Product Design Experience 2 - Geospatial Data Platform

March 2024 - October 2024

Skills applied ✳

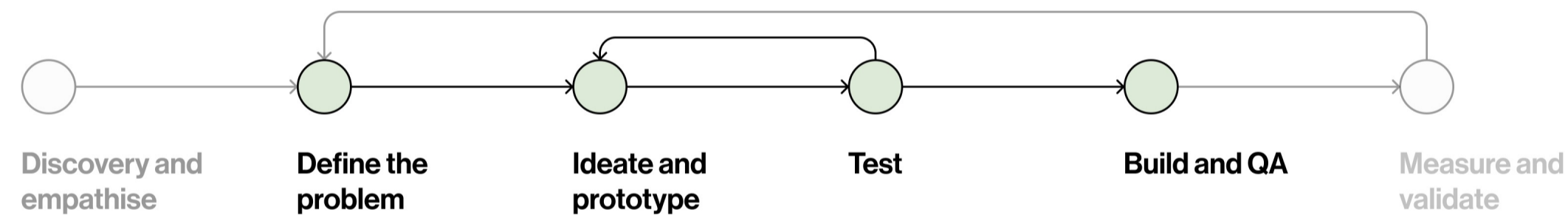Market research   User research   Lo-fi and hi-fi prototyping   Stakeholder analysis

Data visualisation   HTML, CSS & JavaScript   Design systems   User testing

I led the following parts of the design process for this product, which are detailed in this document

Discovery and empathise   **Define the problem**   **Ideate and prototype**   **Test**   **Build and QA**   Measure and validate
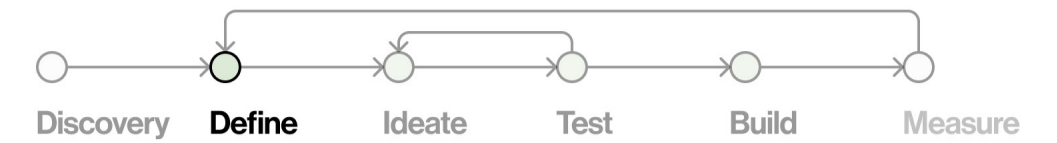
Disclaimer

To comply with confidentiality agreements and protect client and company privacy, all product-specific details, client information and proprietary data have been omitted or anonymised. This portfolio highlights my design process, skills and contributions through generalised examples and high-level summaries. Thank you for understanding the need for discretion while reviewing my work.

Contents

Problem space

Using geospatial data to generate meaningful solutions for clients is slow, expensive and inefficient

Overview of the problem space

- Geospatial data can be used to deliver unique value to clients for a wide range of projects that benefit from space data, from climate and environment monitoring to retail building development.
- However, the current process of accessing, processing and communicating the value of this data is slow, expensive and decentralised, leading to a lot of repeated work and opportunities missed.

Insights from user and market research   ✳   Market research   User research

Long lead time to demonstrate value to clients:

- The company cloud environments which the data is hosted and processed on are bespoke, difficult to use and expensive to provision.
- The data itself can be expensive and difficult to find.
- 3rd party commercial agreements to gain access to specific datasets are slow to negotiate on a case by case basis.

Pursuit time lost to drudgery:

- Engineering effort is spent on downloading data, addressing data quality issues and translating formats rather than solution discovery with clients.
- Ideas are often demonstrated and communicated off static presentations rather than scalable, high fidelity, production-like web applications running on a geospatial platform.

- Difficulty discovering and repurposing existing code and data.
- Difficulty connecting with SMEs across the firm.

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Who

Company employees working with clients or in fields that require access to geospatial data.

What

A geospatial platform that allows users to browse, access and process geospatial data, as well as access examples of previous work.

Why

To improve the efficiency and quality of geospatial solutions and insights that are generated for clients.

When

March 2024 - present

Where

Aiming to provide a solution that works across the firm globally.

How

Using the company's expertise with geospatial data, and leveraging an alliance with Google to deliver the best solution.

Lo-fi prototype
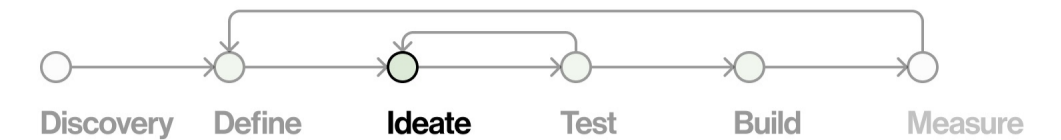
Addressing user needs through early prototyping and iteration

Objective

- To design and test solutions for three critical user needs when leveraging geospatial data effectively within the company.

Key user needs and lo-fi prototype solutions ✳ Lo-fi prototyping

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Central hub for geospatial resources:

User need:
- Access to documentation and help on how to access and process geospatial data.

↓

Solution - Portal:
- A web portal accessible by any employee with the following features:
  - Overview and explanation of what the portal can do for the user.
  - Examples and demos of previous geospatial work.
  - A linked SharePoint with cloud environment setup guides and reusable code for data analysis and processing.

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Cloud environment setup:

User need:
- Enable employees to quickly and easily set up cloud environments for geospatial data processing.

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Solution - Cloud environment setup:
- An infrastructure that allows employees to submit a form requesting a tailored cloud environment.
- Simplify the process by automating set up tasks and creating a cloud environment based on specific data needs.

▦

**Comprehensive data catalog:**

User need:
- Browse available geospatial datasets without incurring additional costs.

↓

Solution - Data catalog:
- A data catalog that is accessible via the web portal with the following features:
  - A user friendly list of all available datasets.
  - Metadata about each dataset (e.g. coverage area, timeframes).
  - Options to request dataset access.
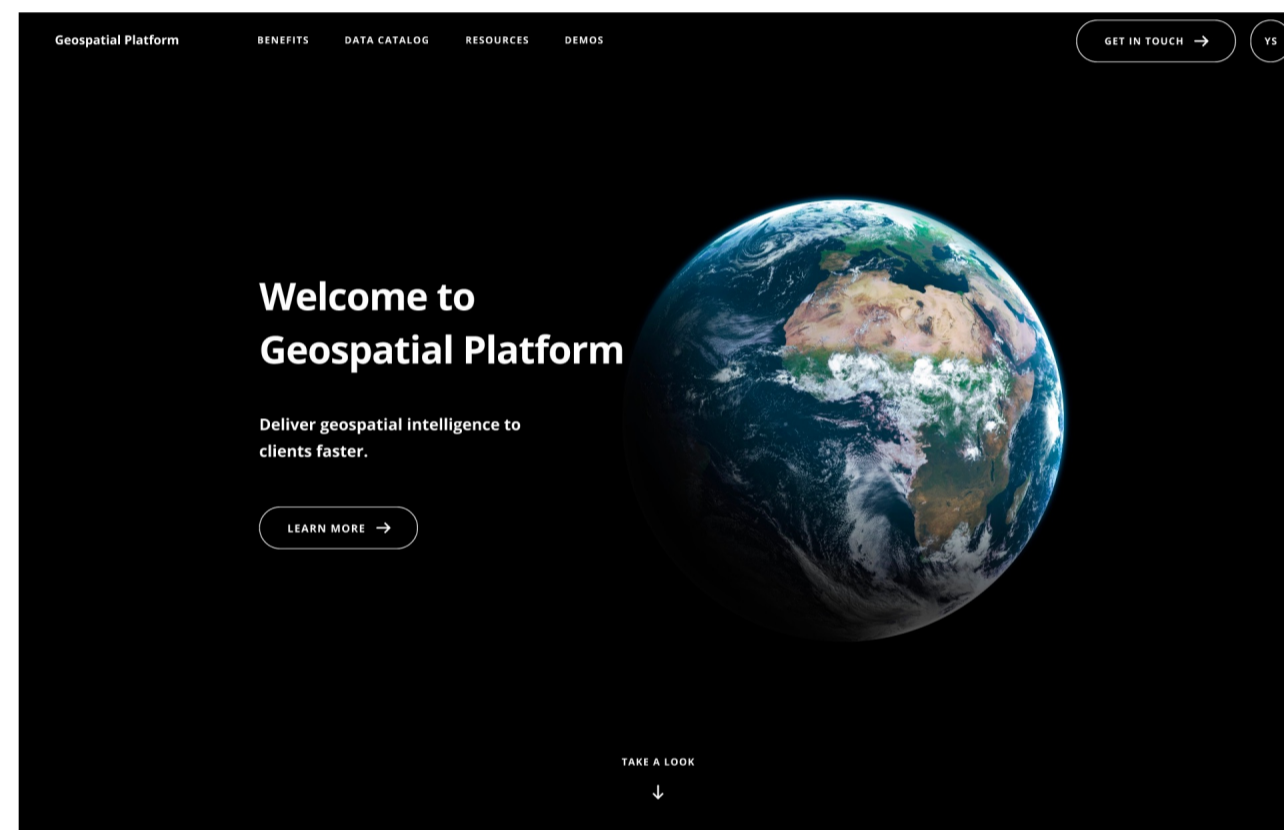 - Includes both Google Earth Engine datasets and previously acquired datasets.
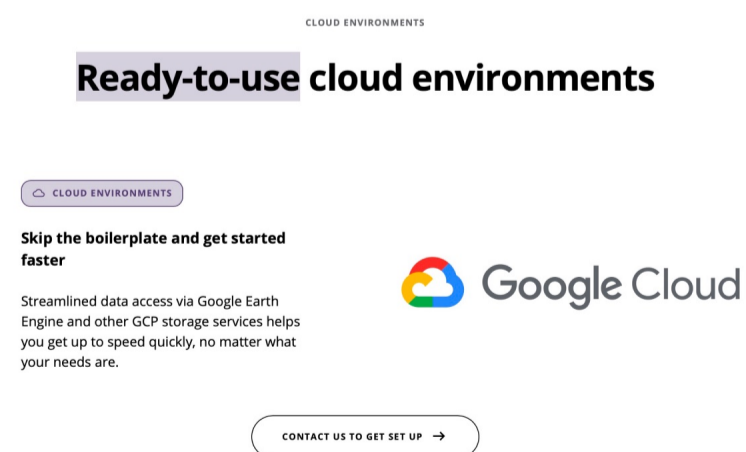
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Lo-fi prototype
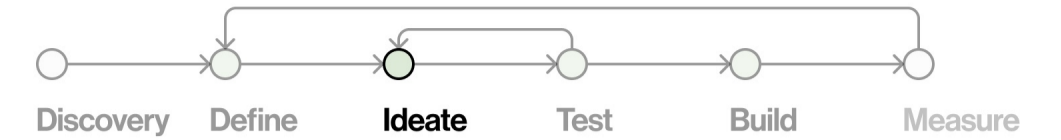
Addressing user needs through early prototyping and iteration

Below are screenshots of the 3 solutions to user needs outlined on the previous page. Due to nondisclosure agreements, client and company details/branding have been removed or simplified.
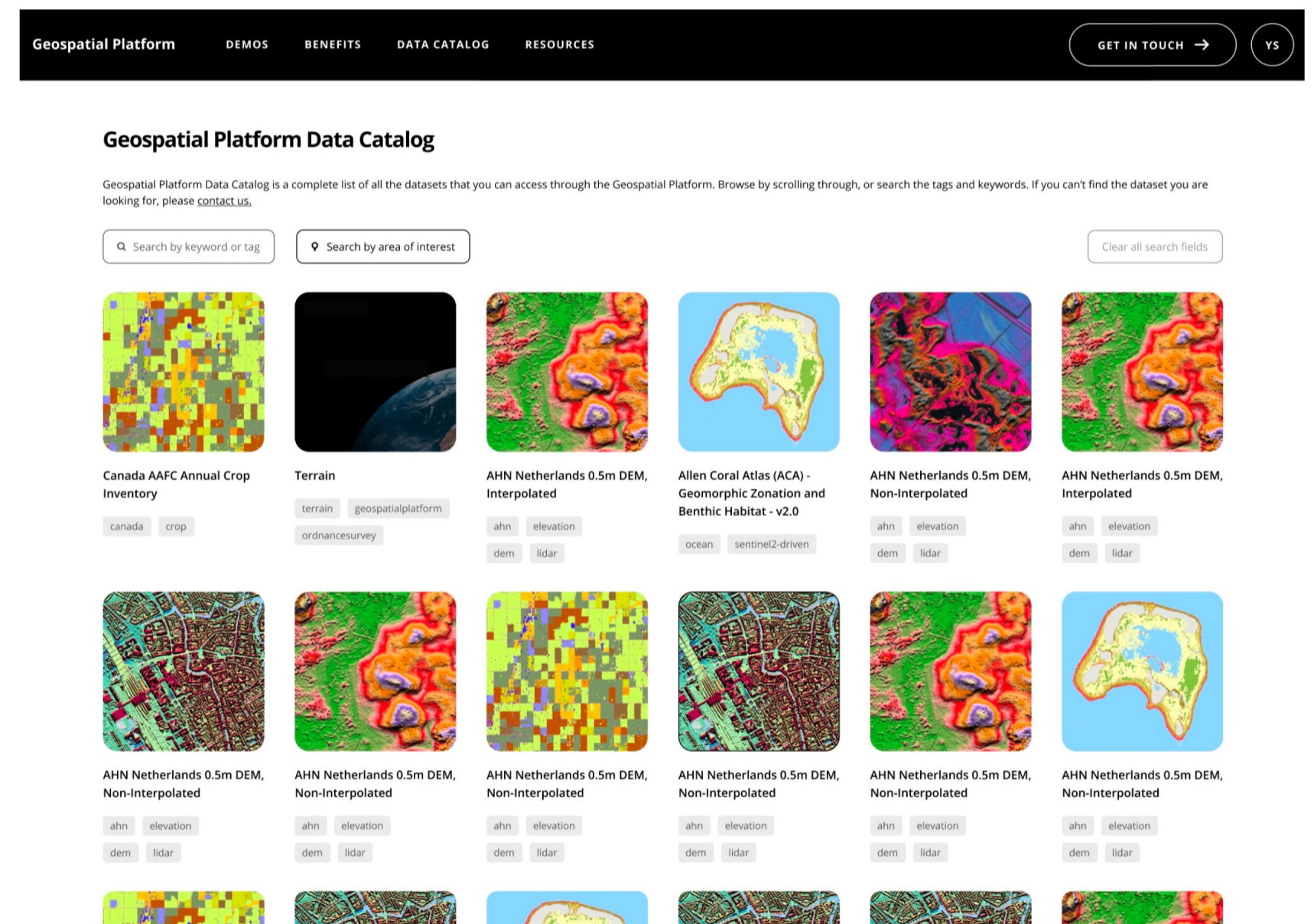
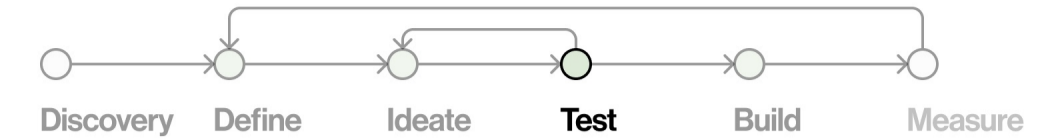### Portal

Cloud environment set up

Data catalog

Stakeholder feedback

Aligning perspectives to refine the hi-fi prototype

Who were the stakeholders? ✳ Stakeholder analysis

Feedback was gathered from the following key stakeholders to ensure the platform addressed all needs:

Users of the platform

Employees who would interact with the platform daily.

Partners and directors

Decision-makers directing funding towards the platform and the team.

Subject Matter Experts (SMEs)

Specialists contributing geospatial insights and expertise.

Google representatives

Providing technical cloud services guidance and managing the relationship with Google.

Engineering team

Developers, PMs, DMs, Product Designers building the product, ensuring feasibility etc.

Key feedback insights

Partners and directors:

Need:
- A visually engaging and unified portal to use as advertising and presentation material.

Action taken:
- Shortened the portal content to be digestible and visually engaging
- Ensured a consistent aesthetic across demos to present geospatial work as part of a cohesive platform.
- Added a promotional video to the portal to explain the platform's value.

Subject Matter Experts (SMEs):

Need:
- Seamless access to demos directly from the portal instead of the SharePoint.

Action taken:
- Linked previous demos to the portal for easier and immediate visual access.

Users of the platform:

Need:
- Clear access to the data catalog and cloud platform requests.

Action taken:
- Designed prominent, easily accessible buttons at the top of the interface for these functions.
- Optimised task flows to make processes short and efficient.

Impact of stakeholder feedback

- Helped define critical priorities for the hi-fi prototype.
- Ensured alignment with business, user and technical goals.

Feature generation and hi-fi prototyping
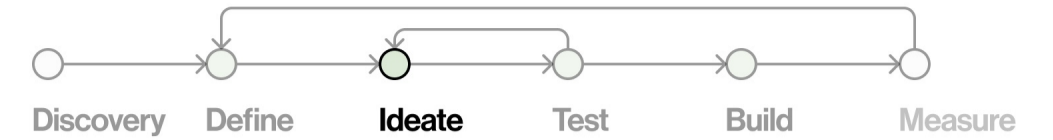
Having analysed the stakeholder feedback and generated outcomes, I developed a hi fi prototype to bridge design and development.

Purpose of the hi-fi prototype

- The hi-fi prototype, developed in Figma, allowed all designs and product decisions to be recorded visually, as well as new features to be tested and developed.

Who were the stakeholders? ✳ Hi-fi prototyping   Design systems

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User flow:

- A detailed, end-to-end journey illustrating how users interact with the platform in a 'start to finish' format.
- Main focus was to **document all features** and on-screen user interface detail.

Figma prototype demo:

- Allowed stakeholders to visualise and interact with the platforms features, testing aspects such as accessibility and usability.
- Facilitated efficient testing and feedback collection.

Design system:

- Integrated design components from the company design system with custom elements tailored to new features.
- Ensured **consistency, scalability and alignment** with brand guidelines.

Examples of new features that were developed quickly with the hi-fi prototype
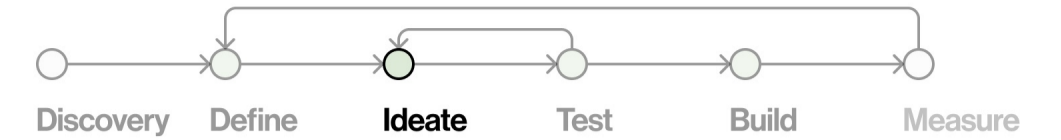
Area of interest (AOI) search in the data catalog:

- Requirement:
  - Directors needed to demonstrate dataset searches using a bounding box on a map.
- Solution:
  - Added a new screen with the functionality for users to draw a bounding box on the map interface.
  - This screen had a section that displayed datasets intersecting with the selected area.

Dataset purchase flow:

- Requirement:
  - Enable browsing and purchasing datasets from specific 3rd party providers.
- Solution:
  - Designed a new browsing interface to showcase available datasets from 3rd party providers.
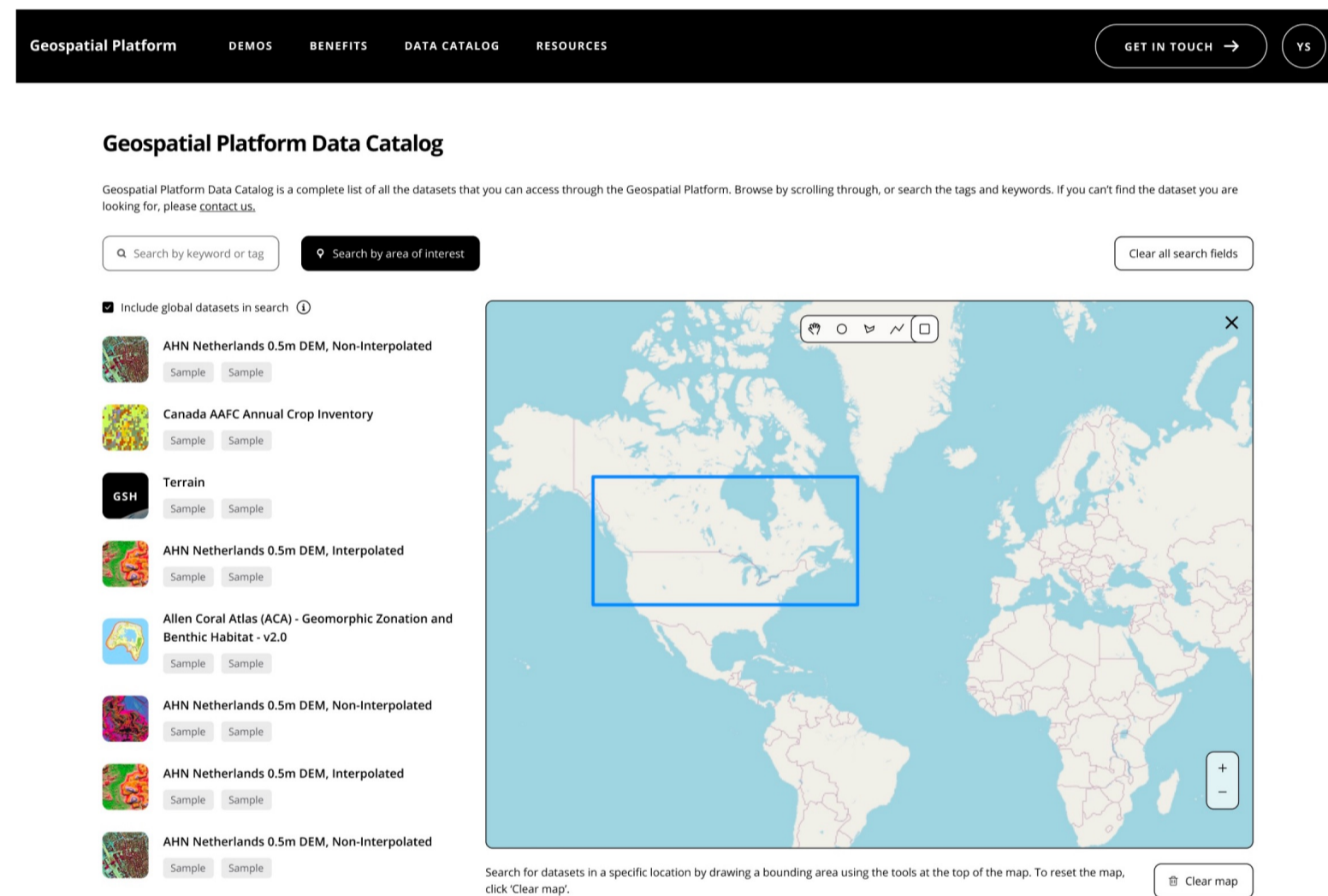 - Created a streamlined purchase flow, including cart and checkout processes.

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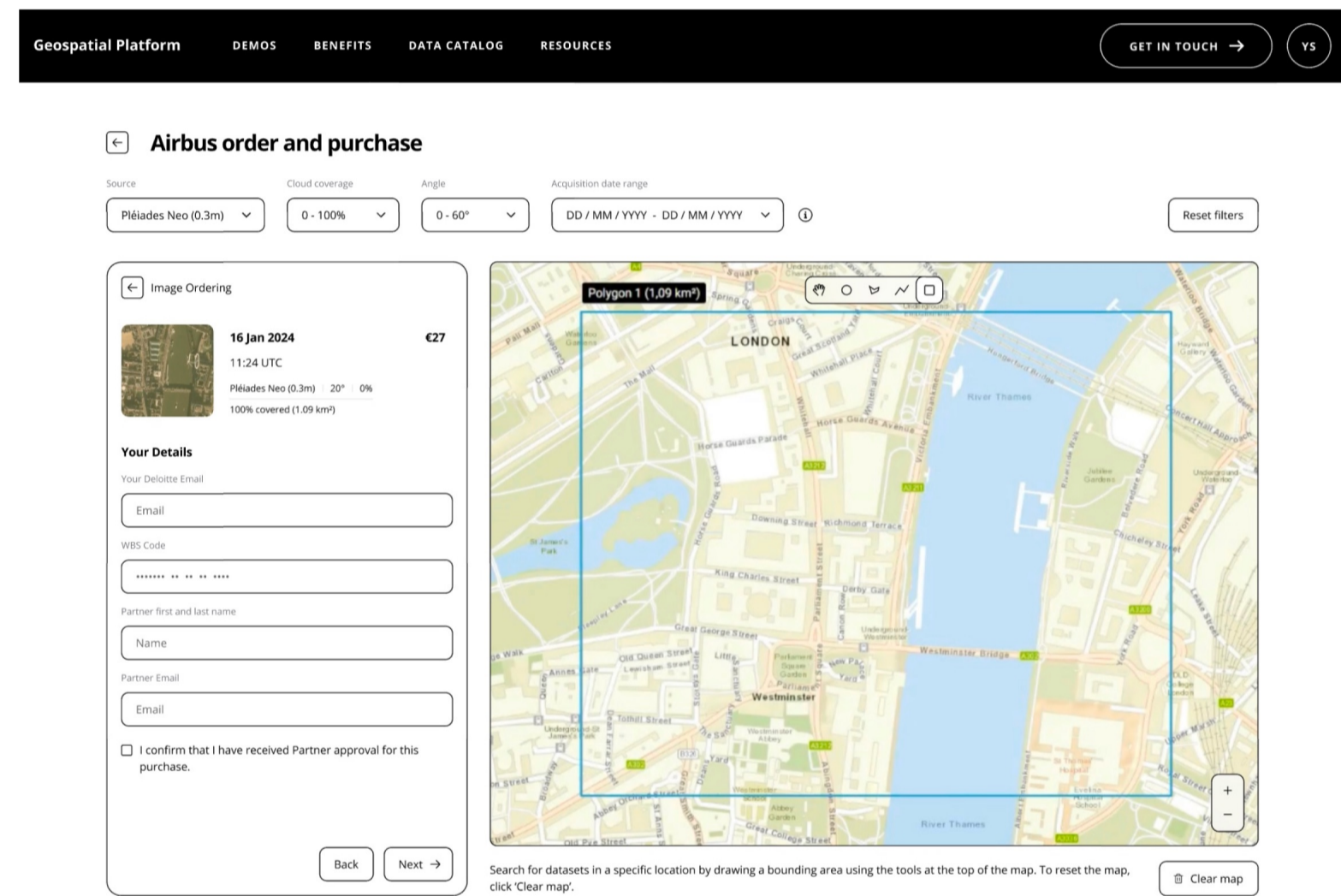# Feature generation and hi-fi prototyping

Having analysed the stakeholder feedback and generated outcomes, I developed a hi fi prototype to bridge design and development.
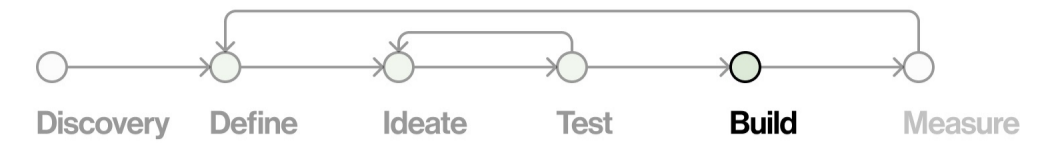
Area of interest (AOI) search in the data catalog:

Dataset purchase flow (details input screen):

Build

Once the hi-fi prototype had been approved by stakeholders (PMs, directors), the designs were handed over to the developers.

My roles as a designer in the build phase ✳ HTML, CSS & JavaScript

Creating and organising front-end tickets:

- Having created the hi-fi prototype, I was in the best position to translate the Figma designs into **organised actionable** front-end tickets.
- I aimed to make each ticket **detailed, clear and developer friendly** so that discussions were focused on the product development, rather than the content of the tickets.
- My previous experience in **HTML, CSS and JavaScript** helped when making the tickets clear and actionable.
- I broke tickets into specific **categories** such as: feature development, interaction details and edge cases.

Design QA:

- As the tickets were completed, I reviewed the development progress to ensure **alignment** with the Figma designs.
- This involved checking the completed development work against both the Figma and the details on the front end ticket.
- Throughout this process, I would also document minor inconsistencies that I found between the designs and the developed product. This allowed the design QA conversations to stay feature specific, but allowed any lower priority defects to be captured and fixed at a later date.

Approving final designs:

- Once design QA had been completed and the product met the **design intent and quality standards**, I gave the green light for release by approving the pull request.

Usability Testing
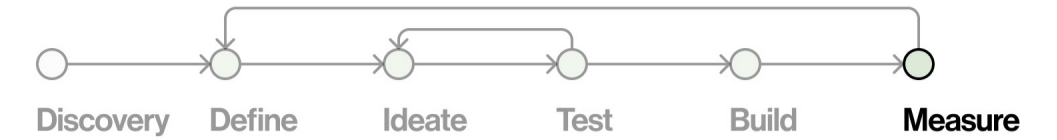
Ensuring that the platform meets user needs through usability testing

Aim of usability testing ✳ User testing

To determine if the product enables users to efficiently and effectively complete three key tasks using the portal and the data catalog:
1. **Understand** the purpose and functionality of the platform.
2. **Browse** available datasets.
3. **Request** a cloud environment to access and process data.

Usability testing documents required

▤ **Session script:** a planned script including introductions, pre-session interview questions, tasks and post-session interview questions.

✎ **Scenario and tasks:** 3 realistic task scenarios designed to test the 3 user tasks, with one example case study.

🔎 **Data collection and analysis sheet:** a structured evaluation of user performance and feedback.

Overview of the sessions

👤 **Participants:** 5 company employees with geospatial experience

▤ **Tasks:** 3 tasks aligned with key platform functionalities

🕐 **Duration:** 45 minute sessions

Key insights and findings

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Portal:
- Demos are the key asset when informing the user about the value of the platform - participants learned from examples.
- The hierarchy of the information did not allow some users to navigate through the portal when trying to learn about the platform, as some information was prioritised for users that were already familiar.

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Data catalog:
- The AOI search functionality was not intuitive - users expected data to appear directly on the map, or struggled with the concept of drawing a bounding box. These interactions were built with the assumption that the process is established within the community, but this assumption was tested and turned out to be incorrect.
- Users couldn't immediately see the information they considered a priority in the metadata.
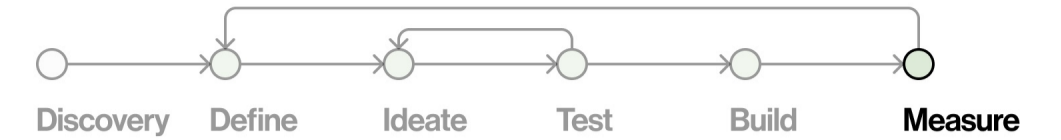
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Requesting access to a cloud environment:
- Users used a variety of pathways to access the request form, there was no one specific favourite.

See next page for screenshots →   8
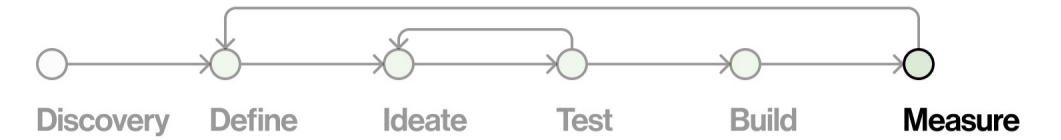
Usability Testing

Ensuring that the platform meets user needs through usability testing

Overview of the usability testing data collection method:

Outcome

Once usability testing had been completed, final updates to the product were made and the geospatial platform was publicised to the company.

Outcome

- The geospatial platform is now used company wide as the default tool to browse, access, purchase and manipulate geospatial and and earth observation data.