

Submission Template

2016 National Research Infrastructure Roadmap Capability Issues Paper

Submission No: <i>(to be completed by Departmental staff)</i>	
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Would you like your submission to remain confidential, i.e. not published on the website?	NO

Question 1: Are there other capability areas that should be considered?

Question 2: Are these governance characteristics appropriate and are there other factors that should be considered for optimal governance for national research infrastructure.

YES – particularly points that relate to outcome, ecosystem, sustainability and co-investment for research infrastructure.

Other comments:

Have national governance over national infrastructure which means having a sustainable operating environment for the facilities that have been federally funded. This may mean looking at the funding model holistically, including a calculation of a subscription by each University in a similar way that the AARNet subscription is calculated. The subscription goes to pay the operating costs of all national infrastructure which may avoid parochial focus that happens when operating costs are funded locally. The model for AARNet is sustainable and could be a model to be considered going forward.

It would be useful to consider how the national facilities are being managed and operated and look at a joint focus of engagement across the research community (ideal position for a researcher who understands research) and the management of the technology operation (ideal position for someone skilled in managing best practice IT Operations).

We also need to consider how new / small eResearch (i.e. new eTools, novel use of infrastructure, new technologies) are funded.

Question 3: Should national research infrastructure investment assist with access to international facilities?

Question 4: What are the conditions or scenarios where access to international facilities should be prioritised over developing national facilities?

Question 5: Should research workforce skills be considered a research infrastructure issue?

YES

Question 6: How can national research infrastructure assist in training and skills development?

Researchers need access to eResearch and data science research skilled staff. Incentives to speed up the approval of relevant new courses along with national facilitation of Communities of Practice may assist.

Question 7: What responsibility should research institutions have in supporting the development of infrastructure ready researchers and technical specialists?

Question 8: What principles should be applied for access to national research infrastructure, and are there situations when these should not apply?

Question 9: What should the criteria and funding arrangements for defunding or decommissioning look like?

Question 10: What financing models should the Government consider to support investment in national research infrastructure?

Question 11: When should capabilities be expected to address standard and accreditation requirements?

Obviously where legislation requires this but also where good practice is developed and recognised in one scenario it should be applied wherever it is relevant. Incentives for self-regulation and implementation of effective and efficient processes need not be expensive.

Question 12: Are there international or global models that represent best practice for national research infrastructure that could be considered?

Question 13: In considering whole of life investment including decommissioning or defunding for national research infrastructure are there examples domestic or international that should be examined?

Question 14: Are there alternative financing options, including international models that the Government could consider to support investment in national research infrastructure?

Health and Medical Sciences

Question 15: Are the identified emerging directions and research infrastructure capabilities for Health and Medical Sciences right? Are there any missing or additional needed?

Question 16: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 17: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Health and Medical Sciences capability area?

Environment and Natural Resource Management

Question 18: Are the identified emerging directions and research infrastructure capabilities for Environment and Natural Resource Management right? Are there any missing or additional needed?

Question 19: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 20: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Environment and Natural Resource Management capability area?

Advanced Physics, Chemistry, Mathematics and Materials

Question 21: Are the identified emerging directions and research infrastructure capabilities for Advanced Physics, Chemistry, Mathematics and Materials right? Are there any missing or additional needed?

Question 22: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 23: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Advanced Physics, Chemistry, Mathematics and Materials capability area?

Understanding Cultures and Communities

Question 24: Are the identified emerging directions and research infrastructure capabilities for Understanding Cultures and Communities right? Are there any missing or additional needed?

Question 25: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 26: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Understanding Cultures and Communities capability area?

National Security

Question 27: Are the identified emerging directions and research infrastructure capabilities for National Security right? Are there any missing or additional needed?

Question 28: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 29: Is there anything else that needs to be included or considered in the 2016 Roadmap for the National Security capability area?

We suggest that cyber security needs to be integrated / built in from the ground up for any facility, service or tool, not viewed separately. The link between research into cyber security and implementation needs to be tight.

Underpinning Research Infrastructure

Question 30: Are the identified emerging directions and research infrastructure capabilities for Underpinning Research Infrastructure right? Are there any missing or additional needed?

Seamless access and authentication is a key element. Focused development of the 'Next Generation AAF' would have great potential to enhance collaboration and provide access to non-web facilities and tools.

The difficulties associated with industry users gaining access to networks could be reconsidered in light of the 'Third Party' work done under the AARNet Access Agreement and Data Retention implementation. Joint Ventures and other forms of partnership enable access but must be paid for and valued.

Question 31: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 32: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Underpinning Research Infrastructure capability area?

Research support expertise and skills: Research Infrastructure operates as an ecosystem of hardware, software and specialist expertise to support researcher use of facilities. Thus, the development and ongoing support of research support expertise and skills is a key enabling capability that is missing from the National Research Infrastructure issues paper.

Underpinning infrastructure – Tier 3?: The roadmap considers Tier 1 and Tier 2 infrastructure as 'in scope'. For enhanced strategic planning, Institution level infrastructure investments for competitive advantage (i.e. 'non-shared') should be identified as a separate Tier 3 and the Roadmap, while naturally focussing on Tier 1 and 2 investments, should articulate how the Tiers are intended to interrelate so that promising research at the institutional scale can migrate and scale to activities of national significance supported by the peak Tier 1 level infrastructure. i.e. the porosity of the tiers be considered. Hopefully this will lead to a more holistic and sustainable eResearch ecosystem across all three Tiers of advanced research computing infrastructure.

For eResearch infrastructure to be leveraged fully it has to be "backward compatible" with research institutions (e.g. Unis) infrastructure. In cloud architecture the areas of interest are:

- Network Integration and Management (the usual problems)
- Data and Information Management (e.g. if data is classified within the institutions which classifications can go onto research cloud storage)

- Information Security Management (e.g. Unis won't signoff to put data or apps onto infrastructure if it doesn't meet the institutional standard security requirements)
- Identity Management (e.g. we still have instances of multiple accounts needed to access facilities)
- Application Integration (e.g. monitoring and logging, passing data between systems hosted internally and cloud based etc)

A suggested principle is not to invest in infrastructure unless there are no commercially available solutions but focus on improved management of research data that can be reused by researchers.

Co-investment for expansion of the AARNet network in regional areas could be an avenue to speed this.

Data for Research and Discoverability

Question 33 Are the identified emerging directions and research infrastructure capabilities for Data for Research and Discoverability right? Are there any missing or additional needed?

Question 34: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 35: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Data for Research and Discoverability capability area?

Mention is made of trusted data. To do good (reproducible) research you need trusted data, trusted methods, trusted tools and trusted underlying infrastructure. Trusted 'eTools' and underlying infrastructure does not appear to be sufficiently covered at present – especially eTools (ie the applications researchers use).

Trust is confidence in the system, shown commitment by the service providers, good levels of communications, support and training services, and attention to "client satisfaction" (i.e. the same as IT and Libraries do internally to deliver a service from networks/servers, apps up to outreach).

We need to ensure that the focus on data does not stifle innovation and support for eTools and use of new and novel use of current technologies in the underlying infrastructure.

Particular elements to consider:

- Archiving;
- Orchestration (ability to move between different facilities);
- Integration;
- development of standards (meta data, data management plan standards) for each area of discipline;
- development and maintenance of master data models for disciplines to facilitate sharing and integration of data

- data governance for master data per discipline;
- an architectural approach per discipline to highlight gaps to provide focus for investment
- Most of the above are about data management so this is the overarching capability that needs to be developed nationally.

Researchers need open and transparent access to data held by government departments (at all three levels) and access to data created from government funded projects. Interesting work is being done in this space at the NSW Data Analytics Centre in the Department of Finance, Services & Innovation.

Other comments

If you believe that there are issues not addressed in this Issues Paper or the associated questions, please provide your comments under this heading noting the overall 20 page limit of submissions.