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Changing the world of travel with Angular and measuring along the way

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Beta.finnair.com

Built with Angular

Decoupled CMS

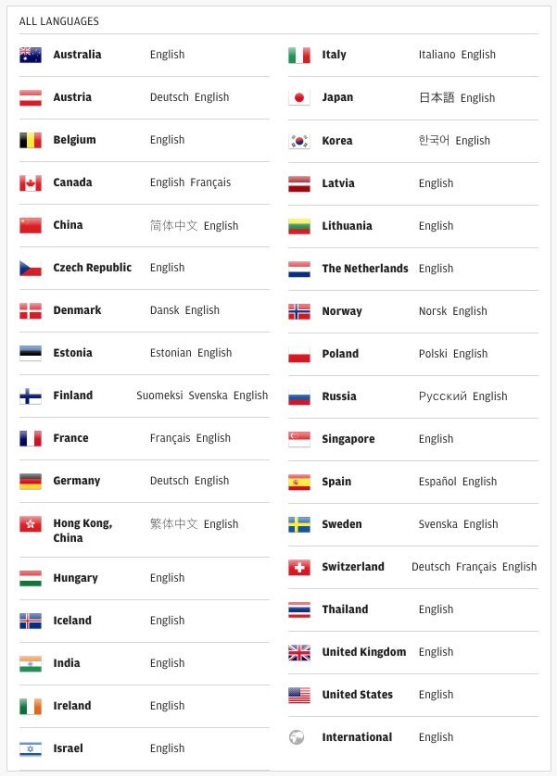
Microservice architecture

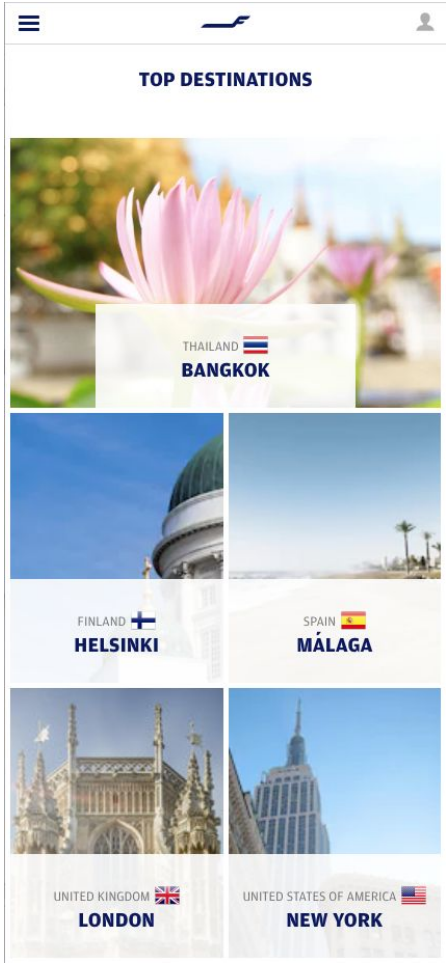
55 language variants

AWS Cloud

Amadeus

GitHub, Node, Java, Travis, Jenkins, Akamai...





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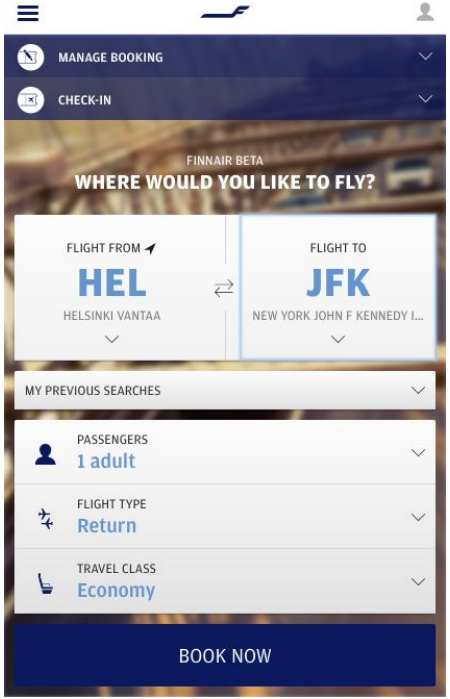
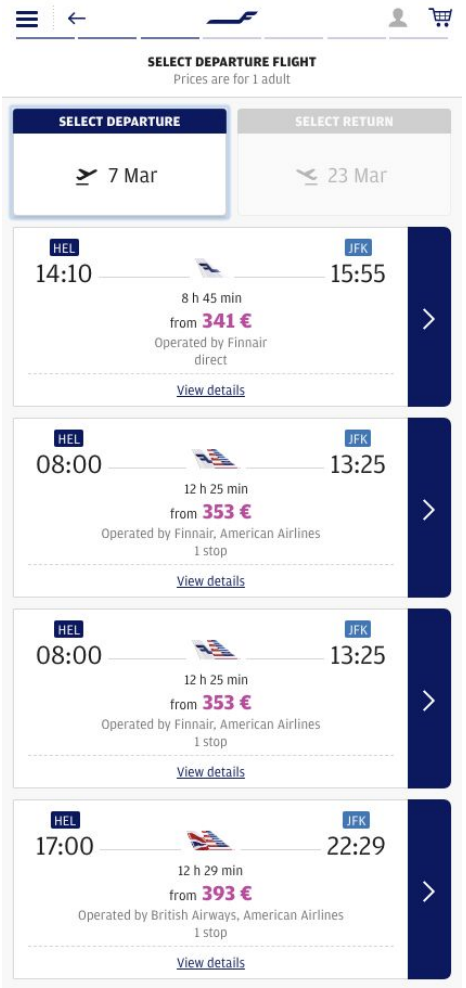
Hypothesis driven design

Multi-vendor team

- Finnair
- Frantic
- Nitor
- Houston Inc
- CGI
- Nextage Design





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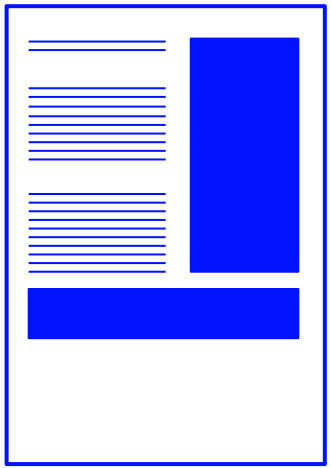
Approaches

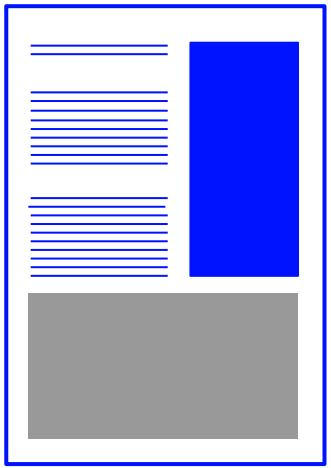
CMS

CLIENT-SIDE APP

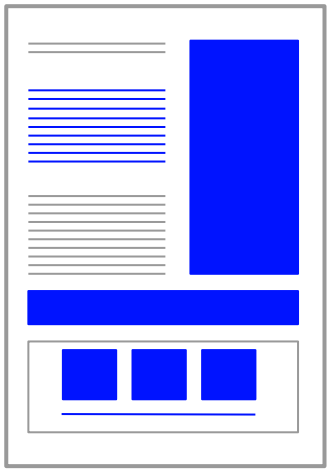
CMS-generated page



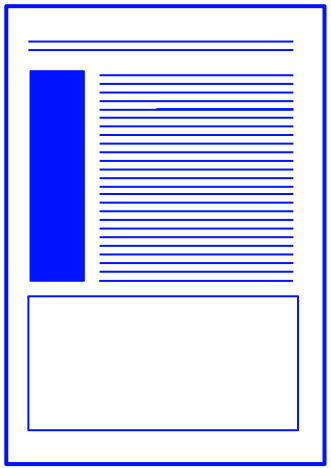
CMS-generated page with an in-page app



Client-side app with included CMS content



App only



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Seamless UX flow

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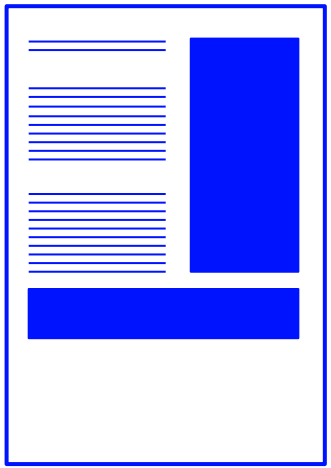
Approaches

CMS

CLIENT-SIDE APP

CMS-generated page



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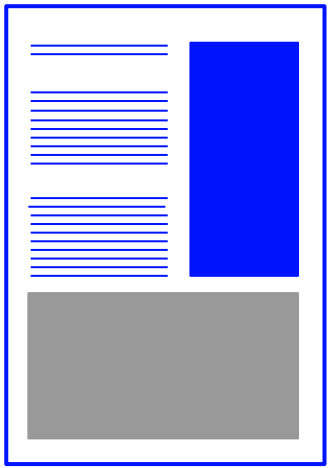

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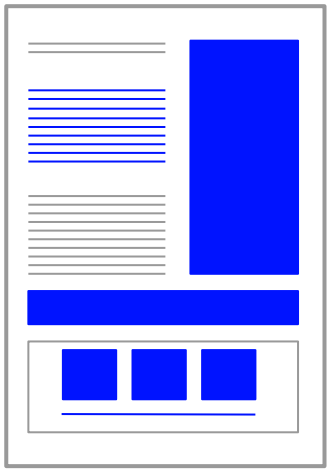

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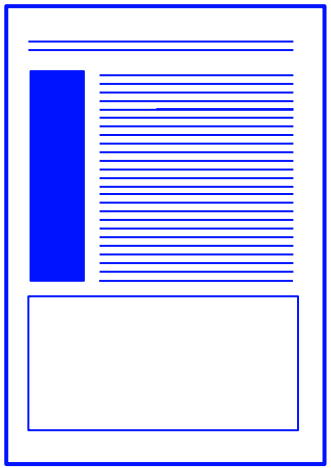

“Beta means we’re now confident that most developers can be successful building large applications using Angular 2.”

-Angular 2 Beta announcement, December 2015

“Beta means *the best* developers can *start* building large applications using Angular 2.”

-There, fixed it for ya

Angular 2 (early 2016)

- SPEED & PERFORMANCE
- SIMPLE & EXPRESSIVE
- CROSS-PLATFORM
- FLEXIBLE DEVELOPMENT: THE CHOICE OF LANGUAGE IS UP TO YOU
- COMPREHENSIVE ROUTING
- DEPENDENCY INJECTION
- LEGACY BROWSER SUPPORT
- ANIMATIONS (LATER)
- INTERNATIONALIZATION (I18N) & ACCESSIBILITY (LATER)

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SPEED & PERFORMANCE

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...once you've gotten it loaded

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NO

Angular Universal

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SIMPLE & EXPRESSIVE

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NO
documentation

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FALSE

documentation

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STEEP

learning curve

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EFFORT

to create
new components

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COMPREHEN-SIVE ROUTING

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AOT &
huuuuge site

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LEGACY BROWSER SUPPORT

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BYGONES
‘cause
PCI & IE EOL

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Our current challenges

- Async dynamic routing because of CMS content
  <-> Angular Router-based routing <-> AOT <-> lazy loading
- Unzipped 2MB of JS is not small
- Learning curve is still steep
- Zone.js issues are painful to debug

(Source: Imgur)

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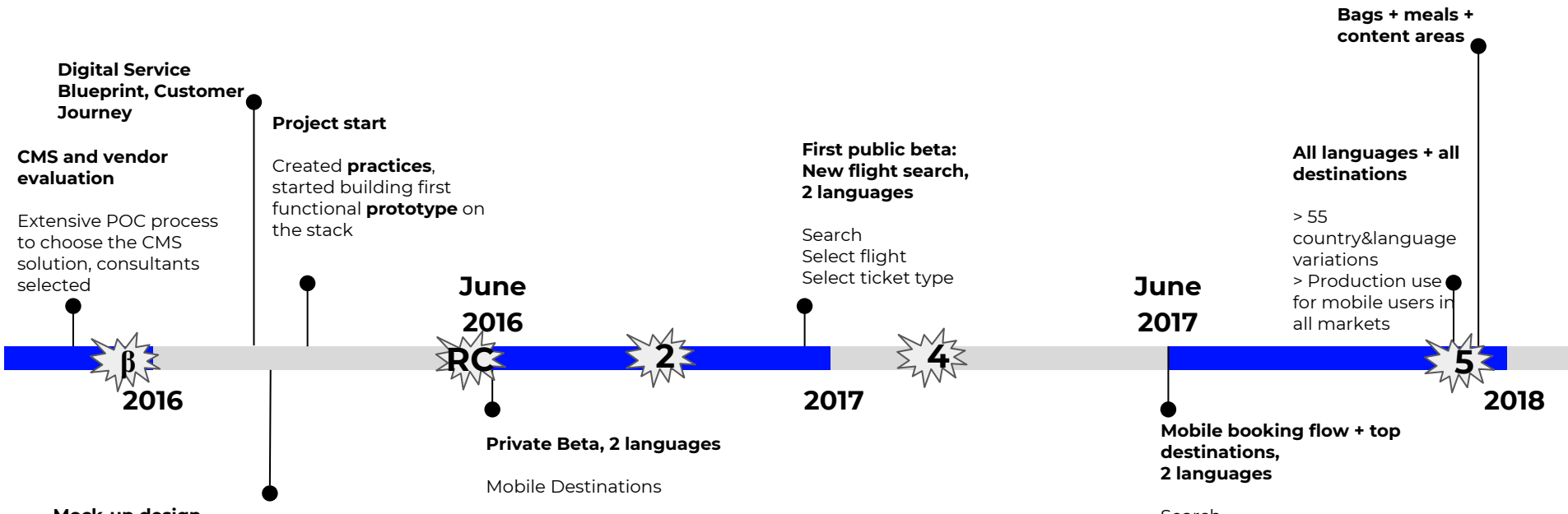
Timeline



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Why we <3 Angular

Why we <3 Angular in a large team

- Expressive - less loc = less bugs
- TypeScript's typing prevents errors
- Encourages modular components
- Automated testing of components is built-in
- Angular 2 templates
- SCSS styles isolation per-component
- Dependency injections
- Rxjs

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TAKEAWAYS

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Validate designs with real users

Framework saves time when creating the conventions

Do fat microservices

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Give thin responses

Minimize

the client-side business logic

Write

tests

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PR PRs

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TypeScript

is awesome

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Abandon

vi and emacs

- you need an IDE

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Tracking & Analytics

Tracking

Page views

Custom events

Business stuff

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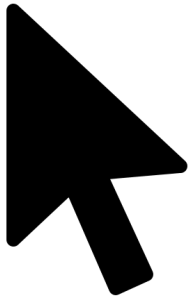
Page views
Router



Custom events
Directives

Business stuff
Store

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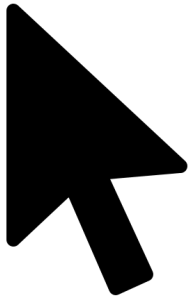
Page views

Router



Custom events

Directives

Business stuff

Store

Tracking
Service

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Page views
Router

Custom events
Directives

Business stuff
Store

Tracking
Service

Google Tag Manager

Google Analytics

Tracking service

- Does nothing

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Tracking service

Does:

- Provide event specific functions
- Formatting and data minimisation
- Push to a global array created by GTM

```
this.dataLayer = this.windowRef.nativeWindow['dataLayer'] = this.windowRef.nativeWindow['dataLayer'] || [];
checkoutFlights(cart: CartData): void {
   // Privacy filtering, manipulate & format
   this.pushEventToDataLayer(GtmEvent.CART_CHECKOUT, formattedCart);
}
private pushEventToDataLayer(event: GtmEvent, eventData: GtmEventData): void {
  this.dataLayer.push({ event, [event]: eventData });
}
```

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The router

- No page refreshes in a SPA ➜ Use router!
- You can subscribe to router's events

```
this.router.events
  .filter((event: Event) => event instanceof NavigationEnd)
  .throttleTime(200)
  .subscribe((event: NavigationEnd) => {
    this.trackingService.pageView(event.urlAfterRedirects);
  });
```

The store - we use ngrx/store

- Good place for following business relevant stuff, **like the payment process**
- Access store as observables using **.let operator** (and now also: **.pipe**)

  or

- Know when to call tracking service functions using **ngrx @effect -side effects**

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The store

```
this.store
  .let(cartData())
  .filter(Boolean)
  .subscribe(cart => {
    this.checkoutFlights(cart);
  });

--- OR ---

@Effect cartCheckout$: Observable<Action> = this.actions$
  .ofType(CartAtions.SET_CART_DATA)
```

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Attribute directives

- Not everything happening in the UI is changes the app state to store.
- Attribute directive can easily:
  - Utilise component's existing event bindings
  - Utilise stuff existing in the template

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Attribute directives

Template

```
<li *ngFor="let flights of flightList; let i = index">
   <button (click)="clickFlight(flight)"
       [elemTracker]="'flight-selection-item'"
       [elemIndex]="(i+1)"
       [elemModifier]="flight.stops + ' stops'"
       [elemType]="ElementTypes.BUTTON">
</li>
```

Directive

```
@Input('elemTracker') trackingId: string;
@Input('elemIndex') trackingIndex: number;
@Input('elemModifier') trackingModifier: string;
@Input('elemType') trackingElemType: ElementTypes;

@HostListener('click', ['$event'])
onClick(event) {
  this.trackingService.trackElement(
    this.trackingId,
    this.trackingIndex,
    this.trackingModifier,
    this.trackingElemType.
  );
}
```

Tracking conclusions

- Router
- @ngrx/store if you are using it ❤️
- Directives can be used for UI tracking
- Service to format and push data forwards
- Easy data layer specs based on your event interfaces

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