Australian Government
Geoscience Australia

Digital Earth Australia pilot website project

dea.ga.gov.au

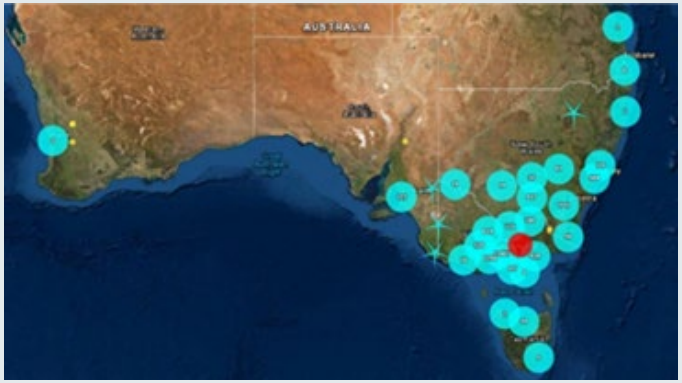
GovCMS Innovation Showcase, 19 November 2021

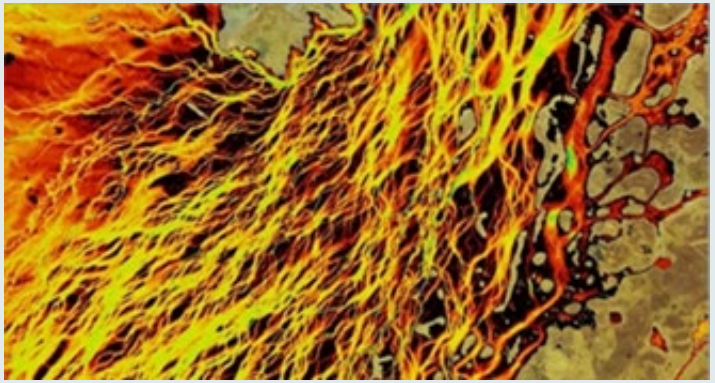
Presenters

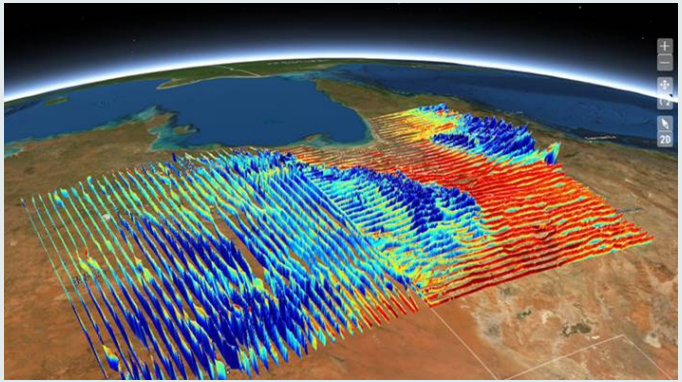
- Alan Maskell | Project Manager, Geoscience Australia
- Lucas Mounsey | Front-end Developer, Today Strategic Design
- Kristen Pol | Business Analyst and Technical Lead, Salsa Digital

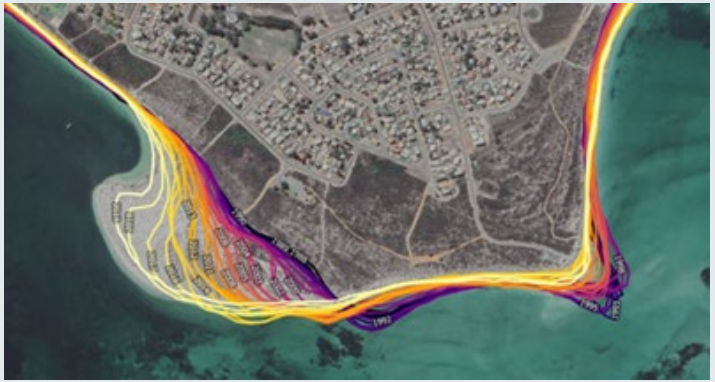
© Commonwealth of Australia (Geoscience Australia) 2021. This product is released under the Creative Commons Attribution 4.0 International Licence.

About Geoscience Australia and Digital Earth Australia









What problems are we trying to solve?

Unlocking potential with Geoscience Australia

Geoscience Australia is a complex organisation with a huge amount of valuable data and science.

Geoscience Australia is facing many challenges. Information is difficult to discover and access, audiences have highly complex requirements and the organisation lacks a public profile.

This piece of work, developed by Today, outlines a human-centred design approach to solving these challenges.

The design process began with getting a deep understanding of Geoscience Australia. This was followed by in-depth user research involving Geoscience Australia stakeholders, a diverse set of practitioners from different scientific disciplines, as well as the general public.

This artefact outlines 20 recommendations for your organisation.

There is an enormous opportunity to use the high-impact, quality scientific data collected by Geoscience Australia to help institutions, academia, industry and the general public to model the future and solve some of society's biggest challenges.

The challenge

How do the general public and stakeholders currently engage with Geoscience Australia's services, and how might they in the future?

Who we spoke to

Digital deep-dive

Today performed an in-depth evaluation of Geoscience Australia's current digital capability. This was conducted through a heuristic review, web analytics, competitor analytics, content audit and a channel audit.

Internal engagement

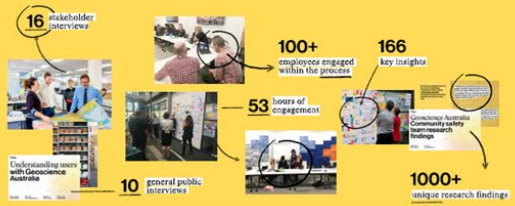
Engaging with executive, technology, marine, community safety, positioning, communications, client experience and education teams allowed us to map the current flow of communication. We then developed a stakeholder prioritisation method to map each science team's stakeholder groups.

User engagement

Today explored the value and application of Geoscience Australia with a diverse range of users. This included 24 + 90 minute interviews with twelve end community safety stakeholders, 42 + 60 minute interviews with general public members, and a stakeholder collages workday with 9th Department of Fire and Emergency Services.

Regular feedback

Throughout this process, Today engaged across various internal teams, presenting back incremental findings. This was designed to build user and organisational understanding as we progressed.



What we heard

There are key challenges identified for Geoscience Australia that make it's role ambiguous and hamper our ability to access users and respond to their needs.

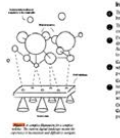
> "Geoscience Australia is an organisation that's playing a critical role in the welfare of the earth"
> — *member of the general public*

Difficult to discover and access

The experience of interacting with Geoscience Australia is disjointed and filtered across channels. This is evident on the website, but also across all communications, organisational silos, the brand, organisational description and purpose.

Insights

- It is difficult to find information through Geoscience Australia and the website is difficult to navigate.
- There is a lack of consistency around how information is communicated - particularly regarding process flows and ways of working.
- There is a lack of clarity around how advocate and convey Geoscience Australia's people, services, and its activities.
- Participants expected the Geoscience Australia brand to present information and content in a predictable manner.



User need:
I want to know what is available to me and be able to navigate information and discover it easily.

Largely unknown, but trusted

Geoscience Australia is not a household name. Many people we spoke to did not know of Geoscience Australia, let alone its relationship to governments, or the spectrum of data, science and service capability that it holds.

Insights

- There is a lack of understanding among stakeholders and the public as to the breadth of knowledge and value created by Geoscience Australia.
- Neither Geoscience Australia nor called out multiple times as not fully communicating the value of a government organisation.
- People generally do not understand the scale of Geoscience Australia, the diversity of science, the breadth of data, and the overall value Geoscience Australia holds. Stakeholders found it hard to identify what was available, where to look and how to access specific data sets.
- Geoscience Australia's baseline data is very high quality and a trusted source, but it is not always easy to find and access. Participants identified that there is potential to achieve significant cost, time and decision-making benefits.
- Geoscience Australia is not seen as the go-to for earth science data. Collaboration tends to be one-to-one – reliant on individuals rather than an industry standard or practice. Many times this is used for competitive advantage as opposed to accelerating applied scientific application.
- Outside direct professional relationships, most people have limited awareness of Geoscience Australia and its data. There is an opportunity to look for new ways to put knowledge into the hands of people that will benefit from it.

User need:
Make me aware of who you are and what you do – you are a valuable and trusted source.

Data and technology are forever evolving

The way science is being created and digested, along with major changes to society, technology and data, has a large impact on how science is applied.

Insights

- Collaboration is necessary to facilitate access to, and leverage of, critical data. This extends to the development of scientific outcomes and product delivery.
- There is an ability and ambition to change over time. Many participants referenced the importance of this changing data and creating chronological overlays.
- Data consistently overlaps to create something termed a 'data mosaic'. Creating from data sources was a common behaviour with all stakeholders. Two people called this out as the role of Geoscience Australia – bringing together or embedding information at a regional or national level.
- People understand the uncertainty difficulties with data management. This has a flow on effect for people in terms of value, cost and dependency. It also means that data can often be perceived to be locked/leveraged for status.
- There is a marked difference in the quality of data available. This is affected by resolution, fidelity, relevance, accuracy and scale. There is a large consideration around how recent high-quality data and how to collect it. Putting different datasets together is currently tricky due to quality and delivery formatting of data.
- The main barriers to data collection are perceived or real competitive advantage of intellectual property, project-by-project barriers such as data being concealed or hidden, and a lack of knowledge of what is available.
- Organisations have to collect data for planning systems, justifying resource decisions, etc. However, many individuals and companies have a poor grasp of the tools and approaches to receive and make best use of this data.
- Scientists and stakeholders are seeking better quality assurance, particularly when it comes to services, methods of data collection and the contextualisation of science, to ensure both traceability and robustness. They look to Geoscience Australia as having a key capability for this.

User need:
Help me navigate the data, science and the changing nature of both.

Latent potential, unmet needs

Everyone wants Geoscience Australia to be more visible and more vocal. The public want more of everything, particularly guidance on the effects of climate change. Scientists are unclear on when, how and what to communicate. Stakeholders want more access and improved avenues to utilise the data and science.

Insights

- Scientists want to be an independent advisor to influence decision making and have a bigger impact.
- All participants want more regional level data, such as more bathymetry of a regional scale. Other specific datasets were sediment thickness, hydro-osmotic data, groundwater data, and data that can be used to better contrast (with accompanying models), hydrocarbon and shallow geology.
- All participants want to get more out of data. This means using data to make quality judgements, the ability to interpret data well and the ability to build an ecosystem.
- The public see Geoscience Australia as a specialist that can leverage to simplify complex data and provide clear guidance.

User need:
Give me more science.

User needs are complex and diverse

Geoscience Australia has a very diverse set of audiences, with highly complex requirements. Not only do they require that complex information be delivered with precision, but they want it to be organised and structured to assist with the efficient completion of specific tasks.

Insights

- People require good evidence to support decision-making, plan beyond life expectancy, and prepare for future scenarios.
- The general public was interested in environment, town context and daily activities. They were also interested in the value and the intrinsic value of data people consume through their purchase in their day-to-day lives.
- The time and cost required to gather more information and resources through interpretation (impacts of stakeholders and politics) is a clear need for better cross-industry, business and government collaboration.
- Collaboration and sharing are important. Not just for improving collective knowledge, but to create quality outcomes with a common framework for decision-making. This is also important for efficiency in looking at the same information, regardless of professional background.
- There was an overarching appetite to collaborate, as well as an openness from all stakeholders to build a more open data culture, developing value collectively across consultants, industry and government.
- Australian value direct engagement with stakeholders, both to build relationships and to ensure the quality delivery of projects.

User need:
Give me information that is anchored in my level of understanding.

A demand for leadership

General public and industry stakeholders hold Geoscience Australia to a high standard. They need the organisation to take national responsibility for providing up to date scientific information, communicating about regional issues such as climate response and to guide industry and the scientific communities.

Insights

- People generally see Geoscience Australia as an important public service, providing accurate, factual information in a time where influential opinion is often driving decisions.
- There was resounding agreement to build out the role of Geoscience Australia within Australian society, particularly focusing on key areas within the public sphere, government and industry.
- Consistently safety and coastal planning stakeholders see the potential for Geoscience Australia to be occupying a high value role in the climate change conversation. This role was seen to be particularly important with a view to political and scientific fact-checking. There was also the perception that this voice needed to be louder.
- Stakeholders called out leadership around governance and guidelines as a specific direction for Geoscience Australia, particularly to help limit disasters, deal with climate adaptation and support sharing and collaboration.
- People generally believe data should be freely available to all and should be provided easily without a dependency on existing relationships or prior expertise.
- Geoscience Australia has a responsibility to play to acting as a quality provider and curator of data, and not to be a competitor to industry.
- People look to Geoscience Australia to initiate important conversations and provide evidence to support decision-making. Geoscience Australia is seen to provide specialist knowledge, filling the transition gap that the states can't justify building themselves.

User need:
Be accountable to me in providing equitable access to data and science.

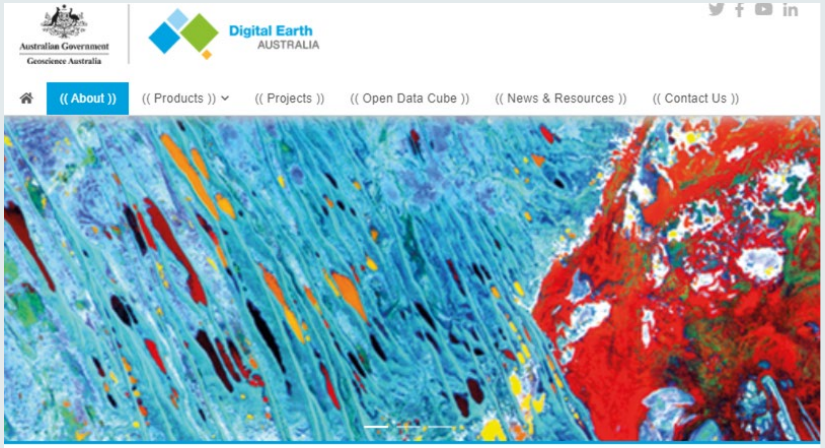
Design principles

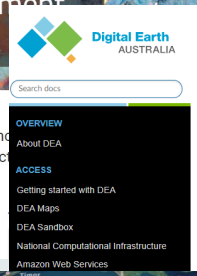
The following principles were generated by Today after synthesising the research findings to develop the next set of recommendations.

Use them to inspire new ideas, prioritise initiatives and create strategic focus.

- Put our users at the centre of everything
- Understand differences to design for everyone
- Make our data discoverable and accessible
- Be a leader and have a clear voice
- Share widely and collaborate effectively

Why Digital Earth Australia as a pilot project?





About

Products

Collaboration partners

User centred experience

Why user centred experience?

Desirability

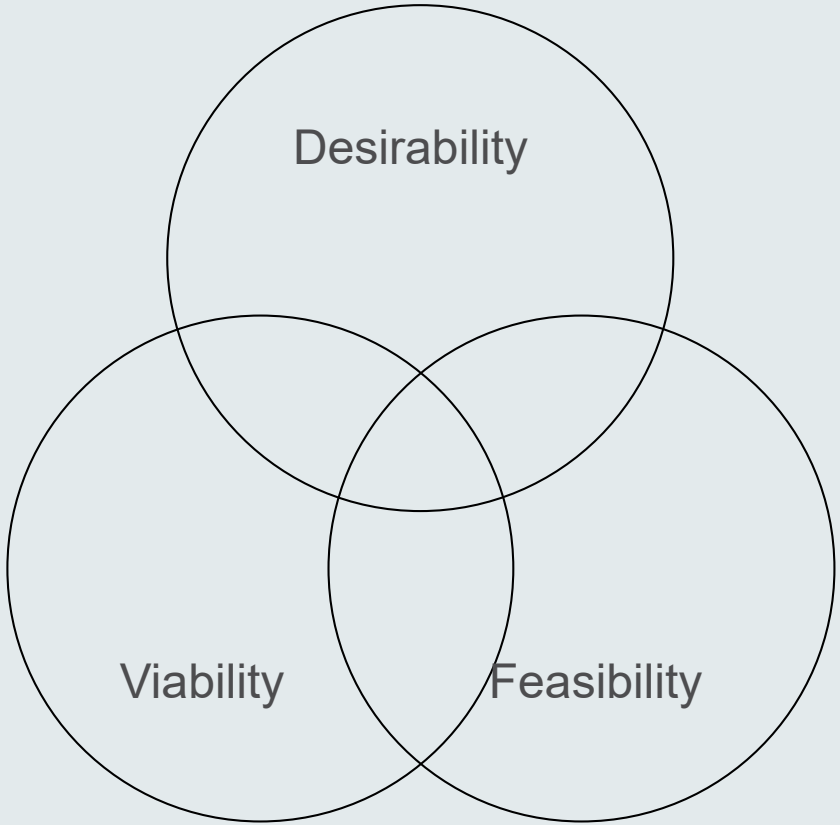
- Design and deliver what people need and value
- Reduce frustration, increase positive perceptions and interactions

Viability

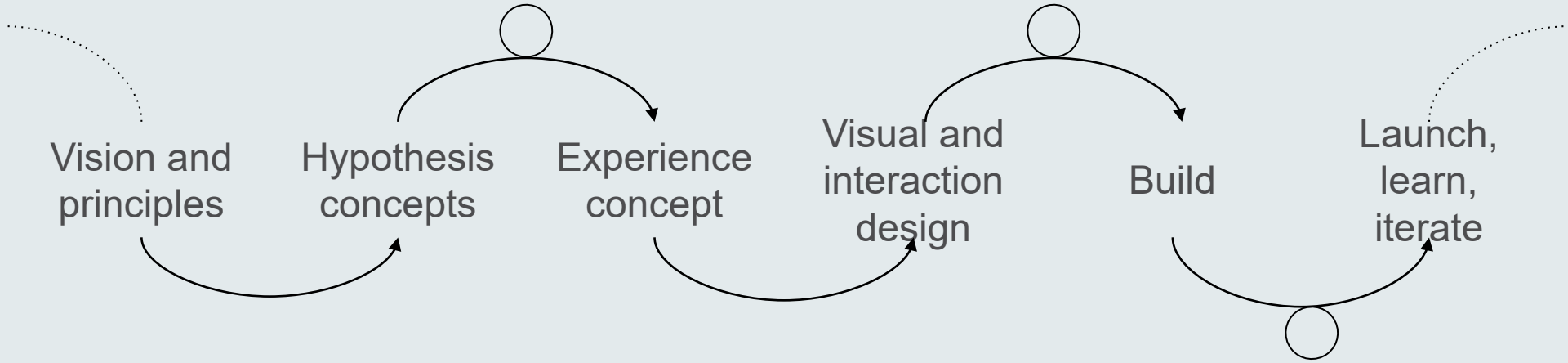
- Prioritise money and effort on what people need and value

Feasibility

- Make technology decisions which will support users now and in the future



Designing a user-centred experience



What direction should we go in?

What *could* the experience be?

What *should* the experience be?

How will it look and feel?

How will it come to life?

How can we improve it over time?

How did we do it?

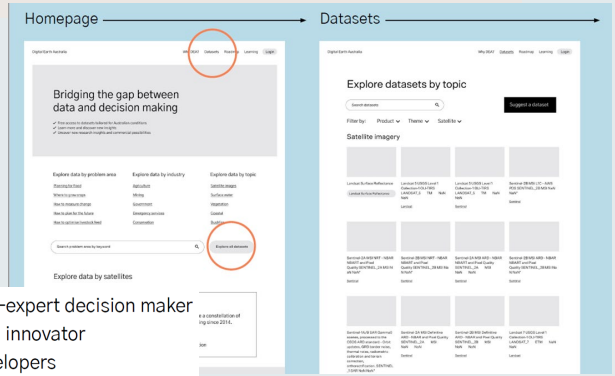
Phase 1: UX and prototyping

"Case studies are the bridge between the real academic information into something they can pick up and use, even if they're not already in that science"

—GOV6

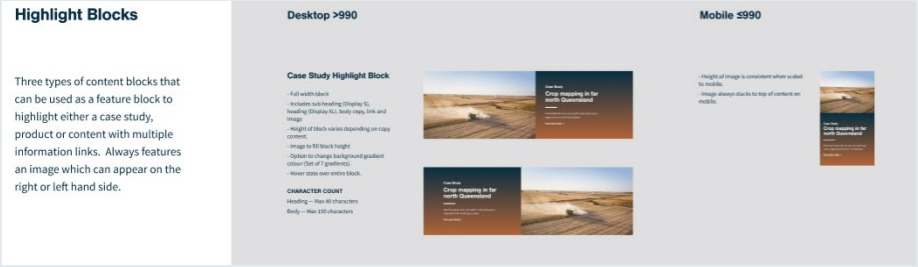
"<It's> giving people more information…making it more accessible for people to find this information…about the earth"

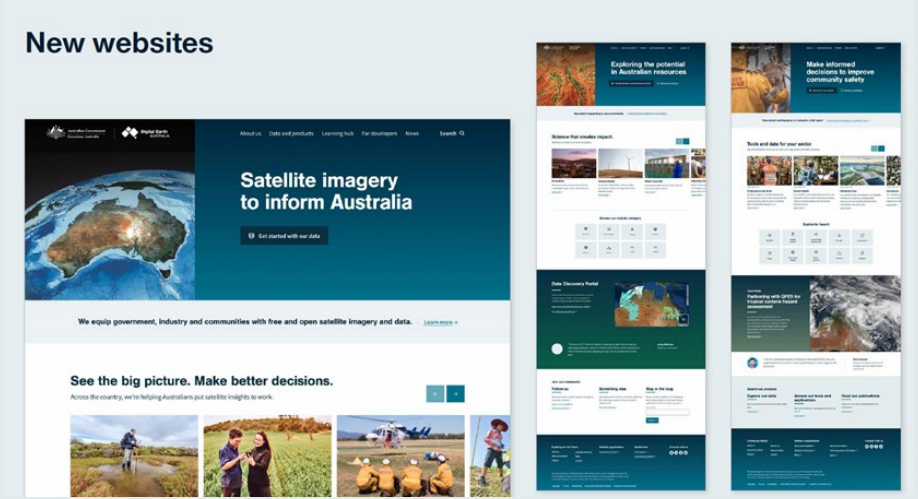
—GEN8



1. Non-expert decision maker
2. Tech innovator
3. Developers
4. Advisors
5. Remote sensing community

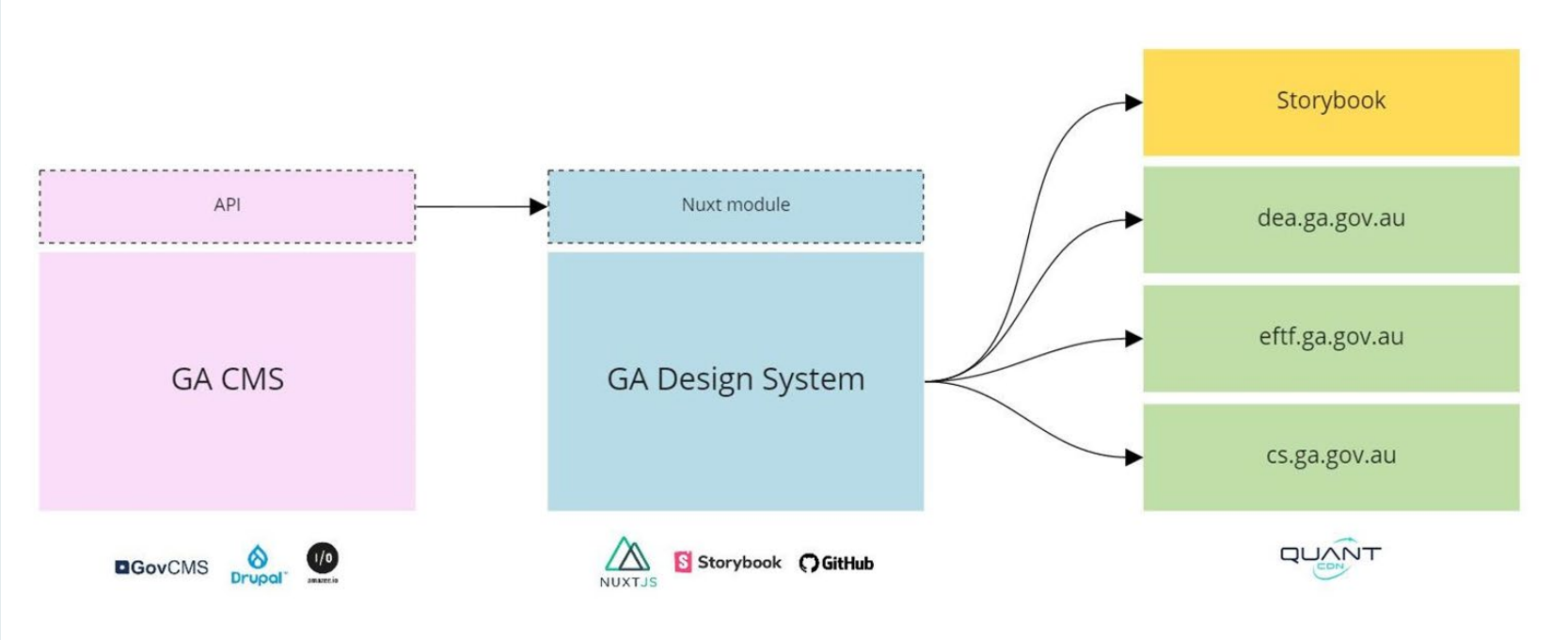
Phase 2: design and build





Design system

Decoupled architecture



A design system for Geoscience Australia

What is a design system?

- A shared visual language at scale allowing the reusability of components and patterns

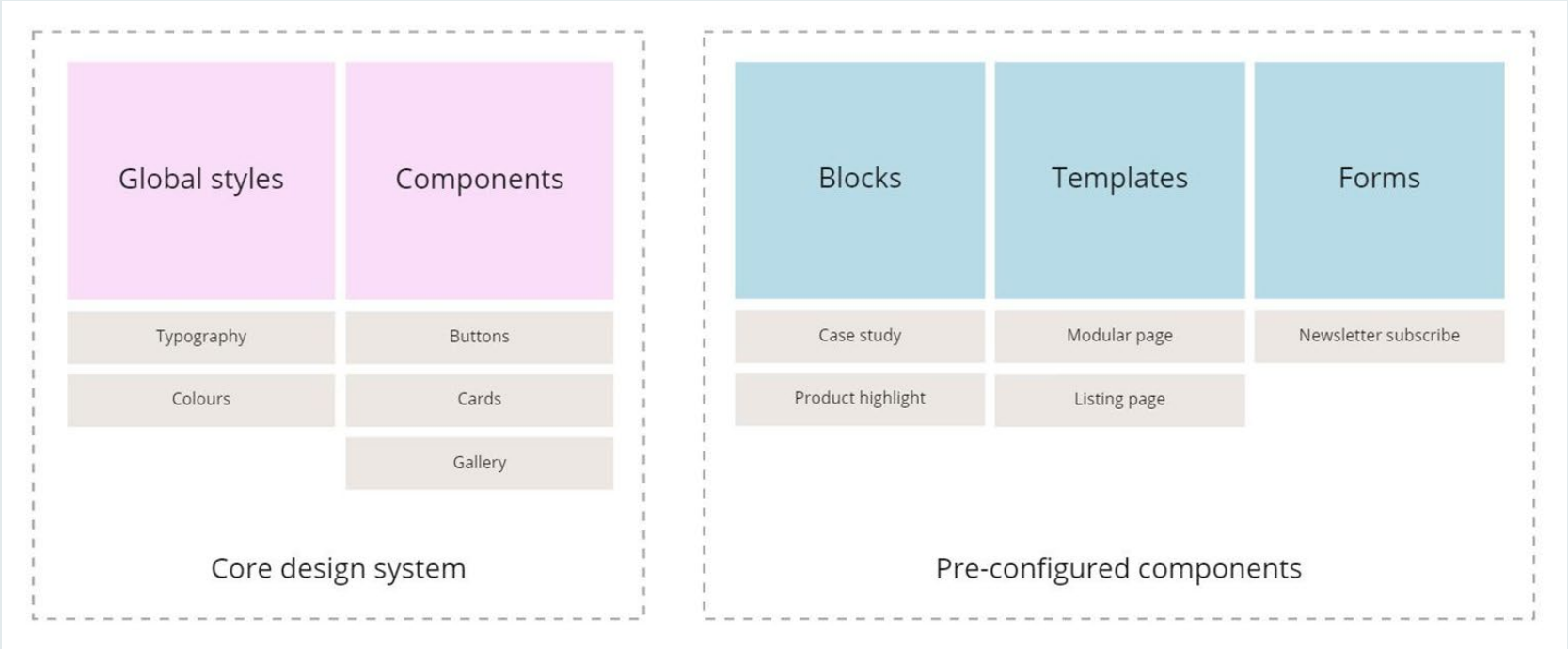
Why use a design system?

- Consistency in user interface design
- New applications and websites can be developed rapidly

How do you maintain it?

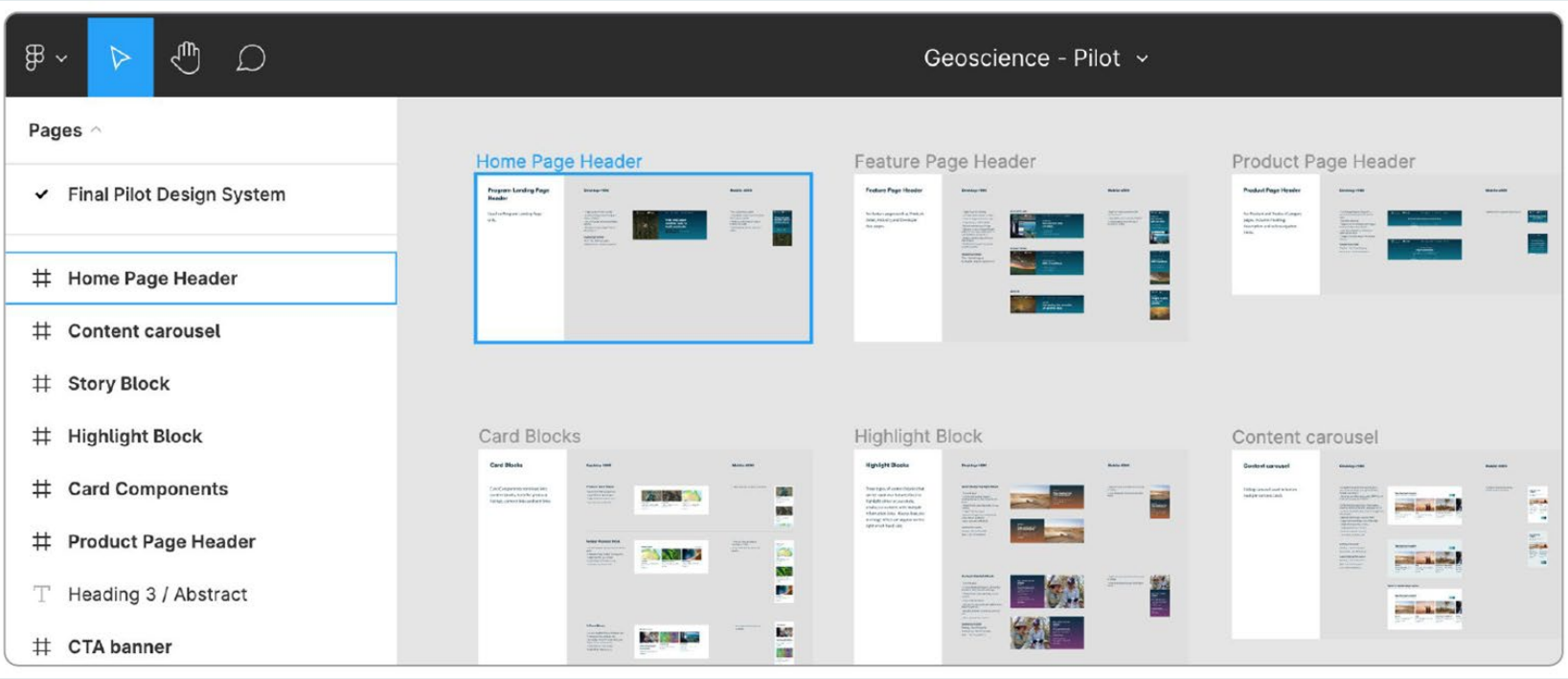
- A methodology or framework is required to organise your styles and components
- Every addition or update requires thoughtful consideration of impact to existing code and future iterations
- Separate the business logic from design logic for reusability
- Documentation through code

Design system in code

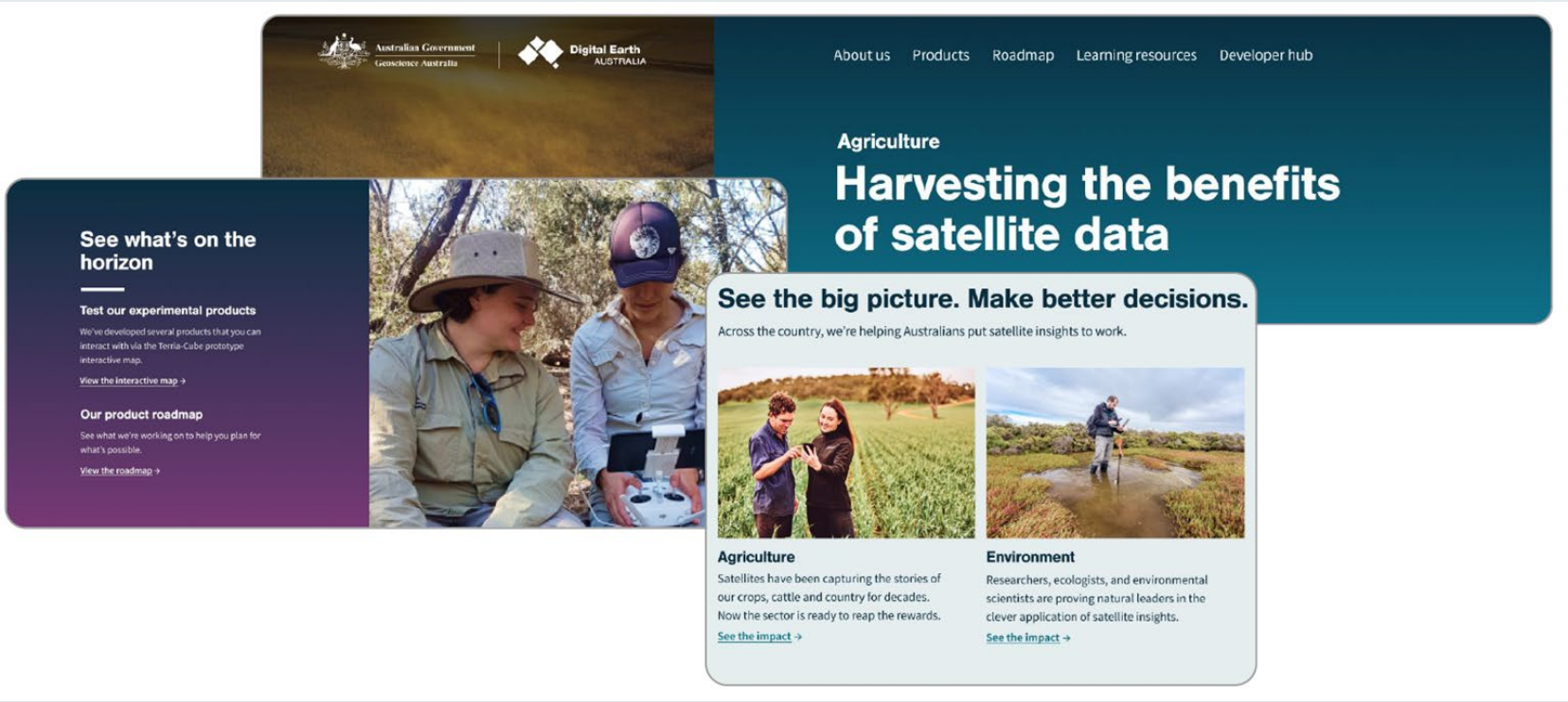


Design system

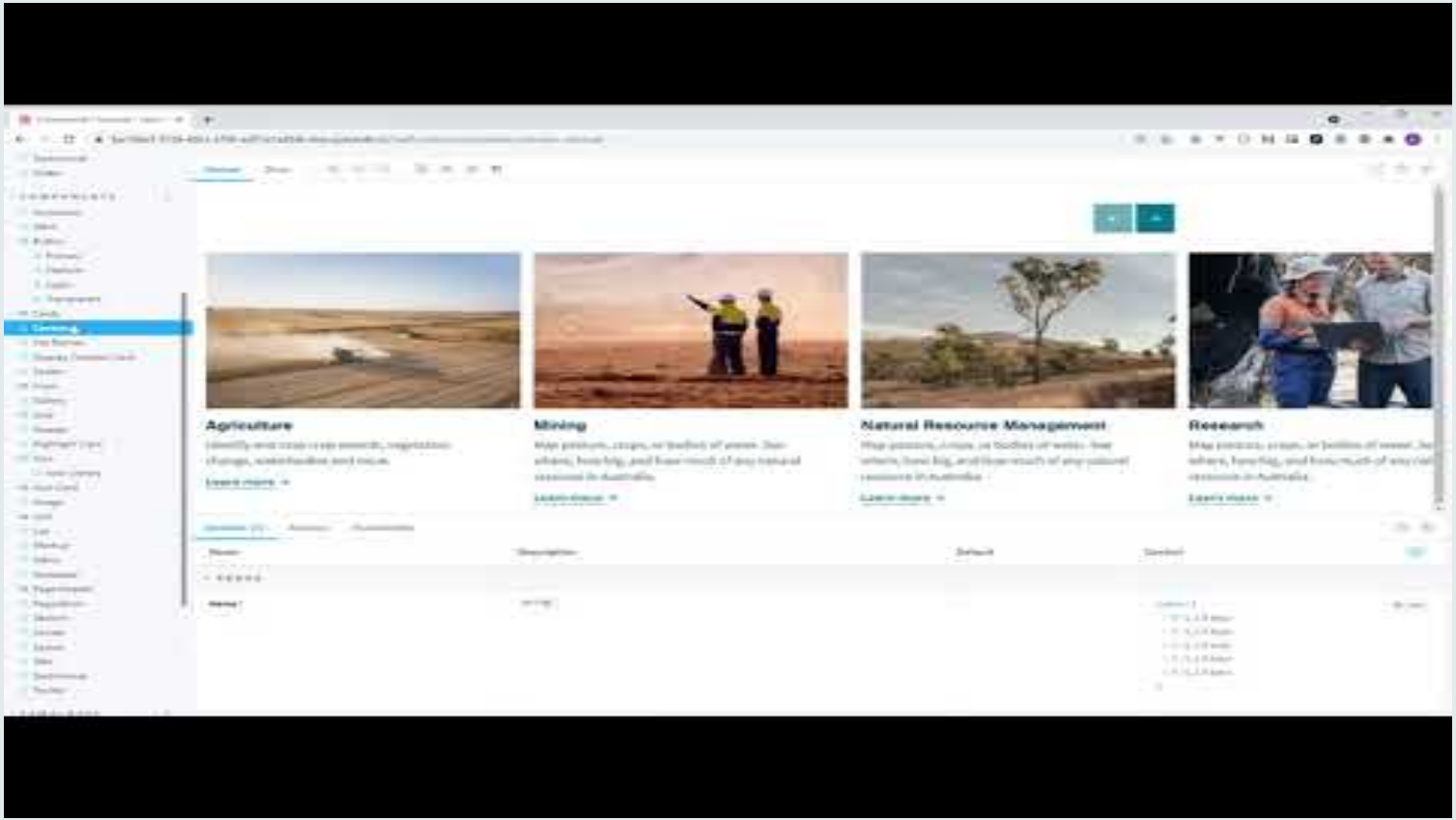
Styles, fonts and components in Figma



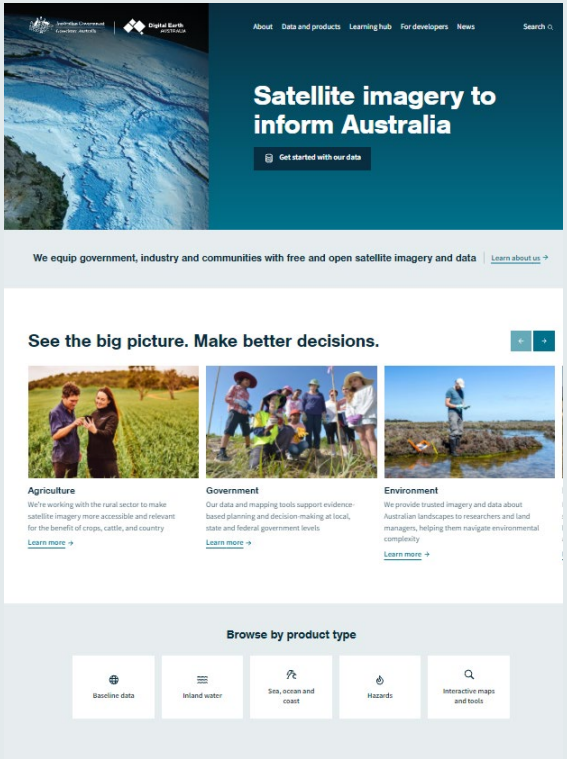
Front-end vue components

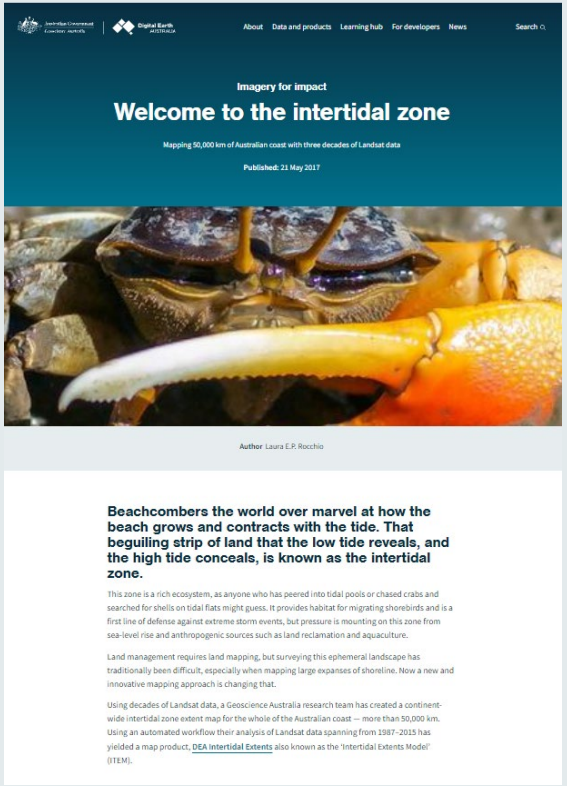


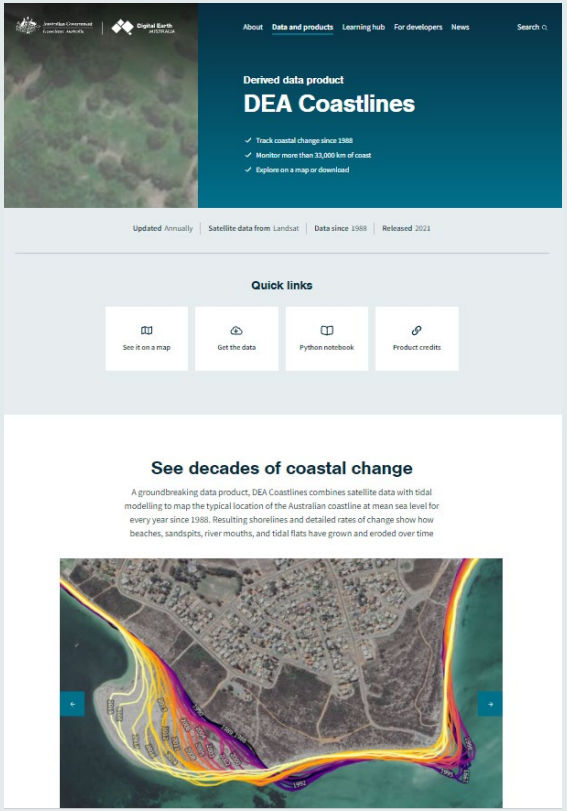
Storybook – design system documentation



New DEA website designs

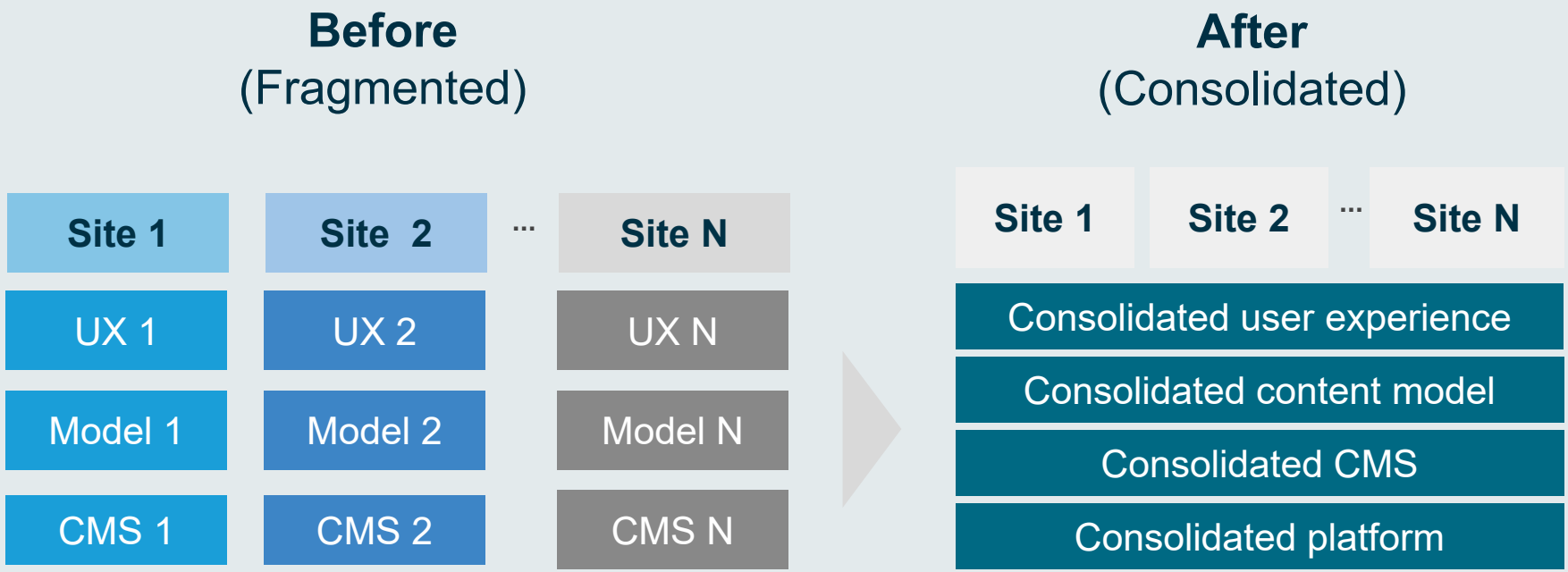






Digital platform

A consolidated digital platform



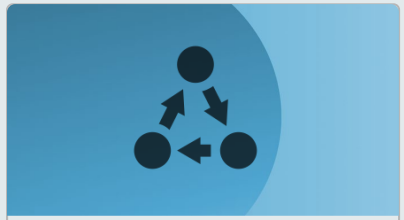
Platform goals

For a new digital experience platform

Secure

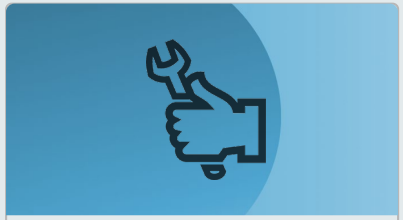
Resilient

Scalable


Interoperable

Configurable

Modular


Easy to maintain

Accessible

Platform technology

Backend

{ json:api }

Drupal™

GovCMS

Middleware

GitHub Actions

Vue.js

NUXTJS

Frontend

Vue.js

algolia

QUANT CDN

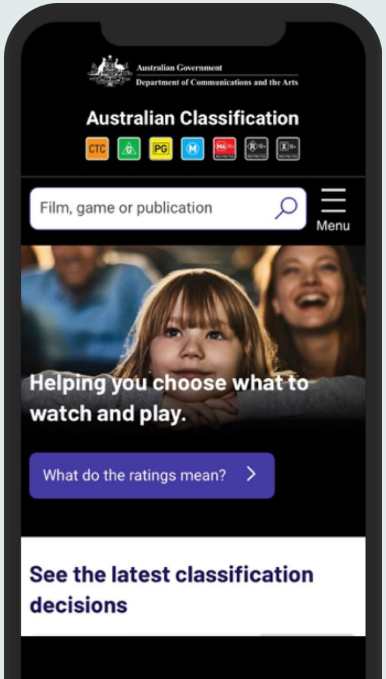
GovCMS Drupal hosting

7 years old. 97 agencies. 347 sites.

GovCMS

dea.ga.gov.au
Unlock archives of satellite imagery

classification.gov.au
Choose what to watch and play



nabers.gov.au
Build a sustainable environment

Proudly built by Salsa Digital

Drupal architecture

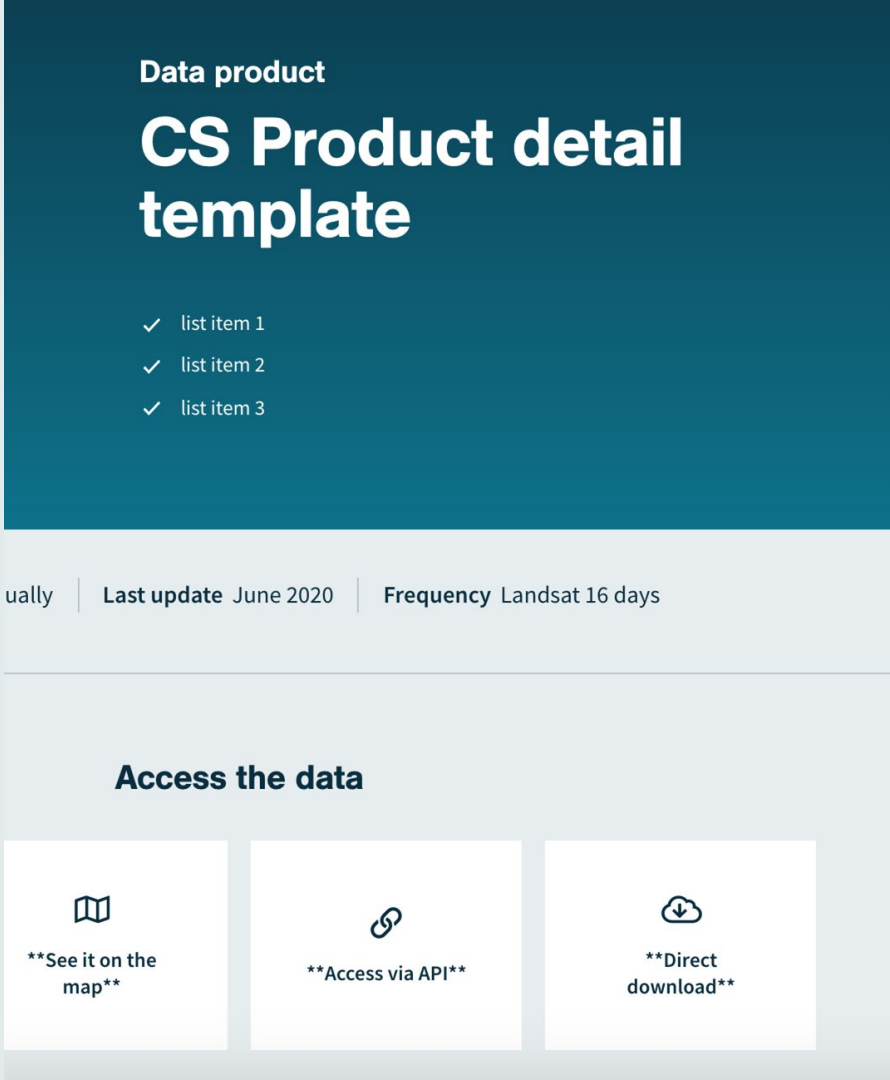
Needed to build Digital Earth Australia site

1	1	2	2
Content type	View	Text formats	Media types

3	4	13	21	116
Menus	Roles	Vocabularies	Paragraph types	Modules

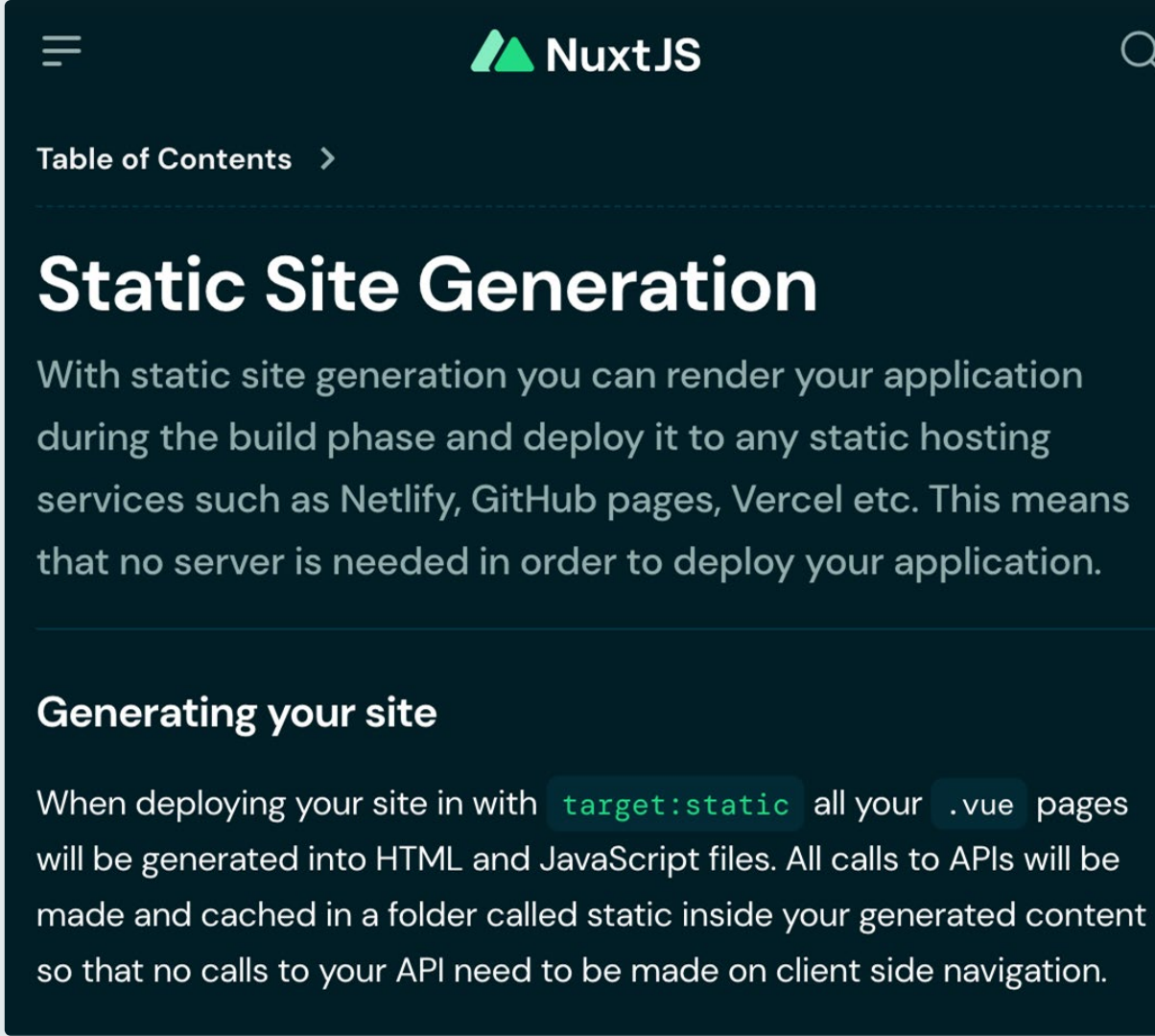
Drupal supports

- ✓ Simple site setup
- ✓ Referenced content
- ✓ Component reuse
- ✓ Content cloning
- ✓ Tagging for search
- ✓ Customisable search
- ✓ Page type templates
- ✓ Master component templates
- ✓ Content sharing between sites



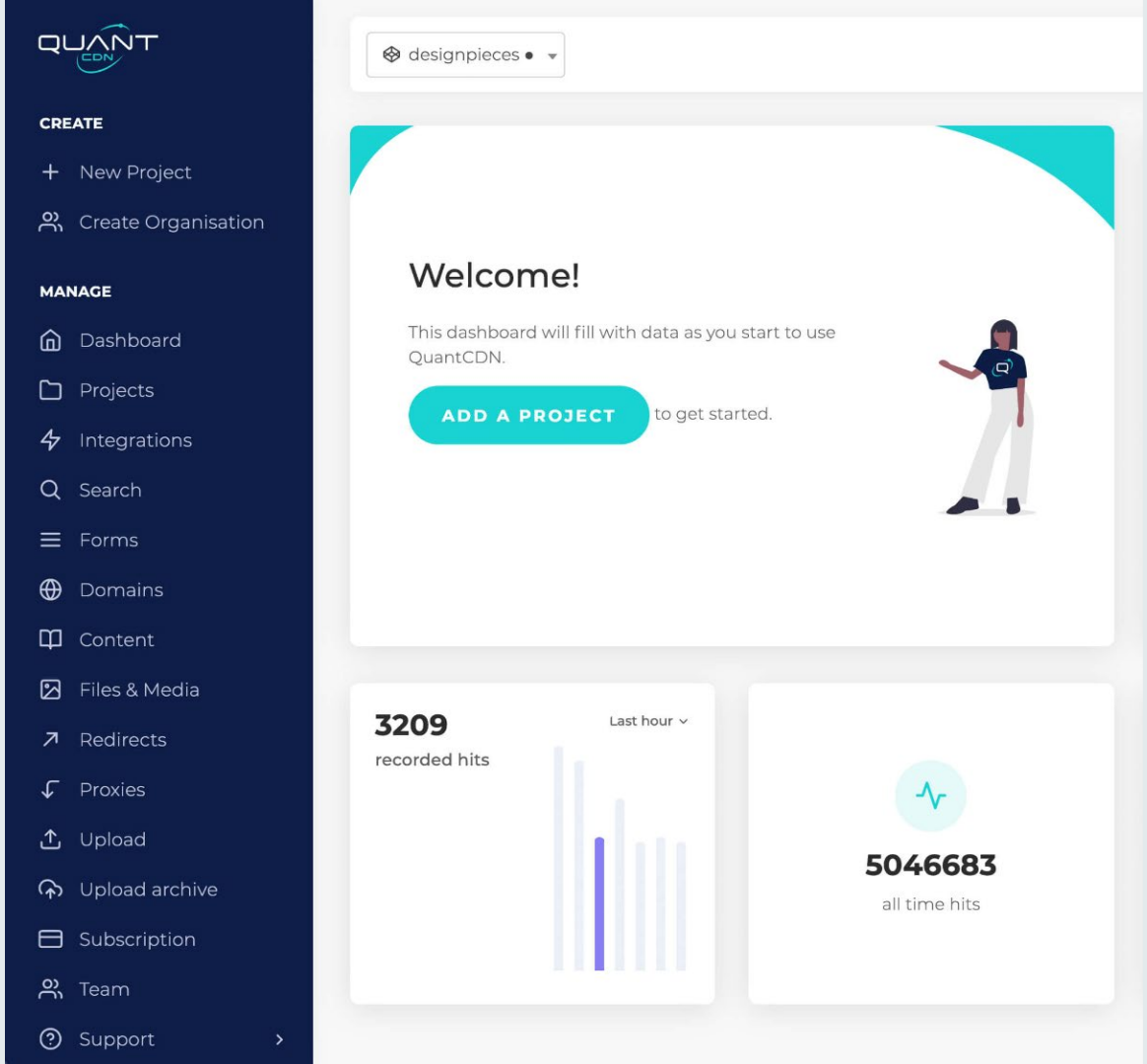
Nuxt JS

- ✓ Framework built on top of Vue.js
- ✓ Static site generation without a web server
- ✓ Performance and SEO benefits
- ✓ DruxtJS not used on this project but may be useful



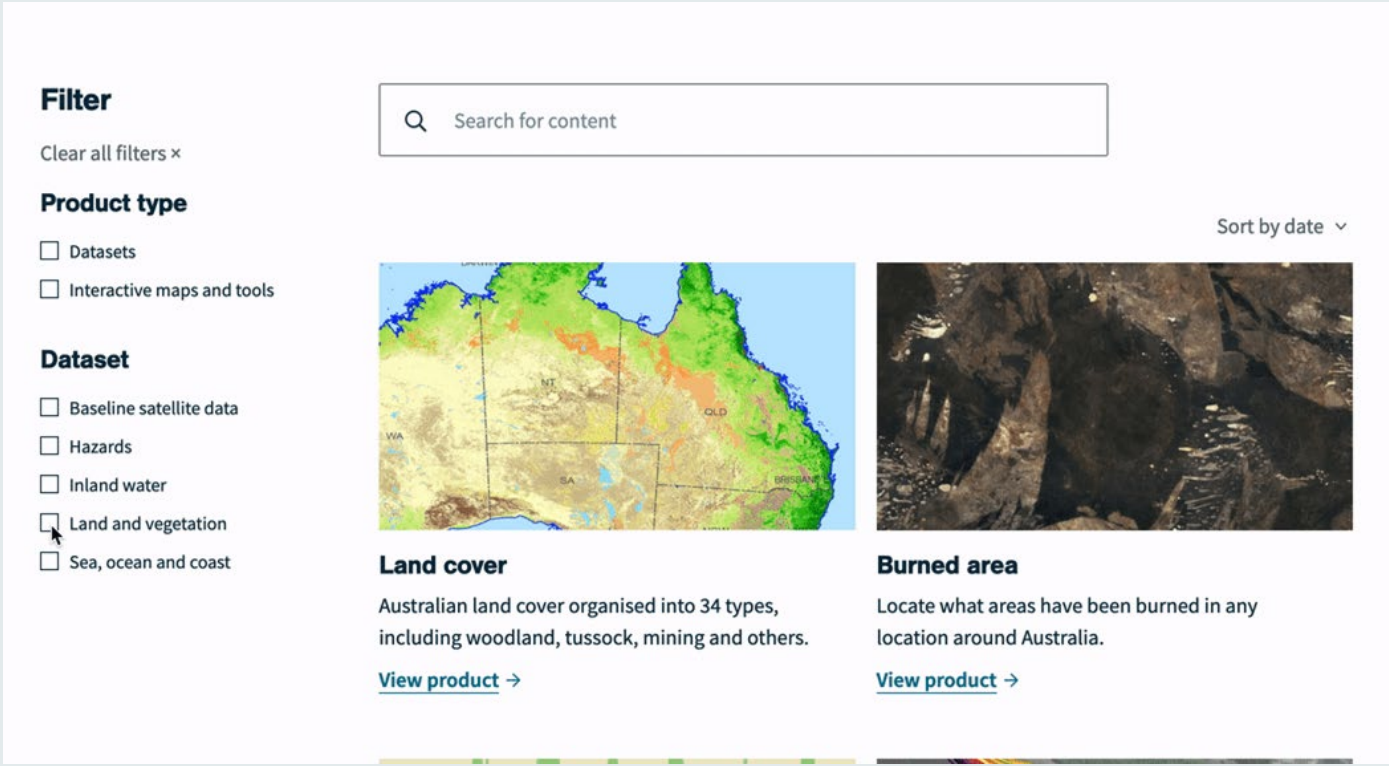
Quant CDN

- ✓ Global CDN, 60+ regions
- ✓ Static and JAMstack
- ✓ Drupal module
- ✓ Static site generators
- ✓ Scheduled releases
- ✓ Infinite revisions
- ✓ Edge content editing
- ✓ Integrated search
- ✓ Traditional CDN controls

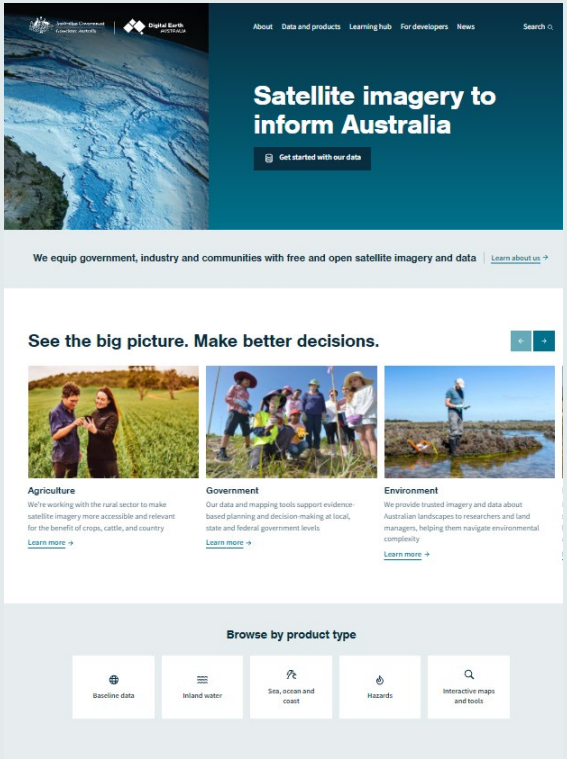


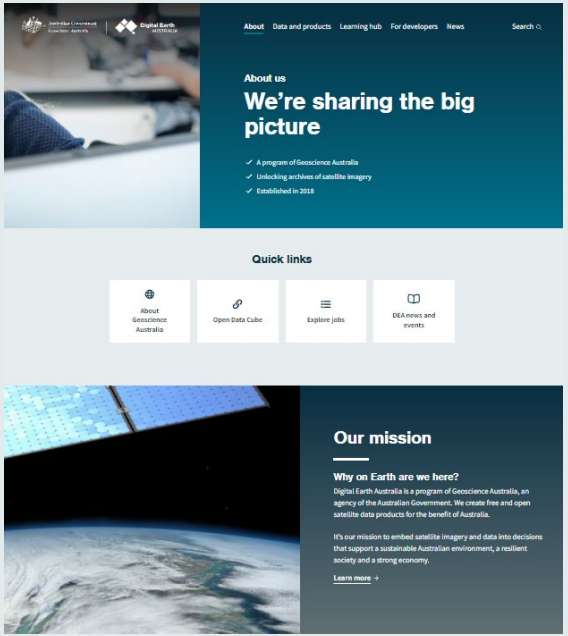
Algolia

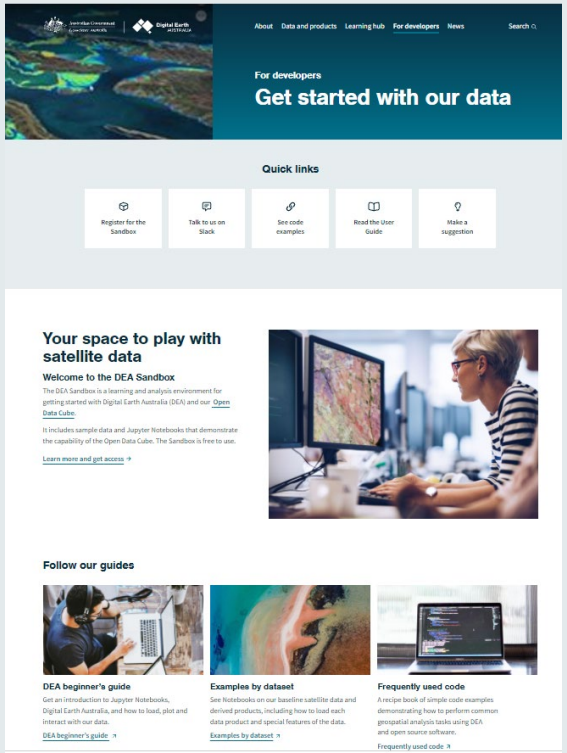
- ✓ Site search
- ✓ Faceted search
- ✓ Customisable
- ✓ Opt-out of index



dea.ga.gov.au launched!







Platform wins

Not too shabby for a pilot project!

Secure

Resilient*

Scalable

Interoperable

Configurable

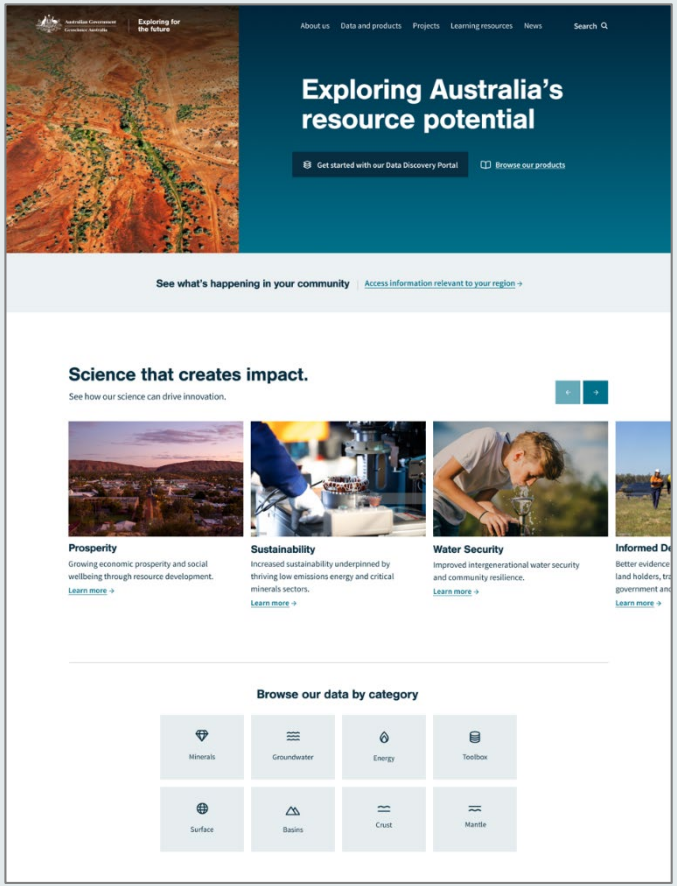
Modular

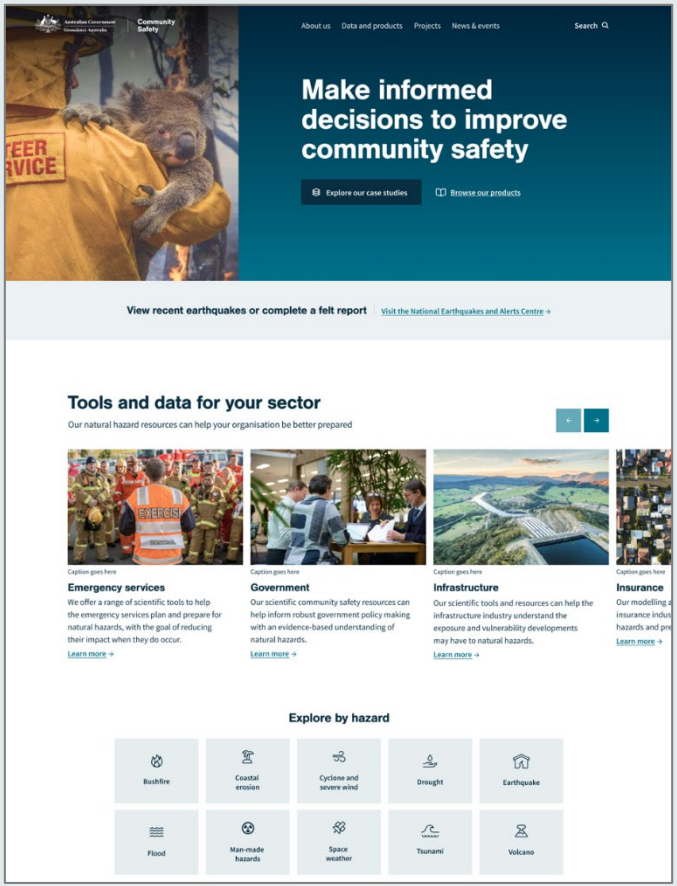
Easy to maintain*

Accessible

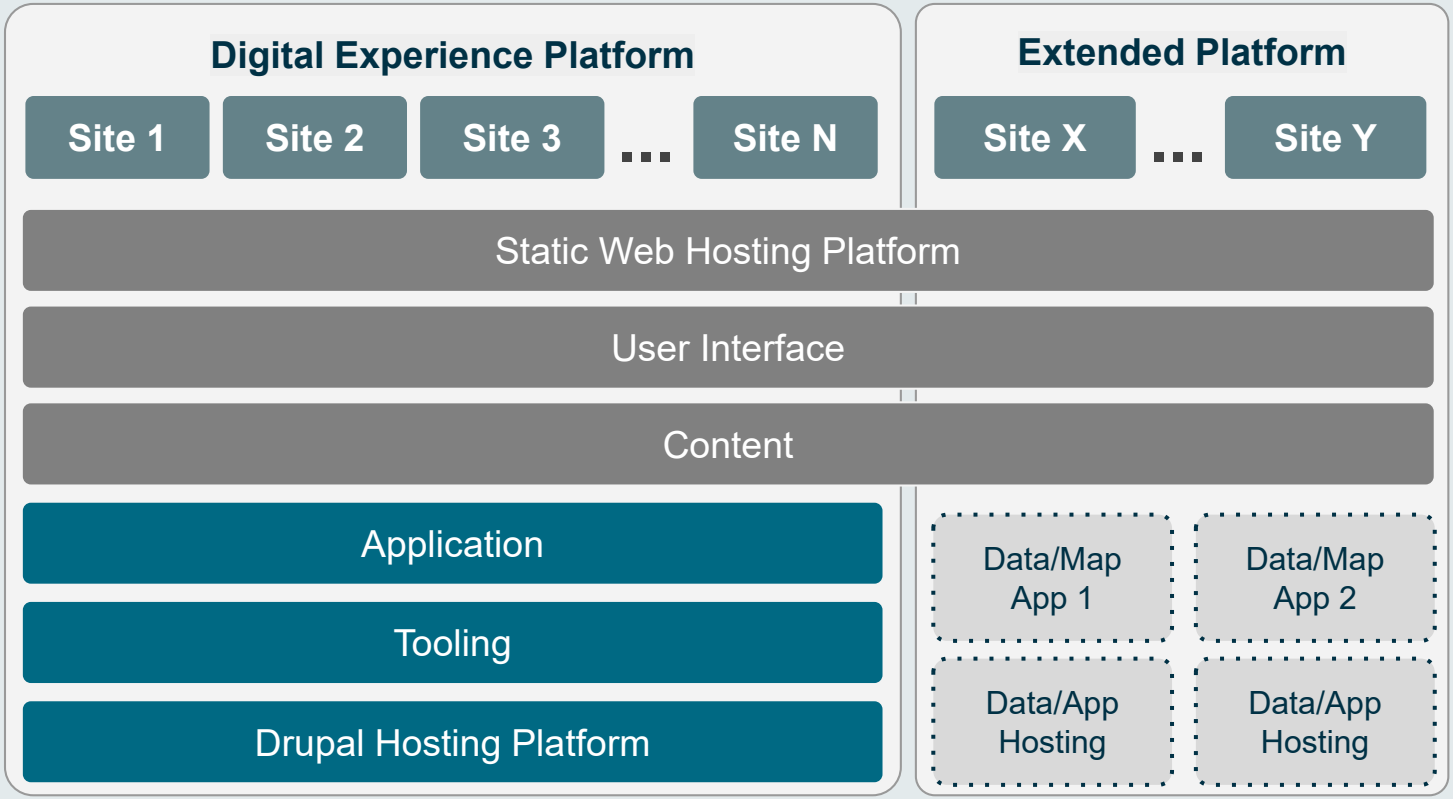
What next?

More pilot sites





Extend platform to support all Geoscience Australia data



Australian Government
Geoscience Australia

Thank you

Questions?

Further information

Web

dea.ga.gov.au
ga.gov.au
today.design
salsadigital.com.au
govcms.gov.au

Email

alan.maskell@ga.gov.au
karen@today.design – Karen Gallagher
con@salsadigital.com.au – Con Fountas
govcms@govcms.gov.au

© Commonwealth of Australia (Geoscience Australia) 2021. This product is released under the Creative Commons Attribution 4.0 International Licence.