigenes Zahlungsmittel:

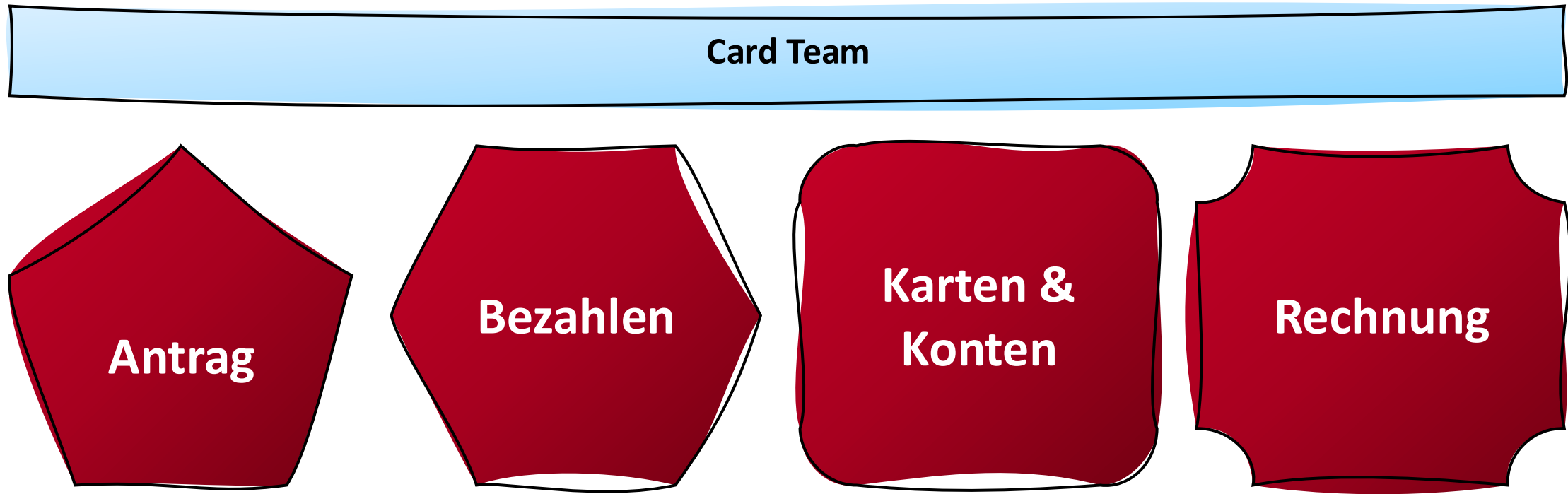
Breuninger Card



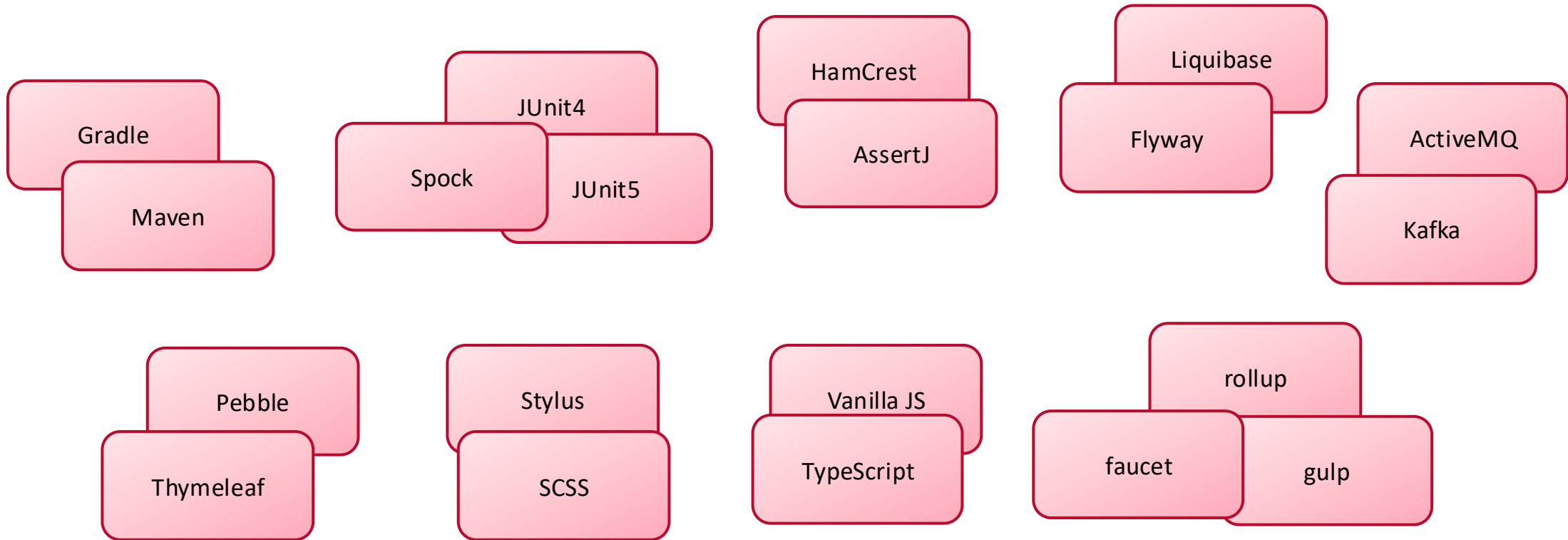




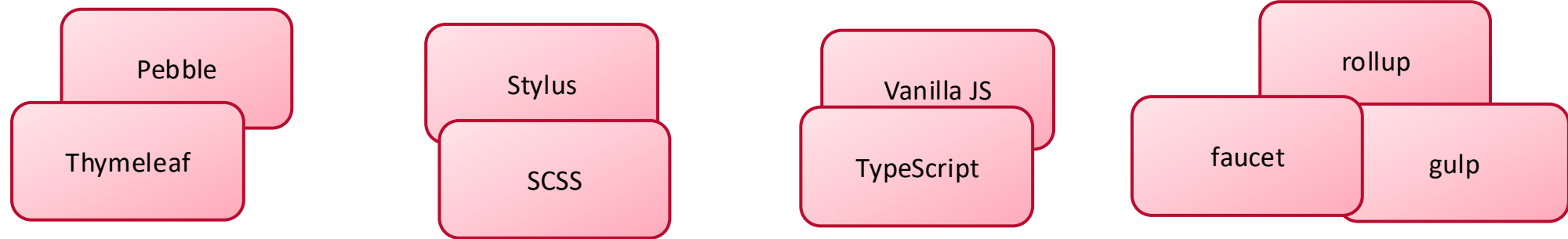




**Bounded Contexts in (Micro)Services;
alle sehen technisch unterschiedlich aus**



* das ist nur ein Ausschnitt



Technologieharmonisierung

TypeScript

- src
 - main
 - frontend
 - components
 - integration
 - scripts
 - bundles
 - meinkonto
 - bcdetails
 - bcdetails.ts
 - pin-vergessen-modal.ts
 - hub
 - nobc
 - pinvergeben
 - pinvergessen
 - sperrern
 - webrechnungskennzeichen
 - services
 - tracking
 - types
 - styles
 - common
 - headingmodule.scss
 - layout.scss
 - shared.scss
 - spacing.scss
 - spinner.scss
 - specific
 - nui.peb
 - templates
 - java
 - resources

SCSS

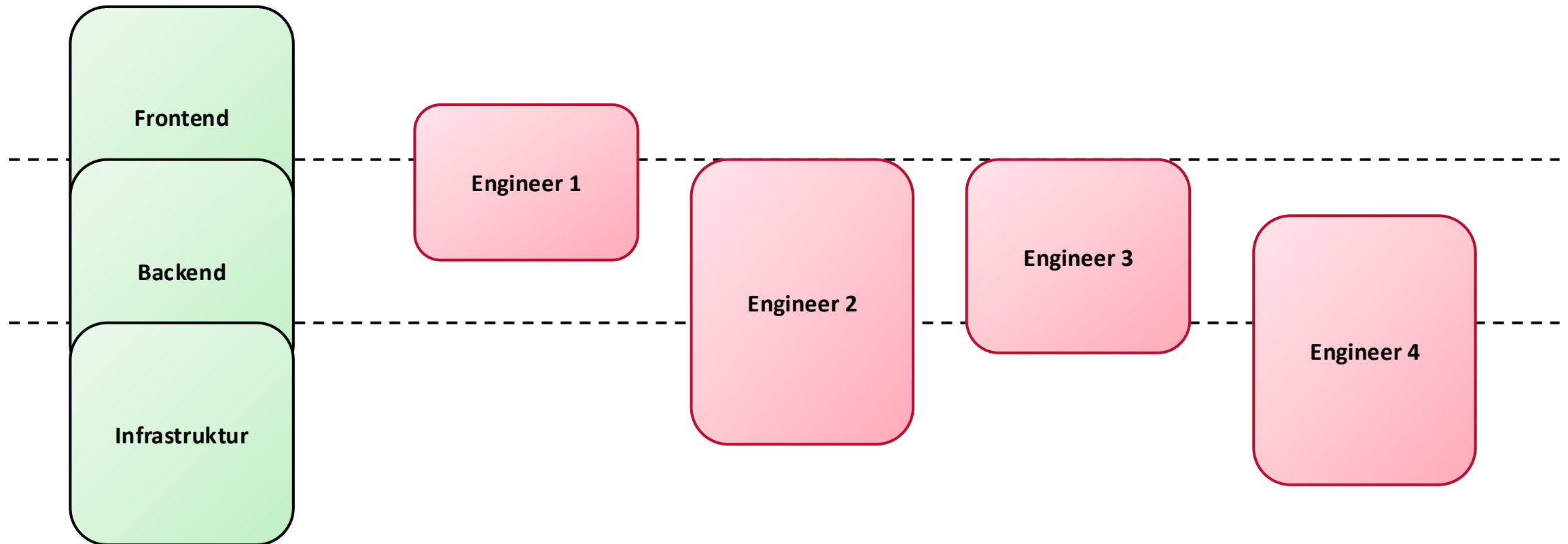
TypeScript

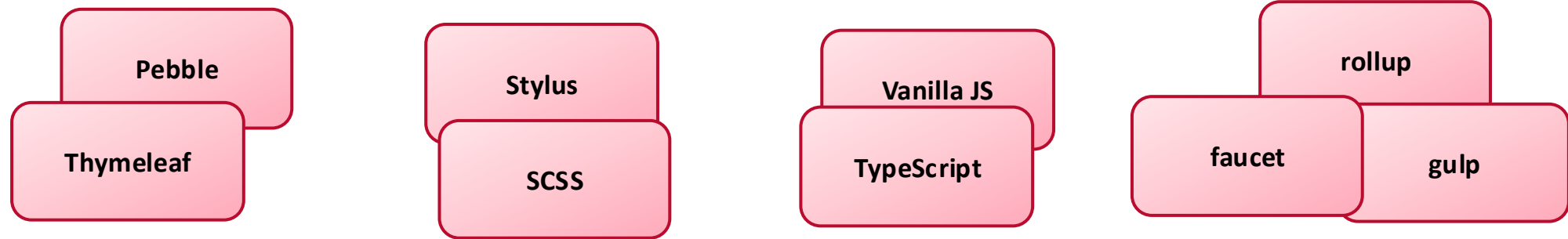
- src
 - main
 - frontend
 - components
 - images
 - integration
 - scripts
 - components
 - legiLinkForwarder-application-service.ts
 - legiLinkForwarder-main.ts
 - legiLinkForwarder-view.ts
 - services
 - tracking
 - types
 - main.legiLinkForwarder.js
 - main.tooltip.js
 - scripts-main-legiLinkForwarder.peb
 - scripts-main-legiLinkForwarder.peb
 - scripts-main-tooltip.peb
 - ssi
 - styles
 - components
 - common
 - _common.styl
 - checkbox.styl
 - input.styl
 - notification.styl
 - nui-icon.styl
 - spinner.styl
 - tooltip.styl

JavaScript

Pebble

Stylus





Technologieharmonisierung

Cognitive Load

- Kontextswitches zwischen Technologien ohne Mehrwert
- Doppelte und dreifache Problemlösung anstrengend

Skillbedarf

- Wer kann?
- Wer will?
- Expertin/Experten einstellen?
- Umfang und Nachhaltigkeit des Skillaufbaus

Local Development

- Frontend Server gestartet?
- Frontend Build ausgeführt?
- Fehler im Code oder Build?

**Individualisierter
Content**

(Saldo, Rechnungen)

Formulare

(AGBs bestätigen, Kontodaten
ändern)

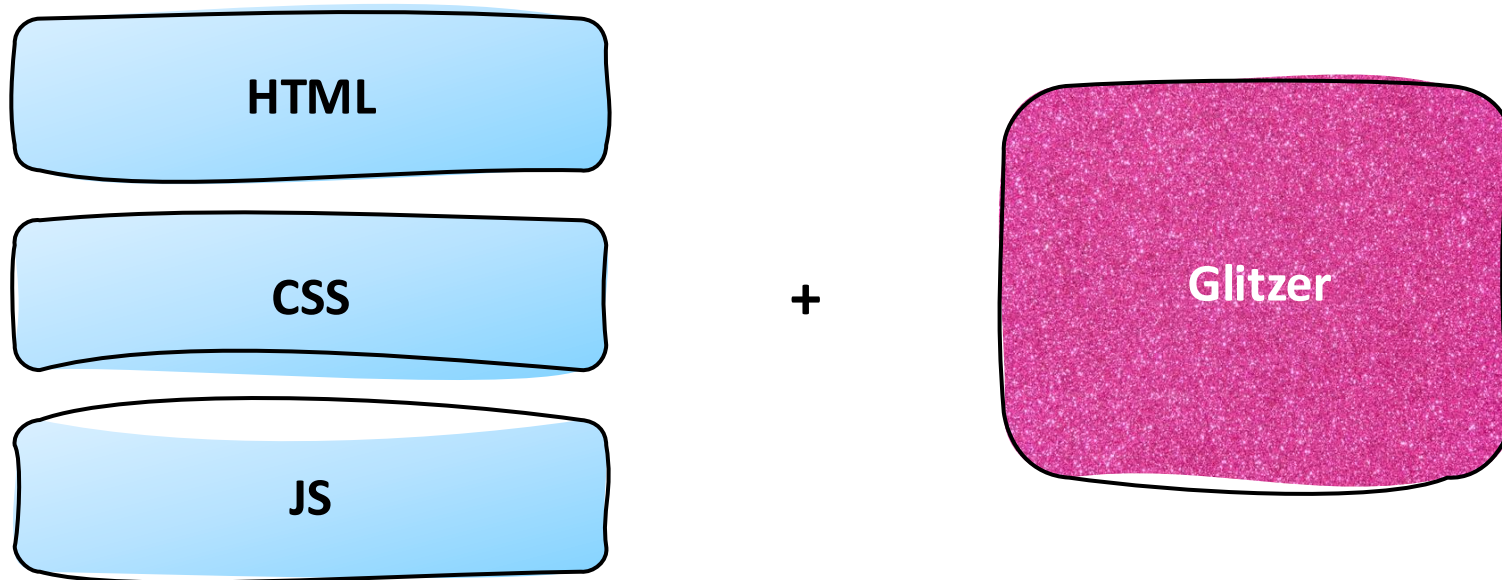
Input Validation

Interaktivität

(Polling, Show/Hide, Tracking)

**Funktion wichtiger
als Performance**

(Antrag abschließen)





HTML

Server Side Rendering mit
Thymeleaf

CSS

Vanilla CSS
ohne Transpilation

JS

Vanilla JS
ohne Transpilation

Glitzer

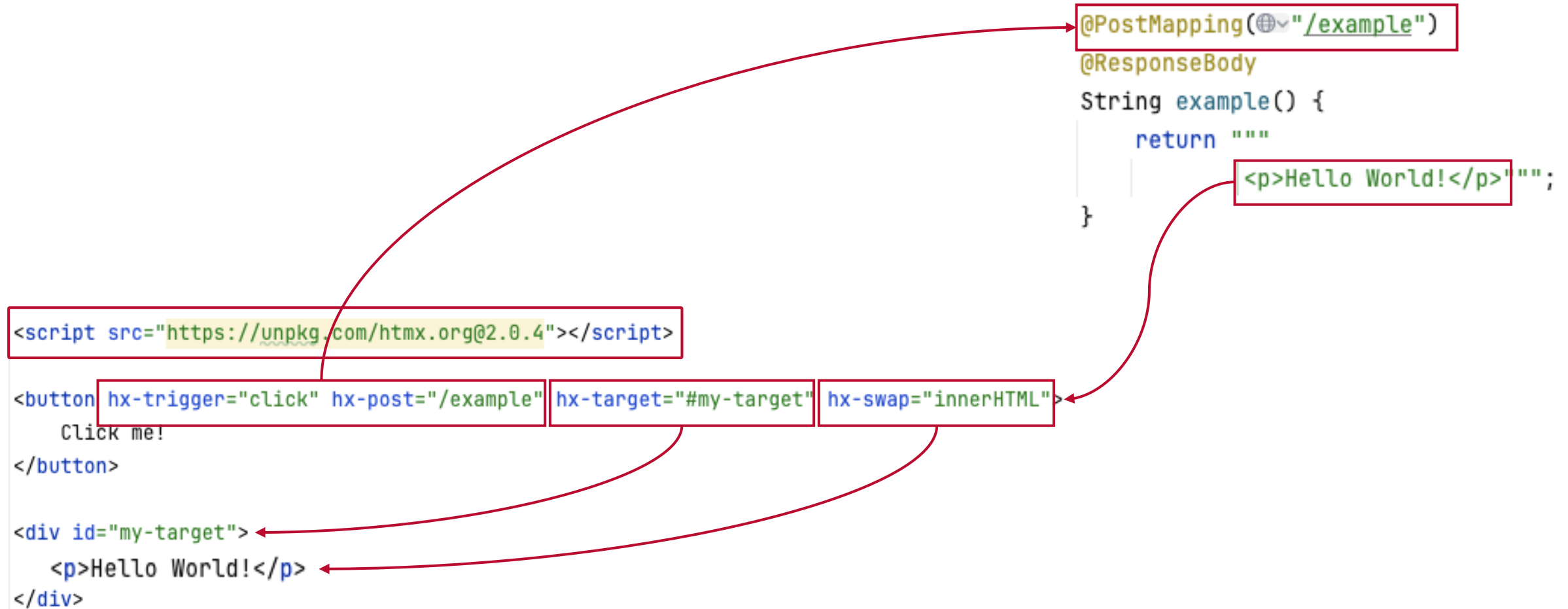
Deskriptive AJAX
Funktionalität mit **HTMX**



Buildless Frontend



HTMX



click, load, blur,
every 1s

```
<script src="https://unpkg.com/htmx.org@2.0.4"></script>

<button hx-trigger="click" hx-post="/example" hx-target="#my-target" hx-swap="innerHTML">
  Click me!
</button>

<div id="my-target">
  <p>Hello World!</p>
</div>
```

```
@PostMapping("/example")
@ResponseBody
String example() {
    return ""
        |<p>Hello World!</p>"";
}
```

The screenshot shows a web browser window with the address bar at `htmx.org/examples/`. The page title is `</> htmx` and the navigation bar includes links for `docs`, `reference`, `examples`, `talk`, and `essays`. A search icon and a star icon with the text `star 48,355` are also present. The main content area is titled `Examples` and contains two sections: `Server-side Integration Examples` and `UI Examples`. The `UI Examples` section contains a table with two columns: `Pattern` and `Description`. The table lists various UI patterns implemented in htmx, such as `Click To Edit`, `Bulk Update`, `Click To Load`, `Delete Row`, `Edit Row`, `Lazy Loading`, `Inline Validation`, `Infinite Scroll`, `Active Search`, `Progress Bar`, `Value Select`, `Animations`, and `File Upload`.

Examples

Server-side Integration Examples

A list of [GitHub repositories showing examples of integration](#) with a wide variety of server-side languages and platforms, including JavaScript, Python, Java, and many others.

UI Examples

Below are a set of UX patterns implemented in htmx with minimal HTML and styling. You can copy and paste them and then adjust them for your needs.

Pattern	Description
Click To Edit	Demonstrates inline editing of a data object
Bulk Update	Demonstrates bulk updating of multiple rows of data
Click To Load	Demonstrates clicking to load more rows in a table
Delete Row	Demonstrates row deletion in a table
Edit Row	Demonstrates how to edit rows in a table
Lazy Loading	Demonstrates how to lazy load content
Inline Validation	Demonstrates how to do inline field validation
Infinite Scroll	Demonstrates infinite scrolling of a page
Active Search	Demonstrates the active search box pattern
Progress Bar	Demonstrates a job-runner like progress bar
Value Select	Demonstrates making the values of a select dependent on another select
Animations	Demonstrates various animation techniques
File Upload	Demonstrates how to upload a file via ajax with a



Übersicht

Einkäufe

Mein Beyond Bereich

Breuninger Card

Persönliche Daten

Adressbuch

Einstellungen

Zum Hilfebereich

MONATLICHE UMSÄTZE

RECHNUNGEN

ZAHLUNGSDATEN ÄNDERN

BREUNINGERCARD SPERREN

VERTRAGSDOKUMENTE HERUNTERLADEN

HILFE & KONTAKT

Bestellung

Login & Registrierung

Zahlung

Versand & Lieferung

Rücksendung & Erstattung

Datenschutzeinstellungen

Zum Hilfebereich

KUNDENBEWERTUNG

Trustpilot

SICHERHEIT

EHI

Sichere Bezahlung durch SSL Verschlüsselung & Schutz Ihrer persönlichen Daten.

ZAHLUNGSARTEN

B

B

MasterCard

VISA

AM EX

RECHNUNG

PayPal

Klarna

Hub
Controller

Umsätze
Controller

Rechnungen
Controller

Zahlungsdaten
Controller

Sperren
Controller

Vertragsdokumente
Controller

Rahmen via Layout Dialect

breuninger



Übersicht

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MONATLICHE UMSÄTZE

RECHNUNGEN

ZAHLUNGSDATEN ÄNDERN

Bitte geben Sie Ihre Bankdaten ein.

Name des Kontoinhabers

Sebastian Sprenger

IBAN

☐ Ich ermächtige die E. Breuninger GmbH & Co., wiederkehrende Zahlungen von meinem Konto mittels Lastschrift einzuziehen. Zugleich weise ich mein Kreditinstitut an, die von der E. Breuninger GmbH & Co. auf mein Konto gezogenen Lastschriften einzulösen.

Hinweis: Änderungen zur SEPA-Lastschrift, die nicht mindestens 3 Werktage vor Einzugstermin vorgenommen wurden, können erst beim nächsten Einzug berücksichtigt werden.

NEUE BANKDATEN SPEICHERN

ABBRECHEN

BREUNINGERCARD SPERREN

VERTRAGSDOKUMENTE HERUNTERLADEN

Hub
Controller

Umsätze
Controller

Rechnungen
Controller

Zahlungsdaten
Controller

Sperren
Controller

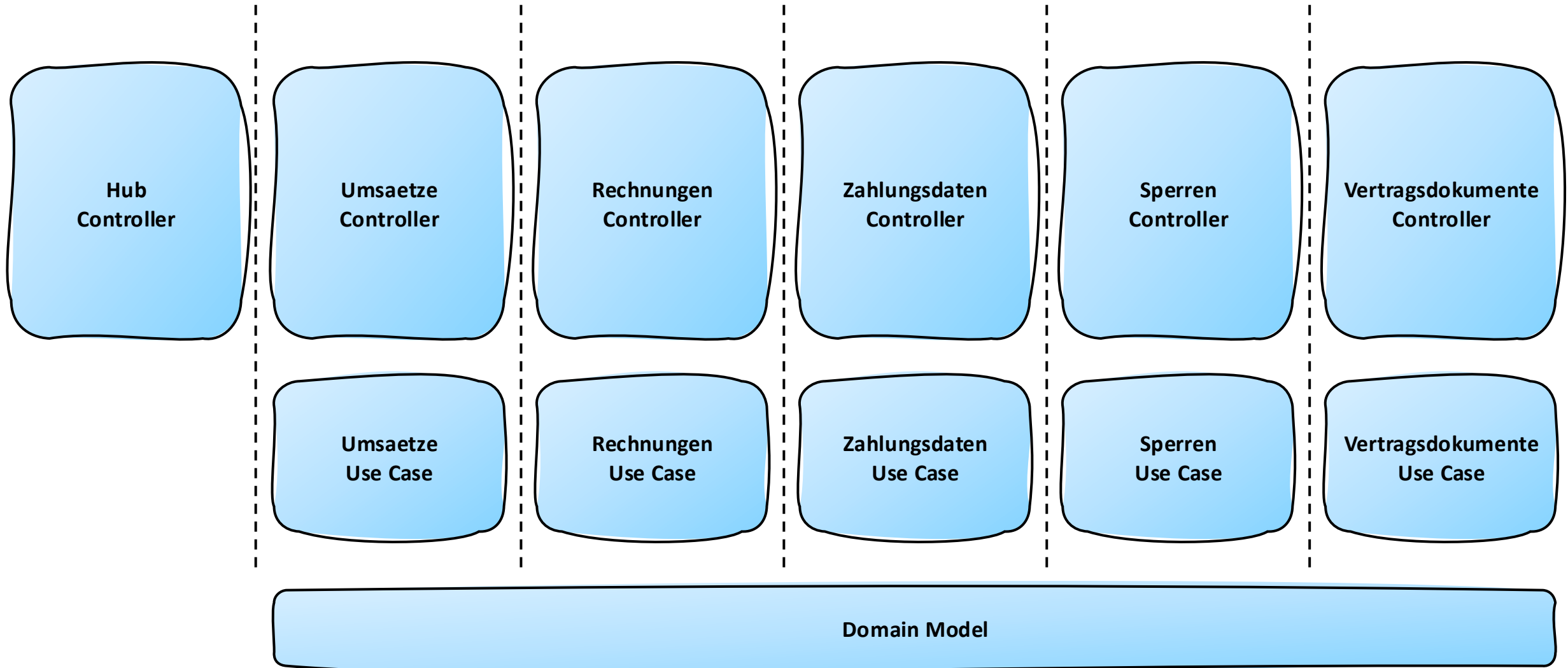
Vertragsdokumente
Controller

Rahmen via Layout Dialect

Partial via HTMX nachgeladen

25

breuninger



HTML

Server Side Rendering mit
Thymeleaf

CSS

Vanilla CSS
ohne Transpilation

JS

Vanilla JS
ohne Transpilation

Glitzer

Deskriptive AJAX
Funktionalität mit **HTMX**



Buildless Frontend



Buildless Frontend

Static Assets

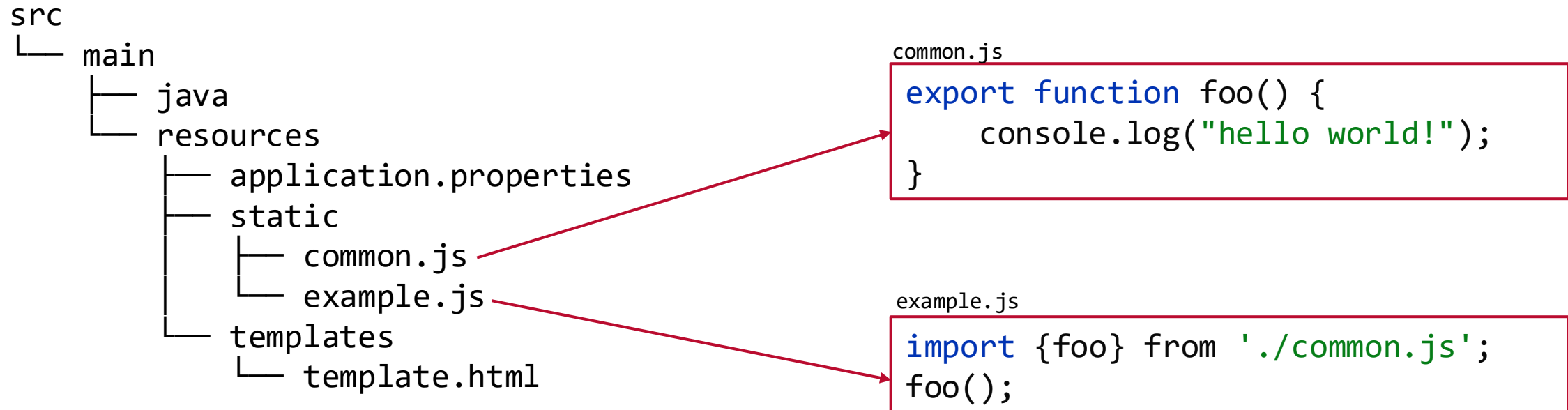
Fingerprinting

Breuninger Komponenten Library

Path Alias

Dependency Management

External JS ohne npm



```
$ curl localhost:8080/example.js  
import {foo} from './common.js';  
foo();
```

WebConfiguration.java

```
@Configuration
public class WebConfiguration implements WebMvcConfigurer {
    @Override
    public void addResourceHandlers(ResourceHandlerRegistry registry) {
        registry.addResourceHandler("/static-assets/**")
            .addResourceLocations("classpath:/static/");
    }
}
```

```
$ curl localhost:8080/static-assets/example.js
import {foo} from './common.js';
foo();
```

template.html

```
<script type="module" src="/static-assets/example.js"></script>
```

```
$ curl localhost:8080
```

```
<script type="module" src="/static-assets/example.js"></script>
```

template.html

```
<script type="module" src="/static-assets/example.js"></script>
```

template.html

```
<script type="module" src="/static-assets/example.1.0.0.js"></script>
```

template.html

```
<script type="module" src="/static-assets/example.a32fae.js"></script>
```

ContentVersionsStrategy

template.html

```
<script type="module" src="/static-assets/a32fae/example.js"></script>
```

FixedVersionsStrategy

template.html

```
<script type="module" src="/static-assets/1.0.0/example.js"></script>
```

WebConfiguration.java

```
@Configuration
public class WebConfiguration implements WebMvcConfigurer {
    @Override
    public void addResourceHandlers(ResourceHandlerRegistry registry) {
        var assetsResolver = new VersionResourceResolver()
            .addFixedVersionStrategy("1.0.0", "**");
        registry.addResourceHandler("/static-assets/**")
            .addResourceLocations("classpath:/static/")
            .resourceChain(true).addResolver(assetsResolver);
    }
}
```

```
$ curl localhost:8080/static-assets/1.0.0/example.js
import {foo} from './common.js';
foo();
```

template.html

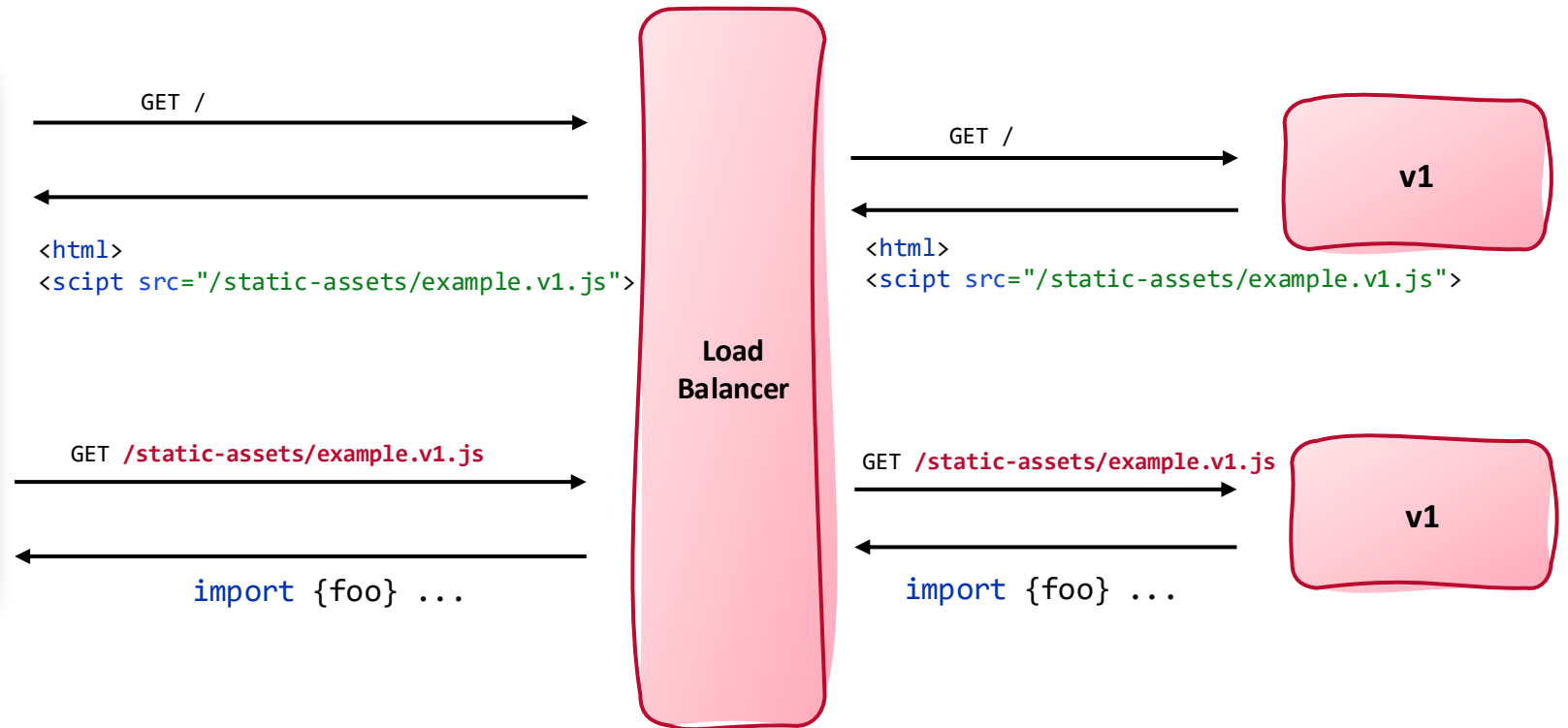
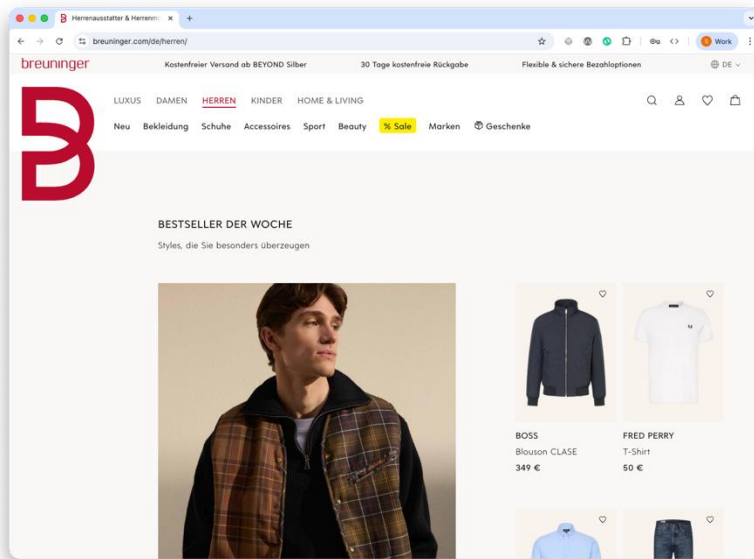
```
<script type="module" src="/static-assets/example.js"></script>
```

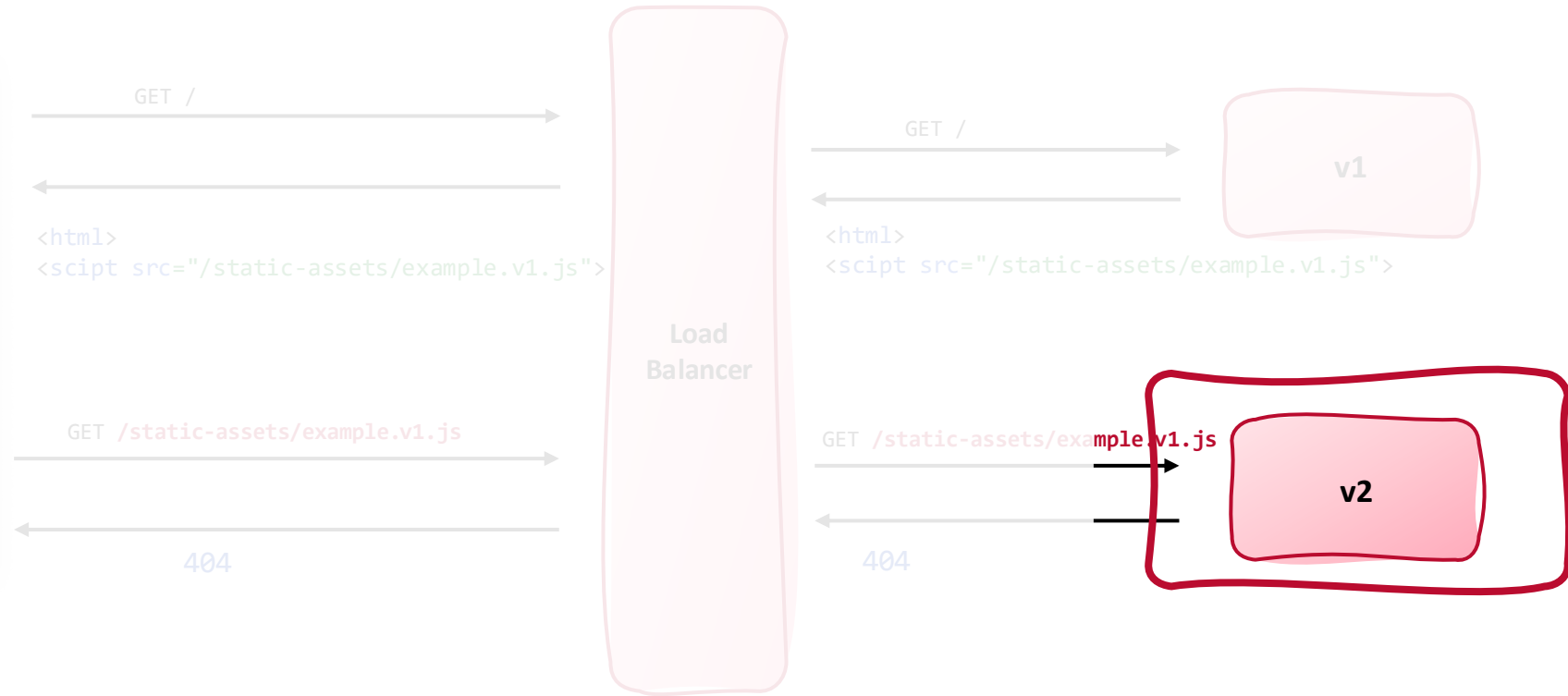
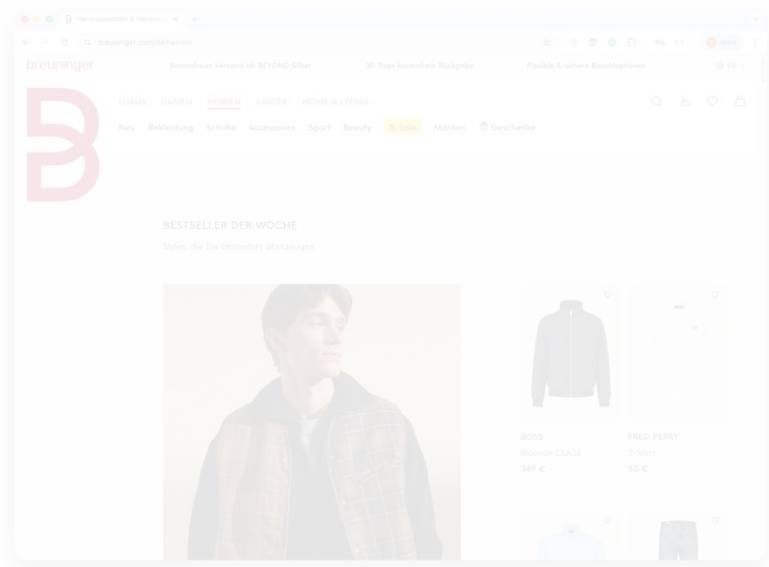
template.html

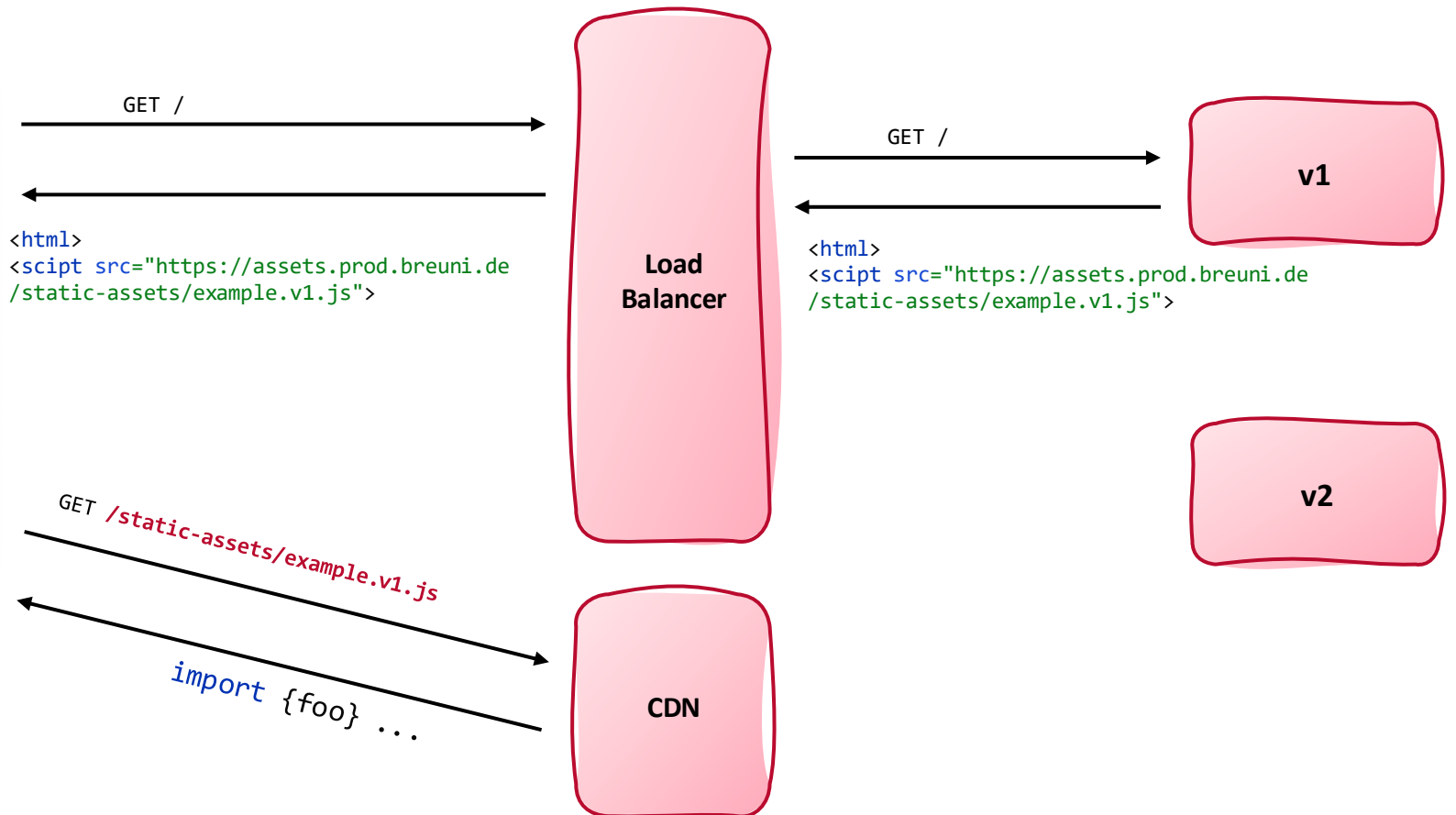
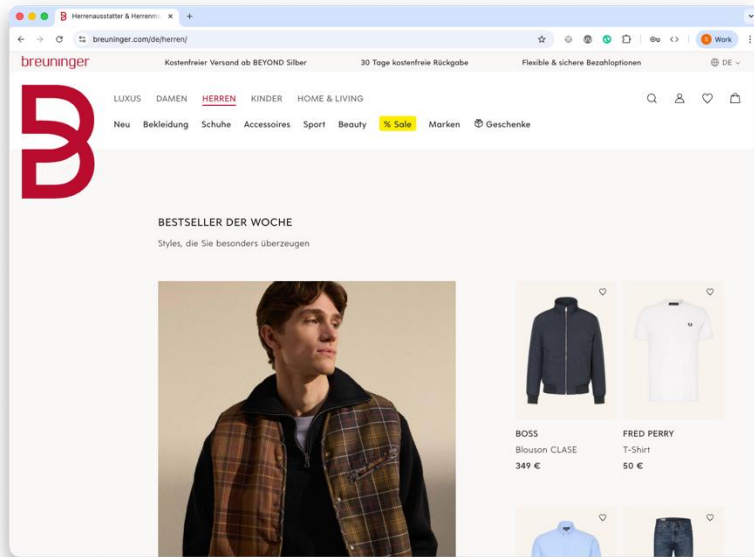
```
<script type="module" th:src="@{/static-assets/example.js}"></script>
```

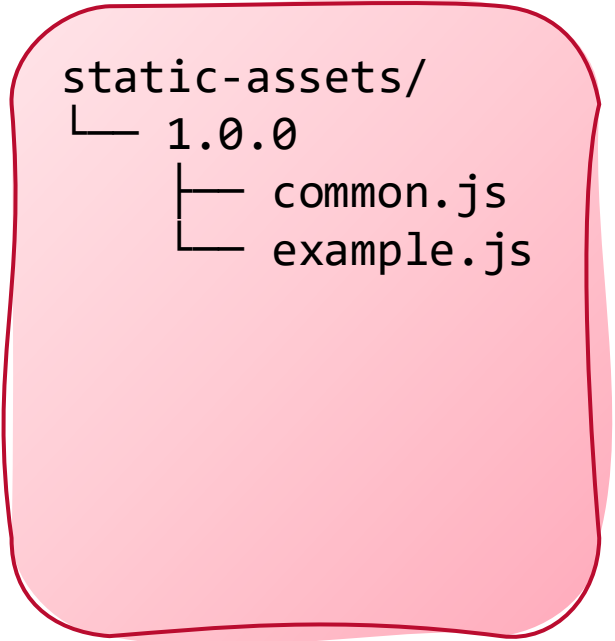
\$ curl localhost:8080

```
<script type="module" src="/static-assets/1.0.0/example.js"></script>
```









```
static-assets/  
└─ 1.0.0  
    ├── common.js  
    └── example.js
```

```
static-assets/  
├── 1.0.0  
│   ├── common.js  
│   └── example.js  
└── 1.0.1  
    ├── common.js  
    ├── example.js  
    └── feature.js
```

template.html

```
<script type="module" th:src="@{/static-assets/example.js}"></script>
```

```
$ curl https://breuninger.com  
<script type="module"  
    src="https://assets.prod.breuni.de/static-assets/1.0.0/example.js">  
</script>
```

```
$ curl localhost:8080  
<script type="module"  
    src="/static-assets/1.0.0/example.js">  
</script>
```

LinkCustomizer.java

```
public class LinkCustomizer extends StandardLinkBuilder {  
    private String prefix;  
    @Override  
    protected String processLink(final IExpressionContext context,  
                                final String link) {  
        var result = super.processLink(context, link);  
        return prefix + result;  
    }  
}
```

application-prod.yaml

```
prefix: https://assets.prod.breuni.de
```

application-local.yaml

```
prefix:
```

template.html

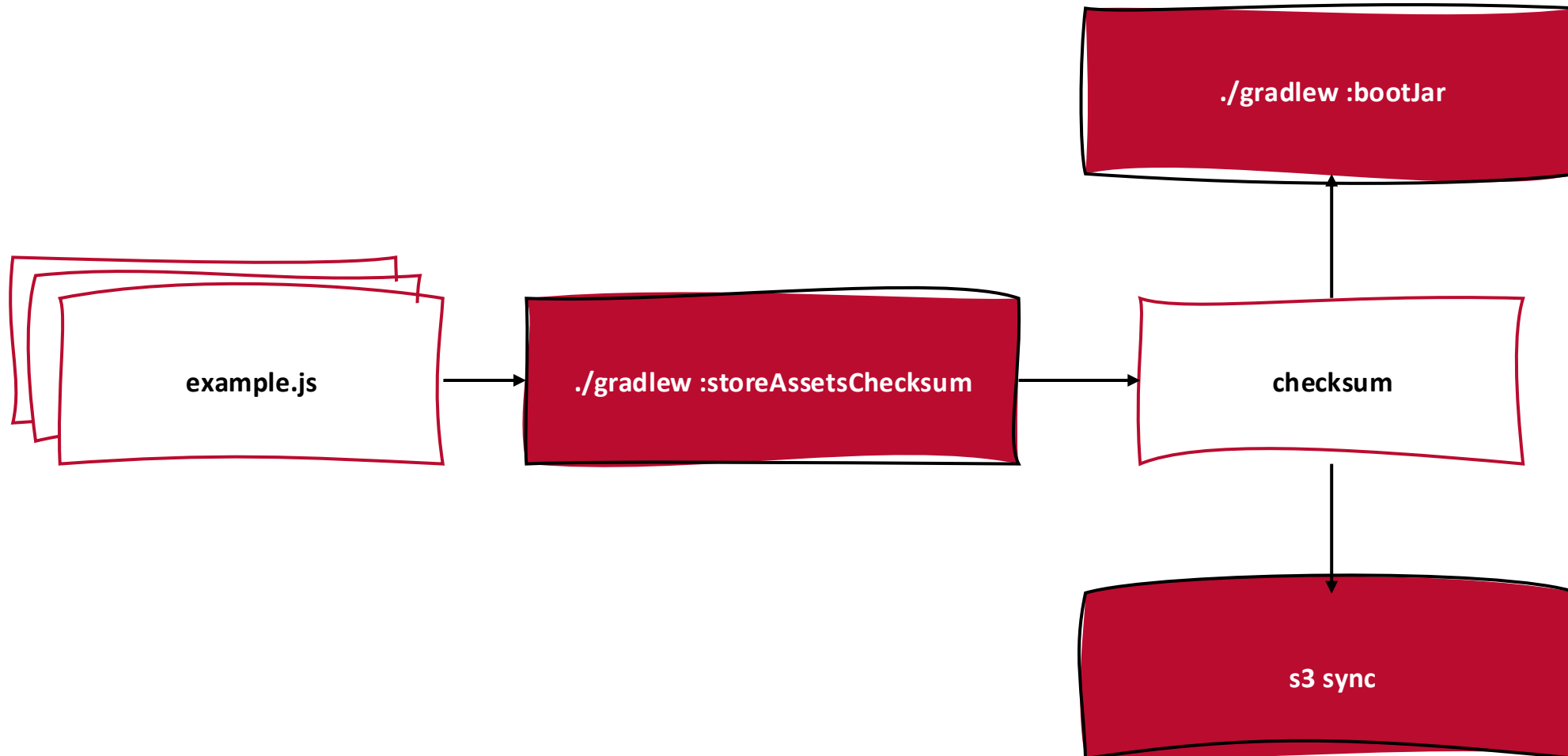
```
<script type="module" th:src="@{/static-assets/example.js}"></script>
```

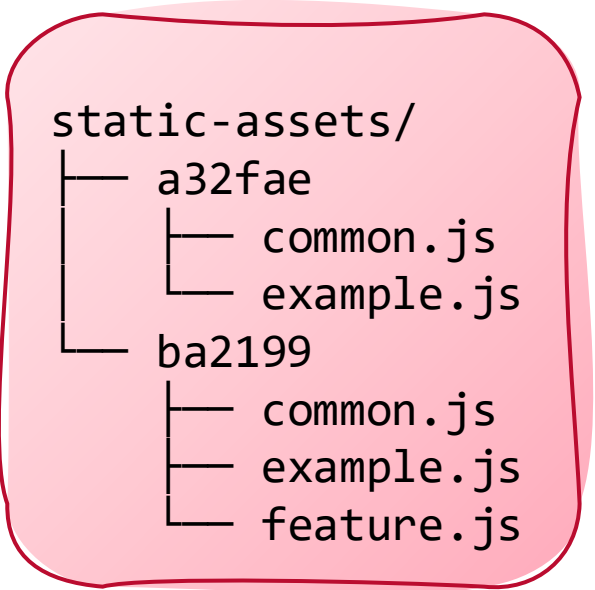
```
$ curl https://breuninger.com  
<script type="module"  
    src="https://assets.prod.breuni.de/static-assets/1.0.0/example.js">  
</script>
```

```
$ curl localhost:8080  
<script type="module"  
    src="/static-assets/1.0.0/example.js">  
</script>
```

WebConfiguration.java

```
@Configuration
public class WebConfiguration implements WebMvcConfigurer {
    @Override
    public void addResourceHandlers(ResourceHandlerRegistry registry) {
        var assetsResolver = new VersionResourceResolver()
            .addFixedVersionStrategy("1.0.0", "/*");
        registry.addResourceHandler("/static-assets/**")
            .addResourceLocations("classpath:/static/")
            .resourceChain(true).addResolver(assetsResolver);
    }
}
```





```
static-assets/  
├── a32fae  
│   ├── common.js  
│   └── example.js  
└── ba2199  
    ├── common.js  
    ├── example.js  
    └── feature.js
```

```
$ curl https://assets.prod.breuni.de/static-assets/a32fae/example.js  
import {foo} from './common.js';  
foo();
```

```
$ curl https://assets.prod.breuni.de/static-assets/a32fae/common.js  
export function foo() {  
    console.log("hello world!");  
}
```

feature.js

```
import {BreuningerButton} from '@breuni-ui/components';  
  
customElements.define('breuninger-button', BreuningerButton);
```

importmap.html

```
<script type="importmap">  
{  
  "imports": {  
    "@breuni-ui/components":  
    "https://assets.prod.breuni.de/webjars/breuni-ui/12.3.1/dist/comp.js"  
  }  
}  
</script>
```

build.gradle

```
runtimeOnly 'org.webjars.npm:htmx.org:2.0.10'  
implementation 'org.webjars:webjars-locator-lite'
```

template.html

```
<script defer th:src="@{/webjars/htmx.org/dist/htmx.min.js}"></script>
```

```
$ curl localhost:8080/
```

```
<script defer src="/webjars/htmx.org/2.0.10/dist/htmx.min.js"></script>
```

importmap.html

```
<script type="importmap" th:inline="javascript">
{
  "imports": {
    "@breuni-ui/components":
      "[(@{/webjars/breuni-ui/dist/comp.js})]"
  }
}
</script>
```

Zusammenfassung



Buildless Frontend

Static Assets

Fingerprinting

Breuninger Komponenten Library

Path Alias

Dependency Management

External JS ohne npm

HTML/Thymeleaf

Vanilla CSS

Vanilla JS

HTMX

Cognitive Load

Skillbedarf

Local Development

Nachtrag: Vanilla JS, das bleibt

Web tracking

Toggle Modale & Passwort Sichtbarkeit

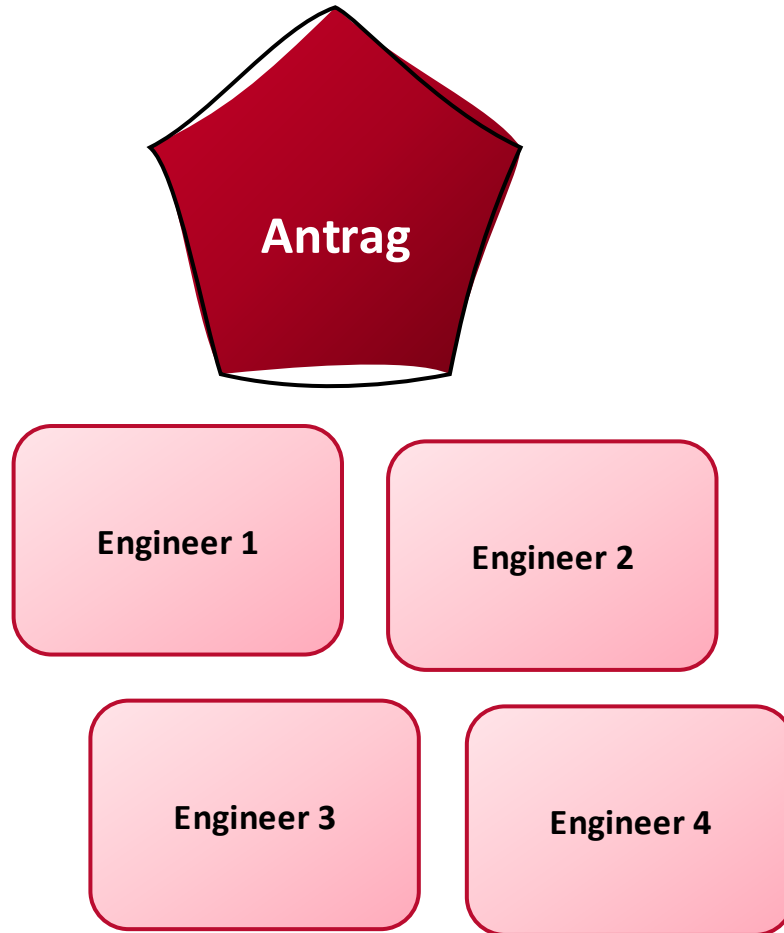
Den ersten Validation Error in die View scrollen

Inputfeld Formatting (z.B. IBAN)

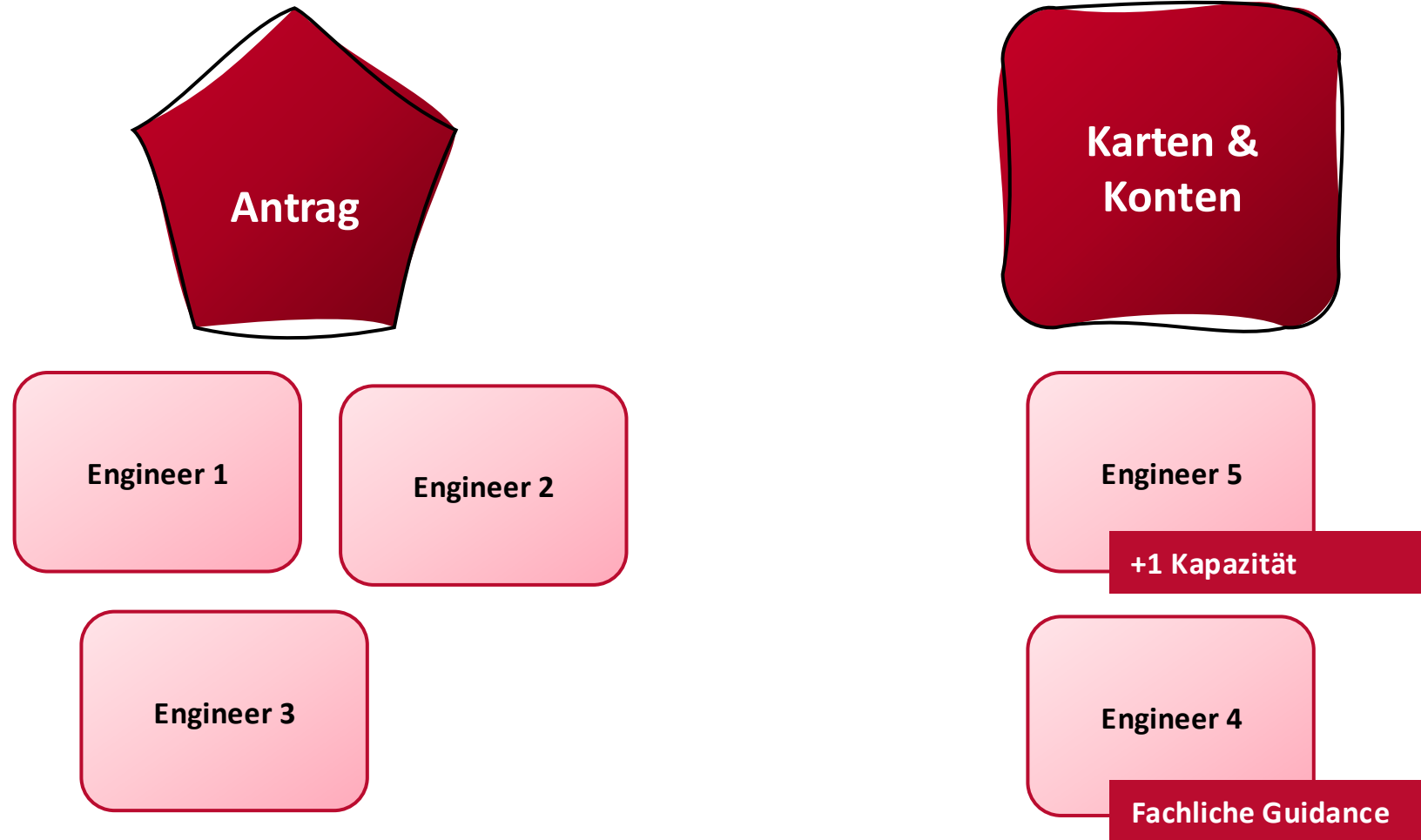
CSS Klassen bedingt hinzufügen oder entfernen

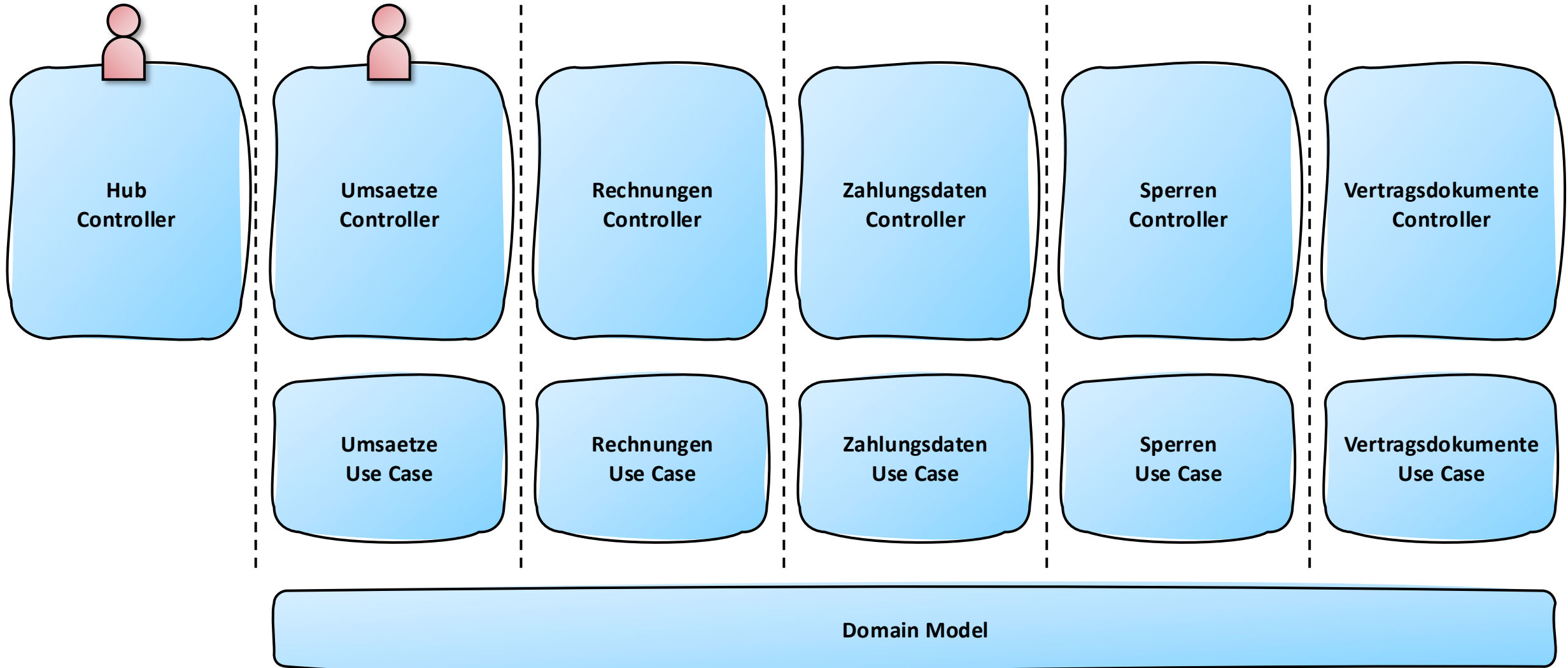
Überweisungsdaten in ein PNG rendern, um es als Fotoüberweisung zu verwenden

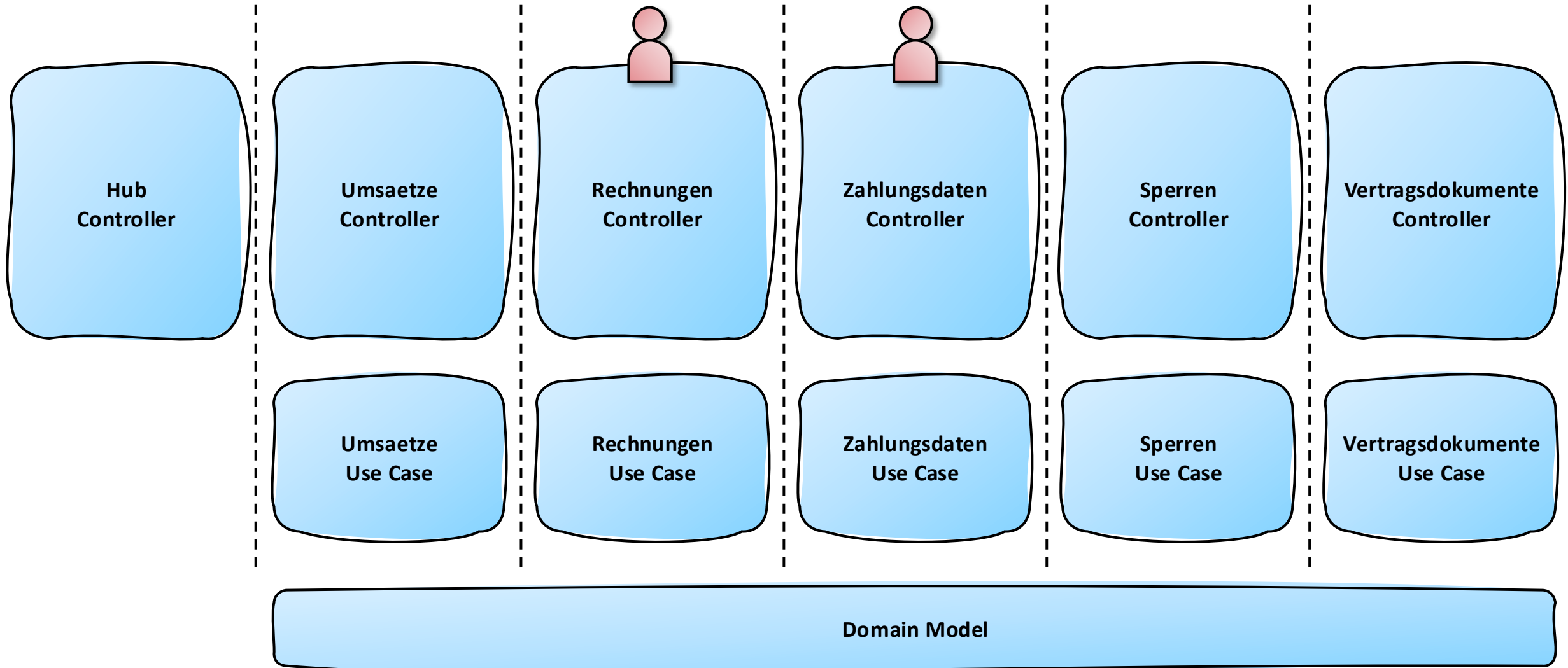
Refactoring als Projekt

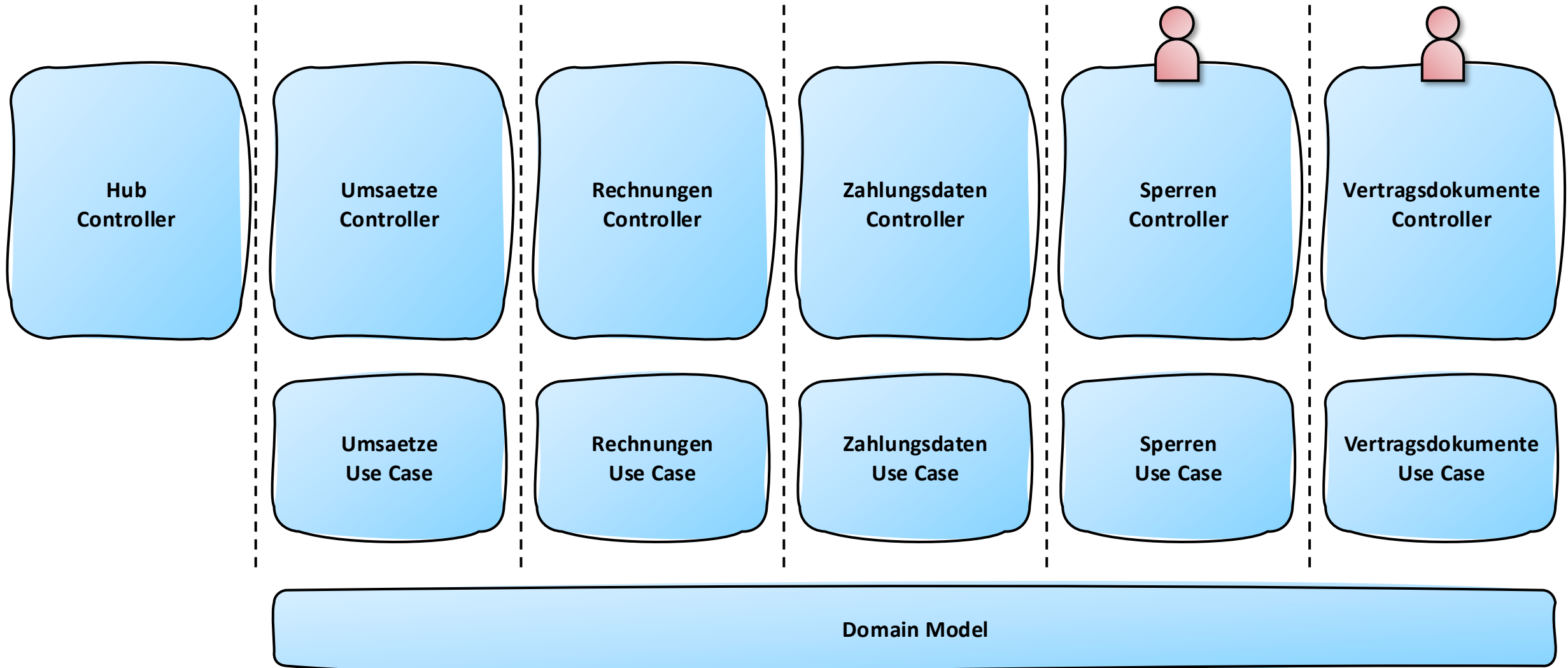


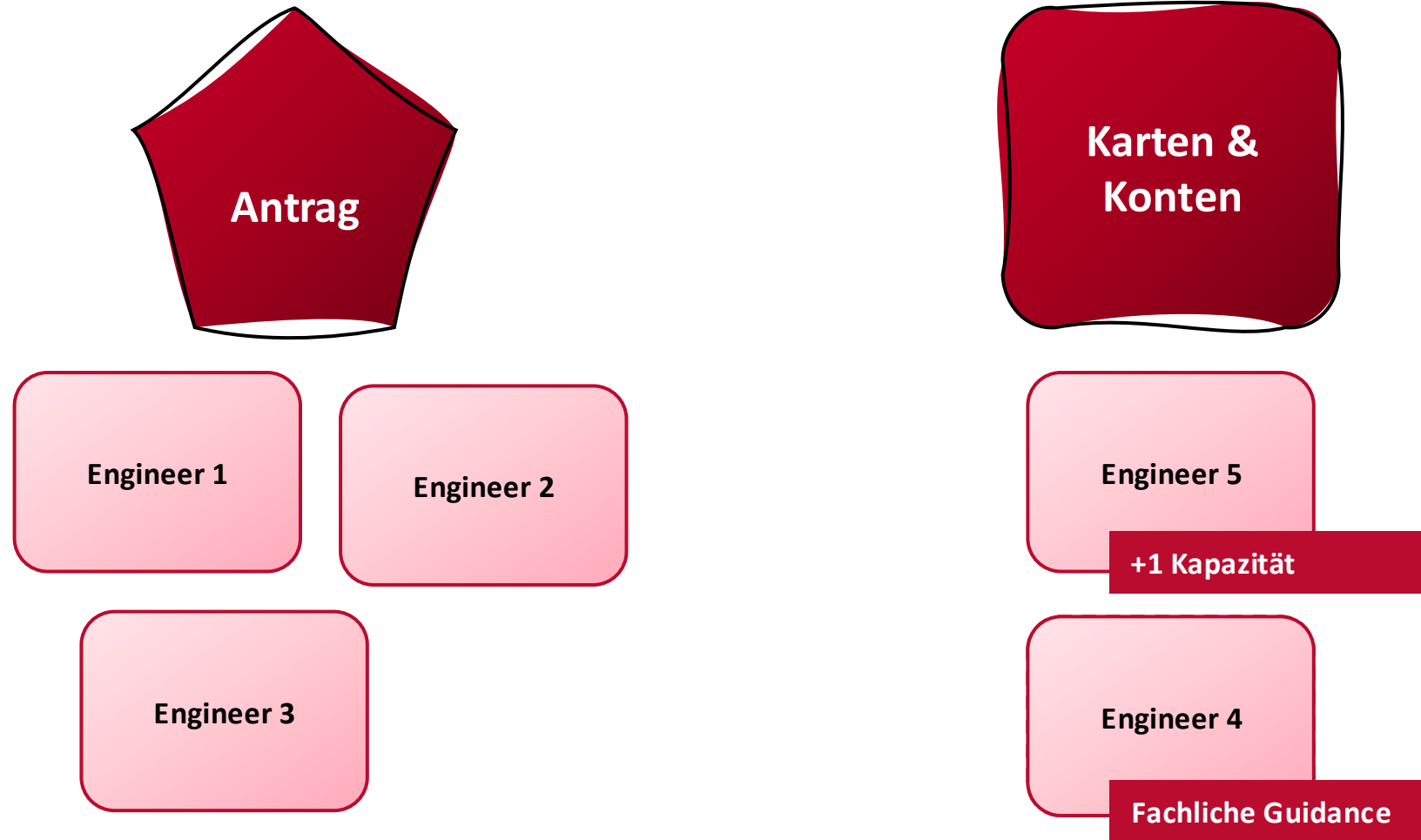
too busy to
improve over here

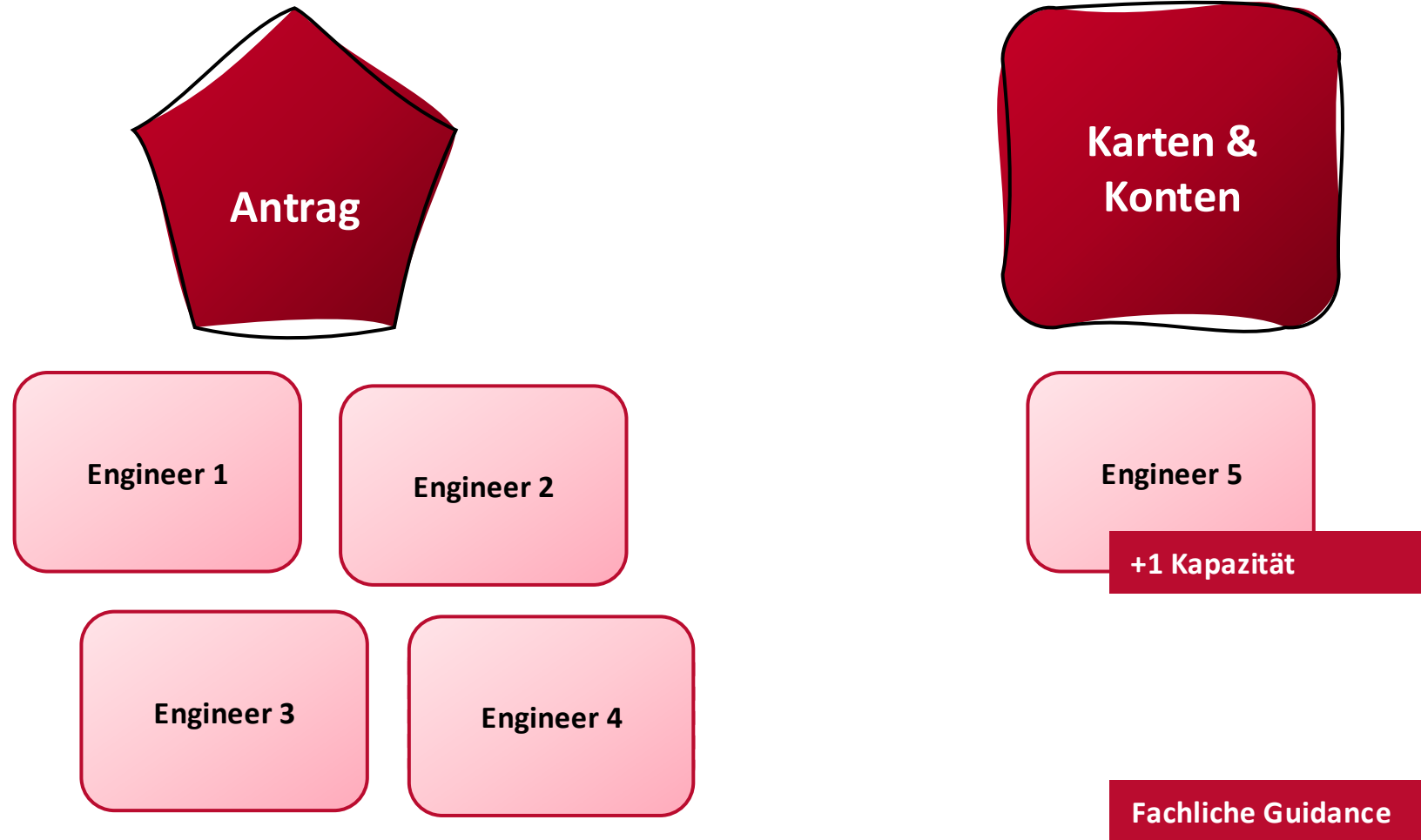


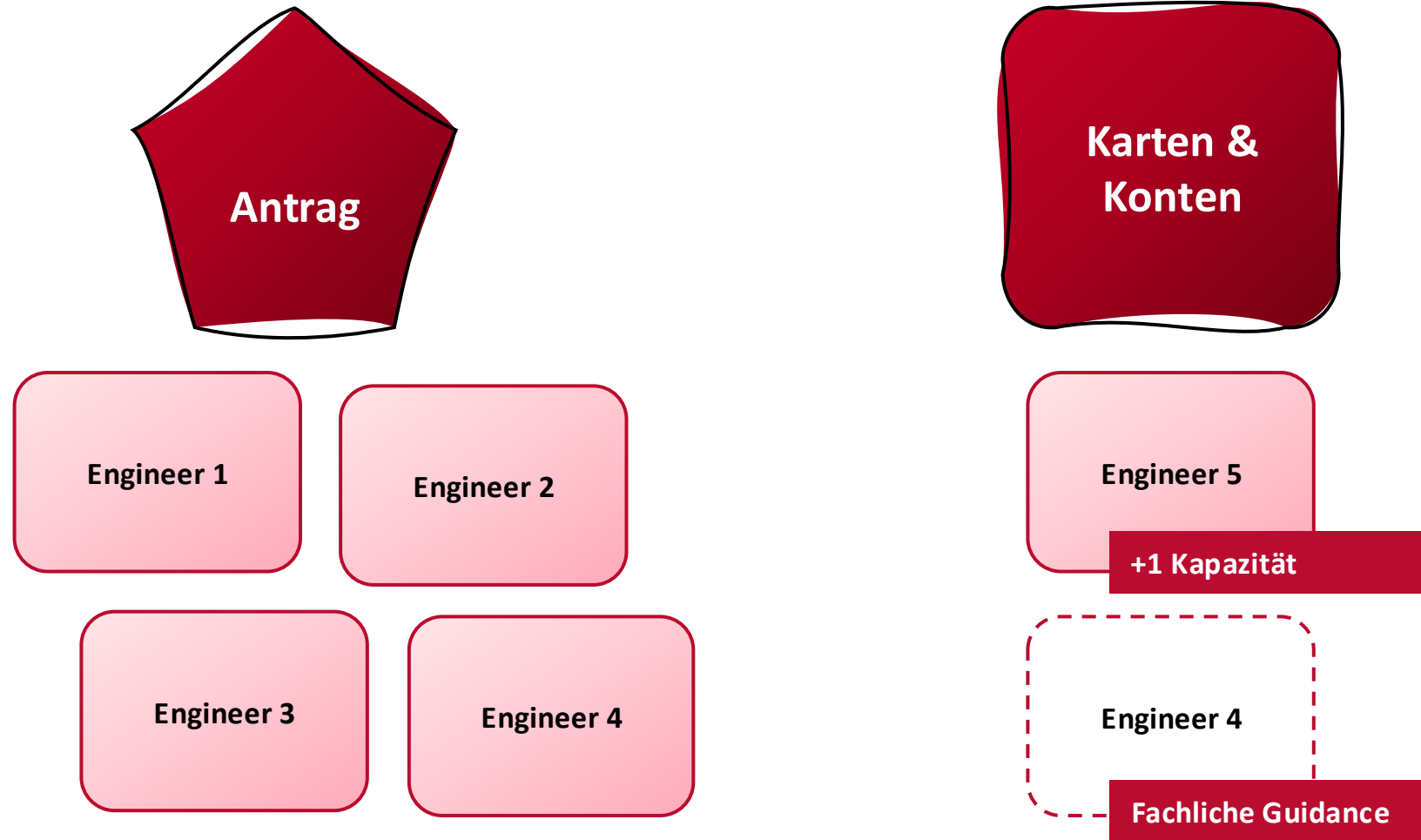












Jeden Morgen 30min Checkin

$$\rightarrow 60d * 0.5h / 480h = \mathbf{6.25\%}$$

Vereinzelte 2-Tages-Workshops, um Lösungsansätze zu evaluieren

$$\rightarrow 10d * 8h / 480h = \mathbf{16.67\%}$$

Reviews der Ansätze mit dem Rest des Teams

$$\rightarrow 5 * 1h / 480h = \mathbf{1\%}$$

60 Tage bei 40h pro
Woche = 480h

$$\underline{\underline{\rightarrow 6.25\% + 16.67\% + 1.00\% = 22.92\%}}$$

Vertikalisierung im Frontend sehr flexibel → Speed

Local Development flutscht → Speed

Alle können und wollen → Speed & Resiliency (Busfaktor)

Refactoring-Projekt mit externer Kraft geht → “Hilft mehr Kapa?”

mit 25%
Selbstbeteiligung

In unserer Domäne geht es um Prozesse und Integration.

Unser Team fühlt sich im Backend wohl.

Server Side Rendering passt zu unserem Denken.

HTMX ermöglicht Interaktivität mit Server Side Rendering.

Software Engineering ist eine soziotechnische Disziplin.

Your mileage may vary.



 breuninger

andrena
OBJECTS