



AAH Policy

INTEGRATED RESEARCH INFRASTRUCTURE FOR HUMANITIES, ARTS & CULTURE DISCUSSION PAPER

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1 Executive Summary

Both in Australia and internationally, humanities, arts and culture (HAC) research, and cultural heritage and curation, are at a pivotal juncture.

Changes in digital technology, ‘big data’, and associated developments are transforming research practice in the humanities and arts. They are providing new ways to answer complex questions about our society and culture, and our connections to and understanding of cultures and communities around the world.

But in order to make new discoveries that will transform our understanding of our cultures, identities, heritage and history, researchers require access to dispersed collections of qualitative and quantitative data and advanced tools to enable data intensive research and analysis.

Much of the data that humanities and arts researchers need to undertake advanced research is a combination of public sector data; data collected, managed and held by collecting institutions (sometimes in partnership with private companies); data produced by individual researchers and projects; as well as data collected and published by private institutions. This information is largely ‘hidden’ from view, or in a variety of ‘unstructured’ formats – such as texts, maps, artefacts, and audio-visual documents – or semi-structured formats in the case of research and field records.

To underpin this transformation in research, this Data Summit provides a timely forum to map and identify:

- > characteristics and trends in HAC data, its storage, distribution, and use;
- > users and beneficiaries of HAC data;
- > how we imagine and plan for HAC digital infrastructures in Australia for the next 5-10 years;
- > what principles, governance, and models best suit HAC national research infrastructures;
- > what frameworks will provide the greatest impact for both researchers and users?

As this discussion paper outlines, the threshold problem lies in the lack of an agreed approach to research infrastructure investment for humanities, arts, and culture. For this reason, we need:

- > A national strategic plan to expand the uptake and development of innovative research infrastructure;
- > A large, collaborative, coordinated, interconnected ‘facility’ for humanities, arts and culture research which addresses a broad national remit. This social research data network – Integrated Research Infrastructures for Humanities, Arts and Culture (IRIHAC) – would facilitate academic research *and* service as a public good resource enabling all Australians to easily access cultural and social data/resources for a wide range of social, cultural, economic, health, and environmental benefits.

Against the context of the current national research infrastructure landscape, the discussion paper canvasses: what such integrated research infrastructures might deliver; principles for design; framework for implementation and what steps this process entails.

The paper also provides key resources to underpin discussion: what HAC research and data infrastructure do we have; where have HAC figured in past Australian national research infrastructure roadmaps; what are useful models internationally and in Australia?

2 Discussion Questions

1. What are humanities, arts and culture (HAC) data?
2. Where are HAC data? What are our nationally-significant collections and reference data sets for research? What are the significant privately-held archives and sets of data (e.g. social media and Internet data)?
3. How does content and ‘unstructured’ data get transformed into (computational) research data (through what curation processes) and then how does it get shared and re-used?
4. What kinds of HAC data are not currently well catered to, or fitting into, digital data, computational and other technologies, and could these issues be addressed via future National Research Infrastructure (NRI) design?
5. Who uses and benefits from HAC data?
6. How does data get interpreted and transformed into knowledge? How do research communities derive value from the data? How do/can other users derive value from it?
7. How do we critically and ethically approach research data management?
8. What are the current and future possibilities for sharing, mining, and analysing HAC data, including data linkage?
9. How might we build on, and leverage, the unique value of user, audience, and citizen engagement in HAC institutions in a future NRI initiative?
10. What sorts of digital infrastructures and tools do we need now and over next 5-10 years?
11. What can be solved by generic solutions and where/when do we need bespoke or ‘domain’-specific solutions?
12. What types of governance and institutional structures are needed to drive a national, collaborative strategic initiative?
13. How do we maximise processes for design innovation, network building and resource sharing?

3 Introduction

3.1 Objectives

The [Humanities, Arts & Culture Data Summit](#) hosted by the [Australian Academy of the Humanities](#) in Canberra 14-15 March 2018 will bring together researchers, policy makers and institutions to discuss a national strategic approach to support future data-driven research and drive step-change in the way researchers can discover, access, mine and analyse Australia's cultural and social data.

This Discussion Paper provides background to National Research Infrastructure (NRI) investment across the broader Humanities, Arts and Social Sciences (HASS) domain and poses a series of questions to help inform the future design of NRI initiatives.

Our Academy has been working with the [Academy of Social Sciences in Australia](#) (ASSA) and galleries, libraries, archives and museums (GLAM) colleagues to outline a framework for Platforms for HASS as part of the current [National Research Infrastructure Roadmap](#) and investment process. The summit will be an opportunity to discuss and advance this work for the Humanities, Arts and Culture (HAC) component of the Platform.

The aims of the summit are to:

- > Progress a strategic agenda for national, collaborative NRI development for humanities, arts and culture (connecting to social sciences and broader STEM system)
- > Articulate the value proposition for a national scale infrastructure for the humanities, arts and culture. What will it deliver for the range of national and international stakeholders?
- > Determine a set of immediate priorities and next steps.

The key questions the summit will focus on are:

1. What is HAC data, what forms and formats does it take, how is it stored, transformed, and distributed?
2. Who are the users and beneficiaries of HAC data? How can we best engage, connect, and collaborate with HAC users and beneficiaries, across research, cultural heritage and other institutions?
3. What does the HAC digital infrastructures landscape look like now and how might it look in the next 5-10 years, from Australian perspectives?
4. What are the principles that might underline options for HAC NRIs? What might the best architectures look like? What governance and infrastructural models could be fit for purpose?
5. What is the best framework for defining and securing impact (research, social, cultural, environmental, and economic)?

3.2 Brief snapshot of Humanities, Arts and Culture

Humanities, arts and cultural research, and its underpinning data, are a central part of a knowledge-based economy, providing new frameworks for the analysis of humanity, and its history, ideas, cultures, economies, languages and social structures. HAC research is a critical partner to the social sciences and STEM fields in developing interdisciplinary solutions to

complex challenges such as climate change, social cohesion and belonging, new technological development, future workforce solutions, resource management, health and welfare.

The broader Australian HASS research sector is large and diverse, comprising 41 per cent of the university-based research system and more than 50 disciplines at the four-digit field of research level, with fields ranging from economics, geography and demography, to languages, archaeology, history, arts and media studies (see [Mapping the Humanities, Arts & Social Sciences in Australia](#) report, 2014).

3.3 National Research Infrastructure Roadmapping

There have been four national infrastructure roadmaps, three of which have identified capability deficits for HASS, see **ATTACHMENT A**. Although HASS capabilities were scoped in both the 2008 and 2011 Roadmaps, neither led to direct National Collaborative Research Infrastructure Strategy (NCRIS) funding for a sector-wide NRI initiative.

The latest Roadmap, the [2016 National Research Infrastructure Roadmap](#) was released in May 2017. The subject of extensive sector consultation, the Roadmap's terms of reference called for 'a framework to maximise the benefits of existing national research infrastructure built over the last ten years and identify the next generation of research infrastructure that will optimise our national science and research effort' (p. 2).

National research infrastructure is defined by the Roadmap as comprising 'the nationally significant assets, facilities and services to support leading-edge research and innovation. It is accessible to publicly and privately funded users across Australia, and internationally' (p. 1).

The Roadmap identified the need for national-scale infrastructure for HASS – as one of nine focus areas 'that require ongoing support to ensure that Australia will be able to maintain its position as an emerging or established global leader':

- > Digital Data and eResearch Platforms
- > Platforms for Humanities, Arts and Social Sciences
- > Characterisation
- > Advanced Fabrication and Manufacturing
- > Advanced Physics and Astronomy
- > Earth and Environmental Systems
- > Biosecurity
- > Complex Biology
- > Therapeutic Development

3.3.1. Platforms for HASS

The Roadmap's Platforms for HASS focus area prioritised three inter-related elements (extracted from p.36):

- > "Integrated and coordinated HASS platforms: Explore integration of networks for coordinated access to physical collections and digital materials enabling the digitisation of priority specimens across all collecting institutions. This could include the sharing of

digitisation infrastructure and standardisation of best practice for processes and interoperability with international research infrastructures.”

- > “Harmonised platforms for Indigenous research: Explore integration of existing institutional level capabilities across a range of data platforms: [AIATSIS](#), [ATSIDA PARADISEC](#), and [NCIG](#) linked to wider platform for integration across all digital collections and portals.”
- > “Harmonised platforms for social sciences research: Explore integration of social sciences data from multiple sources together with tools for analysis and visualisation. This should be linked to the broader integrated and coordinated approach to a HASS platform. Maintain priority for [AURIN](#).”

In terms of the Roadmap’s characterisation of NRI development, Platforms for HASS falls in to the following two categories (excerpted from Roadmap, p. 25):

- > “Explore establishing: new greenfield investment should be explored as Australia does not have existing or may have limited research infrastructure that can be enhanced.”
- > “Explore integration: institutional or national research infrastructure already exists and greater integration or new elements should be considered.”

It is envisaged that Platforms for HASS would also integrate with other areas of the Roadmap, including eResearch and digital capabilities:

- > Develop shared tools and services, including the coordination/sharing of digitisation infrastructure and standardisation of best practice for processes and interoperability with international research infrastructures.
- > Improve research workforce development through data standards and protocols, data management frameworks, digital skills development, and research training in digital methods.

The Digital Data and eResearch Platforms priority area recommended the development of an Australian National Data Cloud. The Department of Education and Training is currently working with the [Australian National Data Service](#) (ANDS), [Research Data Services](#) (RDS) and [Nectar](#) to bring these organisations under the one institutional umbrella later in 2018.

4 Platforms for HASS – development status

To support its consideration of the 2016 National Research Infrastructure Roadmap (the Roadmap), the Government announced in the 2017-18 Federal Budget the development of a Research Infrastructure Investment Plan (the Plan).

Unlike other areas of the Roadmap, Platforms for HASS is a national-scale infrastructure that does not yet exist.

The Australian Academy of the Humanities (AAH) was approached by the Department of Education and Training in July 2017 to lead an effort to inform the Plan for the ‘Platforms for HASS’ priority area.

The Academy convened a Working Party to progress the scoping work requested by the Department. Comprised of representatives from the Academy of the Social Sciences, GLAM

and experts with an understanding of eResearch capabilities, the Working Party focussed their efforts on three key areas:

1. An analysis of the current state of play, including an indicative inventory of existing assets and infrastructures – including a number of NCRIS-funded facilities in the HASS domain, and well developed infrastructure across universities and the cultural and collecting institutions. See [ATTACHMENT A](#).
2. A preliminary review of applicable models, including select NCRIS-funded facilities, international infrastructures, and existing HASS platforms with NRI capability and potential. See [ATTACHMENT B](#).
3. A preliminary framework for two components of Platforms for HASS – comprising Integrated Research Infrastructure for Social Sciences Culture (IRISS) and Integrated Research Infrastructure for Humanities, Arts and Culture (IRIHAC).

Unfortunately due to the Department’s timeframes, AIATSI was unable to be involved in this stage of development. Our submission to the Department recommended a plan for consultation and input on the third component of Platforms for HASS – harmonised platforms for Indigenous research.

5 Integrated Research Infrastructures for Humanities, Arts and Culture (IRIHAC)

The following section is extracted and adapted from Platforms for HASS Strategic Framework & Implementation Plan for an Integrated Research Infrastructure for Humanities, Arts and Culture (IRIHAC): (i.e. that AAH delivered to Department of Education as part of investment planning process in August 2017).

In Australia, the approach to research infrastructure investment for humanities, arts and culture has not been strategic or informed by an agreed set of priorities across the system.

A national strategic plan is needed to realise the potential to expand the uptake and development of innovative research infrastructure. E-research infrastructure and digitisation are the big areas for growth and the strong collaborative approaches already existing in the HASS and GLAM sector form a solid foundation for future development. This is one part of the puzzle.

The humanities, arts and culture sector needs a large, collaborative, coordinated, interconnected ‘facility’ which addresses a broad national remit – essentially a cultural and social research data network which not only facilitates academic research but is also a public good resource enabling all Australians to easily access cultural and social data/resources for social, cultural, economic, health, and environmental benefit.

5.1.1. Scale and diversity of humanities, arts and culture data

Changes in digital and ‘big data’ developments are transforming research practice in the humanities and arts. In order to answer complex questions about our society and culture, and our connections to and understanding of cultures and communities around the world, researchers require access to dispersed collections of qualitative and quantitative data and advanced tools to enable data intensive research and analysis. The discoveries they make will transform our understanding of our cultures, identities, heritage and history.

Much of the data that humanities and arts researchers need to undertake advanced research is a combination of public sector data; data collected, managed and held by collecting institutions

(sometimes in partnership with private companies); data produced by individual researchers and projects; as well as data collected and published by private institutions. This information is largely ‘hidden’ from view, or in a variety of ‘unstructured’ formats – such as texts, maps, artefacts, and audio-visual documents – or semi-structured formats in the case of research and field records.

5.1.2. Users and beneficiaries

A humanities and arts NRI would serve a large community of researchers – based on the Australia Research Council’s latest [Excellence in Research for Australia](#) audit (2015), HASS researchers comprise 41 per cent of the university-based system. The total university-based research system is 43,589 FTE (67,579 headcount) of which HASS comprises 17,866 FTE (or 41 per cent of the total system). The Humanities and Creative Arts (HCA) component is 6,971 FTE which is 16 per cent of HASS. It is a diverse and distributed workforce.

Although designed initially to meet the needs of researchers, an IRIHAC has the potential to service new communities and improve access to Australia’s cultural heritage nationally and internationally. The NRI would have cross-disciplinary potential particularly in qualitative social sciences, and in the STEM arena in areas where culture and science data needs to come together for advanced analysis, for example in tackling climate change, disaster preparedness, cybersecurity, and whole-of-life approach to healthcare delivery.

A humanities and arts NRI opens up possibilities for advanced education infrastructure to be leveraged by educational institutions, contributing to the wider digital literacy agenda, and broadening the skills and capacity development for students and researchers.

Data employed in HASS research is often culturally sensitive. Ethical, security and privacy considerations apply with research relating to Aboriginal and Torres Strait Islander peoples, as well as age-referenced data (especially relating to children), health data, and income data. Protocols for the use and re-use of data are needed, noting the work already undertaken by organisations such as AIATSIS (see [Guidelines for Ethical Research in Australian Indigenous Studies](#)) and drawing on expertise developed in existing institutional infrastructures and in other NRIs. There are a number of initiatives with regards to [Indigenous Data Sovereignty](#) underway, including a symposium convened in Melbourne in October 2017 by the University of Melbourne in partnership with AIATSIS.

In terms of integrating with Indigenous research platforms (in consultation with AIATSIS) the lack of consistent cultural mapping for Indigenous Australia (both urban and rural areas) means that we have yet to fully tap in to and learn from 50,000 years of land management and change. Current science-funded infrastructure goes only a fraction of the way towards bringing the complete picture in view – this new NRI would contribute to bringing biological and ecological data together with language and cultural resources.

Key areas of policy alignment and impact include:

- > Innovation, Industry and Science: [National Innovation Science Agenda](#) (specifically: digital talent and skills, infrastructure collaboration, platforms for open data); Innovation and Science Australia’s [2030 Strategic Plan for the Australian Innovation, Science and Research System](#) (including skills development, research end-user engagement); open data and data-driven innovation (Prime Minister and Cabinet [Public Data Statement](#), [Data 61](#)); [Digital Economy](#).

- > Education and Training: [digital literacy and skills agenda](#)
- > Research: research workforce development, research engagement and impact, data management (including Australian Research Council (ARC) policy)
- > Arts, communications and culture: telecommunications, innovation infrastructure, GLAM collections.
- > Other policy areas where HAC makes an important contribution: health; disability policy (e.g. NDIS); social and community services.

5.1.3. Current NRI landscape

There are a number of National Collaborative Research Infrastructure Strategy (NCRIS) funded facilities which provide some services to the HASS domain, and exemplary infrastructures developed by pioneers in the humanities and arts research sector as well as those in Australia's cultural and collecting sector. These include Trove, which brings together into one platform GLAM collections, as well as collections from universities, research and community organisations; the ANDS/RDS/Nectar-funded HASS Data Enhanced Virtual Laboratory; and domain-specific infrastructures such as PARADISEC, AustLit, AusStage, Australian Dictionary of Biography, Design and Art Australian Online, Media History Archives, Papyri Macquarie, Analysis and Policy Observatory (APO), Founders and Survivors, and the Prosecution Project. Refer to [ATTACHMENT A](#) for an indicative inventory.

These infrastructures are largely operating at an institutional or project-based level, and the state of play can be characterised as 'ad hoc' and uncoordinated. Existing platforms separately work to standardise, harmonise and provide single points of access. They lack a combined set of tools to power innovation in the way researchers analyse these combined datasets, and support for new research methodologies.

5.1.4. What would an IRIHAC deliver?

The development of IRIHAC would:

- > Scale up interoperability across multiple existing infrastructures at the project, institution, regional and national level to better support research needs and priorities at a national-scale, collaboratively, strategically and in a coordinated way.
- > Expand discoverability and access to data (physical and digital collections/materials) in collecting and other research repositories, from existing discovery platforms onto a new enhanced platform.
- > Develop shared tools and services, including the coordination and sharing of digitisation infrastructure, to drive innovation in research practice.
- > Harmonise metadata capabilities, standards, practices and models for data management, access, preservation and curation.
- > Improve research data life-cycle management – translating unstructured/primary data into discipline-specific datasets as a resource for scholarship, education and engagement, and feeding these curated/enriched data back into the wider system for use by researchers, business, industry and the general public.
- > Build an interoperable digital repository in which primary research materials can be housed and where metadata can be enriched over time.

- > Integrate and/or connect with other NCRIS facilities, sharing expertise and leveraging investments.
- > Improve research workforce development through promulgation of data standards and protocols, data management frameworks, digital skills development, and research training in new research methodologies.
- > Coordinate national and international outreach and engagement – across the research sector, collecting institutions, and communities and beneficiaries.
- > Standardise best practice for processes and interoperability with international research infrastructures.
- > Work to locate datasets already created, especially those supported by public funds, and to convert them to archival formats for future access.

5.1.5. Principles for design

In building HASS research infrastructure, it is vital to learn from existing research infrastructure initiatives and operational principles regarding approaches to sustainability/future proofing, removing duplication, common services, and consolidating and clustering efforts. Broadly, the following principles and attributes should apply:

- > Commitment to engaging with multiple and diverse stakeholders: establish strong stakeholder engagement across jurisdictions because challenges for research and the long term retention of scholarly knowledge (in digital format) are inherently connected.
- > Efficiency and reuse: utilise established research infrastructure and coordinate effort to reduce duplication in the research infrastructure system.
- > National scale: provide services that have a high impact, i.e. solving critical national problems or enable critical mass exploitation levels i.e. serving a large proportion of the research community.
- > Internationalisation: incorporate in national research infrastructure a goal to be linked into international networks.
- > Domain specialisms: incorporate in national research infrastructure the need to increase capacity for domain specific informatics and researcher training.
- > Ensure accessibility of data and research outputs in accordance with FAIR principles (findable, accessible, interoperable and reusable), with data open where possible but with strong protocols for data protection and security where required.
- > Deliver value for user communities [Refer to Canadian system for good strategic frameworks on designing for benefit/impact, see <https://www.innovation.ca/results-impacts>]

5.1.6. Steps in the process

A framework for staged implementation would involve three key phases:

Phase 1: Establish a governance and advisory structure to include key stakeholders from the research community and cultural and collecting institutions; conduct a capability/benchmarking audit to assess future requirements of the humanities, arts and culture research sector; conduct facilitation and consultation process to determine business plans, and governance and operating

models. Governance needs to be informed by international developments to support harmonisation and interoperability.

The consultation and facilitation process would work directly with other NRI capability and existing NCRIS-funded facilities to determine the areas of overlap and leverage. The potential of a specific program via the National Research Data Research Cloud (NRDC) would be explored – to enable the development of tools and capabilities for humanities and arts researcher-driven practice. In this context, it is worth referencing the work already underway through an existing pilot project, the HASS Data Enhanced Virtual Laboratory: inclusive of a data curation environment and interoperability framework; workbench for consolidated access to existing toolkits and services (such as transcription, text analysis, and geocoding); a publishing portal for HASS standards and workflows; and expansion of its current community building program.

Phase 2: Prioritise areas for investment following the consultation phase and informed by findings of the capability audit. The initial strategy will focus on infrastructure requirements, technical consolidation and platform interoperability. This phase will utilise established research infrastructure and coordinate effort to reduce duplication in the research infrastructure system, while significantly scaling up capacity and driving efficiencies in the research process. It will leverage existing infrastructures in service of humanities, arts and culture research (listed above) and at [ATTACHMENT B](#). It will identify any nascent infrastructures currently in development.

This phase would also seek to build on existing partnerships that constituent infrastructures have with landmark international RIs to ensure that possibilities for interoperability and data sharing are explored from the outset.

Two centralised facilities could also be explored in this phase:

- > The establishment of a ‘digitisation excellence capability’, with one or two leading repositories, in partnership with key research institutions, would ensure effective use of innovative technology/cloud platforms and the flow of data for research.
- > The establishment/consolidation of a text mining centre.

Phase 3: Build a linked infrastructure based on interoperability realised in Phase 2; using cloud technology; further linking of distributed infrastructure and federated datasets across locations and institutions; establish virtual laboratories for data searches and analysis, visualisation of datasets, enabling researchers to add, retrieve and share data; provide virtual workspaces for researchers and research groups; integrate digital methods and best practice data management, analysis and archiving across the HASS sector more broadly; and complete the data lifecycle by feeding research outputs back to systems that serve industry, government and the public.

6 Next Steps: Towards a 5-10 year Strategy.

The summit will provide an opportunity to discuss proposed next steps. Initial suggestions include:

- > Version 2 of the discussion paper to incorporate input from the summit and form the basis of a wider sector consultation strategy.

- > Formation of an overarching alliance or coalition – a HAC Research Infrastructure Alliance – to coordinate working papers and parties to advance the agenda, and to work with social sciences and other parties towards a collaborative agenda for ‘Platforms for HASS’.
- > Develop use cases to evidence the ways in which researchers, institutions and a range of beneficiaries would use and derive value from the development of HAC/HASS NRI.
- > Develop pilot, ‘proof of concept’ projects.

ATTACHMENT A:

Past Australian National Research Infrastructure Roadmaps

2006 National Collaborative Research Infrastructure Strategy Strategic Roadmap

The 2006 Roadmap did not recommend a domain-specific HASS capability, reasoning that:

“As the needs for many of the specific enabling technologies (such as high-speed data communications) are shared by all disciplines, investment in them is best managed on a system-wide (rather than discipline-by-discipline) basis. This has particular ramifications for the humanities and social sciences. In the Exposure Draft, two suggestions for research infrastructure relating to the social sciences and humanities were canvassed (Development of creative industries, digital content and applications, and Collaborative and strategic data fusion and model interoperability). While the content of these suggestions is targeted to the social sciences and humanities, the broad form of the proposed solutions (aimed at providing an enhanced capacity to rapidly access, draw together, collaboratively consider and interpret information from multiple sources) is relevant to all disciplines. Because much (if not all) of what constitutes “research infrastructure” for the social sciences and humanities are specific applications of generic platforms, the Committee considers that the research infrastructure needs of these disciplines are best considered as part of a system-wide information management strategy.”

See

https://docs.education.gov.au/system/files/doc/other/national_collaborative_research_infrastructure_strategic_roadmap_2006.pdf

2008 Strategic Roadmap for Australian Research Infrastructure

The Humanities, Arts and Social Sciences (HASS) had one capability mapped in the 2008 Roadmap, detailing a HASS-specific eResearch Infrastructure, managing data creation and data management. It was envisaged that such a capability would address the sector’s need for the creation, retention, management and collaborative use of data within and beyond the HASS disciplines, and support a more collaborative and interdisciplinary approach to research.

The capability scoped a two stream piece of infrastructure – data creation and research material digitisation, and data management and linkage. The Data Creation stream would see the conversion of key primary research analogue data to digital form and the facilitation of additional data for ongoing databases. The Data Management stream would enable data to be interoperable, accessible and secure; include data modelling and analysis tools, visualisation capabilities and collaborative tools and platforms; and provide networks to connect HASS with other researchers.

It was proposed that the infrastructure be governed by a peak governance body, supported by two representative reference groups aligning with the two streams of work.

The HASS capability did not receive any funding in the subsequent Budget.

See

https://docs.education.gov.au/system/files/doc/other/national_collaborative_research_infrastructure_strategic_roadmap_2008.pdf

2011 Strategic Roadmap for Australian Research Infrastructure

The third Roadmap covered 12 research outcome targeted capability areas, including a Culture and Communities capability which was similar to the HASS capability described in the 2008 Roadmap. The 2011 Roadmap also included seven enabling capability areas, envisaged as cross-cutting underpinning capabilities applicable to all disciplines. These included Digitisation Infrastructure and eResearch Infrastructure capabilities.

The specific requirements detailed in the 2011 Roadmap for the Culture and Communities capability included:

- > protocols to ensure future data sets are Open Archival compliant;
- > a variety of networking and access tools to facilitate the use of a diverse variety of data;
- > tools with which to capture, analyse, visualise and interrogate the diverse types of data available to the sector; and,
- > virtual spaces for collaboration.

The Digitisation Capability was envisaged to increase the accessibility of data through the digitisation of collections of artefacts, documents, films, animals, insects, plants and genealogical samples.

See

https://docs.education.gov.au/system/files/doc/other/national_collaborative_research_infrastructure_strategic_roadmap_2011.pdf

ATTACHMENT B:

Indicative Inventory of HASS Research and Data infrastructure

Extracted from PLATFORMS FOR HASS submission prepared for the Department of Education and Training, August 2017

National Collaborative Research Infrastructure Funded:

- > *Research Data Services (RDS) and eResearch South Australia (eRSA) Cultures and Community Project
- > *NeCTAR Virtual Laboratories (VL) – Alveo (the Human Communication Science VL) and HuNI (Humanities Networked Infrastructure); and FAIMS (Field Acquired Information Management Systems)
- > Australian National Data Service (ANDS) – in particular the Open Data Collections Program, the Major Open Data Collections Program (involving Australian Policy Online [now Analysis and Policy Observatory (APO)]) and the Public Sector Data Program
- > Population Health Research Network (PHRN) (for HASS health-related research)
- > Australian Urban Research Infrastructure Network (AURIN)
- > Australian Data Archive (ADA) (received NCRIS funding as ASSDA)

Other national infrastructures/facilities:

- > *AIATSIS
- > *Trove by National Library of Australia and NSLA (Repository of collaboratively digitised and born digital full text content including Australian Newspapers, Commonwealth and State Government Gazettes, digitised Australian Journals, AGWA/PANDORA/Whole of Domain Archived Australian Websites)
- > *National Archives of Australia
- > *National Film and Sound Archive
- > *National Museum of Australia
- > *National Gallery of Australia
- > *National Portrait Gallery
- > *Australian War Memorial Collection
- > *Other national, state and territory cultural and collecting institutions (archives, public records offices, museums (collections and archives), galleries)

Collating/aggregating/analytical infrastructures/platforms with a national focus or charter:

- > *Trove (aggregating cultural heritage, research and community collections)
- > *Australian Policy Online o Aboriginal and Torres Strait Islander Data Archive (ATSIDA)
- > Discovering ANZACs

Pilots/regional /discipline-specific infrastructures and platforms (including those with a national charter):

- > *PARADISEC
- > AustLit
- > AustLII
- > *Australian Dictionary of Biography
- > *Australian Women's Register
- > *Encyclopaedia of Australian Science
- > *Design and Art Australian Online
- > *Obituaries Australia
- > *Trove Identities Manager (minting of named entity persistent identifiers, colocation & disambiguation of records from multiple sources)
- > *Museum Victoria
- > *Australian National Maritime Museum
- > *AusStage
- > *The Prosecution Project
- > *Institutional Repositories, Open Journals and ePress open publishing platforms at multiple Universities, Industry bodies, Health institutes & hospitals, state and federal government departments
- > *University archives (Wollongong, Monash, Melbourne, Newcastle, New England, etc.)
- > *Local history and art collections hosted by Local councils/public libraries
- > *Community collections hosted by volunteer museums, historical societies, clubs, RSLs, religious bodies, army/navy/air force, schools
- > *Other local government cultural and collecting institutions (archives, public records offices, museums (collections and archives), galleries)
- > Mobile Museum Project
- > National Centre for Indigenous Genomics
- > Social Health Atlas of Australia
- > Queensland Museum
- > Australian Museum
- > Tasmanian Museum and Art Gallery
- > South Australian Museum
- > Western Australian Museum
- > Museum and Art Gallery of the Northern Territory

- > Founders and Survivors
- > Australian Centre for the Moving Image (ACMI)
- > Museum of Contemporary Art Australia
- > Art Gallery of South Australia
- > Art Gallery of Western Australia
- > QAGOMA
- > Art Gallery of NSW
- > National Gallery of Victoria

Australian Government resources

- > Australian Bureau of Statistics (ABS) – e.g. Census data
- > Australian Taxation Office
- > HILDA – and other Department of Social Services / Department of Human Services datasets
- > Department of Education and Training data – sites like the National Centre for Vocational Education Research, (NCVER), Federal schools funding
- > State Government resources including Births, Deaths and Marriages etc.; Public Records Offices
- > *Parliamentary libraries e.g. Full text Press Releases from MPs databases, Hansard
- > *ABC archives – e.g. RN broadcast segment transcripts
- > *Australian Government Solicitor – Legal opinions
- > Data.gov.au
- > Department of Communications and Arts – including Bureau of Communications and Arts Research; Australia Council Arts Participation Survey

* Indicates a Trove content or digitisation partner, or a Trove user/consumer

Key datasets include:

- > The Australian population census and other important data sources.
- > Longitudinal studies of individuals (such as the Household Income and Labour Dynamics in Australia, Longitudinal Study of Australian Children and Longitudinal Surveys of Australian Youth, funded by various Australian government departments).
- > Nationally representative cross-sectional surveys such as the Australian Election Study and Australian Survey of Social Attitudes, and periodic surveys by the Australian Bureau of Statistics.
- > Time series of economic and social phenomena such as unemployment, labour force participation and other statistics produced from the ABS Labour Force Survey.

- > Administrative data collections such as the Research and Evaluation Database from the Department of Employment and the Mortality data register from the Australian Institute of Health and Welfare, and open data sources such as data.gov.au.
- > Business data collections such as the historical records of firms and other organisations held in locations such as the Butlin Archives and recent data from business activity and records.
- > Qualitative data collections such as the sub-studies from the Australian Longitudinal Study on Women's Health.
- > Linked data such as that provided through the Population Health Research Network and Australian Urban Research Infrastructure Network, and the Australian Census Longitudinal Dataset.
- > Full text historical media collections such as Trove's digitised Australian Newspapers, ABC transcript archives, the Australian Parliamentary Library's Press Releases database.

An indicative list of HASS eResearch capacity developed through the last NCRIS round and administered through ANDS, RDS or NeCTAR is detailed below. The proportion of these 'HASS related' projects would need to be viewed in the context of the total funding. The list indicates that projects have leveraged or received a portion of funding through NCRIS, but in the majority of cases these projects have been primarily funded through other sources (for example, Australian Research Council).

ANDS (x47)

Application

- > Founders and Survivors: Genealogical Connections

Data Capture

- > 3D Anthropological and Archaeological Data capture of 3D digital models and deposit of metadata to Collection Repository
- > Video data in the Social Sciences. Optimising Metadata Capture, Data Sharing Procedures and Long-term Reuse
- > Tools for curating and publishing research data in the form of media collections (Multimedia Collections ARROW)
- > Spatially Integrated Social Science
- > Capture and publication of data on the history of adoption (History of Adoption)
- > Papyri Data Capture
- > Founders and Survivors Project
- > Humanities and Social Science Research Data at the University of Melbourne
- > UWA Rock Art Studies Data Management
- > ANU-ANDS Data Capture Project - Humanities and allied disciplines

Open Data

- > *From Farms to Freeways: Western Sydney
- > Campbell Howard Collection of Australian Plays Open Data
- > *Triathlon in Australia Open Data Set
- > *The Foley Collection
- > The Flint Collection
- > Extending the benefits of genome science to Indigenous Australians through appropriate and respectful data sharing
- > Data Hub of Australian Research in Marine and Aquatic Ecocultures

“Seeding the Commons” Data Management

- > Reformatting the AusStage dataset to support access and re-use by researchers
- > ATSIDA: Community tools and processes for effective data management planning
- > Taking Australian Architectural and Built Environment Records into the Commons
- > Reforming the Movies: the Motion Picture Producers and Distributors of America, Inc. database
- > Screen Media Research Archive
- > UWS Seeding the Commons
- > Archaeological Database Development: The People and Place Project

EIF, NEAT via ANDS

- > Australian National Corpus
- > Museums Metadata Exchange
- > Aus-e-Stage – Collective Intelligence and Creative Visualisation for Collaborative eResearch
- > Increasing the availability and discoverability of Australasian legal research data
- > PARADISEC: ExSite9

High Value Collections

- > University of Melbourne Research Data Collections
- > Transdisciplinary Digital Collections
- > Connecting the Analysis and Policy Observatory Collections
- > Bicycle Network
- > Data on Elections, Democracy and Autocracy
- > Increased Effectiveness of Free Online Access to Myanmar and Indian Case Law
- > PARADISEC PNG Collections Data Enrichment

- > Data for the UTS Data Arena
- > Angus and Robertson Collection for Humanities and Education Research
- > JCU and Connected Urban Tropics

Collection Enhancement Partnerships

- > NT Euthanasia Collection
- > CCYP Wellbeing in Schools Project
- > Digital Lives - Everyday Digital Literacies
- > Fraser Island Collection
- > Ngan'gi Language Collection

Connecting HVC and NCRIS Capabilities

- > ANDS and AURIN Delivering High Value Services

Trusted Data Repository

- > Australian Data Archives as Trusted Digital Repository for Australian Social Science

NeCTAR (x3)

- > FAIMS (app)
- > Alveo - <https://nectar.org.au/labs/when-words-collide/> (lab)
- > HuNI - <https://nectar.org.au/labs/inspiring-cultural-collaboration/>

RDS (x1)

- > Access to Data for Culture & Community Research (storage)

A list of currently funded Australian Research Council (ARC) Linkage Infrastructure Equipment and Facilities (LIEF) extracted from the LIEF Register at <http://www.arc.gov.au/australian-government-investment-research-infrastructure> is overleaf.

Linkage, Infrastructure, Equipment and Facilities (LIEF) Register

Extracted from ARC LIEF Register available at <http://www.arc.gov.au/australian-government-investment-research-infrastructure> NB not updated for latest LIEF round (projects funded for 2018)

University	Proposal Title & ID	Project Leader	All Other Participating Organisation(s)	Primary System(s)	Availability
QUT	TrISMA - Tracking Infrastructure for Social Media Analysis LE140100148	A/Prof Axel Bruns	<ul style="list-style-type: none"> •Curtin University of Technology •Swinburne University of Technology •Deakin University •National Library of Australia 	<p>–TrISMA: Tracking Infrastructure for Social Media in Australia – tracking Australian Facebook and Twitter activities at large scale on an ongoing basis</p> <p>Available for use by accredited researchers at QUT and the partner institutions</p>	Item available
University of Queensland	The AustLit resource: supporting research in studies of Australian literary and narrative cultures LE130100131	Ms Kerry Kilner	<ul style="list-style-type: none"> •The University of New South Wales •University of Wollongong •The University of Sydney •Monash University •Flinders University •The University of Western Australia •Queensland University of Technology •Australian Institute of Aboriginal and Torres Strait Islander Studies 	–Online research Infrastructure	Item available
Victoria University	The Aboriginal History Archive LE170100116	Prof Gary Foley	<ul style="list-style-type: none"> •Victoria University •Deakin University •The University of Newcastle •University of Technology, Sydney •The University of Melbourne •Te Whare Wananga o Awanuiarangi •University of Exeter •The University of Waikato, NZ •National Museum of Australia •Old Parliament House 	<p>—On-line archive interface</p> <p>—Audio-visual recording equipment</p>	TBA
UTS	Comprehensive free access to Australian industrial and workplace law LE170100099	Prof Andrew Mowbray	<ul style="list-style-type: none"> •University of Technology, Sydney •The University of New South Wales •The University of Melbourne •The University of Sydney •The University of Adelaide •The University of Queensland •The University of Newcastle •La Trobe University 	<p>—Oracle Sun X5-2 server</p> <p>—Oracle FS1 storage system upgrades</p> <p>—Oracle ZS3-2 NAS storage upgrades</p>	TBA
Swinburne University	Linked data policy hub: connected resources for social research LE130100185	Prof Julian Thomas	<ul style="list-style-type: none"> •RMIT University •The University of Adelaide •Victoria University of Wellington, NZ •RMIT Training Pty Ltd 	–Online research infrastructure	TBA

Swinburne University	Linked Data PolicyHub Stage II: Urban & Regional Planning & Communications LE160100221	Thomas, Prof Julian	<ul style="list-style-type: none"> • RMIT University • University of Canberra • The University of Melbourne • The University of Sydney • ANZSOG • Internet Archive 	–Data Infrastructure	Item Available
Swinburne University	Collaborative embodied movement design network LE170100066	Prof Kim Vincs	<ul style="list-style-type: none"> •Deakin University •The University of Melbourne •Monash University •The University of New South Wales •RMIT University •Swinburne University of Technology •University of South Australia •Queensland University of Technology 	Offsite Multi-configurable Projection Mapping Kit, Portable Indoor / Outdoor Optical Motion Capture System, Wearable Tracking Group Capture Kit, AR Group Research Kit E34, Augmented Studio for Body Annotation, E27Mobile Locational Field Kit, 360° Realtime 3D Laser Scanner Arena, Creative Computing Studio Motion Capture Augmentation, Sensilab Virtual Heritage and Design Motion Capture Lab, UAV Field Kit for Town Planning, Design and Virtual Production, Ambisonic Sound and Vision Lab, Human Robot Sensory Extension Lab, VR Group Research Kit, EMG Kit, Vistuation Workstations	TBA
UNSW	The Australasian Legal Scholarship Library: new content and sophistication for a world-leading legal scholarship repository and citatory LE130100118	Prof Graham Greenleaf	<ul style="list-style-type: none"> •University of Technology, Sydney •The University of Melbourne •The University of Western Australia •Australian Catholic University •The Australian National University •The University of Sydney •Bond University •Monash University •The University of Queensland 	–Oracle/Sun Fire X4470 Server –Oracle ZFS Storage System ZS3-2 –Arista 7150S Switch and Licence	Item available
UNSW	Design & Art Australia Online Research Tool: enabling next generation e-Research in Australia's visual and design cultures. LE140100120	Prof Ross Harley	<ul style="list-style-type: none"> •The University of Sydney •The University of Melbourne •University of Technology, Sydney •Deakin University •The University of Adelaide •University of Tasmania 	– MongoDB (version 1.8.0-rc0) – Django (version 1.3.1) – PostgreSQL (version 8.4.9) – jOAI (version 3.1.1.2) – VM licences	Item available
UNSW	Federated Archaeological Information Management Systems project: Transforming archaeological research through digital technologies LE140100151	Dr Shawn Ross	<ul style="list-style-type: none"> •The University of Queensland •The University of Sydney •La Trobe University •Flinders University •Southern Cross University •Intersect Australia Ltd •Victorian Partnership for Advanced Computing •The Center for Digital Antiquity •University of California, Berkeley •The University of Chicago, USA •The University of York, UK 	–Online Research Infrastructure www.fedarch.org	Item available

UNSW	The Australasian Legal History Libraries: Stage II LE150100051	Prof Graham W Greenleaf	<ul style="list-style-type: none"> •University of Technology, Sydney •The University of New England •The University of Sydney •University of Western Sydney •The University of Queensland •The Australian National University •University of Tasmania •The University of Adelaide •Griffith University •Southern Cross University •The University of Melbourne •University of Canberra •The University of Notre Dame Australia •The University of Western Australia 	–Australasian Legal History Library	Item available
UNSW	DomeLab: an ultra-high resolution experimental fulldome LE150100081	Prof Sarah I Kenderdine	<ul style="list-style-type: none"> •University of Western Sydney •RMIT University •University of Canberra •The University of Western Australia •University of Tasmania •City University of Hong Kong •National Museum of Australia •Museum Victoria •Australian National Maritime Museum •The Walter and Eliza Hall Institute of Medical Research •AARNet Pty Ltd •Intersect Australia Ltd 	–An ultra-high resolution experimental fulldome	Item not available
University of Melbourne	Urban Analytics Data Infrastructure LE160100174	Prof Abbas Rajabifard	<ul style="list-style-type: none"> • The University of New South Wales • The University of Queensland • The University of Western Australia • University of Canberra • University of Wollongong 	–Data Infrastructure	Item Not Available
Monash University	Behavioural research: advanced exploration of the mind LE130100112	Prof Harmen Oppewal	<ul style="list-style-type: none"> •Swinburne University of Technology •The University of Melbourne 	<ul style="list-style-type: none"> –Tobii T120 Eyetrackers –SR Research eye movement systems –Noldus Facereaders –Affectiva Q-sensor wireless wristbands –NeuroSky Mindband –Emotiv EPOC Mind-Reading Controllers –Quasar wireless dry sensor headsets 	Item available

Flinders	Visualising venues in Australian live performance research LE170100003	Prof Julian Meyrick	<ul style="list-style-type: none"> •The Flinders University of South Australia •The University of Queensland •The University of Melbourne •Monash University •Deakin University •The University of Newcastle •Edith Cowan University •Griffith University •Queensland University of Technology •The University of Sydney •The University of New South Wales •La Trobe University •University of Wollongong •Victorian Arts Centre Trust •State Theatre Company of South Australia •Performing Arts Heritage Network of Museums Australia •Association of Performing Arts Collections 	—Software Engineering —Ortelia 3D Modelling	TBA
Charles Darwin University	A living archive of Australian Indigenous languages LE120100016	Prof Michael Christie	<ul style="list-style-type: none"> •The Australian National University •NT Department of Education and Children's Services 	—Living Archive of Aboriginal Languages	Item available
Charles Darwin University	A Living Archive of Aboriginal Languages - Stage II LE140100063	Prof Michael Christie	<ul style="list-style-type: none"> •NT Department of Education and Children's Services •Northern Territory Library •Catholic Education Office of NT 	—Living Archive of Aboriginal Languages	Item available
Australian National University	Networked knowledge for repatriation communities LE170100017	A/Prof Cressida Fforde	<ul style="list-style-type: none"> •The Australian National University •The Flinders University of South Australia •The University of Melbourne •University of Tasmania •Australian Institute of Aboriginal and Torres Strait Islander Studies •National Museum of Australia •University of Otago, NZ •Association on American Indian Affairs •University of Amsterdam, Netherlands •University of Cologne •Kimberley Aboriginal Law and Culture Centre •Aboriginal Corporation •Ngarrindjeri Regional Authority Inc. •Gur A Baradharaw Kod Torres Strait Sea and Land Council Torres •Strait Islander Corporation •Department of Communication and the 	—Computer hardware for KALACC, GBK and NRA	TBA

			Arts		
University of Adelaide	An Australian Housing Condition Data Infrastructure LE160100056	A/Prof Emma Baker	<ul style="list-style-type: none"> • RMIT University • University of South Australia • The University of Melbourne • Swinburne University of Technology • The University of New South Wales 	–Data Infrastructure	Item Available
University of Adelaide	A regional optical dating facility in Australia LE170100177	Dr Lee Arnold	<ul style="list-style-type: none"> • The University of Adelaide • The Flinders University of South Australia • South Australian Museum • Department of Environment Water and Natural Resources • Defence Science and Technology Organisation 	<ul style="list-style-type: none"> –2 x luminescence readers (Risø TL/OSL readers with single-grain OSL modules) –Low-level beta multicounter system (Risø GM-25-5) 	Item Not Available

ATTACHMENT C: Select National and International Models

Extracted from *PLATFORMS FOR HASS* submission prepared for the Department of Education and Training, August 2017

Population Health Research Network (PHRN)

Proposition	Infrastructure	Organisations	Communities	International
Processing & Analysis	Interoperability and domain informatics Research tools Facility network	University of Western Australia (lead)	Research Industry	IPDLN Farr Institute

- > [NCRIS governance and finance](#)
- > Lead agency: University of Western Australia
- > Commonwealth investment: \$20M NCRIS, \$10M SS, \$3.09M CRIS, \$4.92M, \$4.36M, \$46.6M NCRIS
- > Total: \$46.6M (*Note: funding total goes past 2015 unlike the other NCRIS projects listed here where figures are drawn solely from Dept. E&T statements dated 2015*)
- > Funded: 2009 -

Platform as network

PHRN operates as a brokerage and provides critical national coordination. This national network includes state based units that undertake secure data linkage to support research.

Community of practice (research and data collection)

PHRN provides specialised data curation services that support data integration and analysis.

Atlas of Living Australia (ALA)

Proposition	Infrastructure	Organisations	Communities	International
Data Access	Discovery platform Interoperability and domain informatics	CSIRO (lead)	Research Collecting Citizens	GBIF

- > [NCRIS governance and finance](#)
- > Lead agency: CSIRO
- > Commonwealth investment: \$8.5M NCRIS, \$30M SSI, \$2.8M CRIS, \$5.7M NCRIS. Total: \$47M
- > Funded: 2013 -

Platform as network

ALA infrastructure operates as a brokerage in a complex network of co-contributors and provides a critical national bridging platform. The brokering and bridging characteristics (pulling effort collectively together into a service node) affords national infrastructure system efficiencies through increased interoperability, data availability, collaborative and co-investment.

Community of practice (research and data collection)

The priority for ALA is service of data and technology driven scientific research. Collaboration (in partnership with the collecting sector) has enabled co-contribution through citizen science and transcription programmes.

Bioplatforms Australia (BPA)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Discovery platform Interoperability and domain informatics Research tools Facility network	Bioplatforms Australia Ltd	Research Industry	Cancer Moonshot

NCRIS governance and finance

- > Lead agency: Bioplatforms Australia Ltd
- > Commonwealth investment: \$51M NCRIS, \$50M SSI, \$4.5M CRIS, \$20.9M NCRIS. Total: \$126.4M
- > Funded: 2013 -

Facility (as network of platforms and centres)

BPA infrastructure operates as a brokerage in a complex network of co-contributors and provides critical national coordination. This network also includes facilities undertaking bioscientific and genetic data collection related to research specialisms.

Community of practice (research and data collection)

BPA infrastructure provides research specific technologies to support data processing and analysis and opportunities for collaborative research and offers training.

Trove

Proposition	Infrastructure	Organisations	Communities	International
Data Access	Discovery platform Interoperability informatics	National Library of Australia (lead)	Research Collecting Citizens	DigitalNZ Europeana Digital Public Library of America

In addition to providing discovery and data access services Trove operates as a brokerage in a complex network of large and small co-contributors and provides a national bridging platform for the humanities. The brokering and bridging characteristics afford national infrastructure system efficiencies through increased interoperability, data availability and collaboration. It also provides a shared long term digital repository for collaborative digitisation. Trove provides discovery and data access services for a sub-group of HASS and science

researchers seeking to use cultural heritage data, particularly written historical accounts, as an input to their research.

Platform as community of practice (research and data collection)

Trove is based in the public sector and the API meets in part the needs of data and technology driven HASS researchers (academic and citizen). Co-contribution is enabled through partnerships with other collecting organisations (e.g. contribution of data to a single platform and collaborative digitisation of newspapers) and the public transcription programme.

[Australian Data Archive \(ADA\)](#)

Proposition	Infrastructure	Organisations	Communities	International
Data Access	Discovery platform Interoperability and domain informatics	Australian National University (lead)	Research Public	CESSDA

Platform as network

ADA has a long history of institutional support and established links nationally and internationally to broker researcher access to data in social science data archives and government agencies.

Platform as community of practice (research and data collection)

ADA is a domain focused archive based in the research sector and provides data curation and access services for a sub-group of HASS researchers seeking to deposit and reuse social science data as an input to their research.

[CLARIAH \(Common Lab Infrastructure for the Arts and Humanities\)](#)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Interoperability and domain informatics Research tools Facility network	<i>Lead: university Partners: universities, GLAM, eResearch capability for data</i>	Research Collecting	DARIAH CLARIN

[CLARIAH Proposal](#)

Facility (as network of platforms and centres)

[CLARIAH](#) was created by consolidating existing infrastructure around language based research in HASS in the Netherlands and leveraging [research technologies](#) already developed. Australian equivalents of this type of existing infrastructure are: PARADISEC (and the Centre of Excellence in the Dynamics of Language) and Alveo virtual laboratory (which holds the Australian National Corpus in the corpus collection and data processing and analysis tools).

Platform as community of practice (research and data collection)

CLARIAH community of practice broadened to include more universities and heritage and public institutions, including parliament and university libraries as [partners](#). The [domain focus](#) for CLARIAH is: linguistics, socio-economic history and media studies and the infrastructure investment focus is on common data types, sustainable and long term data management, and sharing expertise and technologies (see [work packages](#)). A [joint CLARIN-Europeana initiative](#) is aimed at establishing Europeana as Digital Service Infrastructure.

ODISSEI (Open Data Infrastructure for Social Science and Economic Innovations)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Interoperability and domain informatics Research tools Facility network	<i>Partners: universities, public sector research, eResearch capability for data (DANS)</i>	Research Public	CESSDA SHARE ESS GGP SERISS

ODISSEI proposal

Facility (as network of platforms and centres)

ODISSEI builds upon a preexisting consortium of multiple research organisations from across the university and public sector. The major aim of that consortium (and ODISSEI) is to increase infrastructure system efficiencies (reduce fragmentation and overlap) and coordinate effort. Australian equivalents of this infrastructure in universities are: ADA and longitudinal surveys and datasets such as HILDA, LSAY and ALSA and public federal research agency equivalents would be: ABS, AIHW, and the departments of Social Services and Education.

Platform as community of practice (research and data collection)

A shared aim in ODISSEI that operates across jurisdictions in the Netherlands is to draw the efforts of research more closely to feeding into social policy directions and outcomes. From a practices perspective the coordination of effort is designed to leverage more effectively the data and expertise in that community and share common infrastructure such as [surveys and panels](#).

DARIAH (Digital Research Infrastructure for the Arts and Humanities)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Research tools Facility network	Pan-European (led by France)	Research Collecting	<i>[via DESIR project seeks Australian links]</i>

Social & Cultural Innovation (ESFRI, p45)

- > ESFRI Roadmap entry: 2006
- > Preparation phase: 2008-2011
- > Construction phase: 2014-2018
- > Operation start: 2019
- > Legal status: ERIC, 2014
- > Capital value: 4,3 M€
- > Operation: 0,6 M€/year
- > HQ: [Huma-Num](#) (Paris, France)

Facility (as network of platforms and centres)

DARIAH is a network of facilities, expertise and technologies in support of arts and humanities research. DARIAH uses working group models to address shared challenges, e.g. research methods and provenance, shares technologies, scholarly communication platforms and state of the art practices, runs event and training programmes, and undertakes advocacy.

Platform as community of practice (research and data collection)

New initiatives indicate the move to build on relationships already established via the DARIAH community and extend working relationships to establish stronger data management practices, partner with the cultural heritage sector, scale up research infrastructure, and expand international links globally. The DESIR project involves a move to consolidate data management practices and infrastructure (see DESIR [Data Management Plan](#)); partner with EU cultural heritage initiatives e.g. Europeana and [PARTHENOS](#), establish the [Humanities at Scale](#) initiative and undertake liaison in other parts of the world (including Australia).

[CLARIN \(European Research Infrastructure for Language Resources and Technology\)](#)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Interoperability and domain informatics Research tools Facility network	Pan-European (led by the Netherlands)	Research Collecting	<i>[UK & US links]</i>

- > [Social & Cultural Innovation](#) (ESFRI, p45)
- > ESFRI Roadmap entry: 2006
- > Preparation phase: 2008-2011
- > Construction phase: 2011-2015
- > Operation start: 2012
- > Legal status: ERIC, 2012
- > Capital value: Not Available
- > Operation: 12 M€year
- > HQ: Utrecht University, Utrecht, Netherlands

Facility (as network of platforms and centres)

CLARIN in this phase of its development is aimed at consolidating data and technical infrastructure and increasing their availability. See CLARIAH.

Platform as community of practice (research and data collection)

CLARIN is focused around language related data as a “carrier of cultural content” in research and heavy emphasis is placed on the impact of stronger skills in data science having an impact on research. See CLARIAH.

[European Time Machine/s](#)

Proposition	Infrastructure	Organisations	Communities	International
Data Access Processing & Analysis	Research tools Facility network	EPFL 162 partners in 48 countries	Research Industry	FET Flagship

The [Venice Time Machine project](#) runs 2012-2024 ([European Commission](#)) and is funded as via READ Horizon 2020 - €8.2 million (7 project partners).

- > Phase I (2012-2016): Time Machine prototype
- > Phase 2 (2016-2020): EU university network
- > Phase 3 (2020-2024): EU city extension

The “Venice Time Machine” model has proved a significant and viable big humanities research platform, such that city based city based Time Machines have been launched as new research platforms, ahead of the proposal to secure EU FET Flagship funding (Amsterdam, Paris, Dresden, Nuremberg, Jerusalem, Budapest, Naples). [EPFL press release](#) on FET Flagship.

The proposed extension of the Venice Time Machine into an FET Flagship involves the replication and extension of the Time Machine model. The intention is to draw from the existing digital heritage data banks (~2000 years) and advanced informatics developed, to further interpret, inference, and simulate cultural knowledge, and to reconstruct the past using, using artificial intelligence and machine learning (where the documentary records of early civilisation are sparse e.g. BCE). “Research and deployment of these components can be envisioned as a collective European effort, creating a distributed infrastructure that could support the creation of “Big Data of the Past” beyond the Venetian example.” [Venice Time Machine Flagship \(European Commission\)](#). The proposed European Time Machine/s FET Flagship (€1 billion in funding over ten years for large-scale research initiatives) has extensive European coverage and collaboration with multiple research infrastructures, programs, universities and cultural institutions:

- > International: IIF Consortium, 15cBOOKTRADE, Fragmentarium, FRIDA
- > EU: Europa Nostra, Europeana, Archives Portal Europe, DARIAH, EuroSDR, ICARUS, CERL, READ, EAUH, E-RIHS, PostData,
- > National: CLARIAH, Golden Agents, CREATE
- > Institutional: MAPIRE

Facility (as network of platforms and centres)

The European Time Machine/s research platforms (including the Venice Time Machine) operate (pre or post FET Flagship funding) as a network of peers and co-contributors, providing pan-EU and international coordination of a complex ecosystem of domain specific research and data infrastructures that support humanities and arts research. The network includes facilities undertaking diverse types of humanities and arts research requiring a range of heritage data collection, advanced informatics and visualisation tools for data analysis.

Platforms as communities of practice (research and data collection)

The distributed Time Machines operate as large scale simulators as nodes in a network that support research investigations into 2000 years of European history. The Time Machines provide research specific technologies to support data processing and analysis and opportunities for collaborative research and training. Data is drawn from co-located heritage collections into research infrastructure, and enhanced with advanced informatics to enable research computation.

[The ‘time machine’ reconstructing ancient Venice’s social networks](#), 14 June 2017, *Nature*, Alison Abbott.