Social architecture for the National Environmental Information Infrastructure (NEII)

Locate 15
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Paul Box
A National Environmental Information Infrastructure

*Empowering Australian’s discovery, access and re-use of environmental information for informed decision-making*

**What?**
- A network of environmental data nodes around a central coordinating core

**Why?**
- Improve discovery, access and re-use of national environmental data

**How?**
- Standards-based architecture (Reference Architecture) & core IT components
- Collaboration mechanisms that engender adoption and sustainability
- Non-technical enablers (policies and frameworks)

Source: Bureau of Meteorology - NEII Programme
Information Infrastructure

• Installed base - ‘shared, evolving, open, standardized, and heterogeneous’
• Standards
  • Standardisation Vs flexibility
  • Bottom-up (local) Vs top down (universal)

World Standards Day - 14 October but....
- US – celebrate on 23 October
- Canada – celebrates on a date 'near the 14th'
Information Infrastructure - a socio-technical endeavour

Technical framework
Information & technology components

Social framework
- institutional arrangements
- people
- relationships & trust
- standards
- culture
- practices
- norms

Greatest organisational effectiveness when technology systems fit social system

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NEII context – ‘frameworks’
NEII Context - Environmental II landscape

- Significant installed base
  - Technical – data services, catalogues, portals
  - Social – governance, agreements, standards, mandate, relationships, trust
- NEII governance – embedded, overlapping & complex enclosing governance arrangements
Social architecture

Conscious design of an environment that encourages a desired range of social behaviours leading towards some goals
Why social architecture?

Governance - embedded, overlapping
Participation - numerous independent interacting communities

Social architecture for NEII

Context:
Jurisdictional & domain legislative, policy & standards

National Environmental Information Infrastructure

Governance (Steering)
Agreement Framework ('Rules of the game')
Participation (Rowing)

social lens to complement the technical perspective
II landscape review

• Case selection
  • federated
  • mature governance
  • limited or no legislatively backing
• International
  – INSPIRE
  – New Zealand SDI (NZSDI)
  – Canadian Geospatial Data Initiative (CGDI)
• Domestic
  – Australian National Data Service (ANDS) RDA
  – Atlas of Living Australia (ALA)
  – Foundation Spatial Data Framework (FSDF)
## Case comparison

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Information scope</th>
<th>Scale and participation</th>
<th>Federated data</th>
<th>Status</th>
<th>Legislation</th>
<th>Central funding</th>
<th>Lead agency with multiple roles</th>
<th>Dedicated lead agency 1</th>
<th>Lead hosts/operate s common infra.</th>
<th>Lead allocates / disburses funding 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSPIRE</td>
<td>Geospatial, environmental</td>
<td>Multi-national</td>
<td>Yes EU Member States</td>
<td>Build</td>
<td>Yes</td>
<td>No</td>
<td>Yes - EU JRC</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>CGDI</td>
<td>Geospatial, multiple themes</td>
<td>National</td>
<td>Yes Provinces + Federal</td>
<td>Operational</td>
<td>No</td>
<td>Yes</td>
<td>Yes - NR Canada</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>NZSDI</td>
<td>Geospatial, multiple themes</td>
<td>National</td>
<td>No – though data sourced from local govt.</td>
<td>Design</td>
<td>No</td>
<td>No</td>
<td>Yes – LINZ</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>FSDF</td>
<td>Geospatial, multiple themes</td>
<td>National</td>
<td>Yes Australian Governments</td>
<td>Design</td>
<td>No</td>
<td>No</td>
<td>Yes – Dept. of Communication</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>ALA</td>
<td>Geospatial &amp; observational, species</td>
<td>National</td>
<td>Yes Australian Governments</td>
<td>Operational</td>
<td>No</td>
<td>Yes</td>
<td>Yes – CSIRO</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>ANDS</td>
<td>Research data</td>
<td>National</td>
<td>Yes but not primarily engaged with Govt.</td>
<td>Operational</td>
<td>No</td>
<td>Yes</td>
<td>YES – ANDS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RDA</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>NEII</td>
<td>Geospatial &amp; observational, environmental</td>
<td>National</td>
<td>Yes</td>
<td>Design</td>
<td>No</td>
<td>No</td>
<td>YES – BoM</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

1 Has the lead agency been established in the context of the II initiative?
2 Does the lead agency determine and manage allocation of funding to participants to enable their participation
Key messages – Governance

- **Representation** (CGDI, INSPIRE, NZSDI, FSDF). Broad inclusive governance
- **Leadership** (CGDI, ALA, FSDF). High level WoG leadership and priority setting - top down drivers and coherence
- **Lead agency** multiple roles (ALA) - trusted to lead because of expertise and proven record in domain.
- Funding and legislation (NZSDI, FSDF). Without a stick or carrot soft approach required
- **Accountability**
  - (NZSDI) - ‘coalition of the willing’ – may lack sufficient accountability
  - (FSDF) - Informal accountability operates in parallel and is powerful motivator
Key messages - Participation

- **Importance of key individuals** (CGSDI, NZSDI, ALA, ANDS, FSDF). Trusted leaders. strong senior champions within participating organisations.
- **Motivation** (INSPIRE, ALA, ANDS, FSDF). Recognition for participating individuals & organisations.
- **Role of networks** (INSPIRE, CGDI, ANDS, ALA, FSDF). Leverage self-organising communities that form around technical and domain issues and expertise.
- **Communication** (INSPIRE, CGDI, ANDS, FSDF). Need for coordination, communication, and awareness at senior level.
- **Capacity building and support for communities** (INSPIRE, CGDI, FSDF). Assist & guide less mature communities and leverage experiences/capabilities of mature ones.
- **Participation and stakeholder engagement** (INSPIRE, ALA, FSDF). Stakeholder engagement in development phase helps build capacity and share best practices.
Key messages - Agreements

- **Licencing** (INSPIRE, CGDI, ANDS, ALA, FSDF) - common (standard) licencing frameworks key for effective data sharing. Many licenses is a 'bureaucratic overload'.

- **Data access** (INSPIRE, CGDI, ANDS, ALA, FSDF) - major barriers to access are policy, organisational, legal, and cultural. Open data initiatives have helped.

- **Rights in data** (ALA) obtaining permissions & attribution of data rights holders is key – difficult in practice

- **Legacy arrangements** - data rights, structure, access may impact on ability to share data
Applying the model
Federated governance

‘authority structures’ & decision making processes, by which communities manage their collective affairs through a continuous process of negotiation & decision-making

- **Authority structure** - organisational structures for collective decision making
- **Representation & hats**
- **Agreements** - the unit of transaction
- **Delegation**
Social architecture for NEII

Jurisdictional legislative, policy & standards context(s)

Authority Structure
- NEII programme governance
- NEII domain governance

National Environmental Information Infrastructure

Governance (Steering)
Agreement Framework ('Rules of the game')
Participation (Rowing)

Information community 1
Information community 2

Organisation (data provider)
Data & services
Policy & standards

Appointing/delegating/representation

Governance
Infrastructure (participation)
Policy & standards

Org 1
Org 2
Org 3
Org n
Agreements Framework

Jurisdictional legislative, policy & standards context(s)

National Environmental Information Infrastructure

Authority structure
Scope
Delegation

Registration

Decision authority (Register owner)
Control body
Register manager
ISO19135

Submitter
Register manager

Agreements

Authority structure

Agreements

Agreements
Types of agreements

• Jurisdictional legislation & policy
• Technology standards – how tech. behaves- e.g. WMS
• Data format standards
• Information standards
  • Information semantics – controlled vocabularies
  • Information models - exchange standards
• Data access agreements - data sharing agreements & data licencing
• Service agreements –SLA/OLA
Participation

Context
• Distributed, fragmented resources, mandate & capability
• Different motivation, drivers, timeframes, mandate, capacity to participate in NEII

Role
• Enable and motivate community participation to:
  – Share EI
  – Develop & curate EI content standards
  – Share knowledge & develop capability
• Leverage, align, mediate, bridge existing capability
• Encourage, facilitate, guide, participants to implement agreements
• Minimise impost/cost on participants
Collaboration Continuum

- **Compete**
  - Competition for clients, resources, partners, public attention.

- **Co-exist**
  - No systematic connection between agencies.

- **Communicate**
  - Inter-agency information sharing e.g. networking.

- **Cooperate**
  - As needed, informal, interaction on discrete activities or projects.

- **Coordinate**
  - Org's systematically adjust and align work with each other.

- **Collaborate**
  - Longer term interaction based on shared goals.

- **Integrate**
  - Fully integrated programs planning, funding.

- **Collective Impact**
  - Alignment of common agenda & measures for a shared vision.

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Adapted from: Kerry Graham Collective Impact consultant – WWF 2014
Summary

• Governance and agreements – ‘rules of the game’
• Governance and participation – ‘skin in the game’
• Recognising there are multiple games
• Federation to domains
• Watch this space

Thank you

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