BYWAY.TRAVEL
Workshop

Zdenek Hynek, November 3, 2020

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BRIEF

Extend current state-of-the-art dynamic packaging technology

CURRENT LIMITATIONS

- inability to select from distributed rural accommodation

- no dynamic route planning across multiple modes of ground transportation; few integrations outside rail

- crucially, no concept of ‘stops’ - places to stop for experiences en route, selecting tickets that accommodate those stops

IMPROVE STATE-OF-ART

- introducing the concept of ‘stops’ - en route stops for experiences without staying overnight to maximise user enjoyment over speed

- selecting relevant ‘stops’ (en route) and ‘stays’ (overnight) based on user preferences

- building a customisable itinerary per customer that allows for: rural cottage-style accommodation stays, multimodal transportation and en route stops

OUTPUTS

- research to investigate the technical and commercial priority of API data feeds in the project term and identify complementary off-the-shelf tech

- data pipeline for four routes

- dynamic packaging engine using static feeds plus APIs to build itineraries and allow customisation

- user interface for dynamic routes

- user engagement feedback and test reports.

TESTIMONIALS

Dynamic packaging for multi-modal journeys in sparsely populated areas is difficult.

“Booking train travel is a complicated problem to solve”

MARK HOLT
TRAINLINE CTO

“We’ve started working on it four years ago and thought that we would launch the app within a couple of weeks. But the task turned out to be much more complicated.”

ALEH TSIKHANAU
CEO AND CO-FOUNDER
OF EIGHTYDAYS.M

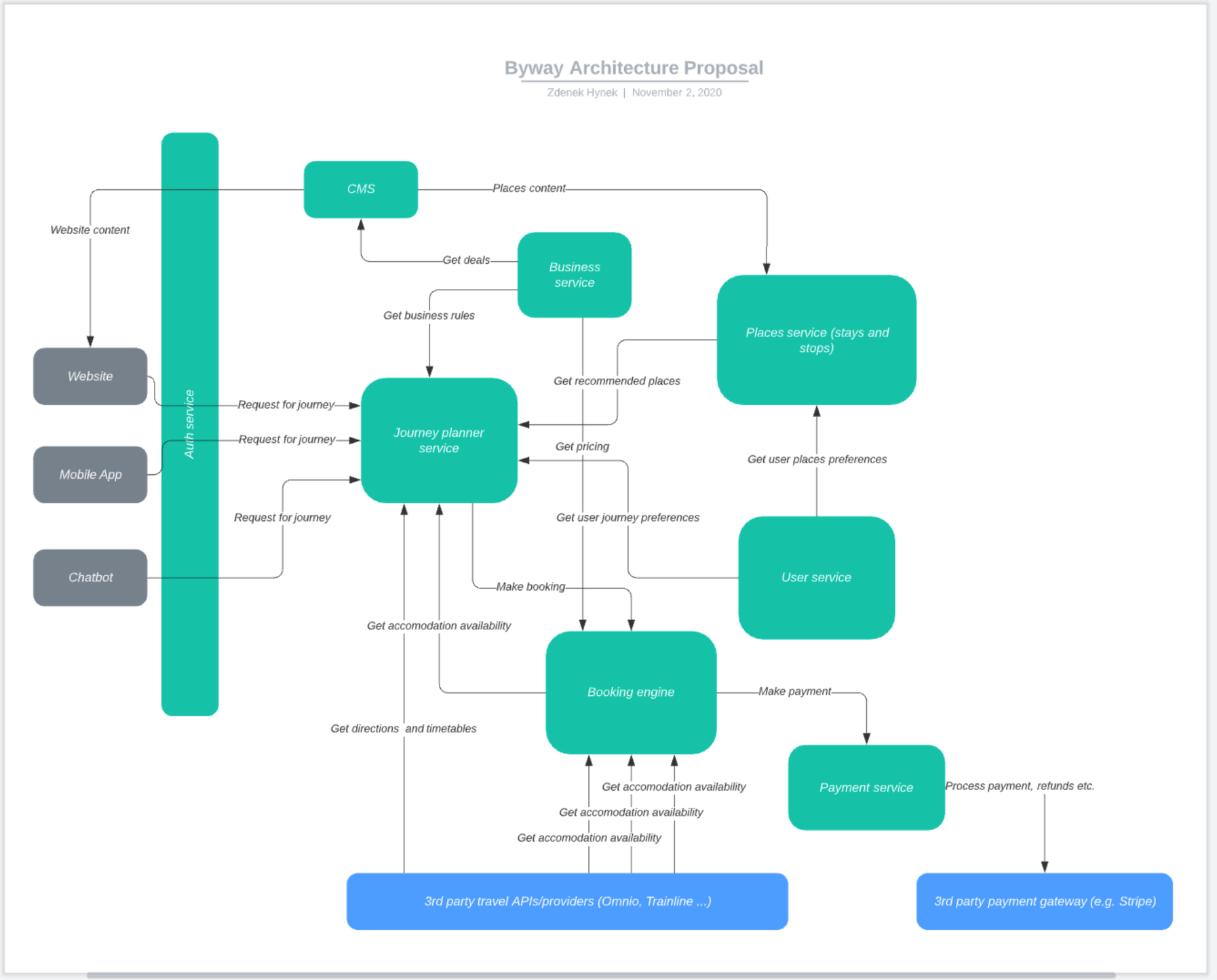
NORTH STAR

Not trying to find the best possible answer.

Instead, try to come up with
the best possible question.

No need to find a perfect solution,
“good enough” is enough.

ARCHITECTURE



DEMO

http://byway.zdenek.xyz/

COMPONENTS OVERVIEW

1. Places service
2. Journey planner service
3. User service
4. Booking engine
5. Business service
6. Auth service
7. Payment service
8. CMS
9. Website
10. Mobile app
11. Chatbot/other channels
12. 3rd party travel APIs
13. 3rd party payment services

1. PLACES SERVICE

Provides list of recommended places for a journey to the journey planner service.

Has database of different points of interest and posssibly accomodations.

Each point of interest has:

- location
- category and tags (e.g. which segments of users relevant to)
- any time constraints, both when available (e.g. open on weekends only), and how much time needed at the place (e.g. need ½ day to complete the hike)
- rating (e.g. some sort of “worth major detour”, “okay, if you’re passing by”)
- any other metadata

Possible features both “stops” and “stays”. Since they are similar entities with just differnt time constraint. Communicates with booking engine to find out which accomodations is available for given journey (e.g for given dates, price ration and number of people)

Communicates with user service to find places matching user preferences.

Feasibly could be used for one-off events as well (e.g. festival). “Just another” place with very strict time constraint.

2. JOURNEY PLANNER SERVICE

Gets points of interest and possible accomodations from places service based on journey and user preferences preferfrom based on the journey and user preferences

Has some knowledge about travel distance between places (e.g. cached direction results, static travel feeds, geographical distance).

Constructs the most enjoyable journey (“provisional itinerary”) by:

- calculating reward of going to the destination (highly rated attraction, great accomodation)
- calculating cost of going to the destination (time, money)
- taking time constraints into consideration for each place (e.g. need to arrive after check-in)

Provisional itinerary calculation possibly uses some variation of travelling repairsmen heuristics, graph theory etc.

Gets directions and exact time schedule for the journey from 3rd party service (similar to Google Directions API).

3. USER SERVICE

Provides information about user preferences.

Recommendations can be based on user segment (avoids cold start problem), user-specific preference (content-filtering) or preferences of similar users (collaborative filtering).

Also manages user profiles.

4. BOOKING ENGINE

Intergates with all the travel supplier APIs

Handles bookings, updates, cancellations

5. BUSINESS SERVICE

Internal for Byway staff

Provides business rules and revenue management, CRM etc.

Could be a third part service

6. AUTH SERVICE

Guards acccess to all the other service and authenticates users based on their roles and priviliges.

7. PAYMENT SERVICE

Integrates with 3rd party payment gateway (e.g. Stripe).

Handles actual payment processing.

8. CMS

Stores content for the website and other services.

Possibly a headless solution (e.g. Prismic, Storybook or similar).

9. WEBSITE

Static site powered by headless CMS.

Possibly developed using Gatsby or Next.js

10. MOBILE APP

More important for the companion app.

Should allow to download journey itinerary.

11. CHATBOT/OTHER CHANNELS

Provides access to journey planner from other places.

12. 3RD PARTY TRAVEL APIs

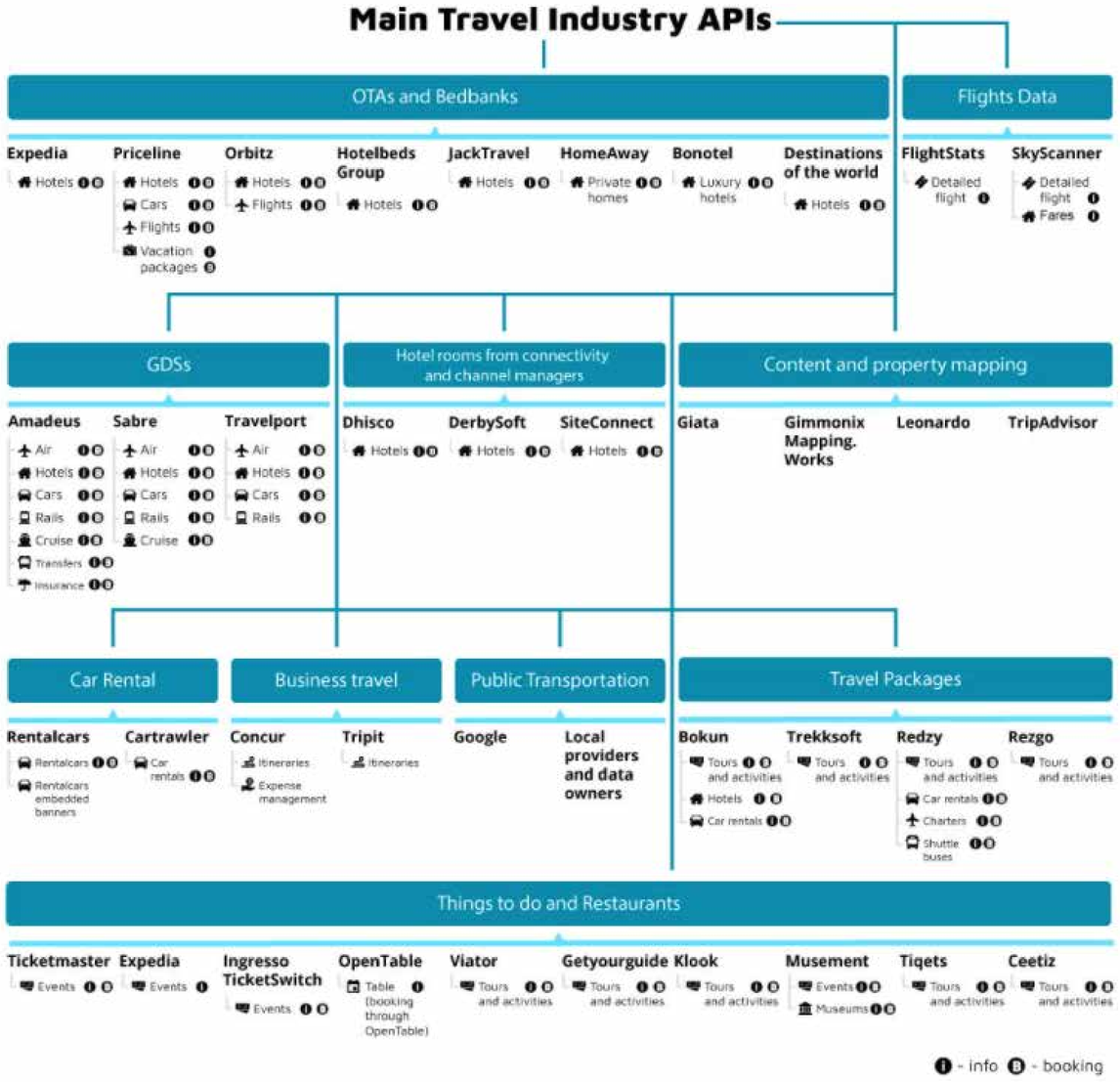
Lot of choices. Needs to be researched and evaluated.

Evaluation should be based on:

- requirements match (does it have all the required fetchers)
- data quality (does it have enough data for regions of interest)
- tech feasibility (is stable, good documentation and support)
- licensing fees
- licensing conditions (e.g. can data be cached)

13. 3RD PARTY PAYMENT SERVICES

Should allow not only for payment processing, but also for refunds, upgrades, etc



From Travel and booking APIs for online travel and tourism service providers

PROPOSED TECH STACK

BACKEND

Node.js for majority of backend services (with Express or similar).

Strapi.io or similar for bespoke CMS for individual services. Or Prismic/Storybook for less customisable more off-the-shelf solution.

If some services are more ML/data science oriented, or some more complicated data processsing (e.g. geospatial analysis), possibly also use Python.

Use MySQL or Postgres (if more geospatial capabilities required) for most of the system data. Possibly NoSql/graph databases if routing algorithms require it.

Hosting on AWS with containerised services with standard monitoring, logging and error-reporting tools provided on the platform. Possibly startup grant available.

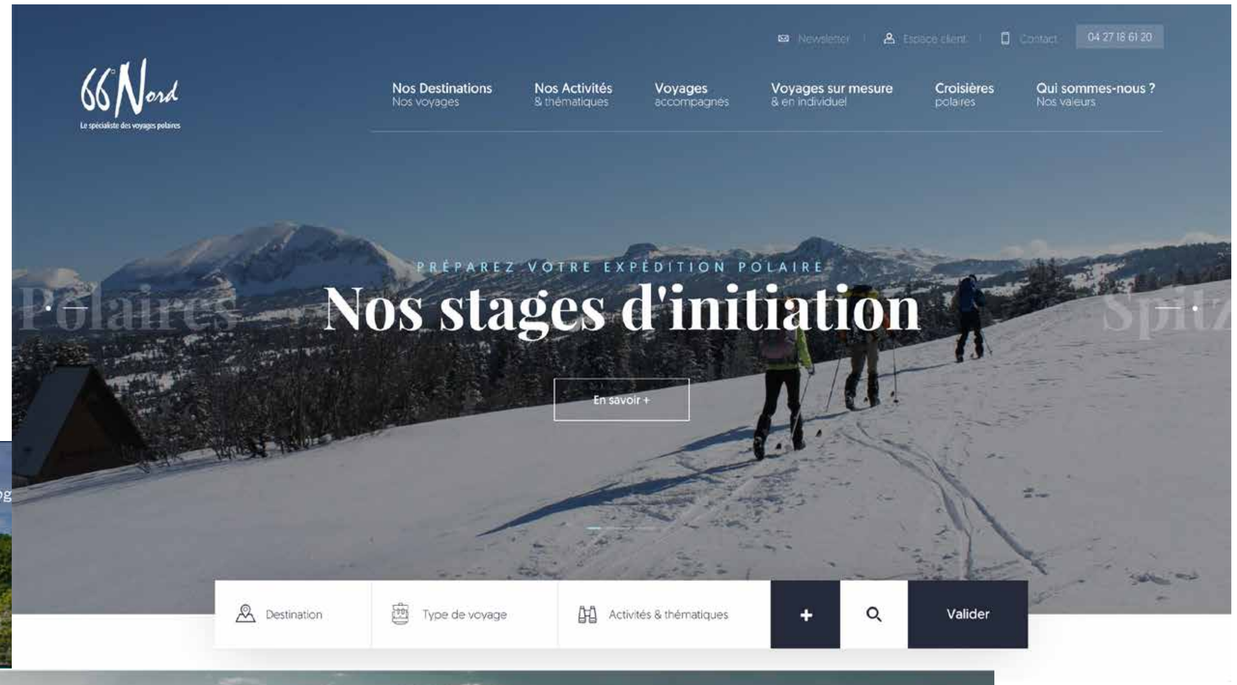
Gatsby or Next.js for static site generation.

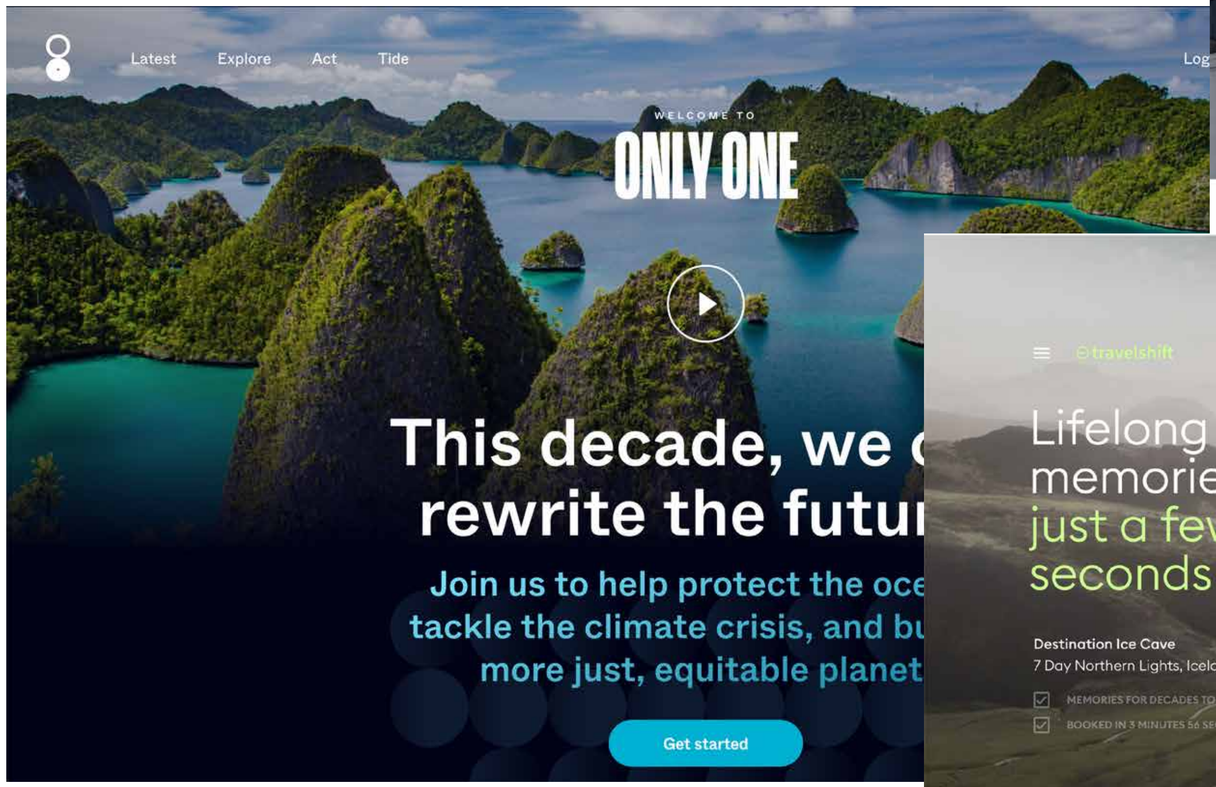
FRONTEND

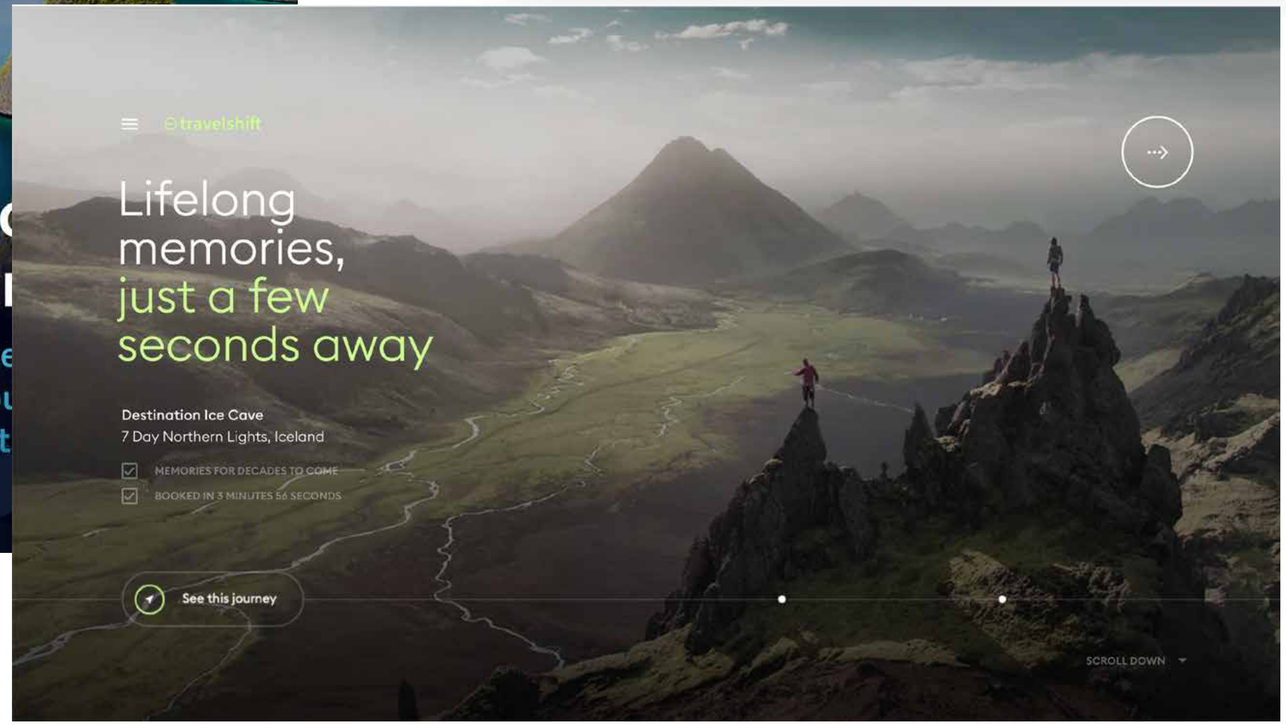
Static side powered by React

DESIGN

Modern and sophisticated, using big images to make people want to travel.







PROPOSED TEAM STRUCTURE

Purely on the tech/product side, not including operations, sales, marketing etc.

- product owner (possibly Cat)
- product designer (combination of UX and UI skills)
- tech/team lead
- frontend developer
- backend developer
- devops
- support engineer
- QA engineer

PROPOSED ROADMAP

2 streams of work:

1. research, prototyping and development of the dynamic packagining
2. improvement of the current processes - aka “quick wins”

RESEARCH, PROTOTYPING AND DEVELOPMENT OF THE DYNAMIC PACKAGINING

- review of competitors products
- research and evaluation of 3rd services and APIs
- proposal for different solutions
- prototyping most promising solution
- evaluation
- iteration

IMPROVEMENT OF THE CURRENT PROCESSES

- review of existing processes
- research into existing 3rd party solution
- prototyping and development of internal tools to improve existing processes

The focus should be on the Places, Journey Planner and Booking Engine components.

THANKS