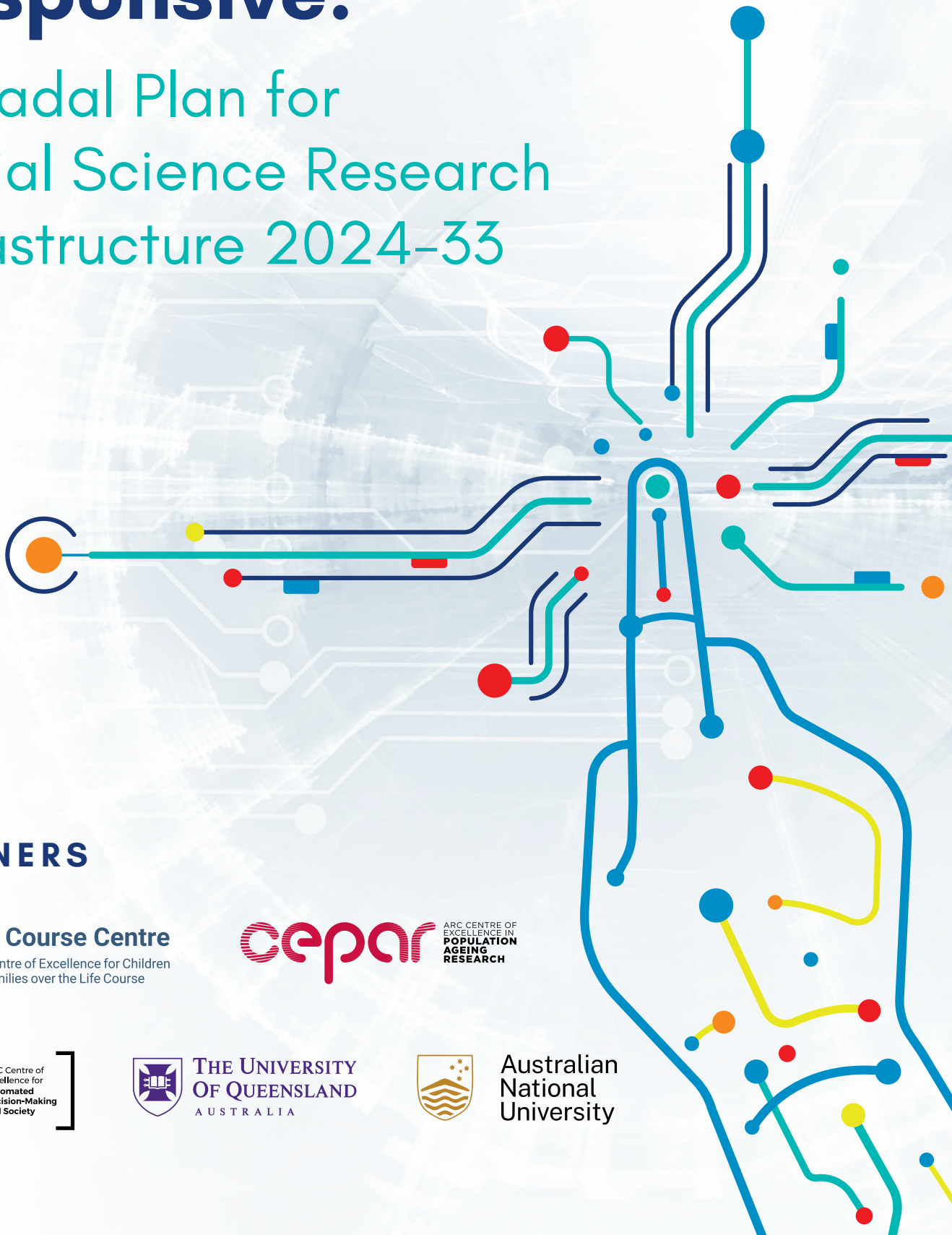
ACADEMY OF THE SOCIAL SCIENCES IN AUSTRALIA

Connected, Innovative and Responsive:

Decadal Plan for Social Science Research Infrastructure 2024-33



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About this publication

The Academy's *Decadal Plan for Social Science Research Infrastructure 2024-33* seeks to build sector-wide consensus around the research data and analytics capabilities, resources and infrastructures that social science researchers will need, over the next 10 years, to stay responsive to emerging social and research challenges, while taking advantage of the unfolding transformations in digital technologies. This project has been led by the Academy of the Social Sciences in Australia (the Academy) with support from the ANU Centre for Social Research and Methods (CSRM), the ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S), the ARC Centre of Excellence for Children and Families over the Life Course (Life Course Centre), the ARC Centre of Excellence in Population Ageing Research (CEPAR) and the UQ Institute for Social Science Research (ISSR).

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Contents

Executive summary

The *Decadal Plan for Social Science Research Infrastructure 2024-33* is a forward-looking blueprint for transforming Australia's social science research infrastructure over the coming decade, so it can effectively support researchers working at the forefront of their fields and equip the social sciences to address Australia's most pressing and evolving societal challenges.

This Plan is intended to guide and shape the collaborative efforts of those involved in the development, maintenance and use of social science research infrastructure. From individual researchers and research teams, to data and analytics organisations, universities, government departments and agencies, community organisations and socially-oriented businesses.

The Plan is structured around the following elements:

- **three goals,** representing the sector's vision for social science research infrastructure by 2033 (see table 'At a glance', on the right)
- **nine priority actions,** for the social sciences research sector to champion towards the stated goals and vision (see 'At a glance')
- **five decision-making principles,** to ensure future investments in social science research infrastructure meet the evolving needs of the sector and Australian society (listed overleaf).

A central element of this Decadal Plan is the vision of establishing a coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS). The ARIESS would crystallise the sector's aspirations for a well connected network of capabilities, where available assets and services are highly visible, affordable, accessible and governed through standardised, transparent protocols and processes. Importantly, the ARIESS would comprise systems and governance mechanisms that allow for the safe and ethical use of human and culturally sensitive data in social science research, and which effectively support Aboriginal and Torres Strait Islander peoples self-determination around the use of Indigenous Data.

The goals, priority actions and principles in this Decadal Plan are firmly grounded on a thorough and collaborative process, which involved:

- the mapping of current infrastructure strengths and gaps, documented in the *Stocktake of Social Science Research Infrastructure*
- the release of a discussion paper, followed by a four-week stakeholder consultation process
- further validation of infrastructure strengths and gaps, through real-world use cases on cutting-edge social science research, documented in the section 'Infrastructure for what? Understanding the demands of contemporary research'
- oversight by over 100 experts comprising the Plan's Steering Group and Expert Working Group.

The Academy extends a warm invitation to all members of the social science research community, data and analytics organisations, universities, government departments and agencies, community organisations and socially-oriented businesses to engage with this Decadal Plan, to embrace and champion its goals and to collaborate in shaping a more dynamic, responsive and globally competitive Australian social science research sector.

At a glance: Decadal Plan goals and priority actions

Goals	Priority actions
1. **A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS),** connecting existing and emerging capabilities to create a cohesive and functional infrastructure ecosystem, which caters to the rich tapestry of disciplines, methodologies and communities within the social sciences, and supports the goals and aspirations of Aboriginal and Torres Strait Islander peoples.	1.1. Engage and mobilise key stakeholders from the research, government, community and business sectors in the design, implementation, and review of initiatives shaping the ARIESS. 1.2. Take decisive steps to embed Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS) and Indigenous Cultural and Intellectual Property (ICIP) goals and aspirations across the ARIESS, in line with the *Maiam nayri Wingara Principles* and Australia's *National Agreement on Closing the Gap*. 1.3. Establish mechanisms for sectoral cooperation at the national level, to collectively develop or acquire strategic data and analytics assets necessary to tackle urgent national challenges. 1.4. Formulate a comprehensive and coordinated sectoral response to Artificial Intelligence and other emerging technologies, across the various components of the ARIESS.
2. **Social science data and analytics are easily found and reused by researchers nationwide,** in ways that maximise the value of existing assets and infrastructures and allow urgent research questions and societal challenges to be addressed by researchers.	2.1. Develop and implement a suite of technical standards to underpin the national architecture of the ARIESS, including: *National Standards for Social Science Research Data and Metadata*, a *National Framework for the Use of Human and Culturally Sensitive Data in Research* and a set of *Social Science Research Vocabularies*. 2.2. Foster a national commitment, by social science disciplines and supporting university institutions, to share research assets created through publicly-funded research and research infrastructure, such as data, research software, code, workflows, vocabularies and training materials; and to implement the necessary steps and mechanisms to enable such sharing. 2.3. Establish national capabilities to securely and ethically handle human and culturally sensitive data, specifically catering to the needs of the social sciences research sector.
3. **Robust investment in research capabilities and infrastructure delivers a globally competitive sector,** comprising world-class assets, instruments and a workforce with the skills and supports necessary to harness current and emerging technologies.	3.1. Build a suite of national observation instruments for social science research—and accompanying storage and computational capabilities—to leverage the growing volume of digital social data for driving innovations in social science and policy. 3.2. Advocate for new research funding streams to support the envisaged digital transformation of the social science research sector and corresponding upskilling of its research workforce. These funding streams should target critical needs not covered by existing research and research infrastructure funding streams, such as the *National Collaborative Research Infrastructure Strategy* (NCRIS) or the Australian Research Council's Discovery, Linkage, or Linkage Infrastructure, Equipment, and Facilities (LIEF) grants.

Five principles for fit-for-purpose social science research infrastructure

01

Design for diversity

Engage researchers from a diverse range of social science disciplines, sectors and technical skill levels in the design, implementation and review of initiatives shaping the ARIESS. Social science disciplinary and professional associations, major social research centres, universities and disciplinary peak bodies, including the Academy of the Social Sciences in Australia, play pivotal roles as advocates and conduits to ensure comprehensive representation from across all corners of the sector.

02

First Nations-led

Prioritise Aboriginal and Torres Strait Islander peoples' self-determination in social science research infrastructure planning, by engaging Indigenous Data Sovereignty (IDS), Indigenous Data Governance (IDG) and Indigenous Cultural and Intellectual Property (ICIP) experts at the earliest stages and highest levels of decision-making for research infrastructure design, investments and policy.

03

Streamline ethical and responsible research

Invest in robust systems for secure and ethical sharing of human and culturally sensitive data, which cut through complex regulatory frameworks, align with evolving social licence expectations and Indigenous Data Sovereignty (IDG) mandates and reduce time and cost burdens on researchers.

04

Open to partners and community

Ensure that the benefits from research infrastructure extend to research partners and the broader community, in line with the *FAIR Principles for scientific data management and stewardship* (Findable, Accessible, Interoperable, Reusable) and Australia's data-related commitments under the *National Agreement on Closing the Gap*.

05

Enable equitable access

Publicly funded infrastructure operates on business and delivery models that offer affordable access options to researchers at all levels and to projects of all sizes, including for exploratory research and training purposes. Additional capacity for training, in particular, is essential for enhancing digital literacy and infrastructure usage. Costs and resources are allocated based on principles of transparency, equity, innovation and impact.

Introduction
Setting the course for the next decade

This section provides an overview of Australia's current social science research infrastructure landscape. It examines existing strengths and challenges across key areas and articulates the sector's overarching goals for targeted, impactful and cost-effective research infrastructure developments over the next decade.

IN THIS SECTION

- Current state
- Goals.

Current state

A preliminary *Stocktake of Social Science Research Infrastructure* identified over 800 individual capabilities—both mature and emerging—under the stewardship of over 60 different organisations. This includes a number of areas where Australia has developed significant advantages in social science research infrastructure over the years:

Indigenous Data Sovereignty

With leadership from Aboriginal and Torres Strait Islander scholars and communities, through organisations such as the *Australian Institute of Aboriginal and Torres Strait Islander Studies* (AIATSIS), the *Maiam nayri Wingara Indigenous Data Sovereignty Collective* and the *Lowitja Institute*, and initiatives such as the *Improving Indigenous Research Capabilities* project, Australia stands at the forefront of global Indigenous Data Sovereignty efforts. These organisations and individuals are paving the way for the establishment of operational principles to ensure respectful use of *Indigenous data* in research and, importantly, in research about Aboriginal and Torres Strait Islander peoples.

> Indigenous data has been defined as *information or knowledge, in any format or medium, which is about and may affect Indigenous peoples both collectively and individually.*

Embedding data sovereignty principles into research infrastructures and methodologies is crucial for Australian research. Historically, Indigenous data has been collected, used and stored by non-Indigenous researchers in ways that have lacked consideration for Aboriginal and Torres Strait Islander data rights or the needs and priorities of individuals and communities. Such practices have perpetuated the historical marginalisation of Aboriginal and Torres Strait Islander peoples, hindered recognition of traditional knowledges and allowed for research that disproportionately focuses on deficits rather than strengths, resulting in continued harm to these communities.

The progress achieved by these leading Aboriginal and Torres Strait Islander organisations can set a precedent for the incorporation of best-practice data governance for other minorities and vulnerable groups, and ultimately foster a fairer and more positive use of human and culturally sensitive data in our society. Moving forward, it's essential to prioritise robust and continued support for all Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS) and Indigenous Cultural and Intellectual Property (ICIP) initiatives.

Linked and longitudinal national assets

Since the 1960s, a number of Australian institutions have invested in the sustained development of whole-of-population and population-representative enduring linked data assets. These assets include integrated public-sector administrative data collected by state, territory and Commonwealth agencies, such as the *Person Level Integrated Data Asset* (PLIDA) and the *Business Longitudinal Analysis Data Environment* (BLADE) hosted by the Australian Bureau of Statistics (ABS), the recent *National Disability Data Asset* (NDAA) and a broad suite of social longitudinal studies, such as the Department of Social Services' *Household, Income and Labour Dynamics in Australia* (HILDA) Survey and the *Longitudinal Study of Indigenous Children* (LSIC).

There are also world-class, freely available academic national social surveys going back up to 40 years, including the *Australian Survey of Social Attitudes* (AuSSA) by the Australian Consortium for Social and Political Research Incorporated (ACSPRI) and the

Dr Luke Hendrickson, Program Manager of Data Integration Services at the Australian Bureau of Statistics, presents on the future of integrated data assets. Photo: ABS.

cross-university Australian Election Study. Since 1981, the Australian National University has operated the Australian Data Archive (ADA), a digital repository to preserve social, political and economic data, and make it available for social science research nationwide.

These assets and infrastructures are embedded in global international research programs and enable Australian social scientists to participate in and drive the development of new knowledge and research methodologies at the forefront of their fields. Australia's linked and longitudinal data assets, in particular, facilitate crucial research on policy impacts, government programs, social inequality drivers and wellbeing determinants. In doing so, they support Australia's economic prosperity, security, sustainability, democracy and quality of life. They also attract international researchers and doctoral students interested in using these resources, with an annual growth of 30 per cent in research demand for PLIDA alone. The importance of these national data assets will only grow over time, as they continue to expand and become increasingly interconnected and sophisticated.

Australia's high quality public data assets are accompanied by world-class governance, legislative and infrastructure environments that support *FAIR Principles* (Findable, Accessible, Interoperable and Reusable). The Office of the National Data Commissioner's (ONDC) Dataplace is Australia's new national digital platform supporting access to public sector data, data sharing across government agencies and organisational accreditation. New initiatives also include the Australian National Data Integration Infrastructure (ANDII) to link data assets across Commonwealth, state and local governments, a $16.4 million investment in a new longitudinal *Life Course Data Asset* and upcoming legislation to enable unique person identifiers. While these advancements are primarily taking place at the Commonwealth level, it is vital for the social science research sector to prepare to leverage these emerging capabilities, for example, by building national research infrastructure to affordably access these assets.

Civic and cultural collections

Australia enjoys a wealth of mature civic, cultural and historic collections, made possible through ongoing investments, curation and preservation efforts by a variety of organisations across the GLAM (galleries, libraries, archives and museums), government, community and research sectors. Notable examples include the National Library of Australia and its search portal Trove, the Analysis & Policy Observatory (APO), the Australasian Legal Information Institute (AustLII) and the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC).

Evolving alongside them are a suite of new generation capabilities designed to capture and analyse the various aspects of modern-day digital lives. These include innovative social data labs such as ANU's Virtual Observatory for the Study of Online Networks (VOSON Lab) and QUT's Australian Digital Observatory (ADO); and forthcoming capabilities, such as the Australian Internet Observatory (AIO) being developed by researchers at the ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) and the longitudinal data asset *Australian Children of a Digital Age* (ACODA) by the ARC Centre of Excellence for the Digital Child.

Together, these collections provide a unique window into what people think, say and publish about society, underpinning critical research into areas such as social cohesion, the spread of ideas through social media, or the organisation of political movements. These collections and tools allow researchers and members of the public alike to understand, contextualise and revisit our history as a society. The next decade presents opportunities to integrate Artificial Intelligence (AI), automation and other advanced technologies to uplift qualitative and quantitative methods in these areas, through improvements in quality, efficiency and impact.

Advanced modelling for sustainable cities, environment and infrastructure

Australia's social science research sector enjoys state-of-the-art analytics capabilities to simulate the complex, dynamic interactions of systems and agents over time. Notable examples of such capabilities include the *Australian Urban Health Indicators* and *Australian Transport Research Cloud* by the Australian Urban Research Infrastructure Network (AURIN), or the *Housing Analytics Workbench Tools* and *Colouring Cities* by the Australian Housing Data Analytics Platform (AHDAP).

These capabilities underscore an important and expanding role of university research in society—the use of social science to elevate the quality of decision-making in government, industry and community—and demonstrate the potential of interdisciplinary research for tackling urgent challenges such as climate change. Over the next years, these and similar capabilities will need to expand in order to address new challenges, and to increase the number and scale of research collaborations with industry, government and community.

Responding to Artificial Intelligence

In recent years, AI has crossed a performance threshold that is enabling transformative applications across numerous aspects of our work and lives. This has vast potential to revolutionise research across all fields, especially in the social sciences.

Some of the areas we can expect AI to significantly uplift social science research capabilities and infrastructure include:

- autonomous hypothesis generation and testing in social science analytics labs
- performing smart queries over linked and longitudinal data assets (capable of discerning contextual nuances, relationships and patterns within the data)
- leveraging synthetic data to enrich and diversify datasets, towards greater breadth and inclusivity in social science research
- consolidating disparate data assets from the myriad research projects, amassed over decades and stored across various university repositories, into a cohesive and intelligent data corpus.

However, the timing and magnitude of future AI developments remain highly uncertain. As we plan ahead, a prudent approach is to focus on those infrastructure improvements that are imperative, irrespective of AI's influence—those enhancements identified as essential to elevate the quality and impact of Australian social science research—while simultaneously exploring how to navigate the opportunities and challenges that AI brings to these areas. This approach can help social science researchers and research organisations to allocate their efforts and resources effectively, while staying responsive to the evolving technological landscape.

Connect and expand

Research infrastructures are the backbone of the dynamic and progressive social science research sector we enjoy today, and provide the groundwork for realising the vision of a cohesive and thriving Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS).

As we chart the course for the next decade, this Decadal Plan seeks to amplify existing capabilities, ensure they are readily accessible to a broader spectrum of researchers, and ultimately serve as the catalysts for tangible advancements in public policy, education, justice, health and wellbeing for all Australians.

Goals

Social science researchers and infrastructure leaders from across the country came together to define three goals for the next decade:

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

Over the next 10 years, our goal is to consolidate an Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS). This involves the progressive integration of new and existing capabilities, including those identified in the *Stocktake of Social Science Research Infrastructure*, into a well-integrated, functional whole.

It's essential that this consolidation process is inclusive: welcoming all parts of the sector, diverse research methodologies and communities and, importantly, that it includes Aboriginal and Torres Strait Islander researchers and research infrastructure leads. We will achieve the desired level of collaboration and inclusivity by prioritising investments that improve connectivity, amplify the impact of existing and emerging infrastructure, and pursue benefits for the broadest range of social science disciplines and researchers.

GOAL #2

Social science data and analytics are easily found and reused

The second focus area is optimising and maximising the use of shared research assets and infrastructures. Given the sector's substantial existing resources, comprising world-class capabilities available through research and government organisations, a focus of this Decadal Plan is enabling researchers to extract more value from available shared resources. This focus entails getting more researchers to use existing facilities and assets, along with the development of robust and culturally-appropriate data governance structures.

GOAL #3

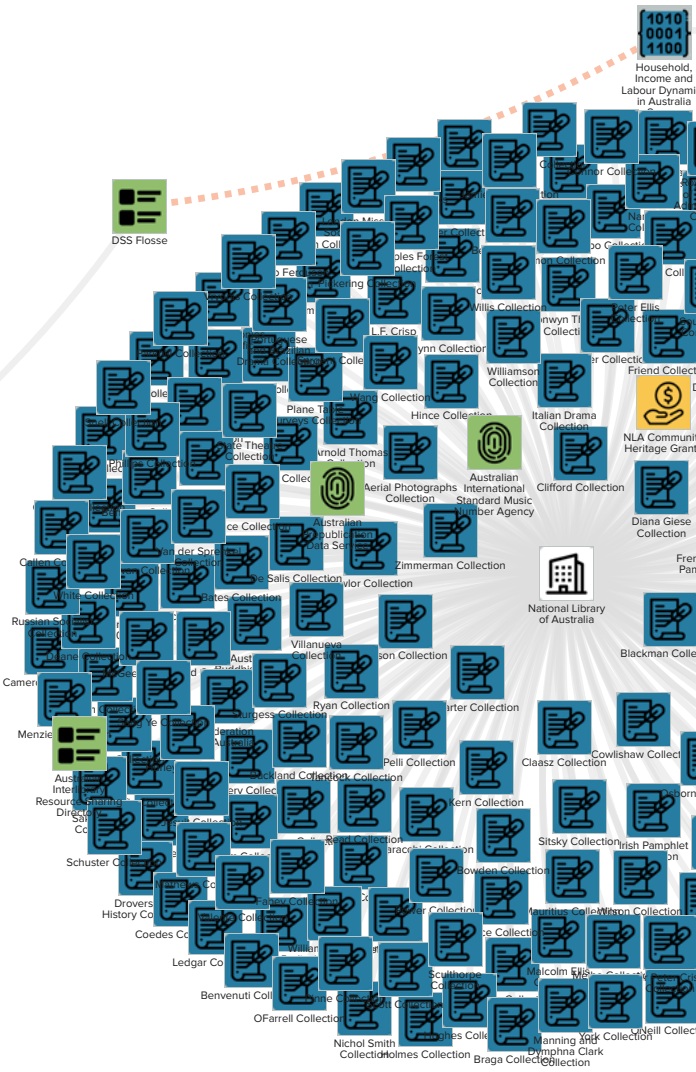
Robust investment in research capabilities and infrastructure delivers a globally competitive sector

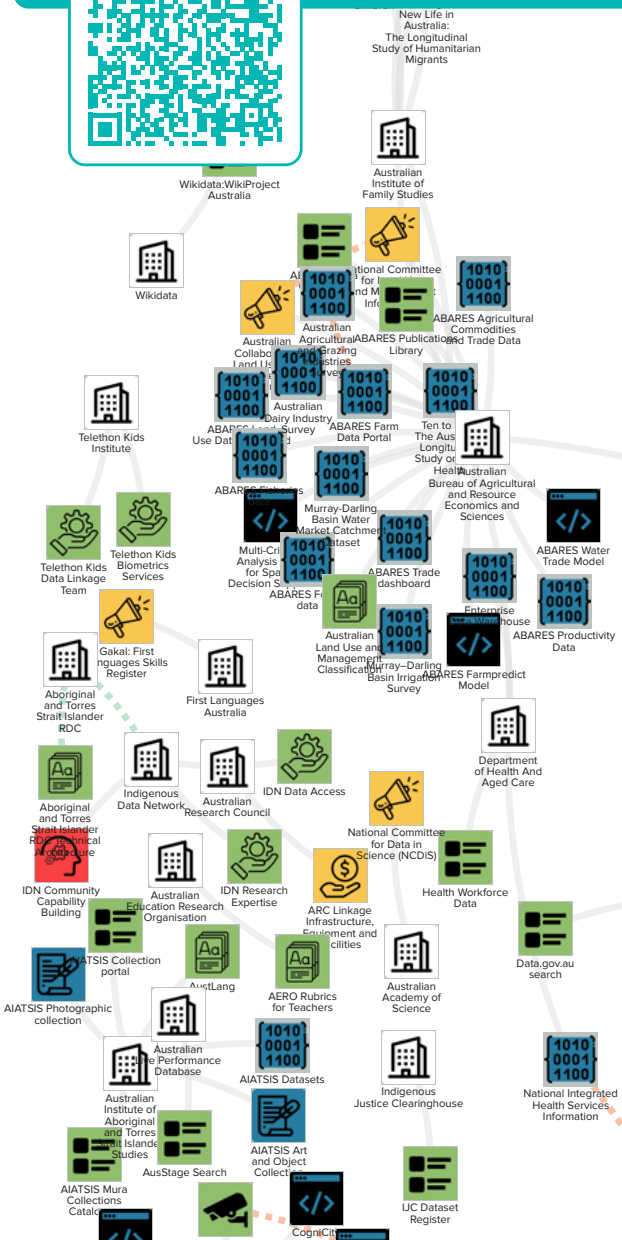
The third focus area involves cultivating a top-tier workforce and assets. This includes investing in and incentivising a skilled research workforce, as well as a specialised infrastructure workforce capable of leveraging opportunities presented by current and emerging technologies. Additionally, it entails developing or acquiring world-class assets and instruments to keep Australian social science ahead of emerging research trends and national challenges.

Starting strong

In crafting this Decadal Plan, the Academy and partners undertook a *Stocktake of Social Science Research Infrastructure*. So far, we have identified and mapped over 800 capabilities enhancing social science research—making it bigger, better and faster. This inventory covers a wide range of resources, from data collections, to modelling and analytics tools, to training and advocacy organisations. All capabilities identified are available to researchers across Australia, actively maintained, and stand ready for deployment in both current and future research projects.

These 800 capabilities serve as the foundational elements of the envisioned Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS). Our objective is to progressively bring together and integrate these capabilities over time, effectively addressing existing gaps and capitalising on emerging opportunities.





Digital technology offers a myriad of opportunities for learning and play, but also significant risks for young children. Gathering data from over 3,000 Australian families, the ACODA Longitudinal Study will identify 'hot spots' for investigation, provide crucial evidence for research into the opportunities and problems presented by digital technologies, and inform recommendations for policy and practice concerned with the wellbeing of young children. Photo: ARC Centre of Excellence for the Digital Child.

Infrastructure for what? Understanding the demands of contemporary research

In this section, we delve into real-world use cases, offering insight into the daily hurdles faced by social science researchers engaged in cutting-edge applied research and policy work. These cases provide a deeper understanding of the types of infrastructure assets and capabilities that could truly make a difference in advancing critical social science research agendas, from urgently needed data assets and analytics tools, to solutions to overcome technical, legal, or financial barriers hindering progress. The selected use cases and challenges presented in this section are indicative of the broader aspirations, gaps and challenges prevalent across the sector, and have been instrumental in informing the proposed 'Action plan'.

IN THIS SECTION

- Empowering Indigenous sovereignty
- Connecting the dots: The new social science of longitudinal and linked data
- The social sciences in the situation room: Analytics to navigate society's toughest challenges
- Harm and opportunity: Exploring the architecture of digital societies.

Empowering Indigenous sovereignty

Context

Across the world today, the wellbeing of First Nations peoples is increasingly connected to research infrastructures: collections have the potential to support cultural knowledge reproduction; access to data is crucial to self-determination; and respectful use and governance of Indigenous data are foundational to a society and research sector that uphold First Nation peoples' rights.

Both in Australia and globally, Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS) and Indigenous Cultural and Intellectual Property (ICIP) experts are steadily making progress: applying the respective nation-state Indigenous Data Sovereignty principles, along with the international *CARE Principles for Indigenous Data Governance* (Collective benefit, Authority to control, Responsibility and Ethics), into existing research infrastructures and codesigning new infrastructure. While this transformational work is theirs to lead, this Decadal Plan presents an opportunity for the social sciences sector to embrace the goals of the Australian Indigenous Data Sovereignty movement in shaping research infrastructure for the next decade.

> Some of the ideals for future national research infrastructure hold significant risk for Indigenous communities. Open data, interoperability [...] There is unquestioned acceptance and enthusiasm to reap the considerable benefits that can be gained, and insufficient awareness that the same benefits are unlikely to flow to First Peoples, but the risks will.
>
> **Distinguished Professor Emerita Maggie Walter PhD FASSA**

Members of the Maiam nayri Wingara Data Sovereignty Collective and the Australian Indigenous Governance Institute (AIGI), at the Global Indigenous Data Alliance, National Indigenous Data Sovereignty Summit in Cairns, 13 June 2023.
Photo: Maiam nayri Wingara Data Sovereignty Collective.

Directions

In Australia, several pivotal initiatives are underway, with a notable emphasis on establishing robust systems and governance structures, including:

- the Australian Public Service's forthcoming *APS-wide Framework for the Governance of Indigenous data*, a major step towards Indigenous Data Sovereignty in Australian public sector organisations, led by the National Indigenous Australians Agency (NIAA) and co-designed with Aboriginal and Torres Strait Islander data experts
- Yumi Sabe, a knowledge exchange platform developed by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), designed to enhance the accessibility, contestability and utility of research findings, specifically for the benefit of Aboriginal and Torres Strait Islander peoples
- the design of metadata tools and standards to annotate Indigenous data assets, led by ARDC's Improving Indigenous Research Capabilities initiative
- the establishment of a first-of-its-kind Indigenous Human Research Ethics Committee (HREC) to evaluate research proposals in health and medical fields, led by Lowitja Institute with funding from the National Health and Medical Research Council (NHMRC).

The Productivity Commission's *Closing the Gap Review*, released earlier this year, proposes significant steps to advance IDG, IDS and ICIP in Australia, particularly, in relation to 'Priority Reform Four: Shared Access to Data and Information at a Regional Level' of the National Agreement on Closing the Gap. This review encourages different levels of government to commit to tangible actions, including reforming data systems, investing in Indigenous data infrastructure and, notably, the establishment of an Indigenous-led Bureau of Indigenous Data (BoID), to support and oversee these changes. These recommendations align closely with IDG, IDS and ICIP priorities and aspirations and, as such, are supported by this Decadal Plan.

While the above and other crucial initiatives are underway, progress could be expedited with the right infrastructures in the research sector. Below, we identify immediate critical steps to accelerate the realisation of IDG, IDS and ICIP goals and aspirations.

Immediate needs

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

Strategic and regulatory policy

Support the integration of IDG, IDS and ICIP into Australia's research infrastructure policies and technical architectures. This involves advocating for the appointment of an Indigenous Data Commissioner, and for membership of IDG, IDS and ICIP experts in key forums, such as the Department of Education's National Research Infrastructure Advisory Group, and others. Collectively, aim to elevate the baseline for Aboriginal and Torres Strait Islander engagement from consultation and co-design, to Indigenous leadership.

Leadership

Ensure consistent integration of IDG, IDS, ICIP and the *CARE principles* within the research sector, by establishing national, standardised institutional processes applicable to all research work concerning or affecting Aboriginal and Torres Strait Islander peoples. These principles should be consistently applied throughout the research lifecycle, from conceptualisation to publication, demonstrating a clear commitment to researcher compliance and institutional accountability to Aboriginal and Torres Strait Islander peoples.

Leadership

Support the work of Aboriginal and Torres Strait Islander IDG, IDS and ICIP experts by establishing a central National Indigenous Reference Group, or similar mechanism. This group would proactively manage external requests for Aboriginal and Torres Strait Islander input from across the research and research infrastructure sectors, while actively engaging and collating views from diverse Aboriginal and Torres Strait Islander communities and organisations nationwide.

GOAL #2

Social science data and analytics are easily found and reused

Strategic and regulatory policy

A *National Framework for the Use of Human and Culturally Sensitive Data*, which provides mechanisms for Aboriginal and Torres Strait Islander peoples to control their data, including appropriate licensing categories and conditions, user-friendly data agreements and provisions for withdrawing data from shared repositories —acknowledging the complexity of balancing technical limitations with culturally safe practices.

Leadership

Establishing and sufficiently funding First Nations-led governance structures to oversee access to Indigenous data for research, whether data originate in government or university institutions, such as a First Nations-led and controlled entity accredited under the *DATA Scheme*.

Digital collections

Finding and appropriately annotating Indigenous data held in digital collections across university institutions and government agencies, as a first step towards Indigenous data visibility, discovery, access and control. Although tools for annotating Indigenous data are under development—such as Traditional Knowledge labels, Indigenous metadata guidelines and software—significant challenges persist due to the vast amount of undiscovered and uncatalogued data, and the difficulties in ensuring appropriate Indigenous leadership, cultural knowledge and governance oversight structures to support these activities.

Discovery tools

A unified national directory consolidating all Indigenous data assets available for research purposes (including assets from both government and university repositories), tailored to the needs of Aboriginal and Torres Strait Islander users.

Access management

Opening channels for Aboriginal and Torres Strait Islander communities to access Indigenous data held in university repositories.

Curation and stewardship

Data management systems allow Indigenous data owners or members of Aboriginal and Torres Strait Islander communities to add contextual information to datasets, where relevant, in support of more nuanced narratives about Aboriginal and Torres Strait Islander peoples—about their culture, communities, resilience, goals and successes.

GOAL #3

Robust investment in research capabilities and infrastructure delivers a globally competitive sector

Funding streams

Prioritising investment in research infrastructure to support Aboriginal and Torres Strait Islander research, capability-building, expertise and careers, consistently with 'Priority Reform Four: Shared Access to Data and Information at a Regional Level' of the *National Agreement on Closing the Gap*. This involves continuing funding for existing IDG, IDS and ICIP initiatives and organisations, supporting participation of experts in national and international forums, and providing financial support and mentorship to cultivate young or emerging Aboriginal and Torres Strait Islander leaders in these fields. Investing in young and emerging leaders promotes inclusivity, diversity and innovation, and provides an avenue for sustained self-determination and empowerment within Aboriginal and Torres Strait Islander communities.

Funding streams

Investing in infrastructures that simultaneously build capability for the research sector and for Aboriginal and Torres Strait Islander leaders, practitioners and community members. Examples might include infrastructures for citizen science, community curation of historical or orphaned data, community data digitisation and preservation, and community-accessible digital research skills training.

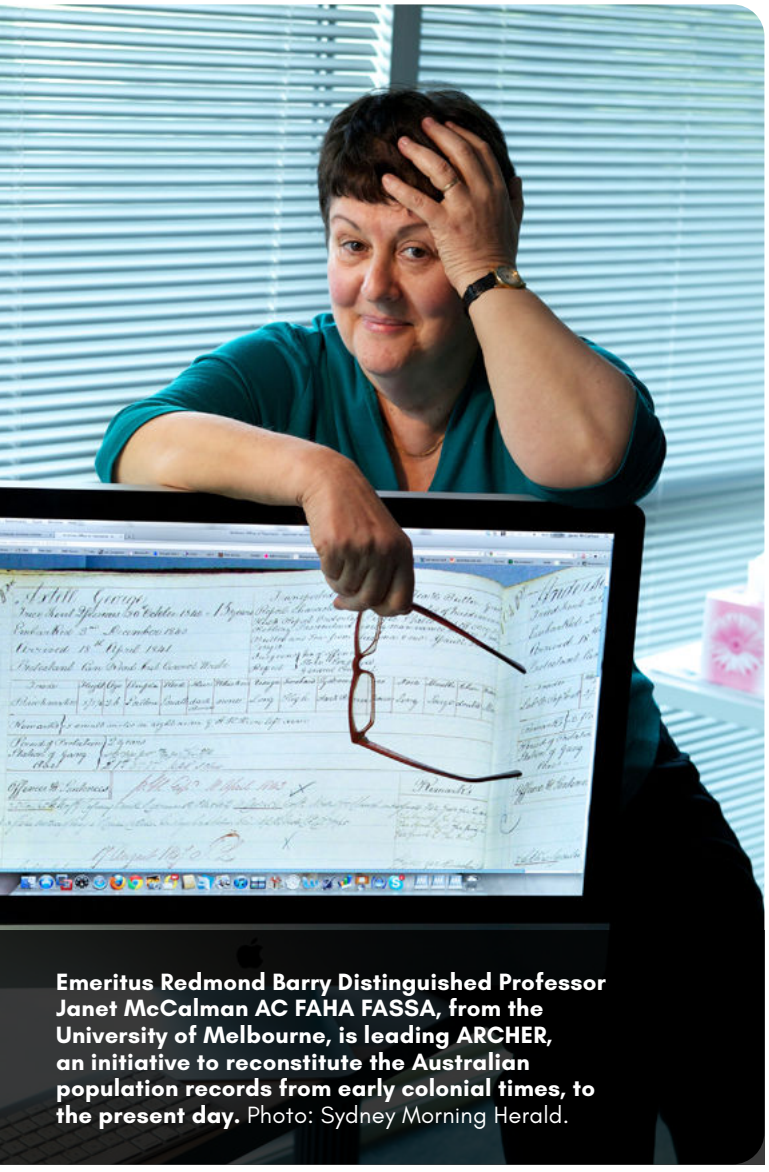
Skill development and training

Building the cultural competency of non-Indigenous researchers and research administrators, who are key enablers and practitioners in this space now and into the future.

Acknowledgement

This use case was written by non-Indigenous Academy staff members, with input and feedback from IDG and IDS experts in our Steering Group and Expert Working Group (see 'The Making of the Plan'). The aim of this piece is to integrate the interests of the Australian IDG, IDS and ICIP movements into the sector's plan for an Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS).

Connecting the dots: The new social science of longitudinal and linked data



Emeritus Redmond Barry Distinguished Professor Janet McCalman AC FAHA FASSA, from the University of Melbourne, is leading ARCHER, an initiative to reconstitute the Australian population records from early colonial times, to the present day. Photo: Sydney Morning Herald.

“

We would have a database of the Australian population, from early colonial times, all the way to the present, which could grow over time with linkages to many other datasets. In data terms, this would be the ultimate ‘big data’ infrastructure for social science research and for all Australians.

Emeritus Redmond Barry Distinguished Professor Janet McCalman AC FAHA FASSA, University of Melbourne

Context

Imagine immersing yourself in the intricate history of familial wealth. What societal factors influence the transfer of poverty or affluence across generations? How about the ebbs and flows of health across place and time? What tales of resilience and vulnerability could historical and present-day longitudinal data whisper, and how could we use this knowledge to address contemporary challenges?

In this digital age, social science researchers are increasingly able to match the depth of their inquiries with ever more expansive, fine-grained and multilayered social data, propelling social science disciplines into exciting new explanations for what determines human health, wellbeing and happiness. Game-changing initiatives like granting researchers access to present-day government administrative data, or the digitisation of national historical population records, are opening unprecedented opportunities to reshape our understanding of the threads weaving the societal fabric, and introduce innovative policies that break long-term cycles of disadvantage in education, public health, welfare, employment or migration. What research infrastructures will be essential to sustain and advance these new avenues of inquiry over the next decade?

Directions

Fostering competitive advantages in the use of linked and longitudinal data to study equity, health and wellbeing will require collaborative efforts from the government, university sector and research partners. The suggested approach situates Australian government population data and linkage capabilities at the centre, surrounded by a dynamic research sector and flexible research infrastructure, which plugs into those capabilities to unlock their potential. Achieving this vision requires investment in three areas:

- continuously maintaining and enhancing national datasets or 'the spine' (i.e. Census and associated linkage capabilities), which serve as the axis for the aggregation or integration of a growing network of data assets
- developing data access and computing infrastructure, where researchers and research partners, such as government agencies, can ethically and securely work with large-scale, human and culturally sensitive datasets, and connect them to the central spine to augment the depth and richness of analyses. Cutting-edge computing capabilities of this kind are already available in Australia (e.g. Australian Bureau of Statistics DataLab, Melbourne Institute Data Lab and Population Health Research Network's Secure Unified Research Environment), but existing organisations are facing challenges in keeping up with surging demand from the research sector (increasing in some cases by 30 per cent per year). Also, many researchers find access costs, skill requirements and capacity bottlenecks prohibitive. Building affordable, accessible, user-friendly infrastructure with capacity to meet growing demand from the research sector will be critical over the next decade
- ongoing renewal of data and associated infrastructure. The envisioned network of data is not a set-and-forget exercise. Regular investments will be necessary to refresh data assets and maintain effective connections to the spine; either to address new social challenges or to keep advancing the frontiers of social science research.

Immediate needs

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

Leadership

Establishing an ongoing forum for social science researchers and research partners (government agencies, industry and communities) to periodically review research infrastructure priorities for the sector. This coordination effort could be facilitated through a *National Social Science Data and Analytics Roadmap*, which identifies critical data and analytics assets to address national challenges or advance social science disciplines. The roadmap would be reviewed every three to five years to ensure its relevance and effectiveness.

Leadership

Establishing a National Brokerage Facility to negotiate access to critical data and analytics assets currently impeded by technical, governance, legal, or financial barriers. The functions of such facility could include collective purchase of privately held data and analytics assets or licences, and the brokerage of data sharing agreements and partnerships. The main goal is to centralise brokerage expertise, minimise duplication of costs and efforts, and ensure any successes are collectively enjoyed across the nation.

GOAL #2

Social science data and analytics are easily found and reused

Technical tools and standards

Collaboratively develop and maintain national data standards for the social sciences to maximise the reusability of research data, including key vocabularies and a resilient geospatial referencing system. These standards should establish minimum requirements for all data assets, such as the use of persistent identifiers for places and people, definitions, basic demographic markers and contextual and provenance information.

Strategic and regulatory policy

Agreement, across university institutions nationwide, to share the value created through data linkage, such as any newly linked datasets, cleaned versions of datasets, definitions, or workflows; as well as agreement on the mechanisms and infrastructures required to enable such sharing.

Discovery tools

A single national directory to find and access social science research data, including human and culturally sensitive data, and combining assets held by the government, research sector and research partners.

Virtual desktop and HPC

Research infrastructure to securely and ethically access and analyse linked data, including human and culturally sensitive data. The optimal solution would provide access to linked data from the national spine, offer ample capacity to meet the research sector's needs—including for exploratory inquiries and training—and operate on an affordable, inclusive business model where access is not constrained by cost, but creates opportunities for all projects that showcase high levels of innovation or positive societal impact.

Strategic and regulatory policy

A national framework for the linkage of human and culturally sensitive data in social science research. The Office of the National Data Commissioner is working on streamlining researcher access to the national spine (through the *DATA Scheme*); the gap is for the research sector to work out an agreed approach to use and augment the spine for research, so data linkage is technically possible and ethically sound.

GOAL #3

Robust investment in research capabilities and infrastructure delivers a globally competitive sector

Data collection

Digitisation infrastructure, to accelerate the ingestion of data to extend the spine into the past (historical population records) or accelerate the creation of peripheral linked assets (from family or community archives). An ideal solution would involve:

- digitisation equipment in as many locations as possible across the country, potentially in partnership with university or public libraries. Include options to deploy in research partner organisations or regional and remote areas, such as in Aboriginal and Torres Strait Islander communities
- accessible by researchers as well as community (amateur historians, community archives, citizen science)
- standard protocols to facilitate preservation, reusability and linkage
- direct upload to a national shared repository for long-term preservation, which provides access to community, where relevant conditions are met.

Data collection

Data donation infrastructure (both hard and soft capabilities), to enable individuals to voluntarily contribute personal data for research use, in secure and ethical ways, including its deposit into shared research repositories for long-term preservation.

Skill development and training

Researcher training in advanced analytics to work with linked assets, from digital skills (programming, databases, data collection) to advanced analytics (statistics, network and geospatial analysis, machine learning). Training should be tailored to the social science data available to Australian researchers, and the research questions and methodologies specific to social science disciplines.

Funding streams

Dedicated funding streams for data and analytics work not covered by traditional research project grants, such as the additional work required to make data reusable, upgrade and maintain research software, develop and maintain standards and vocabularies, or produce and update training materials. Additional funding is also required to proactively develop nationally-significant assets, where these exceed the scope of research grants programs, such as for the establishment of new longitudinal data assets.

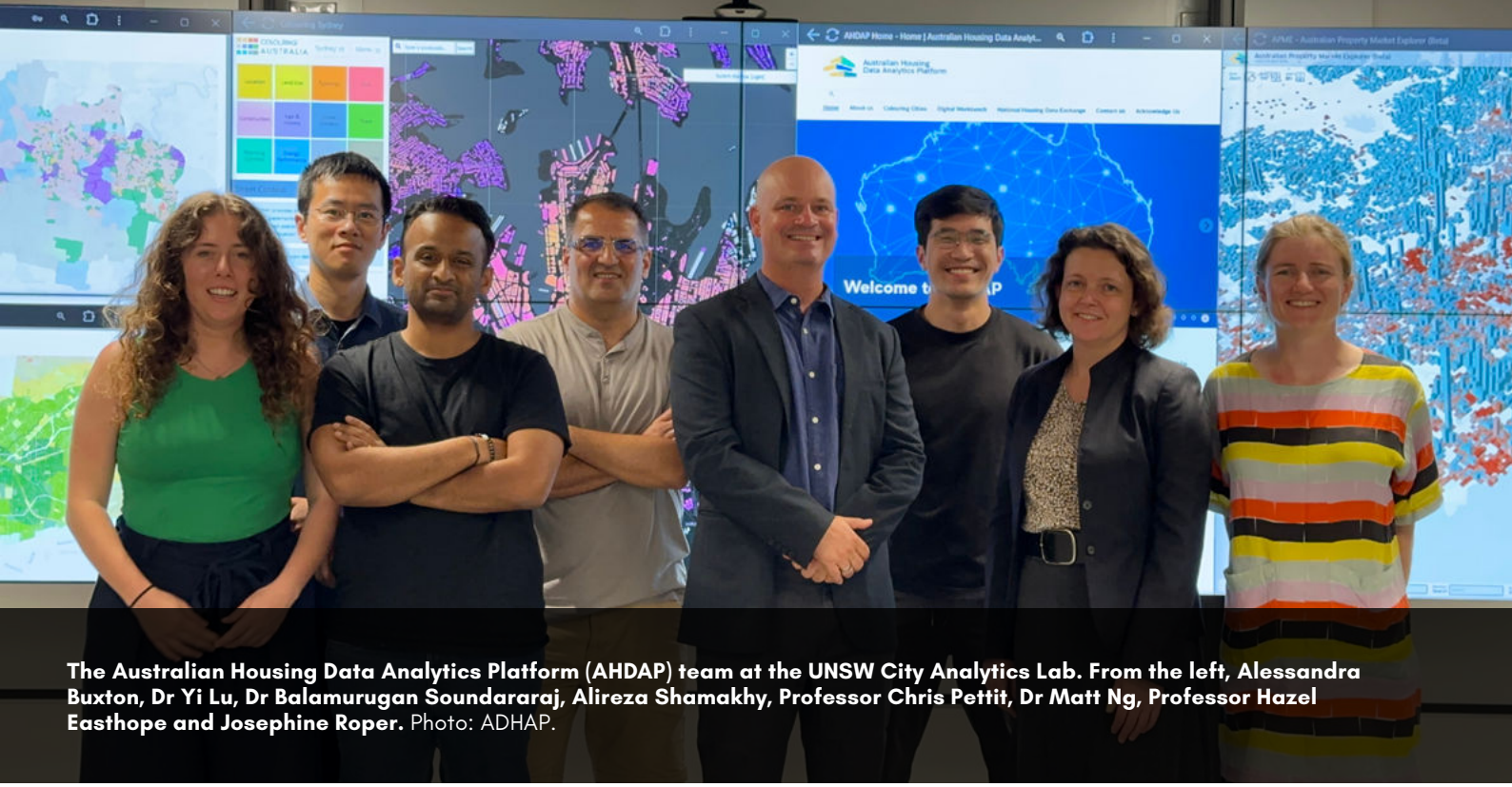
The social sciences in the situation room: Analytics to navigate society's toughest challenges

Context

In 2020, amid rising COVID cases, the impacts of the pandemic were being felt across society: supply chains broke down leading to shortages of basic goods; businesses closed; quarantine measures and school closures upended daily life for households of all types; all the while grief, fear and sweeping changes started to take a toll on mental health at a national scale. While health scientists were at the forefront of developing vaccines and treatments, social scientists—from public health professionals, to economists, to psychologists, to educators, to HR specialists—worked at stabilising other interconnected systems. In Australia and across the globe, governments convened interdisciplinary teams of experts to gather and make sense of available data. Their insights were critical in informing the policies and interventions that guided nations through the crisis (the Australian Institute of Health and Welfare and the Public Health Research Network provide notable examples).

Despite the availability of on-time data and advanced analytics today, these capabilities are not yet universally accessible to Australian social scientists or government. There are some clear social science leaders in this space, such as the Australian Urban Research Infrastructure Network (AURIN) and the Australian Housing Data Analytics Platform (AHDAP), working in the interface of built environments, housing, transport, health and environment, operating with rich databases and who have developed decision-support tools, futures modelling, visualisation capabilities and other tools to translate scientific knowledge into actionable intelligence for government, industry and communities. Capabilities such as these make social science directly relevant to decision-making when a crisis hits and, during stable times, empower us to creatively explore opportunities for societal reinvention. If we could revamp flexible work in the midst of a pandemic, what other groundbreaking transformations are possible?

The coming years present an opportunity to establish the appropriate shared research infrastructure to cement and expand use of these existing capabilities, and to achieve similar capabilities in other critical areas, such as education, nutrition, skills and employment or national security.



The Australian Housing Data Analytics Platform (AHDAP) team at the UNSW City Analytics Lab. From the left, Alessandra Buxton, Dr Yi Lu, Dr Balamurugan Soundararaj, Alireza Shamakhy, Professor Chris Pettit, Dr Matt Ng, Professor Hazel Easthope and Josephine Roper. Photo: ADHAP.

Directions

Stakeholders identified two pivotal features essential for the deployment of these transformative capabilities across university research:

- **Capabilities to observe key societal processes, in real time.** These systems rely on access to a critical suite of indicators necessary to keep the pulse on critical, interrelated societal processes. Data points must be frequent enough to alert of emerging issues before they surface, and to accurately depict the trajectory in an evolving crisis. Data provenance and quality should be of standard to reliably use in modelling, as well as ethically sourced and managed. Data cleaning and transformations should be fast and streamlined; and data collection systems resilient to shocks, to ensure intelligence will be available when most needed. Examples of such capabilities in STEM fields, and funded through NCRIS, include Australia's Integrated Marine Observing system (IMOS), the Australian Community Climate and Earth System Simulator (ACCESS) and AuScope.
- **Cross-domain analytics and modelling.** On the analytics side, the defining capability is the ability to model cascading impacts across multiple societal areas, such as dynamically linking climate, transport, employment, productivity and wellbeing. Tools employed for this purpose adhere to rigorous research standards, yet place a deliberate emphasis on supporting decision-making processes for government agencies, communities and industries, especially within 'situation room' environments. This emphasis translates into features like interactive maps, dashboards, visualisations, scenario analysis and others; the ability to deploy tools in partner organisations (e.g., through online portals); and secure and user-friendly interfaces that can be manipulated by non-specialists.

Immediate needs

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

Leadership

Establishing ongoing mechanisms for social science researchers to periodically come together to identify data assets that are critical to keep the pulse of the nation in key areas, such as through the development of a *National Data and Analytics Roadmap for the Social Sciences*, reviewed every three to five years.

Leadership

National brokerage capabilities to support the acquisition of key data assets or the negotiation of data partnerships—for example, with those organisations embedded in the supply chains that would be disrupted in a crisis (from farms, to grocery shops, to transport, to government). Consulted stakeholders also identified the need for national brokerage capabilities to assist in the identification of suitable policy, industry and community-sector partners for data-driven projects.

GOAL #2

Social science data and analytics are easily found and reused

Technical tools and standards

National data standards for social science research, which build on existing vocabularies and standards and can be adopted nationwide, including a resilient geospatial referencing system. These standards should establish minimums requirements for all data assets, including the use of persistent identifiers for places and people, and others that facilitate data harmonisation and linkage.

Discovery tools

A unified national directory for discovering and accessing all data assets and analytics tools available for research purposes. This includes assets from both government and research sectors, as well as private-sector assets obtained through collective purchase agreements or data partnerships.

Strategic and regulatory policy

A national framework for the use of human and culturally sensitive data in social science research, that is both consistent with IDG, IDS and ICIP principles and easily integrated with the *Five Safes Framework* adopted by national government agencies to manage sensitive data. The ultimate goal of such framework is to offer a transparent and reassuring backdrop to any data partnerships. As such, it should be written in language accessible to any partner organisation, and clearly outline how privacy and cultural restrictions are safeguarded.

Virtual desktop and HPC

The research infrastructures for accessing human and culturally sensitive data are equipped with technical features to enable ethical and secure integration of this data into advanced analytics and modelling capabilities within research institutions and decision-support systems in government and partner organisations.

GOAL #3

Robust investment in research capabilities and infrastructure delivers a globally competitive sector

Data collection

New national observation instruments, that take advantage of the opportunities afforded by online technologies, namely:

- instruments to capture crucial real-time societal data, from an array of sources (transactional or administrative data, social media engagement, sensors, wearables); and to swiftly gauge public sentiment, attitudes and emerging needs—particularly vital in times of crisis
- social sciences laboratory for controlled trials in simulated online environments, to rigorously test the effectiveness and potential impacts of proposed interventions and policies, at scale
- data donation infrastructure, to enable individuals to voluntarily contribute personal data for research use, including data from online transactions, smart device use and wearable devices.

Funding streams

Advocate for new funding streams to support data and analytics work not covered by traditional research project grants, such as the costs involved in continuously maintaining and renewing the portfolio of data assets and research software capabilities described in this section. In addition to sustaining these assets, these funding streams would support the parallel development of the required technically skilled workforce within universities. Ongoing funding streams for work of this type would lay a tangible foundation, upon which to build solid career pathways for the much needed technical workforce.

Funding streams

Advocate for new funding streams to support capability-building within partner organisations, such as improvements to data collection and preservation processes, or the incorporation of advanced research analytics into operational or strategic decision-making processes, through training or similar change management initiatives. This is particularly critical to support partner organisation who act as custodians of critical data assets, but whose key business is not data collection, data management or sharing, to incentivise and facilitate their data sharing journey.

Skill development and training

Advanced analytics training. Particularly, statistical and data science training to enable researchers to critically evaluate the quality, reliability and limitations of data employed in analytics tools, and of the results produced through modelling and other processes.

Harm and opportunity: Exploring the architecture of digital societies

Context

Our lives increasingly intersect with the digital, from socialisation and entertainment, to trade, to work and education, health and our interactions with government services, thanks to tools and services that are cheap, fast-paced, personalised, interactive and always available. The digital comes full of promise, but it is also the ground for new forms of harm, injustice, inequality and disadvantage. Mastery over the emerging technologies shaping our societies (including AI), will be pivotal to our ability to shift the balance between risk and opportunity for Australia, and to the fate of nations globally.

It's easier said than done. Digital, online and autonomous technologies defy traditional ways of doing social science research. For example, where an economist might have analysed socioeconomic indicators and government policies for the causes of inequality, we are now also needing to understand the data mining strategies and algorithms shaping the menu of opportunities tailored and delivered to personal devices daily. It presents a steep curve for social science, requiring new data collection tools and methods, in a territory complicated by commercial interests, complex tech and matters of ethics and privacy. Having the right research infrastructure in place will be crucial to allow Australian social scientists to swiftly step up to this evolving challenge, help establish effective oversight, policies and measures to cultivate social equity and resilience, and grasp any arising opportunities—*how would mobile devices and online platforms function if designed specifically to improve personal wellbeing, and social cohesion and equality?*

> A national commitment to digital platform National Research Infrastructure (NRI), on the scope and scale that is often provided for science and medical infrastructure is likely to be one of the most cost effective and sustainable approaches.
>
> **Professor Daniel Angus FQA, Director, Digital Media Research Centre, Queensland University of Technology**

Maria del Mar Quiroga (right), senior research data specialist from the University of Melbourne's HASS Taskforce, demonstrating the use of OpenRefine for cleaning data, at the ARDC HASS and Indigenous Research Data Commons Computational Skills Summer School, held in Sydney, 7-8 February 2023. Many tools that can help make research more efficient and reproducible are not well known, and support networks are scarce in the Humanities, Arts and Social Sciences. Photo: Renee Nowytarger / ARDC.

Directions

Stakeholders recognised the need for two key elements to tackle these emerging challenges in social science research:

- **Capturing digital content and digital trace data.** Addressing the complexities of digital content and digital trace data presents a distinct challenge from traditional social science research. Unlike conventional data, digital life data floods in daily through countless digital interactions, prompting the sector to prioritise selection over production. Complicating matters, data is generated before ethical permissions can be secured, posing challenges in typical ethics review processes. The data itself arrives in diverse formats (video, image, text, code) and bespoke structures, originating from a myriad of agents. Capture methods often involve intricate coding techniques such as APIs and crawlers, further compounded by the ever-changing nature of digital environments. The substantial volume and intricacy of this endeavour underline the compelling case for a national, coordinated approach. This collaborative strategy offers the sector the optimal chance to conduct competitive research in these evolving domains.
- **Experimentation and discovery with digital-life technologies.** In the same way biochemistry, genomics, engineering, robotics and other types of labs in universities put industry-level technology within reach of university researchers, the social sciences require dedicated facilities to experiment with the technologies shaping digital social life, such as social media, virtual marketplaces and classrooms, gaming arenas, or distributed governance mechanisms like blockchain. These laboratories would help shed light on the workings of black box technologies, make room for discovery, hypotheses testing, researcher training and public interest research. Considering the demand for such experimental facilities would span the whole range of social science disciplines, as well as fields in humanities, health sciences and technologies, investments should prioritise infrastructure that make it possible to bring these experimental tools to the largest number of disciplines and institutions. This will be particularly critical to achieve the desired lift to social science research in a context of limited technically-skilled human resources and funding.

Immediate needs

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

Leadership

Establish mechanisms for social science researchers and partner organisations to periodically come together to agree on key data and analytics assets that are necessary for social science disciplines to stay abreast of emerging digital technologies, and their impacts on society. This would help streamline the data-capture and cleaning efforts of internet, social media and digital-life researchers nationwide, and ensure comprehensive pools of data are available to support social science research on key technologies and societal issues.

Leadership

National brokerage capabilities, to streamline such tasks as recruiting data donation participants, or facilitating the collective purchase of commercial data assets; with the aim of minimising redundant efforts and making benefits acquired broadly accessible to researchers nationwide.

Leadership

Mapping the opportunities and challenges arising from Artificial Intelligence and other emerging technologies, for the social sciences and specifically in the Australian context. Based on that analysis, formulate recommendations to address identified policy, technical and training infrastructure gaps in a coordinated and effective manner.

GOAL #2

Social science data and analytics are easily found and reused

Technical tools and standards

National data standards, to streamline the processing of digital-life files pouring in from multiple sources (e.g. APIs, crawlers, donations), with different structures and formats, to facilitate their transformation into a well-indexed and comprehensively documented archive of research-ready data.

Technical tools and standards

Where possible, utilise technologies like image recognition and topic modelling to facilitate the classification and annotation (metadata) of the massive volumes of incoming digital-life data.

Leadership

A national commitment to share value created from shared research infrastructure, such as new or updated vocabularies, enhanced datasets, workflows or analysis code; as well as agreement on the mechanisms and infrastructures required for sharing.

Discovery tools

A unified national directory for data and analytics tools, providing a centralised platform to discover or deposit digital-life data suitable for research, along with the necessary tools for capturing and analysing it, such as code and software.

Strategic and regulatory policy

A national framework for the ethical use of human and culturally sensitive data in research, that caters for the particularities of digital life-type data. Some of the current challenges include: traditional ethics clearance processes requiring informed consent before capturing data are unfit for real-time social media data; terms of service vary significantly across social media platforms and are subject to abrupt changes; the functionality of services like X (formerly Twitter) or Instagram blur distinctions between public and private individuals; and the global nature of data introduces complexities in understanding cultural risks.

GOAL #3

Robust investment in research capabilities and infrastructure delivers a globally competitive sector

Funding streams

A national research software incubator, to support the development of tools to capture and analyse digital-life data, which caters to the whole spectrum of social science disciplines (software development skills have traditionally clustered around niche areas). A national software incubator would:

- invest in high-impact software projects
- make existing and new tools available to a larger group of researchers and projects (e.g. by converting project-specific code into broader-purpose reusable software)
- cultivate technical expertise and tools to experiment with an array of emerging technologies (generative AI, blockchain, augmented and virtual reality)
- facilitate cross-pollination between them
- train successive cohorts of research software developers
- identify and disseminate best practice.

Virtual desktop and HPC

Develop sufficient computational capacity and storage. The ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) foresees a substantial increase in demand for large-scale cloud storage and computing power, as a result of the growth of digital-life data and research. This growth is projected to produce data flows equivalent to those generated by large-scale observation instruments in fields like genomics or astronomy, which are well supported in Australia by robust national storage and compute infrastructure. Similar capabilities will be needed to maintain Australia's competitive edge in social science research on digital technologies and digital-life fields.

Data collection

National observation instruments to study digital platforms, emerging technologies and their impacts on society, such as:

- data donation capabilities and infrastructure, to allow individuals to voluntarily contribute personal data for research use, in secure and ethical ways, such as trace data documenting their use of smart phones, search engines and social media, wearable devices, smart home sensors and others
- test environments for social science experimentation (including controlled trials), such as gaming platforms, virtual marketplaces, or social media platforms.

Skill development and training

Training to address emerging skill gaps. On one hand, contemporary training in emerging research methods specific to computational social science and digital humanities, such as social network analysis and natural language processing. On the other hand, training in the mathematical and statistical foundations necessary for utilising data-intensive research applications like machine learning models effectively within the social sciences.

Dr. Rajeev Samarage, Melbourne Institute Data Lab, University of Melbourne speaking at the ARDC's HASS and Indigenous Research Data Commons Symposium in June 2023. Photo: Anthony McKee / ARDC.

Action plan: Towards an Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

This section consolidates the insights from the preceding section into a list of priority actions for the sector, aimed at advancing the vision for a nationally integrated and coordinated ARIESS. Ratified through consultations with social science researchers and research infrastructure experts from across Australia, the proposed 'Action plan' provides a robust blueprint for high-impact research infrastructure investments over the next decade.

IN THIS SECTION

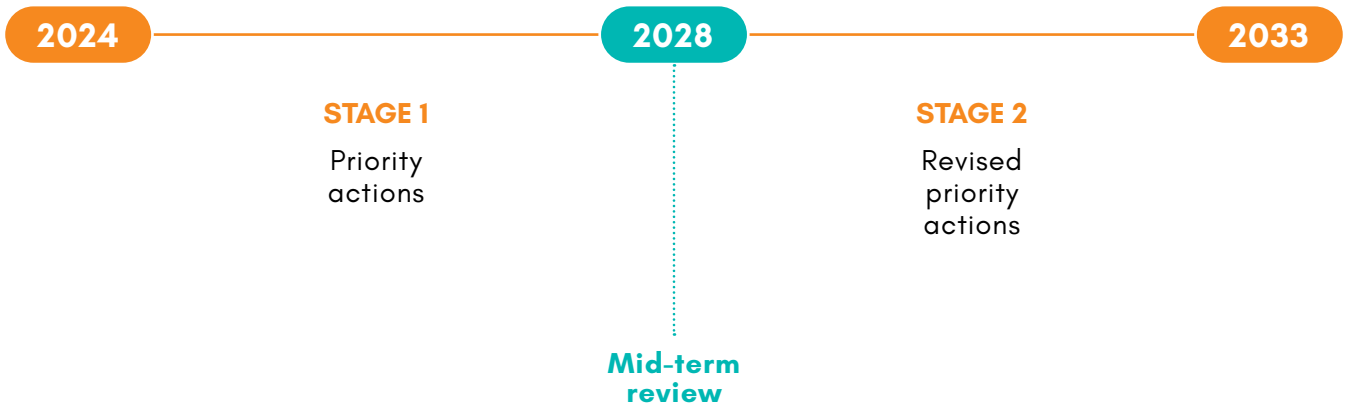
- Action plan
- Implementation.

Action plan

This section distils the cross-cutting needs identified in the preceding use cases, into a list of priority actions for the sector, aimed at advancing the vision of an Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS). The priority actions identified (depicted in Figure A) respond to immediate needs and, as such, are earmarked for delivery within a three to five-year timeframe.

Following this period, a comprehensive **mid-term** review will be necessary (in 2028), to assess progress, observe any shifts in trends or contextual factors, and adjust course accordingly, resulting in a revised list of priorities for the second half of the decade. This two-stage approach will ensure the Plan stays relevant and responsive to the changing needs of researchers and society.

Decadal Plan lifespan and checkpoints



Decadal Plan: Goals, priority actions and steps

GOAL #1

A coordinated Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS)

PRIORITY ACTIONS	STEPS
1.1 Engage and mobilise key stakeholders from the research, government, community and business sectors in the design, implementation and review of initiatives shaping the ARIESS.	**1.1.1** Set up structures to drive implementation of the Decadal Plan, including: • an Implementation Working Group • an online ARIESS Hub to engage stakeholders and monitor progress • a mid-term review to evaluate progress and adjust the action plan for the latter half of the decade. **1.1.2** Establish strategic partnerships with key stakeholders in Commonwealth and state and territory government agencies, to foster a deeper understanding of the infrastructure needs within the social science sector, and to identify and leverage opportunities to collaborate towards transformative social impact.
1.2 Take decisive steps to embed Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS) and Indigenous Cultural and Intellectual Property (ICIP) goals and aspirations across the ARIESS, in line with the *Maiam nayri Wingara Principles* and Australia's *National Agreement on Closing the Gap*.	**1.2.1** Engage with the government regarding the appointment of an Indigenous Data Commissioner and establishment of a Bureau of Indigenous Data, to spearhead the adoption of IDG, IDS and ICIP principles across data custodian organisations in the government and research sectors. **1.2.2** Engage with relevant officials to ensure IDG, IDS, and ICIP experts are involved at the highest levels of advisory or decision-making for national research infrastructure. Build and expand on existing efforts, such as the welcome inclusion of an Indigenous expert in the Department of Education NRI Advisory Group. **1.2.3** Advocate for greater investment and continued support towards First Nations-led governance mechanisms, which facilitate or amplify Aboriginal and Torres Strait Islander input into research infrastructure matters. **1.2.4** Indigenous experts and university institutions to collaboratively develop a *Pathway to Integrate IDG, IDS and ICIP into University Research Systems and Practices*. This Pathway would establish national, standardised processes for all university research involving Aboriginal and Torres Strait Islander peoples, and align with the forthcoming *APS-wide Framework for Indigenous Data and Governance*. **1.2.5** Engage with government and university institutions to form a National Indigenous Human Research Ethics Committee, to evaluate research proposals concerning Aboriginal and Torres Strait Islander peoples across all disciplines and university institutions. This Committee could expand from Lowitja's forthcoming Indigenous Human Research Ethics Committee (HREC), funded by NHMRC and primarily focused on health and medical research.
1.3 Establish mechanisms for sectoral cooperation at the national level, to develop or acquire strategic data and analytics assets needed to address urgent national challenges.	**1.3.1** Advocate for new funding streams, to support the development or acquisition of strategic, nationally-significant data and analytics assets, in line with Australia's *Science and Research Priorities* and evolving disciplinary needs. **1.3.2** The Academy and prominent research sector organisations collaborate to periodically release a *National Data and Analytics Roadmap for the Social Sciences*, in consultation with key government, industry, and community partner organisations. **1.3.3** Develop a National Brokerage Facility for the social sciences, to negotiate access to priority assets, through data partnerships, collective purchasing of assets or licences, and the dissolution of technical, governance or legal barriers.
1.4 Formulate a comprehensive and coordinated sectoral response to AI and other emerging technologies, across the various components of the ARIESS.	**1.4.1** The Academy and leading sector organisations collaboratively develop an *ARIESS Response to AI and Emerging Technologies*, identifying policy, technical and training challenges and opportunities for Australian social science, and formulating a plan to address them.

[Continued] **Decadal Plan: Goals, priority actions and steps**

GOAL #2

Social science data and analytics are easily found and reused by researchers nationwide

PRIORITY ACTIONS	STEPS
2.1 Develop and implement a suite of technical standards, to underpin the national architecture of the ARIESS, including standards for data and metadata, a framework for the use of human and culturally sensitive data in research, and a suite of social science research vocabularies.	**2.1.1** Develop *National Standards for Social Science Research Data and Metadata*, in collaboration with technical experts, users from all disciplines, and IDG, IDS and ICIP experts. These standards would govern data preservation, formatting and annotation nationally (including for Indigenous and digital-life data); set minimum requirements such as the use of persistent identifiers for places and people, essential demographic markers and basic contextual and provenance information; and align with relevant national and international standards. **2.1.2** Develop a *National Framework for the Use of Human and Culturally Sensitive Data in Research*, with three objectives. First, the establishment of nationwide standard practices around licensing, access and linkage of sensitive data, including solutions to challenges specific to digital-life data. Second, the integration of relevant principles and frameworks, including IDG, IDS and ICIP, the Five Safes Framework and the DATA Scheme. Third, the provision of a transparent backdrop for data partnerships, written in highly accessible language and clearly outlining ethics and privacy safeguards. This framework would be periodically updated to ensure continued alignment with social licence expectations. **2.1.3** Develop a suite of social science research vocabularies, to facilitate data linkage to the national spine, and to serve as models for future vocabularies.
2.2 Foster a national commitment, by social science disciplines and university institutions, to share research assets created through publicly-funded research and infrastructure, such as data, research software, code, workflows, vocabularies and training materials; and to implement the necessary steps and mechanisms to enable such sharing.	**2.2.1** Establish or designate national, centralised directories for social science research assets, including for data, software, standards and training materials. These directories would aggregate existing organisational catalogues, consolidating all assets available for research across universities, government and the private sector (e.g. through collective purchase or partnerships). Leverage existing capabilities like Dataplace, Research Data Australia, and DReSA. Ideally, a concierge function would help users identify suitable resources. **2.2.2** Create or designate metadata tools (software) to streamline and accelerate the creation of standard-compliant metadata for social science assets. Where ethically sound and beneficial, integrate emerging technologies like audio or image recognition, topic modelling and AI to enhance the annotation process. Include capabilities specific to Indigenous data, such as Traditional Knowledge labels or Indigenous metadata standards. **2.2.3** Create metadata for all assets (data and analytics) in university repositories, including Indigenous-led identification of Indigenous data. **2.2.4** Access management systems enable the entire range of users to access shared assets—researchers, partner organisations, community members and Indigenous data owners. Systems support dynamic adjustment of access controls in response to shifts in IDG, IDS, ICIP or social licence. **2.2.5** Data management systems enable asset users to contribute back to the ecosystem, for example, by updating open-source code or enhancing metadata. Among other benefits, this supports Indigenous-led development of more nuanced narratives about Aboriginal and Torres Strait Islander peoples. **2.2.6** Develop discipline-informed, national guidelines for the retention of social science research data, such as criteria to determine which data will be kept in long-term storage or deleted; ensuring administrative and technical decisions by data managing organisations are sufficiently informed by research needs and priorities.
2.3 Establish national capabilities to securely and ethically handle human and culturally sensitive data specifically catering to the needs of the social sciences research sector.	**2.3.1** Research stakeholders, government and other funding agencies explore suitable business and operational models to deliver the required capabilities (2.3) and collaborate in their implementation. These facilities should offer affordable services, sufficient capacity to meet research sector demand, including for exploratory inquiries and training, and integrate First Peoples-led governance (in alignment with IDG, IDS, and ICIP).

[Continued] **Decadal Plan: Goals, priority actions and steps**

GOAL #3

Robust investment in research capabilities and infrastructure delivers a globally competitive sector

PRIORITY ACTIONS	STEPS
3.1 Build a suite of national observation instruments for social science research—and accompanying storage and computational capabilities—to leverage the growing volume of digital social data for driving innovations in social science and policy.	**3.1.1** Identify suitable business models to deliver the required national observation instruments in line with the five principles identified. Then, build and deliver them, including the following minimum capabilities: • online data capture (code, APIs, data donations) • digital test environments, including for online controlled trials • digitisation of physical assets • national polling and surveying capabilities. **3.1.2** Build the required storage and computational capabilities to ethically and securely handle the increasingly large volumes of digital data (e.g. digital-life data, linked data assets).
3.2 Advocate for new research funding streams, to support the envisaged digital transformation of the social science research sector, and corresponding upskilling of its research workforce. These funding streams should target critical needs not covered by existing research and research infrastructure funding streams, such as the National Collaborative Research Infrastructure Strategy (NCRIS) or the Australian Research Council's Discovery, Linkage, or Linkage Infrastructure, Equipment, and Facilities (LIEF) grants.	**3.2.1** Fund and implement a National Research Software Incubator Program to: • invest in high-impact software development projects for social science disciplines • propagate sustainable software development practices • cultivate a software development entrepreneurial ecosystem that facilitates cross-pollination and innovation across a range of technologies (e.g. software and platform development, advanced analytics, generative AI, blockchain, virtual reality). **3.2.2** Develop a National Training Program on Advanced Social Science Analytics that provides: • specialisation paths in contemporary streams - e.g. natural language processing, social network analysis, geospatial analysis • foundations in mathematical and statistical concepts underpinning data science, machine learning and AI applications, in the context of social science research challenges • accessible to researchers in all career stages (including honours and HDRs) • combines online instruction, in-person support and guided hands-on application to each student's own research work. **3.2.3** Advocate for dedicated funding streams for digital capability building in community or partner organisations, recognising the inherent benefits for social science research and the essential social imperative to do so. Including funding for: • ongoing development of IDG, IDS and ICIP capabilities within the university sector and community partners, with a focus on providing special support to young or emerging leaders • citizen science, digitisation, preservation, or curation of community collections • improvements to data collection and preservation, or use of analytics in decision-making, in partner organisations • training materials accessible to the community.

Implementation

This section outlines essential considerations to guide the successful implementation of the Decadal Plan.

Engaged and committed partners

Implementation will require ongoing leadership by a group of nationally-representative stakeholder organisations, committed to progressing the identified goals and actions.

Leveraging existing advantages

Solutions to the priorities and steps outlined in this Decadal Plan should build on existing strengths and advantages. The *Stocktake of Social Science Research Infrastructure* serves as a valuable resource for identifying current capabilities.

Critical cross-cutting features

Several cross-cutting features that underpin all social science research infrastructure are identified in the next section, 'Five principles to select and build fit-for-purpose social science research infrastructure'.

Exploring new business models

Many identified capability gaps stem from inadequate business and delivery models. For example, short-term or insecure funding, high access costs for projects, capacity limitations leading to delays and insufficient training opportunities are some of the areas highlighted as needing improvement.

Advocating for new funding streams

The goals outlined in this Decadal Plan are steering the sector towards a digital transformation of significant scale, which surpasses what can be realistically achieved and sustained with traditional funding streams. The envisaged digital uplift entails new lines of work within research organisations, such as the tasks needed for ongoing maintenance and renewal of digital research assets (e.g. ensure continued integrity of data collections, maintain and upgrade research software) and their supporting infrastructures (e.g. development and updates to policies, standards and training; maintenance, upgrades and renewal to directories, access management and storage systems).

This need for additional digital research infrastructure to support a data-driven era has also been recognised in '5.5.4 Securing research infrastructure' of the *Australian Universities Accord*.

Consulted stakeholders from national organisations with expertise in the management of large physical and digital collections, such as the Australian Data Archive, National Library of Australia, National Archives of Australia, Australian Library and Information Association, and Council of Australian University Librarians, all alert to the fact that the costs of maintaining digital assets is significantly greater than those of maintaining physical collections, as well as demand more ongoing work, and require new specialist technical workforce.

Research infrastructure providers report having difficulties attracting and retaining technically skilled professionals, such as software developers, data specialists and training experts, in large part because of the lack of secure funding for the aforementioned

ongoing tasks (e.g., data curation, software or platform maintenance). Currently, funds for these activities are borrowed or diverted from traditional research project grants. As a result, they fail to provide the sustained support necessary to offer meaningful careers to technically-skilled professional careers in academia, or for nurturing the sustained development of technical strengths within the research sector.

It is for these reasons that this Decadal Plan advocates for the establishment of new funding streams, targeted specifically to support the desired uplift to digital research infrastructure, in line with the needs of contemporary research. These funding streams may include expansions or adjustments to the existing NCRIS or National Competitive Grants Program (ARC grants).

The digital skills training gap

To ensure that the social sciences research sector can fully harness the benefits of emerging technologies, including machine learning and AI, there is a critical need for well-funded and coordinated training capabilities. While there is an abundance of statistical and data science training materials, there remains a gap in training that is tailored to specific social science disciplines and the unique data and social phenomena they study or model, especially for the most advanced methods and applications (where freely available resources tend to fall short). Another important gap is the development of a training framework that guides individuals to the most relevant learning pathways and resources.

Currently, this specialised training is only offered by organisations like ACSPRI and Intersect, with no current roadmap to fund or scale up operations, or make their offerings affordable to all researchers (e.g. PhD top-up scholarships). In other cases, such training may be available, but restricted to researchers affiliated with specific institutions, for example, The University of Melbourne's HASS Taskforce.

Engaging with key partners

While collaboration from all stakeholders is necessary, each goal involves key partnerships:

- **For Goal 1, Indigenous Data Governance, government (national, state and territory and local) and civil society organisations.** Formulating clear asks, gathering feedback efficiently across these sectors and demonstrating consensus will be vital to diligently progressing the Plan's goals.
- **For Goal 2, University institutions.** An alliance of university institutions is essential to incorporate the required changes to access management systems, that will facilitate national asset sharing, as well as implementation of required changes to human ethics review processes.
- **For Goal 3, Research infrastructure providers and technical experts.** Including knowledge transfer from existing technical research capabilities (e.g. STEM national observation instruments, STEM cloud and computational infrastructure) and bringing in expertise from across a range of industries driving digital-life technologies and applications (e.g. social media platforms, simulated environments, internet of things, generative AI).

Distinguished Professor Emerita Maggie Walter PhD FASSA is a Palawa woman (Tasmanian Aboriginal), a founding member of the Maiam nayri Wingara Data Sovereignty Collective and a prominent advocate for Indigenous Data Sovereignty in Australia. Photo: Supplied.

Five principles to select and build fit-for-purpose social science research infrastructure

A 10-year plan is, by design, a high level instrument. It paints a future trajectory for the sector with an intentionally broad brush, refraining from excessive technical prescription, and recognising actual solutions will emerge in dynamic, collaborative and cross-disciplinary contexts. As the Plan unfolds over the next decade, the design specifications and business models of actual research infrastructure solutions will be shaped by subsets of the sector, with the potential to lose touch with the evolving needs of the broader constituency. How can we enhance the likelihood that scoping, design and implementation of future shared research infrastructure effectively leads to a well integrated and nationally coordinated ARIESS?

This section articulates five fundamental principles for well-integrated, high-impact ARIESS investments over the next decade.

IN THIS SECTION

01 Design for diversity

Although there is significant appetite in the social sciences for incorporating more digital infrastructure tools and assets, actual engagement and use of advanced social science research infrastructure remains limited to 'power users' or researchers with advanced skills.

How do we turn the tide and bring a majority of the sector to use these research infrastructures? The *Draft National Digital Research Infrastructure Strategy* already identifies user-focused infrastructure as a priority for the next decade. We propose that a critical avenue to increase user-focus is to systematically engage with discipline representative organisations and peak bodies in any initiatives shaping future research infrastructure, early on in planning and design processes.

Why

Systematic consultation through disciplinary organisations improves representation from researchers and disciplines currently underrepresented in existing research infrastructures, who we'll need to bring along to truly transform the sector.

Since data and analytics requirements are shaped by the methodologies of research disciplines, seeking input from disciplinary organisations is more likely to yield advice that stands the test of time, and less likely to be swayed by the transient needs of specific projects or individual organisations.

How

In Australia, the social sciences sector comprises a large and diverse network of 150+ research and discipline organisations, represented at the national level by the Academy of the Social Sciences in Australia. As a Learned Academy, the Academy of the Social Sciences in Australia is funded by the Commonwealth to provide independent expert advice spanning the whole range of social science research disciplines, and is well equipped to convene input from all corners of the sector for the design, implementation and review of critical research infrastructure initiatives.

Traditional open consultation campaigns tend to occur too late in the decision-making process. The best time to engage disciplinary organisations is early in the planning and design processes of research infrastructure initiatives (e.g. scoping). At the institutional and local levels, this could involve engagement with schemes such as the Australian Research Council's Linkage Infrastructure, Equipment and Facilities (LIEF) scheme, elements of Medical Research Future Fund (MRFF) and National Health and Medical Research Council (NHRMC), and input into policy and planning in their research infrastructure programs. At the same time, within universities and national bodies, our disciplines need to self-organise to present the case for forward developments and investment in social science national research infrastructure, including through the National Collaborative Research Infrastructure Strategy (NCRIS).

Another avenue is to foster appropriate levels of participation from social science experts in critical decision-making forums. The social sciences comprise 20+ disciplines and around 40 per cent of the academic workforce, so any initiatives or organisations aiming to build truly national and cross-disciplinary infrastructure should include a sizable portion of social science experts in their advisory and decision-making teams.

ADM+S members and participants taking part in the 2022 Dark Ads Hackathon, which challenged teams to come up with ideas and approaches for providing public accountability for targeted advertising online (28-30 September 2022, Melbourne).
Photo: ADM+S.

02 First Nations-led

Aboriginal and Torres Strait Islander peoples and their goals should not be impeded by another decade of sluggish progress towards effective governance of Indigenous data in the Australian research sector.

A more productive approach to Indigenous self-determination is to actively engage Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS), and Indigenous Cultural and Intellectual Property (ICIP) experts at the highest levels of planning and decision-making for both current and future research infrastructure initiatives. In other words, the model for Aboriginal and Torres Strait Islander engagement should shift from mere consultation and co-design, to genuine Indigenous leadership and self-determination. Without Aboriginal and Torres Strait Islander people actively making decisions regarding their data, the goals of IDG and IDS cannot be achieved.

The concept of IDS means Aboriginal and Torres Strait Islander people have power and control over their data, and actively lead shaping the policy, investment and design agendas. An Indigenous leadership model ensures that upholding the principle of sovereignty occurs, empowering Aboriginal and Torres Strait Islander voices to lead and control infrastructure investment and design choices at every stage of the process, in line with the Australian Indigenous Data Sovereignty Principles (see *Maiam nayri Wingara Communique*).

This Decadal Plan outlines priority actions to accelerate the desired shift towards Indigenous sovereignty focused on the establishment Indigenous-led and controlled infrastructures and governance structures at the national level, where they can most effectively exert influence on the research infrastructure ecosystem (see 'Action plan').

As the sector moves towards the implementation of these actions over the coming years, it is crucial for stakeholders to actively engage Indigenous leadership in this transformative process.

We invite all stakeholders to support these efforts, by engaging with IDG, IDS and ICIP principles and practices and by integrating, wherever relevant and possible, this leadership and sovereignty principle into their work and efforts in the research infrastructure space.

Indigenous leadership ensures that initiatives uphold the principle of Indigenous Data Sovereignty, empowering Aboriginal and Torres Strait Islander voices to lead and influence infrastructure investment and design choices at every stage of the process, in alignment with Indigenous Data Governance principles nationally and globally.

03 Streamline ethical and responsible research

Today's data-abundant landscape creates enormous opportunity for groundbreaking advancements in social science research. However, unlocking this potential hinges on the development of infrastructures, data management policies, protocols and governance structures that ensure human and culturally sensitive data can be securely and ethically used.

Some of the present challenges facing the social sciences research sector include:

- **A complex regulatory landscape.** Social science researchers must navigate a complex web of international, national and state privacy laws; integrate diverse best practices and standards from various sectors; and constantly adapt to bespoke systems, processes and procedures from different data custodian organisations.
- **Lack of a research validation framework.** Unlike in pharmaceutical research, there's no established framework in the Australian context to validate social science research findings before their implementation in real-world contexts, such as in social policy. This gap can lead to flawed interventions and decisions, with the potential to cause widespread harm.
- **Evolving social licence expectations.** Social science researchers need to keep pace with evolving societal views about ethical data sharing and reuse, principles for Indigenous Data Governance (IDG), Indigenous Data Sovereignty (IDS) and Indigenous Cultural and Intellectual Property (ICIP), and a rapidly shifting technological landscape impacting the use of real-time and online data and the incorporation of human data into AI models.

These challenges have wide-ranging effects on the social science research sector, leading to increased costs, delays in project completion, the erosion of community trust, and the potential for causing harm.

This Decadal Plan proposes a number of priority actions towards establishing the necessary infrastructures, policies, systems, processes and governance structures.

As the sector advances towards the implementation of these actions, stakeholders are encouraged to actively participate in establishing national, streamlined processes for the ethical management of sensitive data within the social sciences research sector, by aligning the governance and technical architectures of current and emerging research assets, capabilities and infrastructures with the efforts of the broader sector, as outlined in this Decadal Plan.

As the sector advances towards the implementation of these actions, stakeholders are encouraged to actively participate in establishing national, streamlined processes for the ethical management of sensitive data within the social sciences research sector.

04 Open to partners and community

In the current research infrastructure ecosystem, social science research data is split between public datasets, cloud-based repositories open to users from multiple institutions, and university institutional repositories accessible exclusively to internal staff.

Moving forward, there is a pressing need to transition towards shared research infrastructure that accommodates access for research partners and the broader community, complete with interfaces tailored to their requirements.

Social science and humanities collections thrive on collaborative efforts with government agencies, non-profit organisations and community stakeholders. These partners contribute by permitting data collection, donating data, or collaborating on data interpretation. Opening channels for partners and communities to access data enhances those collaborations, and directly supports the aspirations for data sovereignty of Aboriginal and Torres Strait Islander peoples.

More inclusive access can also amplify the social impact of research. The social sciences contribute significantly to maintaining collective memory, preserving cultural heritage and ensuring accountability of various entities to the Australian public. Two-way infrastructures can better support these vital roles, thereby magnifying the public impact of research infrastructure investments.

This outward-oriented approach should be a defining feature of all capabilities within the envisioned Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS). While this aspiration entails technical and governance complexities, it is essential to balance benefits for the research sector with broader social imperatives of the social science disciplines.

In the coming years, stakeholders can support the progressive realisation of this aspiration through practical measures, such as:

- **Making all data directories visible to the community,** ensuring transparency about the information held.
- **Investing in partner and community capability-building,** such as improving data management processes in partner organisations or communities, and digitising historical records. Exemplars in this space include the Population Health Research Network (PHRN), the Bushfire Data Challenges Program, the Improving Indigenous Research Capabilities project and the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC).
- **Providing accessible documentation and training,** in formats and languages easily accessed and understood by everyone. In projects of significant community interest, accessibility may involve additional efforts, such as investing in equipment to access data in regional and remote areas, or creating documentation in community languages.
- **Giving value back,** such as by offering long-term, secure storage for community archives and providing partners and the community with access to useful tools. The Australian Urban Research Infrastructure Network (AURIN), the Australian Housing Data Analytics Platform (AHDAP) or ANU's Virtual Observatory for the Study of Online Networks (VOSON), for example, offer high-end analytics capabilities for free public use.

PARADISEC is a model for community access. 'We take collections to remote communities and other places where people couldn't otherwise access them, using Raspberry Pi computers'explains Director Nick Thieberger. Pictured: *(Top)* **The PARADISEC team at PARADISEC's 20th anniversary celebration in Sydney, 27 April 2023.** *From the left*: **Nick Fowler-Gilmore, Starr Abelardo, Julia Colleen Miller, Amanda Harris, Jodie Kell, Nick Thieberger, Steven Gagau and Anje Rossendell-Piper. Not pictured: Nick Ward. Photo: Nicola Bailey;** *(Bottom)* **ANU PhD student Daniel Majchrzak learning how to digitise field notes; reel-to-reel audio tape; a stack of open reel tapes containing audio recordings of languages spoken in New Caledonia and Vanuatu, digitised and archived in PARADISEC.** Photos: PARADISEC.

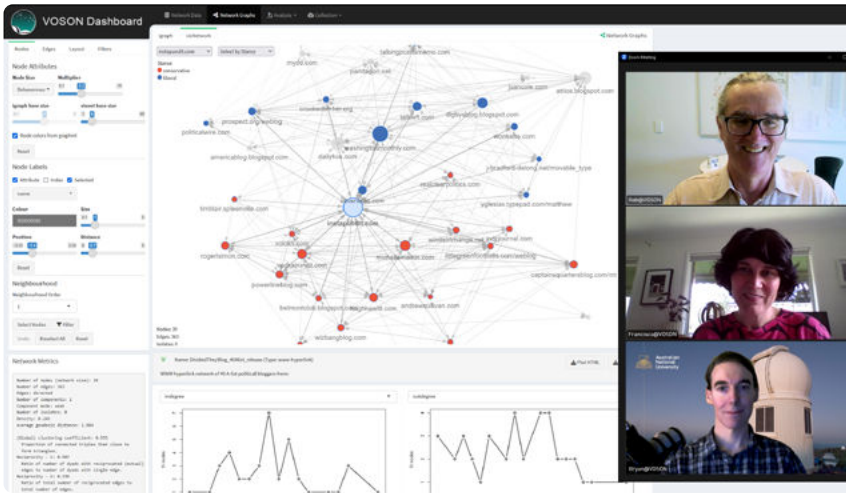
05 Enable equitable access

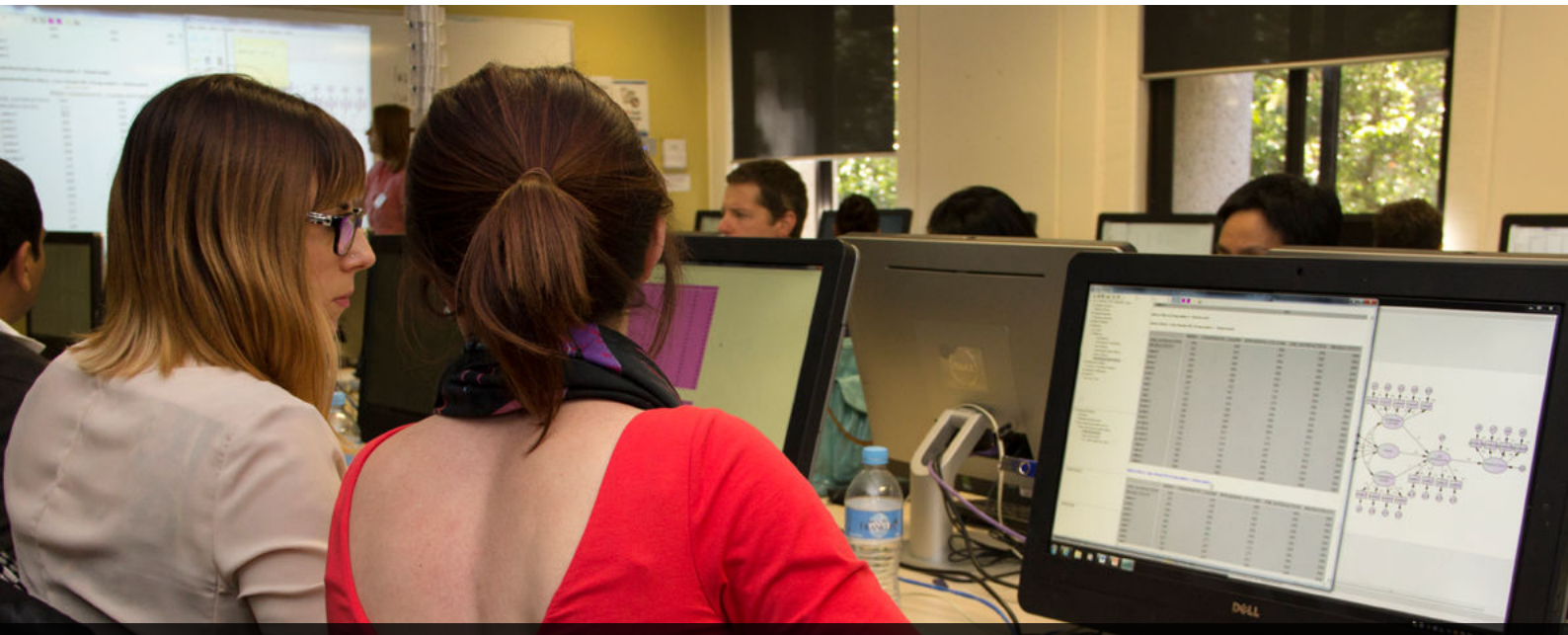
The Australian Research Infrastructure Ecosystem for the Social Sciences (ARIESS) aims to uplift capacity and opportunities for the entire social science research sector.

Decisions made early in infrastructure development pipeline, like scoping, business model generation, and design choices, significantly impact the range of users who can ultimately access research infrastructures. Next, we highlight key considerations to promote more equitable access to research capabilities and infrastructure in the social sciences:

- **Scoping and designing for the majority of users.** The social science disciplines are many, but have lots in common. Our best chance at building step-change social science research infrastructure is finding and investing in capabilities that serve the needs of the greatest number of social science disciplines, users and levels of skill. A bold approach would see research infrastructure operators establish ambitious usage targets for existing and new facilities, and monitor and report progress against them.
- **Embedding affordability within the business model.** ARIESS capabilities should accommodate users with diverse financial capacities, including options for high-impact research initiatives with limited or no funding, and access to research infrastructure for familiarisation or training purposes (including HDR projects). For publicly-funded infrastructure it is particularly important to signal what are acceptable cost-recovery models, and prevent access restrictions based on financial or other grounds. Transparent cost schedules are critical to incentivise uptake from new users, by aiding in the scoping and budgeting of research proposals.
- **Scaling and fairly allocating capacity**. In anticipation of increased demand, future-proofing infrastructure with excess capacity (where feasible) or easily scalable delivery models is paramount. In cases of inevitable capacity constraints, processes will need to be established to allocate capacity based on principles of equity, innovation and impact. Clear guidelines on capacity and transparent allocation processes empower early users and inform capability providers about expected service levels.

Our best chance at building step-change social science research infrastructure is finding and investing in capabilities that serve the needs of the greatest number of social science disciplines, users and levels of skill.





(Top) **Dr Marissa Takahashi, Manager of the QUT Digital Observatory and the Australian Digital Observatory. Photographed at the ARDC's HASS and Indigenous Research Data Commons Symposium in June 2023.** Photo: Anthony McKee / ARDC; *(Centre left)* **Professor Robert Ackland, delivering a social network analysis short course at the Australian Consortium for Social and Political Research Inc. (ACSPRI), a not-for-profit organisation formed in 1976 to promote and enhance social science research and methods in Australia;** *(Centre right)* **The VOSON Lab team (Professor Robert Ackland, Francisca Borquez V. and Bryan Gertzel) demonstrating the open source VOSON web app for online network collection and analysis. The VOSON software has been publicly available since 2006;** *(Bottom)* **Social science methods training delivered by ACSPRI. The 2024 ACSPRI Summer Program marked the 40th year of ACSPRI social science methods short courses.** Photos: VOSON Lab and ACSPRI.

(Top, clockwise) **Participants at the ARDC and Academy's Social Sciences Research Infrastructure Roundtable, held in Canberra, 5 April 2022. Michael Smedes, Chief Data Officer, Australian Bureau of Statistics; Associate Professor Steven McEachern, Director, Australian Data Archive; Dr Chris Hatherly, CEO, Academy of the Social Sciences in Australia, with Steven McEachern and Alison Dellit, Assistant Director General, National Collections Access, National Library of Australia; Jenny Fewster, Director, HASS and Indigenous Research Data Commons, ARDC, with Professor Mark Western, Research Director, The Queensland Commitment and Professor of Sociology at the University of Queensland; Dr Amanda Lawrence, Research Fellow, ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S).** Photos: Hilary Wardhaugh / ARDC. *(Bottom)* **Participants at the 40th Anniversary of ACSPRI's Summer Program, University of Melbourne, 31 January 2024: Professor Robert Ackland (ANU), Dr Chris Hatherly (Academy), Kathryn Unsworth (ARDC), Steven McEachern (ANU, ADA) and Professor Leonie Huddie (Stony Brook University).** Photo: ACSPRI.

The making of the Plan

IN THIS SECTION

- Governance
- Process
- Team and acknowledgements.

Governance

Partners

This Decadal Plan was made possible through a partnership with five major Australian social science research institutions and centres. The Academy expresses its gratitude for their generous support and collaboration.

ANU Centre for Social Research and Methods (CSRM)
Professor Matthew Gray, Director

ARC Centre of Excellence for Children and Families over the Life Course (Life Course Centre)
Professor Janeen Baxter FASSA, Director

ARC Centre of Excellence in Population and Ageing Research (CEPAR)
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ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S)
Distinguished Professor Julian Thomas FAHA, Director

UQ Institute for Social Science Research (ISSR)
Professor Lisa McDaid, Director

Steering Group

This project was guided by a Steering Group comprising nine prominent leaders in the fields of social science research and research infrastructure, whose wealth of experience played a pivotal role in guiding the project's strategic direction and alignment with the evolving needs of the sector.

- Scientia Professor **Kaarin J. Anstey** FASSA FAHMS | ARC Laureate Fellow; Director, UNSW Ageing Futures Institute; Co-Deputy Director, ARC Centre of Excellence in Population Ageing CEPAR
- Dr **Chris Hatherly**, CEO Academy of the Social Sciences in Australia
- Dr **Amanda Lawrence** | Research Fellow, Open Knowledge Systems, ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S), RMIT University
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- Associate Professor **Francis Mitrou** | Chief Investigator, ARC Centre of Excellence for Children and Families over the Life Course (Life Course Centre)
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- Professor **Wojtek Tomaszewski** | Deputy Director (Research) and Research Group Leader, UQ Institute for Social Science Research; Chief Investigator, ARC Centre of Excellence for Children and Families over the Life Course (Life Course Centre)
- Professor **Mark Western** FASSA | Research Director, The Queensland Commitment.

Process

Roundtable

The call for a Decadal Plan emerged during the *Social Science Research Infrastructure Roundtable*, convened in Canberra in April 2022, by the Academy in partnership with the Australian Research Data Commons (ARDC). This pivotal event brought together 23 representatives from Australian universities, research institutes, Commonwealth Government science and data agencies, community organisations, Academies and national collections, to discuss future planning and investment in social science research infrastructure. The development of a Decadal Plan emerged then as an opportunity to enhance coordination and alignment regarding research infrastructure directions and investments in the social sciences.

Stocktake

As a first step towards this Decadal Plan, the Academy conducted a *Stocktake of Social Science Research Infrastructure*, to serve as a baseline for identifying opportunities and gaps, and to track progress over the Plan's implementation. The stocktake identified over 800 capabilities enhancing social science research today. As we move forward, we invite all stakeholders in the sector to explore this live resource, to foster collaboration, address challenges, and ultimately achieve a more connected and impactful social science research infrastructure ecosystem.

Consultation

Next, the Academy embarked on an extensive consultation process (24 July to 18 August 2023), open to all individuals and organisations with stakes in the Australian social science research landscape. The four-week consultation period was accompanied by a discussion paper, which sought input from the sector on the barriers and opportunities presently impacting research quality, productivity and impact, and the potential role of shared research infrastructures in addressing them. This process garnered 23 submissions, each of which contributed significantly to the refinement and enrichment of the Plan.

1. CSIRO Social Science and User Experience Working Group, CSIRO's Data61
2. Research Data Culture Conversation (RDCC) | Monash University, The University of Melbourne, The University of Sydney, The University of New South Wales and The University of Queensland
3. The University of Western Australia
4. ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S)
5. Victoria University
6. RMIT University
7. University of Southern Queensland
8. Australian Business Deans Council
9. The Council of Australian University Museums and Collections (CAUMAC)
10. Lowitja Institute
11. Open Access Australasia
12. ARCHER, An Historical Register of the Australian People from Earliest Records to the Present Day
13. Deputy Vice-Chancellor Research and Enterprise, Australian Catholic University

14. Monash University
15. University of Tasmania
16. The University of Queensland
17. Curtin University
18. Flinders University
19. Fisheries RDC
20. Faculty of Architecture, Building and Planning, The University of Melbourne
21. Australian Institute of Health and Welfare (AIHW)
22. Australian Library and Information Association (ALIA), Council of Australian University Librarians (CAUL), National and State Libraries Australasia (NSLA), Australian Society of Archivists and Council of Australasian Archives and Records Authorities (CAARA)
23. School of Social Sciences, The University of Adelaide.

Expert Working Group

To further ensure this Plan would be collaboratively written with the sector, the Academy sought engagement from experts throughout the drafting process, gathering an Expert Working Group of 90 individuals. This Expert Working Group offered feedback on two versions of the Decadal Plan through email, comments on live documents, and both online and face-to-face discussions. Their invaluable input significantly influenced and lends considerable weight to this strategic document. The Academy extends its gratitude to this outstanding group for generously volunteering their time and expertise to this initiative, and looks forward to their ongoing involvement in the Plan's implementation and other future initiatives of the Academy.

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5 | The making of the plan

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5 | The making of the plan

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