From biodiversity to infrastructure:

repurposing the Atlas of Living Australia for climate risk decision making

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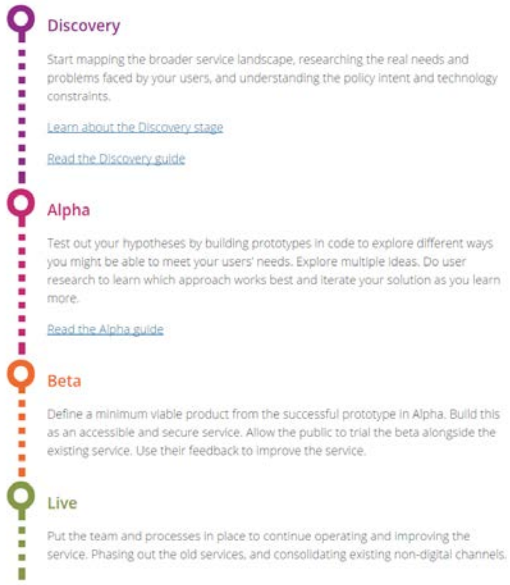
Overview

- Climate Risk Information and Services Platform (CRISP) project
- Atlas of Living Australia – technology stack
- What we did to reuse it
- What we learned

Climate Risk Information and Services Platform (CRISP)

an exploration of the **policy and technological feasibility** of making climate risk information more accessible, relevant and **useable** to decision-makers on a (prototype) web-based platform, looking through a Commonwealth lens



Discovery

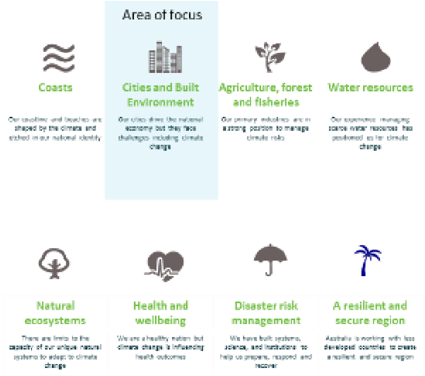
- Extensive engagement
- Tested assumptions and confirmed utility and shape of CRISP

→ Decision making ecosystem map
User requirements

- Audit of existing climate risk landscape – tools and data

→ Non-functional requirements
- longer term sustainability & support (Webb & Beh 2013)

- Identified primary use case – Infrastructure Australia project assessments- projects requesting >$100m of Commonwealth investment



Hypothesis - a configurable climate risk decision making workflow tool with in-situ access to reliable, curated sources of climate risk data can assist in improving climate risk decision making

Climate risk data | Configurable workflows | Policy activities

Evaluation of technology choices

- Functional fit – data discovery & visualisation + configurable workflows
- Mature, supported, stable platform – sustainability
- Minimise development costs – more resources for the science & its application
- Leveraging existing government investment

- Deploy & evaluate
- Adapt and reskin for climate risk
- Evolutionary prototyping on top of an existing system

BioCollect
- field data collection and management
- configurable survey forms
- configurable projects

Spatial portal
- centralised data store
- add OGC WMS

Function	ALA
User customisable workflow	Y
Scalable community creation and management	Y
User and permission management for communities	Y
Management of user entered data	Y
Discover spatial data	Y
Visualise spatial data	Y
Explore tabular data	Y

Understanding workflow requirements

June 2016

Discovery

Feb 2017

Hypothesis
ALA technology evaluation

Alpha

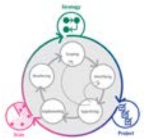
Alpha prototyping

Understanding of workflow requirements

1 July 2017

Workflow design

Science - Climate Compass



Policy/business - IA

UI - code

Atlas of Living Australia

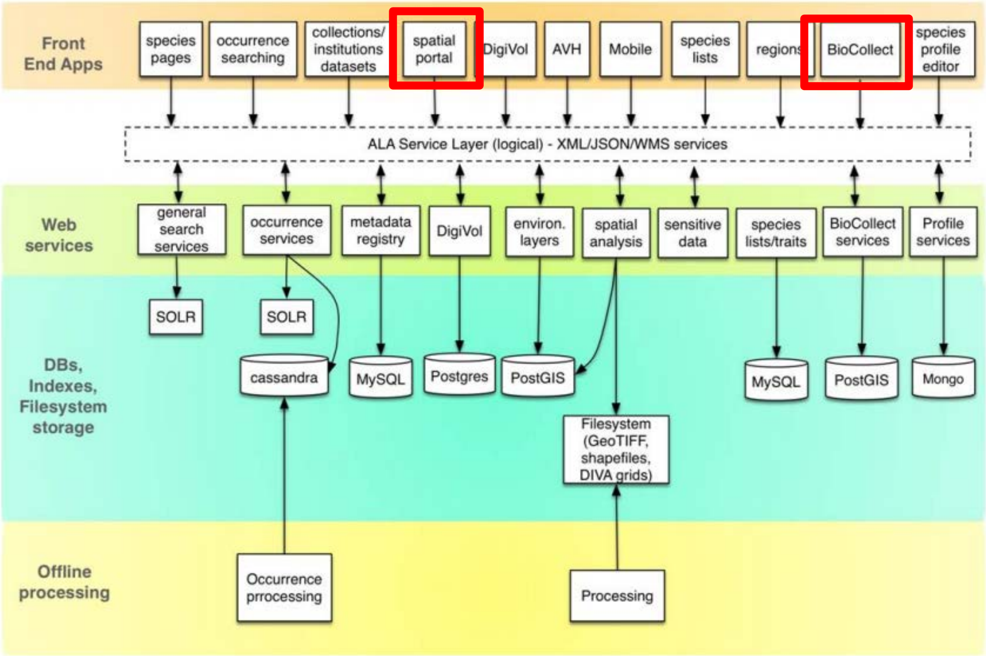
centralised web-based infrastructure to capture, aggregate, manage, discover and analyse biodiversity data through a suite of tools and spatial layers

Architecture

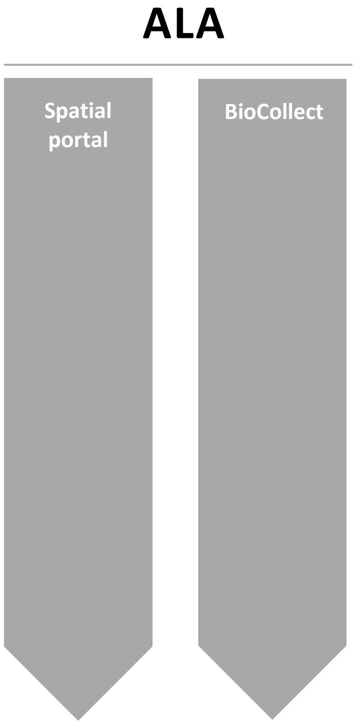
- suite of modular tools and components linked together via a micro-services architecture
- database, server-side application layer, client-side interface layer
- co-dependent components
- interact via web service APIs - publicly exposable

Deployment

- Deployment of ALA nodes in multiple countries – typically the whole infrastructure
- Designed for deployment of interdependent components – using Ansible



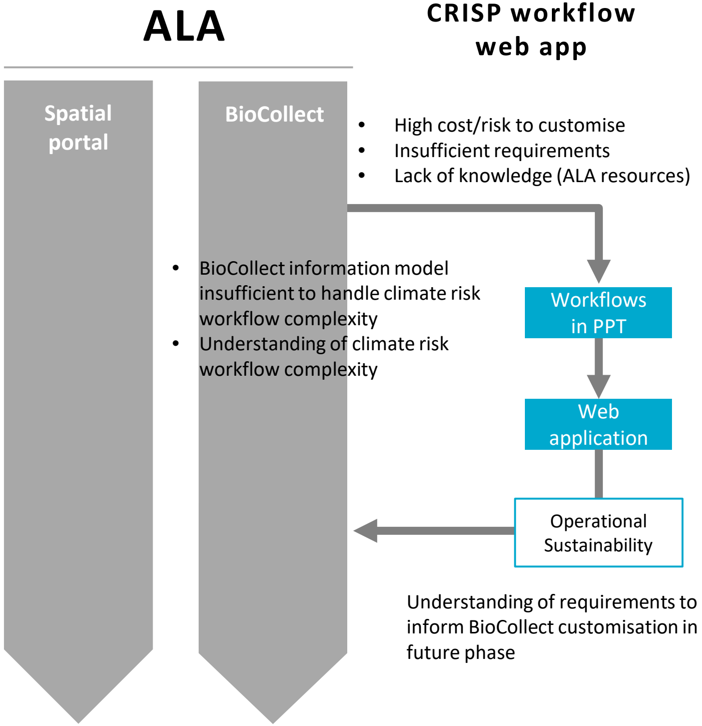
The build - deploying the bits we need



Dockerisation and deployment

- working backwards from required components
- interdependence of components and services

Finding out what we didn’t know – workflow complexity



Rapid prototype

- agile development & testing of workflows
- Firm up the information model (storage of workflows data)
- User data entry enable refinement of UI and data model in next phase

Meteor Framework HTML and MongoDB

What did we learn?

- Compressed timeframes -> overlapping discovery and alpha phases ☹ -> insufficient requirements to evaluate costs and risk of using ALA
- Hitting the wall – knowing when to cut and run as the technical costs and risks become apparent ☺
- Lo-Fi Wireframes in PPT ☺
  - low cost/risk - engaged science team and users in rapid feedback and response
  - flexibility to implement
- CRISP as client for ALA services - beneficial for improving ALA interoperability ☺

Greenfield development or adaptive reuse?

- Reuse is a good thing - reusing and repurposing eResearch infrastructure - large 'known unknown'
- eResearch infrastructure designed for specific usage context
- Evaluating fitness for use - 'learn to swim by swimming'
- Factors to consider:
  - distance between original and reuse context
  - scale of known unknowns – scale and complexity
  - learning curve – technologies and application (business rules in the code)
  - access to knowledgeable resources

- Reuse of the technology stack
  - defers some dev costs, but
  - imposes other risks and costs - codebase dependencies
  - does not address longer term operational and institutionalisation concerns

Greenfield development or adaptive reuse?

Trade off between cost and risk of rapid prototyping versus modification of stable scalable solution

“If you want to go fast, go alone. If you want to go far, go together”

Thank you

Land and Water
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http://www.crisp.csiro.au/