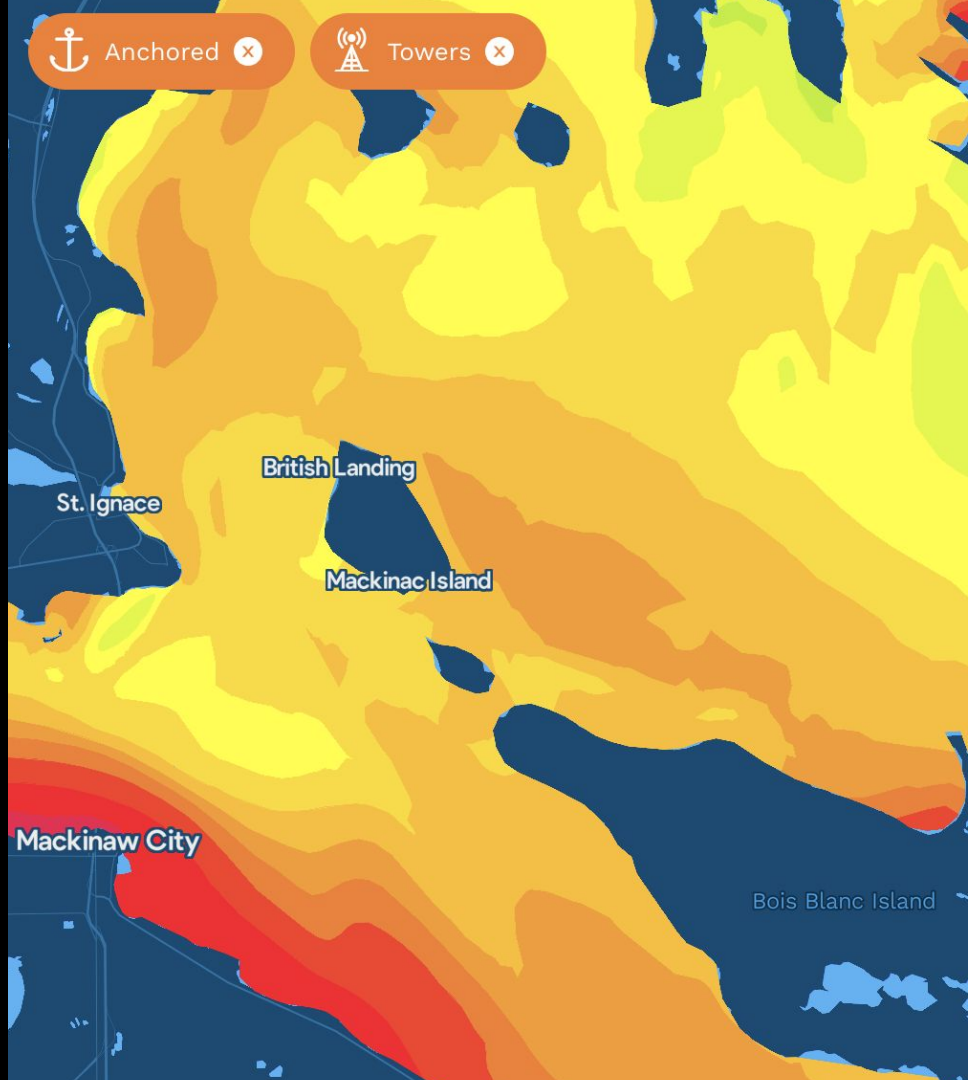

dig
Hey, We’re DIG

Agenda

What We'll Cover

- Who is DIG?
- A few examples of work with GLOS + AOOS
- AOOS ERDDAP Data Retrieval + Caching
- Intersection of Data + UX
- Q + A



Who is DIG?

We create best-in-class digital experiences that deliver on consumer expectations and drive growth.

Who is DIG?

Innovation Strategy

We'll help you understand what's possible and how to make it happen. No do-overs necessary.

Experience Design

Human-centered design is in our DNA. We envision your product from the user's POV and make sure no detail or scenario is overlooked.

Tech Enablement

We're technically great at what we do, thanks to the developers who build for performance with pride in their work. We like to stay one step ahead so you can edge out competitors.

Growth Mapping

We help you coordinate a market launch and get customers through the digital door 24/7.

Customer Care

We build strategies to delight customers when they need support with your product or service.

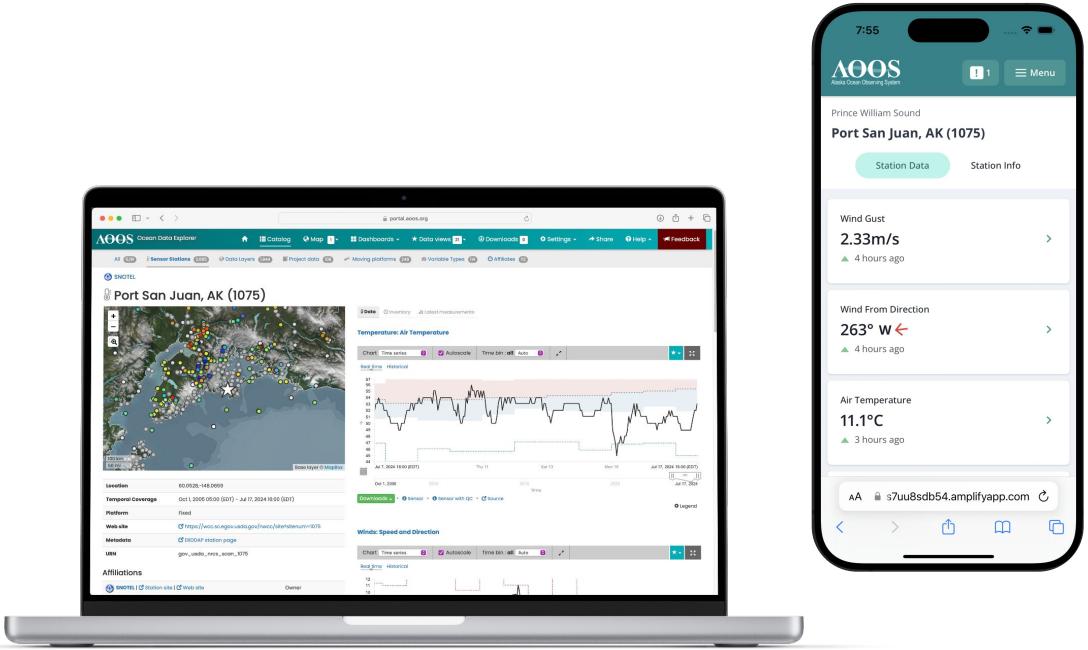
Work Examples


Seagull
Map
Console
Search Seagull by Keyword
Muskegon Buoy
45161
Buoy
NOAA-GLERL
Active
Mark As Favorite
Water Temperature
Air Quality
Wind
Waves
Water Quality
Diagnostics
SURFACE
29.93 inHg
Air pressure at mean sea level
65.73 °F
Air temperature
1367.06 µmol/(m²s)
Photosynthetically available radiation in air
NW (312°)
Wind direction (from)
17.45 kts
Wind Gust Speed
14.85 kts
Wind speed
Notifications
About
Location
43°10'45"N, 86°21'39"W
Partners
GLERL
12:00
seagullwebapp.com
45029
Port Sheldon
View Webcam
Buoy
LimnoTech
Active
4.1kts
7.2%
Wind Speed
Muskegon
Cook Nuclear Plant
Map Overlays
Water Temperature
Water Current
Wind Speed
Anchored
Towers
3 PM
July 9
July 10
Today
July 12
July 13

AOOS

AOOS Points:

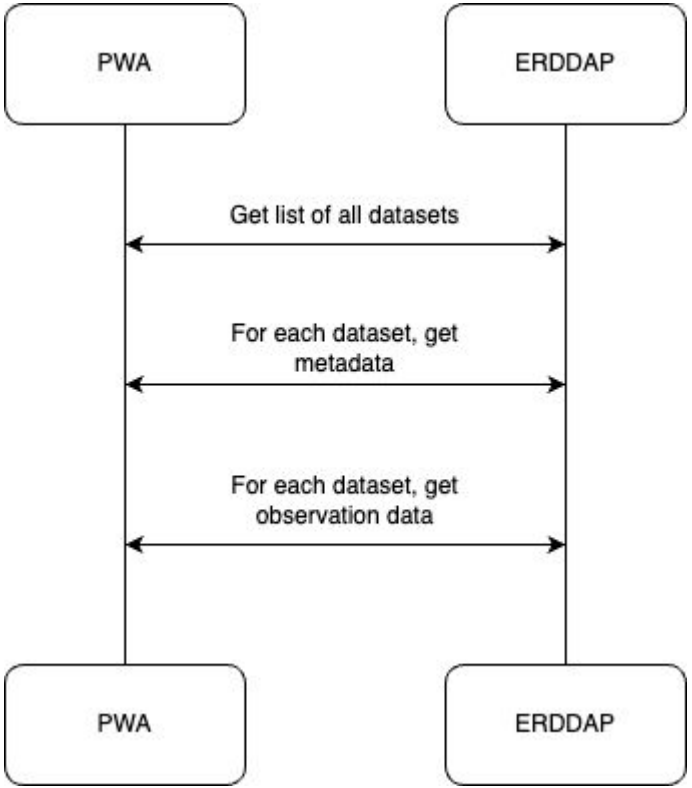
- Ocean Data Explorer
- Mariner Dashboards
- Low bandwidth, needs to be reliable
- Simple, mobile-friendly UI



AOOS ERDDAP Data Retrieval + Caching

Request flow

- Need to get/cache all observations for offline usage in PWA (Progressive web app)
- Data source: ERDDAP
- For n datasets, this requires 1+(n*n) network requests



AOOS PWA

Example

- Get all datasets

```
const REGIONS = [
  'prince-william-sound',
  'bering-sea',
  'cook-inlet',
  'kodiak',
  'southeast-ak',
];

export const ERDDAP_FILE_TYPE = "jsonlKVP";
export const ERDDAP_DOMAIN = 'mariners-dashboard.erddap.aoos.org/erddap/tabledap';
export const ERDDAP_URLS = REGIONS.map((region) => {
  return {
    id: region,
    url: `https://${region}.${ERDDAP_DOMAIN}/allDatasets.${ERDDAP_FILE_TYPE}?metadata&accessible="public"`
  };
});

ERDDAP_URLS.map((region) =>
  axios.get(region.url)
    .then((response) => {
      return parseJsonLines(response.data)
        .filter((dataset: any) => dataset.datasetID !== "allDatasets")
        .map((dataset: any) => ({ ...dataset, regionID: region.id}));
    })
    .catch((error) => {
      console.error(`Error fetching metadata for region: ${region.id}`, error);
    })
);

// example response
const response = [{
    "datasetID": "46060-west-orca-bay-36nm-south-s",
    "title": "46060 - West Orca Bay 36NM South Southwest of Valdez, AK",
    "metadata": "/erddap/info/46060-west-orca-bay-36nm-south-s",
},
{
    "datasetID": "46061-seal-rocks-55nm-south-of-v",
    "title": "46061 - Seal Rocks 55NM South of Valdez, AK",
    "metadata": "/erddap/info/46061-seal-rocks-55nm-south-of-v",
},
{
    "datasetID": "46076-cape-cleare-ak",
    "title": "46076 - Cape Cleare AK",
    "metadata": "/erddap/info/46076-cape-cleare-ak",
}];
```

Example

- Get metadata for each dataset
- Response includes all the available parameters, their units, etc.

```
const metadata = await axios.all(
  metadataUrls.map((dataset) =>
    axios.get(`${dataset.metadata}.${ERDDAP_FILE_TYPE}`)
      .then((response) => {
        const metadata = parseJsonLines(response.data);
        const isTidalBuoy = getIsTidalBuoy(metadata);

        const dataUrl = getDataUrl(metadata, dataset.datasetID, dataset.regionID);

        return {
          ...dataset,
          metadata,
          isTidalBuoy: isTidalBuoy,
          dataUrl,
        }
      })
      .catch((error) => {
        console.error(`Error fetching metadata for ${dataset.datasetID}`, error);
      })
  )
);

// example response
const response = [{
  "Row Type": "attribute",
  "Variable Name": "NC_GLOBAL",
  "Attribute Name": "defaultDataQuery",
  "Data Type": "String",
  "Value": "sea_surface_wave_from_direction,
    wind_speed_of_gust,
    air_pressure_at_mean_sea_level,
    sea_surface_temperature,
    wind_from_direction,
    sea_water_practical_salinity,
    air_temperature,
    sea_surface_swell_wave_period,
    wind_speed,
    time"
}];
```

Example

- Get observations for each dataset

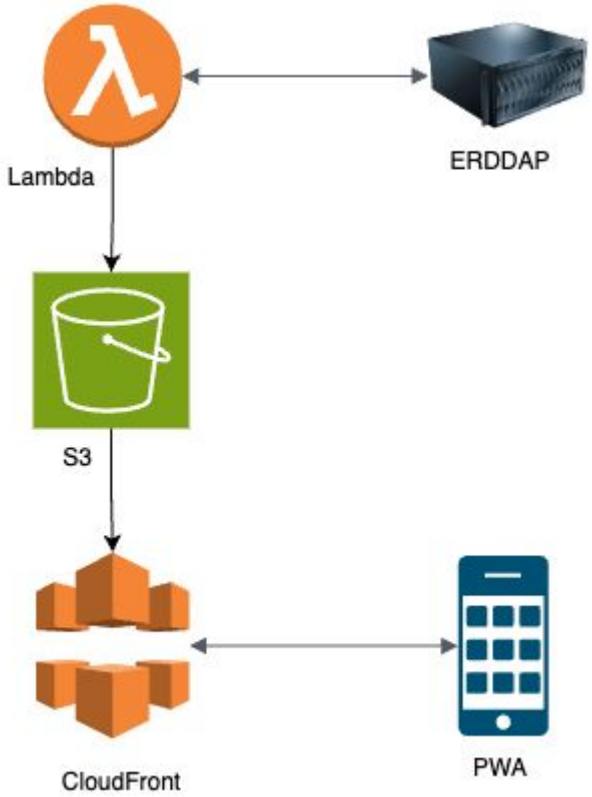
```
const observationData = await axios.all(
  metadata.map((dataset) => {
    if (!dataset?.dataUrl) {
      return;
    }
    return axios.get(dataset.dataUrl)
      .then((response) => {
        const obsData = parseJsonLines(response.data);

        const filteredObs = filterByQartod(obsData);
        return {
          datasetID: dataset.datasetID,
          regionID: dataset.regionID,
          obsData: filteredObs,
        };
      })
      .catch((error) => {
        console.error(`Error fetching observation data for ${dataset.datasetID}`, error);
      })
    })
);

// example response
const response = [{
  "time": "2024-07-14T12:50:00Z",
  "air_pressure_at_mean_sea_level": 1000.3,
  "air_temperature": 11.4,
  "sea_surface_temperature": 10,
  "sea_surface_wave_mean_period": 4.1,
  "wind_speed": 11,
  "wind_from_direction": 100,
}];
```

Cloud cache

- AWS Lambda responsible for the large number of requests to ERDDAP
- Triggered by Cloudwatch rule every 8 minutes (for data - less frequently for metadata)
- Merges results and saves them to S3
- S3 bucket made available through CloudFront
- CloudFront facilitates edge location cache for reduced latency
- PWA gets all the data it needs in two requests (metadata + data)

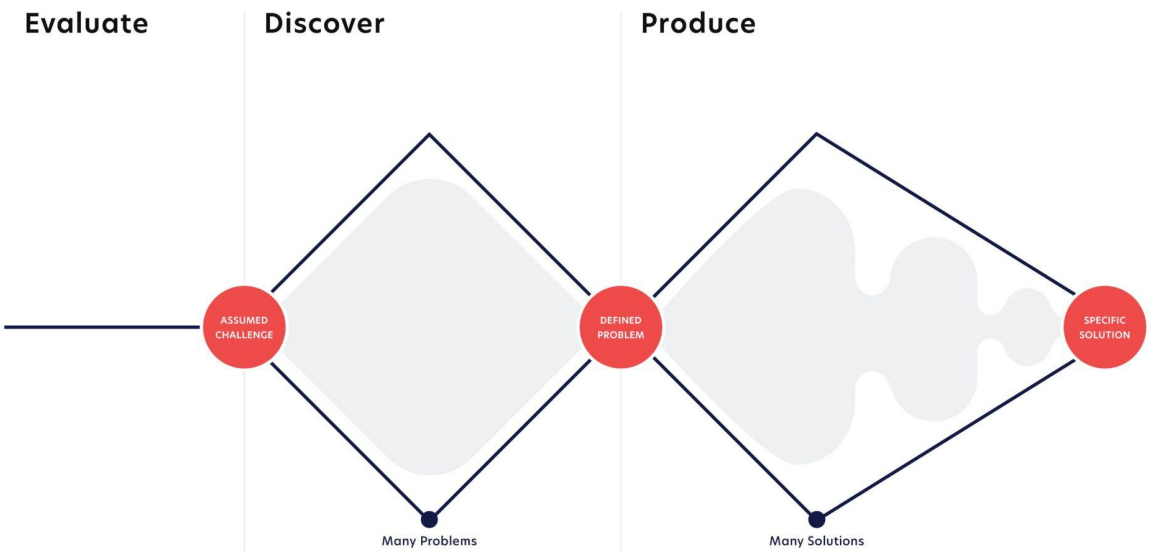


Seagull: Intersection of Data + UX

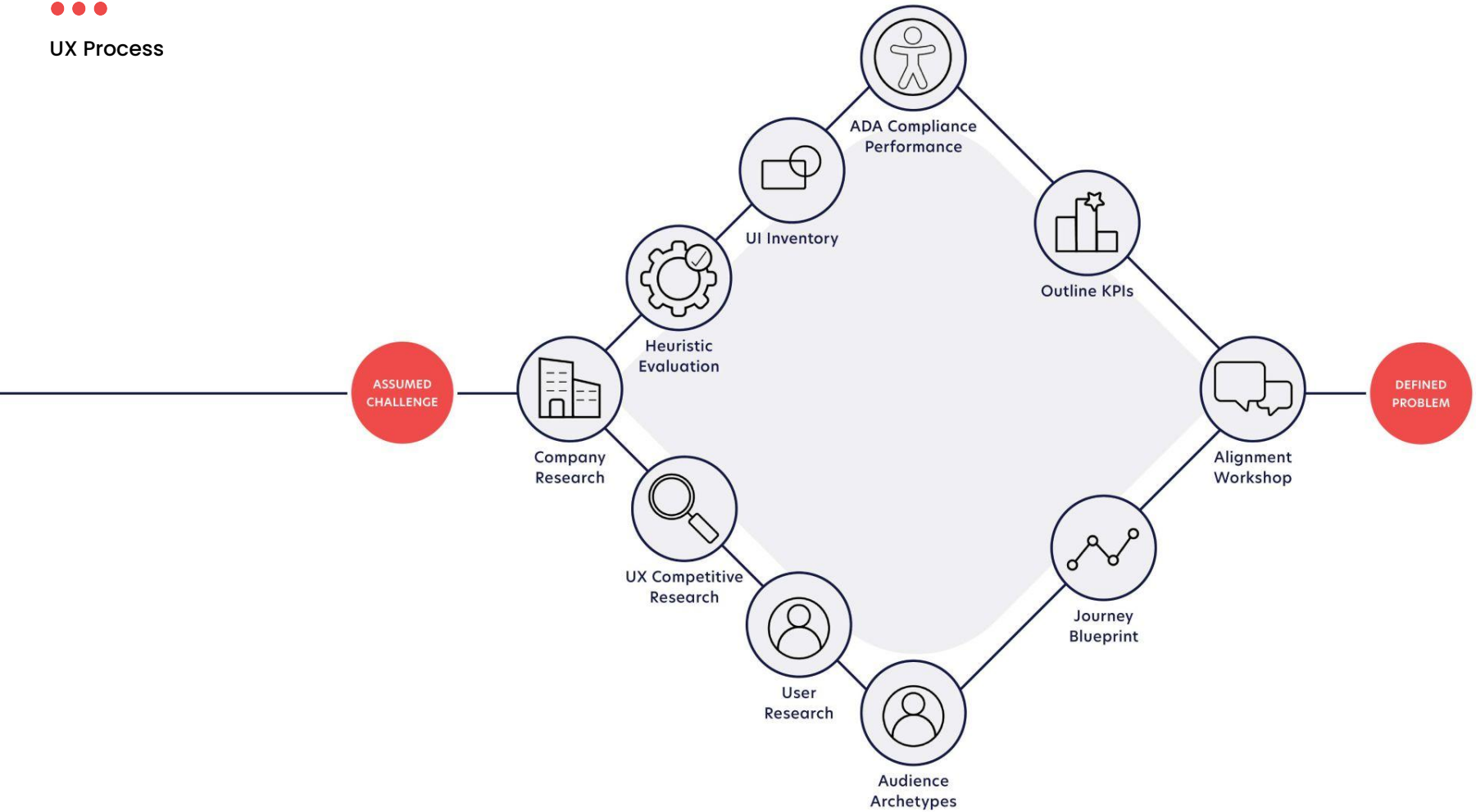
What is UX (User Experience)?

What is UX?

User experience (UX) design is a process that involves creating products or services that provide positive and meaningful experiences for users. UX design considers all aspects of a product or service, including its functionality, usability, accessibility, branding, packaging, installation, and operation. UX designers also consider less tangible aspects like delight and emotion



UX Process


ASSUMED CHALLENGE
Company Research
Heuristic Evaluation
UI Inventory
ADA Compliance Performance
Outline KPIs
Alignment Workshop
DEFINED PROBLEM
Journey Blueprint
Audience Archetypes
User Research
UX Competitive Research

Defining Archetypes

Target user groups are identified to reveal user goals, usability needs, motivations and behaviors.

Richard, The Renovator

Richard is the family man that can tackle any home project. He manages a hardware store in the suburbs of Chicago and works long hours. His wife of 19 years works as an elementary school teacher. Their two kids are grown and have since moved out, letting Richard renovate and upgrade their home, including their 30-year old windows. After seeing the energy savings from their Nest Thermostat, Richard is inclined to look at smart products that can help him manage his home.

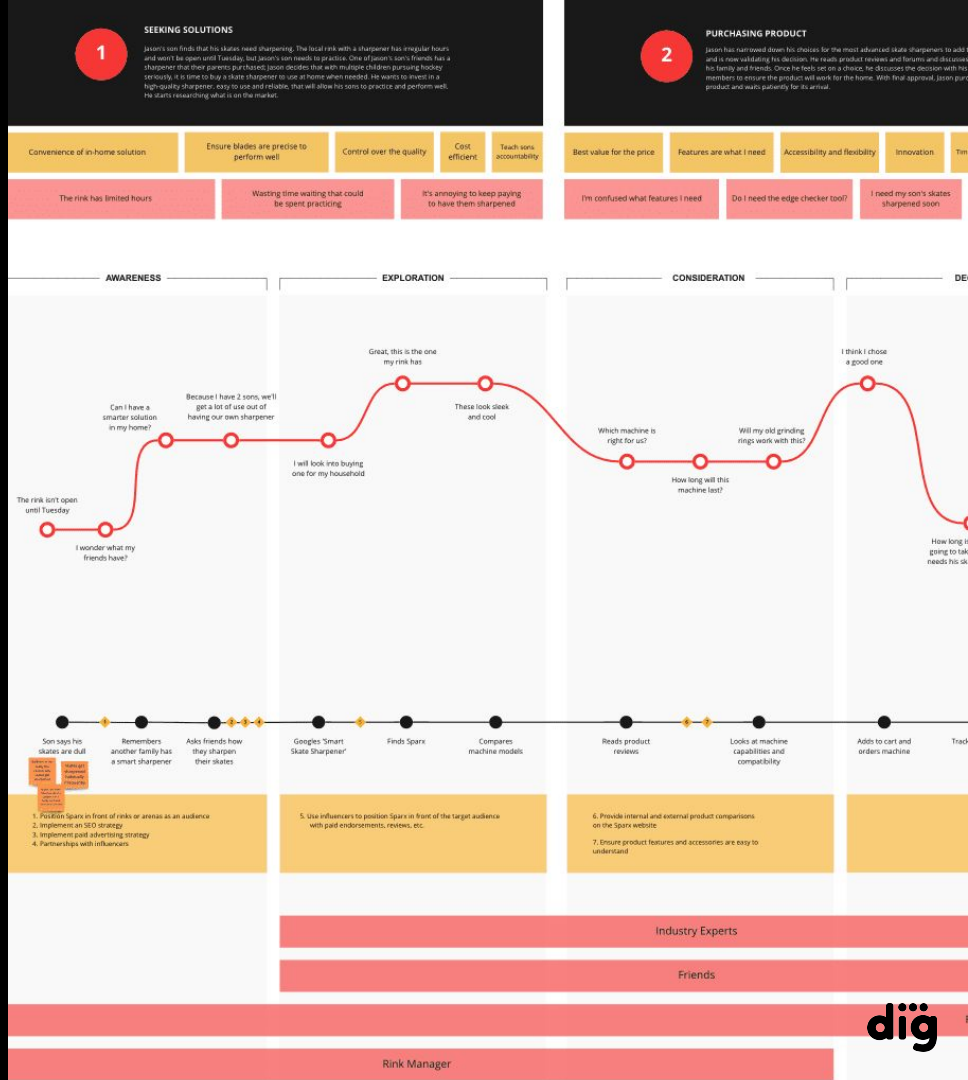
Active Urbanite
This buyer uses tech to help manage their busy city life while at home. "Living in the city where everything is hectic, I treasure a place that I can home to and feel safe and relaxed."

Connectors
Low product ownership and high integration—these households don't own many smart products, but the products they do have are well connected. They are likely to engage with a professional home systems integrator.

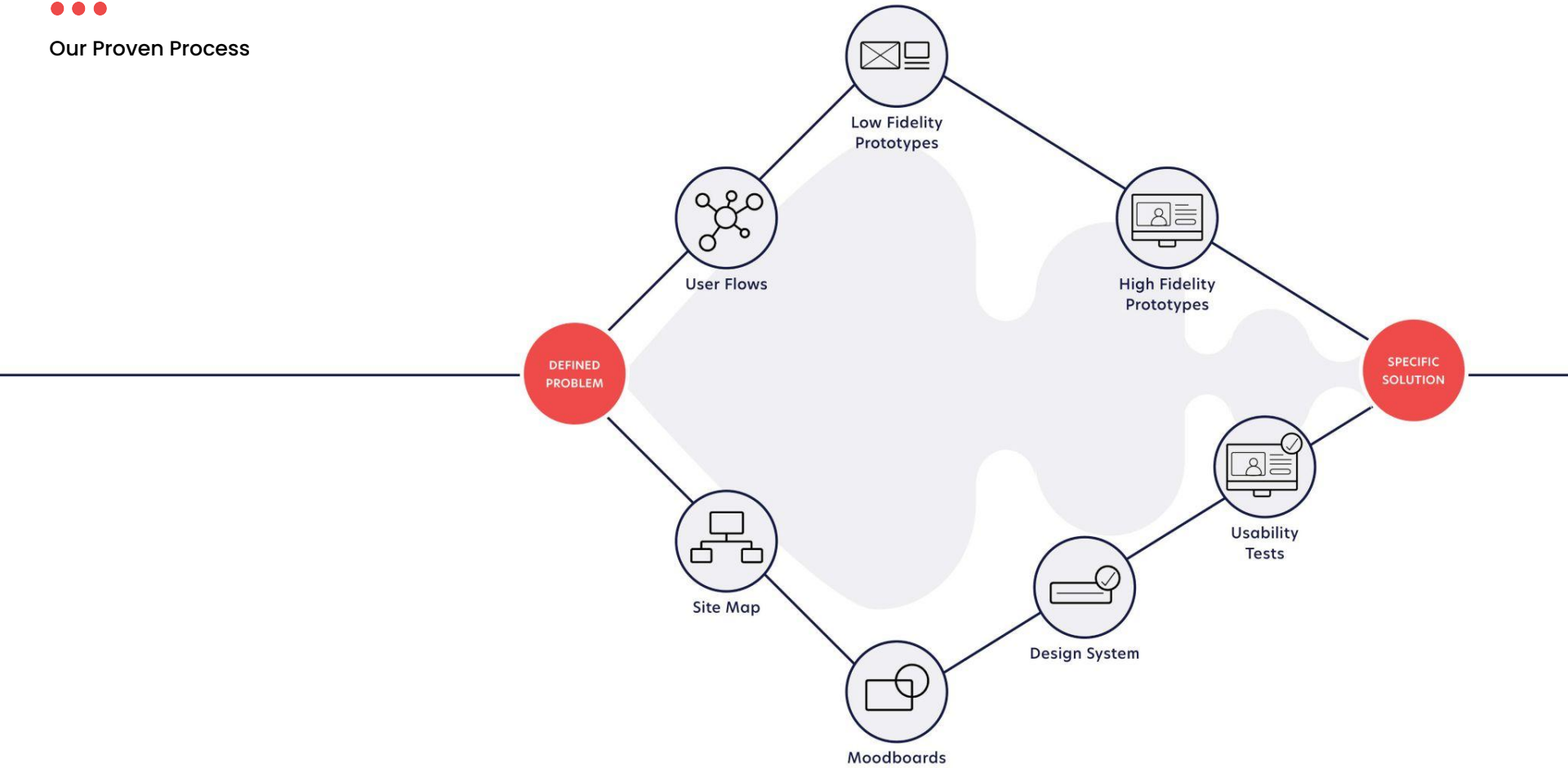
Our Proven Process

Journey Blueprint

We'll bring all the discovery work together into a journey blueprint where we showcase the target audience's journey and how they interact with the market and your business.



Our Proven Process

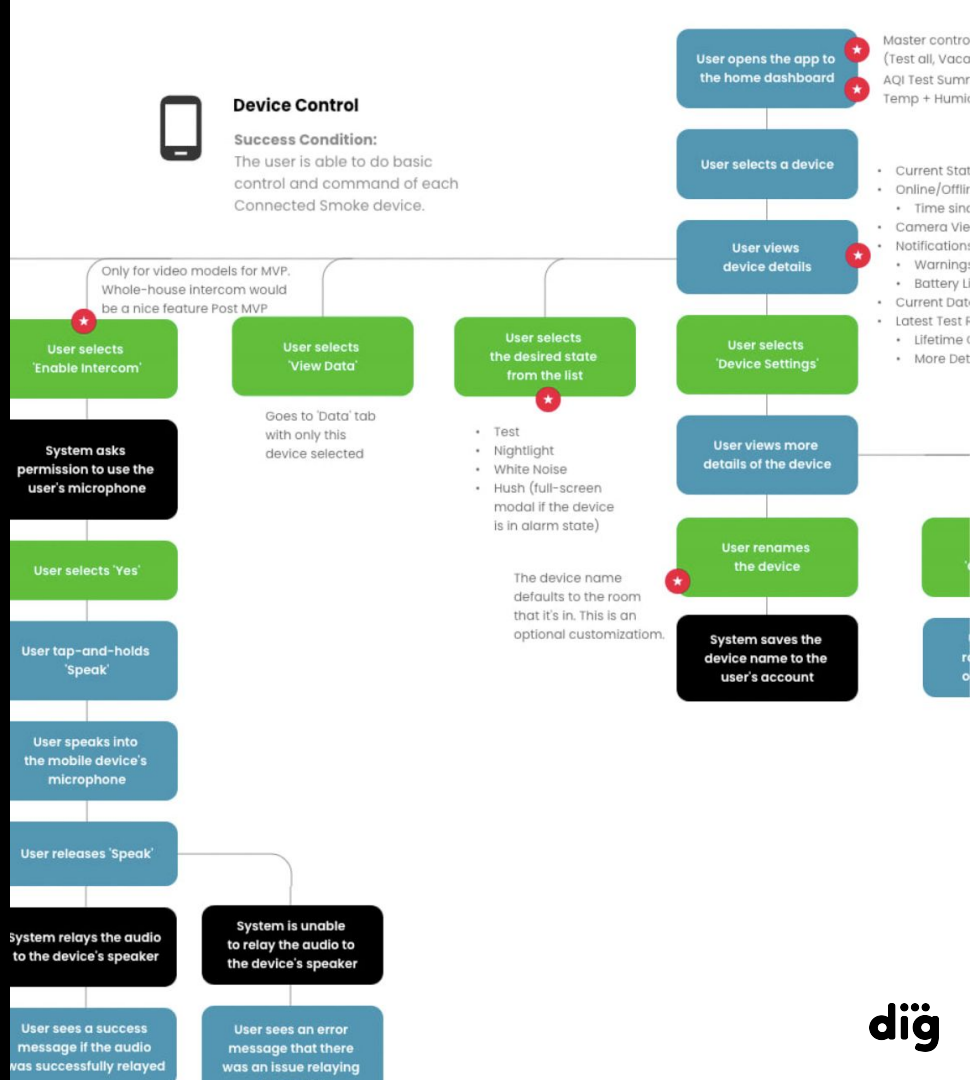


Site Map

All pages are outlined to show the optimal organization and connectivity throughout the experience. Sitemaps act as the source of truth for which pages are needed for a user to complete a series of tasks.

User Flows

User flows unite the goals of the audience and the organization of the site map so that steps a user takes to complete a task are documented, understood and ideal.

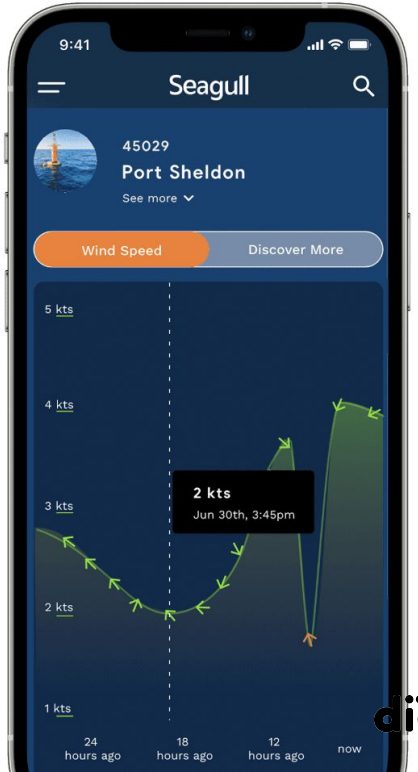


Seagull

Our Approach

Using a design for the masses approach, we did our best to make all of the Great Lakes data digestible and appealing in a Platform that could scale but also be generally fun to investigate diving deep into specific historical data sets or being able to compare data. Time Series data, historical data, Near vs. Forecasts, Comparison of historical data! Omics Data!

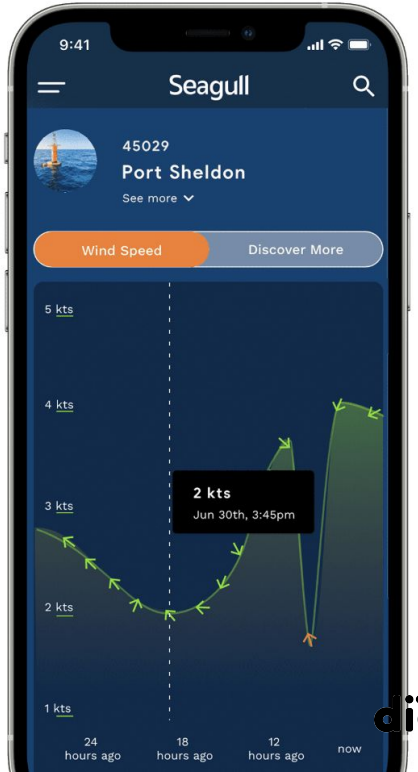
Users can create alerts and even shortly, begin to share their favorite buoy or interesting time series events on their social platform of choice.



Seagull

Our Approach

We are 5 years in from concept to scaled usage of Seagull by citizen scientists, recreational Great Lakes enthusiasts and other organizations!



Seagull

But what next?

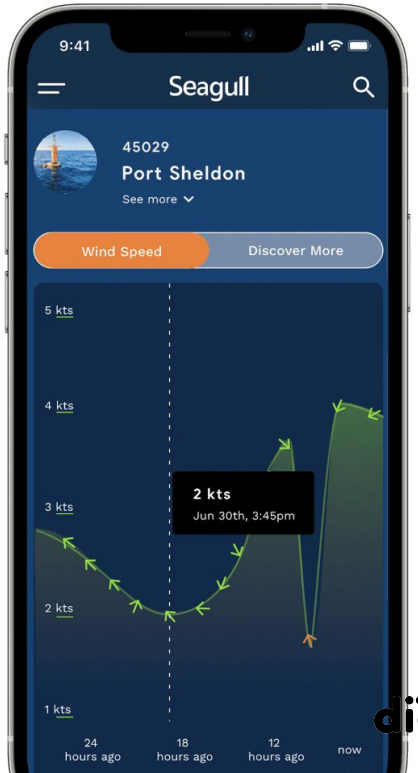
what do users want to see?

Who are our users?

What data matters to them?

What insights can we surface?

What story are we telling?



Data Science + UX

How do we provide value to users? Do we work towards better narratives and greater insights with the data that is surfaced in Seagull? How can we produce better data visualizations that will serve our audience?

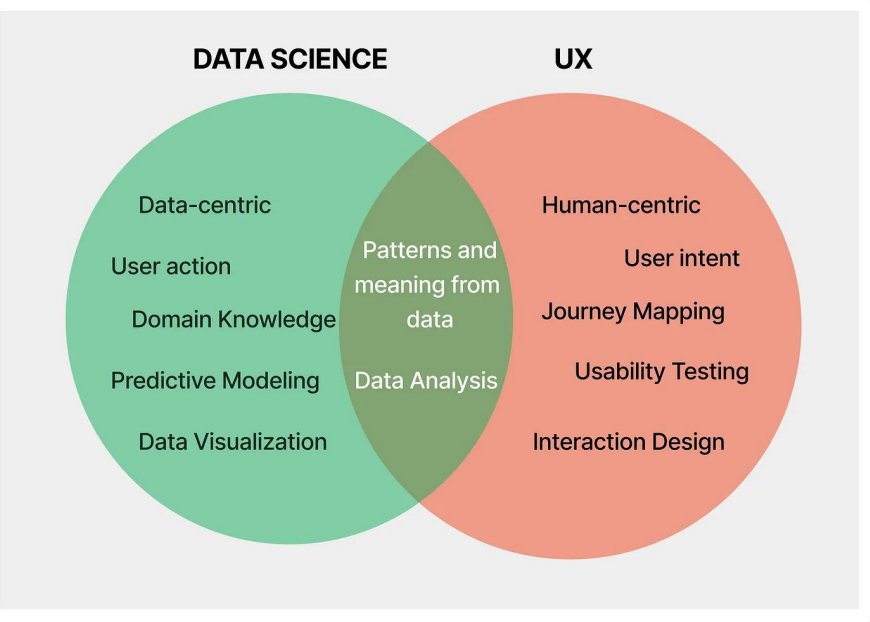
The plan is to go deeper in both.

How can we use both qualitative research (User Surveys, User Interviews, Increase user understanding) with quantitative research - better data insights through data science and machine learning to serve our user base well and provide features that will meet their needs?

Without understanding our why, we just have data.

Data Science can answer the what but UX can find the why.

But what does this mean for Seagull?



Implementing Data Science + UX Research Methods

- **Informs product decisions and feature sets**
  What features are users actually using in this product? Do they need more data comparison tools? Do they like the data comparison tools? Are they looking for something else?

  Can we surface more insights or narratives around data events based on the users and interests of user groups?

- **Clarity around actual user base and needs**
  We can document who is using the Seagull tool and which data sets. We also can understand why and build increased capability and features with knowledge around behaviors, motivations and needs.

Q + A

Questions?

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