MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

The National Research Information System: Overview

Version 1.1 August 2018

New Zealand Government

Version History

Version	Date	Key updates
1.0	October 2017	
1.1	August 2018	Removing out-of-date references to the timeline

The National Research Information System: Overview

August 2018

Ministry of Business, Innovation and Employment

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Acronyms and abbreviations used in this document

DOI	digital object identifier
HRC	Health Research Council
MBIE	Ministry of Business, Innovation and Employment
MPI	Ministry for Primary Industries
NRIS	National Research Information System
OIA	Official Information Act 1982
ORCID	Open Researcher and Contributor ID
R&D	research and development
RS&I	research, science and innovation
TEC	Tertiary Education Commission

1. What is the purpose of this document?

This document provides a high-level overview of the purpose, benefits and design of the National Research Information System (NRIS). The document supports the development of social and cultural licence for NRIS and as such it is aimed at an informed general audience. More detailed information about NRIS design and development is available in other documents.

2. What is the National Research Information System (NRIS)?

NRIS is an information hub where people can easily find information about research, science and innovation (RS&I) in New Zealand.

It will contain data sourced from organisations active in the New Zealand research, science and innovation system.

NRIS will help people answer questions such as: What projects are underway? Who is working on them? Who is an expert I can contact on a particular topic? What are they working on? How much is being spent on a particular area? Which areas need additional resources and support?

NRIS will initially contain information about research, science and innovation funded wholly, or in part, by the New Zealand government. As experience and confidence with the system grows, we expect information on other RS&I activities, such as privately-funded research, could be included.

NRIS is not a repository, ie it will not hold the actual results of research (such as published papers) or research data[1]. Most of the information about research, science and innovation that NRIS holds will come from funders such as the Ministry of Business, Innovation and Employment (MBIE) and the Ministry of Primary Industries (MPI), and research institutions such as Crown Research Institutes and universities.

In line with the government's information and data management principles, NRIS supports an open data[2] approach to research information, with information easily accessible and widely available. That said, some research information is commercially sensitive or raises privacy issues and needs protecting. When this need exists, such information will be protected within NRIS. Creating NRIS does not affect legal frameworks, such as what can be disclosed under the Official Information Act (OIA) or who makes decisions about disclosure.

NRIS is expected to be operational in 2018 with data from MBIE, the Health Research Council (HRC) and the Royal Society Te Apārangi. Over the next five years, we expect all major suppliers of data to be progressively integrated. As part of this process, we will help organisations meet data collection and quality standards.

Development is being led and managed by the Ministry of Business, Innovation and Employment (MBIE). The development and operation of NRIS is driven by a commitment to collaboration, co-governance and co-design. MBIE is working in partnership with the research, science and innovation sector, including the Māori research community, to build a system that benefits all participants and users.

1 Research data is data that is collected, observed, or created, for purposes of analysis to produce research results

[2] Open data is data that anyone can access, use or share.

2.1. What information will be in NRIS?

NRIS will contain information about the inputs to, and outputs of, research, science and innovation (RS&I) as well as the context in which research, science and innovation is conducted[3].

This includes information about:

- people, groups and organisations
- projects
- the funding environment
- facilities, equipment, and services
- events (such as scientific conferences and workshops or periods of observation or experiment)
- outputs and processes
- measurements and indicators including outputs, outcomes and impacts.

The information in NRIS excludes the results of research, science and innovation (ie data, copies of outputs etc). For example, NRIS will include information about who is doing a Master's or PhD thesis and the topic of their research, but not the actual thesis and associated data. This information may include data on where to find the results of RS&I activities.

[3] After CERIF – see "Research Information the CERIF approach" (section 4, Research information) downloaded 1 September 2017 from http://helios-eie.ekt.gr/EIE/bitstream/10442/13864/1/IJMSO_2014_CERIF_authorFinalVersion.pdf

2.2. Where do I find information about NRIS?

Three main sources of documentation describe NRIS

- NRIS Overview
- NRIS Conceptual Framework
- NRIS technical documentation

These documents are available at www.mbie.govt.nz search: 'NRIS'

Their purpose and update schedule are set out in the following table:

Table 1 Purpose and Review Schedule for NRIS documents

Document	Purpose	Current Version
NRIS Overview	Overview of the purpose, benefits and design of NRIS	Release 1.1 – August 2018
NRIS Conceptual Framework	Concepts and high-level data transfer model for NRIS	Release 1 – October 2017
NRIS technical documentation	Technical information on the development and operation of NRIS, including data standards and security view	NRIS Data Specifications (December 2017, minor document updates May 2018) Further releases on specific aspects of NRIS as they become available

3. What is the purpose of the National Research Information System?

The National Research Information System provides accurate, reliable, accessible and timely information on research, science and innovation in New Zealand.

At the moment, finding information about research, science and innovation (for example how a project was funded, who is working in a particular field or how much government spends on a particular area) can involve a lot of work for incomplete results. NRIS will draw and build on other information systems to provide a comprehensive single source for RS&I information about New Zealand.

NRIS will bring together and open up data on the RS&I sector, simplify administration for researchers and research organisations, and improve the quality of data. Data about funding and in-kind support, researchers and their projects, and the diverse outputs of research, science and innovation will all be available in one place.

This helps researchers focus on research, fosters innovation and enables funders to direct their investments in the most effective way.

3.1. Where has the initiative come from?

Across the board, quality data and information help in making business decisions. Data and information help to inform strategic direction, set investment priorities and improve decision making.

Creating NRIS is a key action in the *2016 Research, Science and Innovation Domain Plan*[4], which identifies information needs and a data improvement plan. The Domain Plan is focused on 'more accurate, reliable, accessible and timely data' with benefits for government agencies, funders, researchers, firms and the New Zealand public.

[4] For more information on the 2016 Research, Science and Innovation Domain Plan see http://www.mbie.govt.nz/info-services/science-innovation/research-and-data/sector-data

3.2. What principles guide NRIS?

NRIS is guided by the government's approach to data and information, especially the emphasis on open data and the joint stewardship and custodianship of data in the public sector. Following that approach, NRIS is underpinned by the following principles based on those in the 2016 Research, Science and Innovation Domain Plan[5]:

1. Provide a **system-wide view** of research, science and innovation information
2. Ensure **open** data which is easily **accessible** and widely used
3. **Protect** personal and commercially sensitive data
4. Enable the **reuse** of data
5. Reduce **collection and reporting burden**
6. Ensure data is **trusted**, **authoritative** and **well-managed**
7. Enable **easy and automatic** movement of data between systems.

The development and operation of NRIS is driven by a commitment to collaboration, co-governance and co-design. MBIE is working in partnership with the research, science and innovation sector, including the Māori research community, to build a system that benefits all participants and users.

Processes and business rules for NRIS will reflect the principles above and ensure these principles are embedded in the operation of NRIS.

[5] These, in turn, draw on the government's overarching data and information management principles: https://www.ict.govt.nz/guidance-and-resources/open-government/new-zealand-data-and-information-management-principles/

3.3. What value is NRIS?

At the heart of NRIS is a commitment to deliver value across the whole research, science and innovation sector and thereby benefit the whole of New Zealand.

NRIS will enhance the dissemination (and hence impact) of research, science and innovation through greater visibility of RS&I information, enable better management and targeting of effort, and provide for greater transparency. Data from research funders, research institutions and researchers will be able to be viewed and combined to create information and generate new insights.

The information available through NRIS will improve understanding of the RS&I sector, helping to answer questions around how much activity is happening in a certain area or where there are gaps in expertise nationally. Greater understanding will help government, funders and research organisations make better decisions and investments.

For Māori, there will be more readily available information about kaupapa Māori research and researchers, activities that aim to deliver benefits for Māori and collaborations with particular iwi.

NRIS will deliver a wide range of benefits. There are benefits for researchers and research organisations, RS&I publications, funders, government and the public.

Benefits from a fully realised NRIS include:

3.3.1. Getting a better picture of what research, science and innovation is happening

- Research, science and innovation information easily accessible and up-to-date
- Information on New Zealand research available from a single source

3.3.2. Making it easier to find experts and partners

- Support for finding experts or partners
- Increased opportunities for collaboration
- Helping bring together the best teams

3.3.3. Helping to develop new products and services

- Easier to find researchers and relevant results
- Businesses, community organisations, iwi and others can identify opportunities for collaboration
- Easier to leverage earlier work

3.3.4. Greater exposure of New Zealand research, science and innovation

- Increase international exposure of New Zealand research, science and innovation
- Greater domestic visibility of New Zealand work

3.3.5. Reducing the reporting burden

- Reduce workload involved in reporting
- Easy to provide information once and then use it multiple times
- Reduce complexity in the system

3.3.6. Reducing duplication of activities

- Less risk of repeating/bidding for already funded projects
- Avoid unintentional duplication

3.3.7. Better understanding of the research, science and innovation sector

- Better system view
- Improve transparency and accountability of public funding

3.3.8. Making smarter decisions and investments

- Extensive, high-quality data to support decisions
- Stronger evidence-based decision making
- Allow more powerful analysis of the research, science and innovation sector

3.4. What questions can NRIS answer?

NRIS will be a searchable database so it will be easier to ask and answer questions.

The data will be available in many different ways – by project, publications, researcher, organisation or sector, right down to detailed questions such as how many people worked on crayfish research in the last couple of years? And what did they do?

Fully realised, NRIS will help answer:

3.4.1. Questions for researchers… eg

1. Who else is working on this area? What have they done?
2. Where can I find a good biostatistician (or any other expert)?
3. Who can I collaborate with?

3.4.2. Questions for research organisations… eg

1. What other organisations are working in this field?
2. How does our institution compare?
3. Who can we work with?

3.4.3. Questions for industry and community… eg

1. Who are the scientific experts in my area or field?
2. What research is going on that might be relevant to my firm/industry or community?
3. How much should we invest in innovation?
4. What are effective ways of partnering with research institutes?

3.4.4. Questions for Māori… eg

1. What work has been produced with Te Reo Māori as the primary language?
2. Who is doing work that aspires to benefit our iwi?
3. Who are the other Māori researchers and research organisations working in my field?

4. What kaupapa Māori research has already been done in this field?

3.4.5. Questions for funding agencies… eg

1. How much are we investing in different areas?
2. What proportion of total funding do we provide in each area in which we invest?
3. Who else is investing in similar areas to ourselves and what are they funding?
4. How do projects and their funding evolve over time?

3.4.6. Questions for government… eg

1. How are researchers working with communities and firms?
2. Are current policy settings working well?
3. What research in New Zealand is relevant to particular policy areas?
4. What science and research is informing policy?

Being able to answer these simple questions will enable researchers and others to answer more complex questions on the innovation system itself. These questions are set out in Section Five of the *2016 Research, Science and Innovation Domain Plan*[6].

[6] For more information on the 2016 Research, Science and Innovation Domain Plan see http://www.mbie.govt.nz/info-services/science-innovation/research-and-data/sector-data

4. How does NRIS support Māori research development?

Many of the benefits of NRIS will help support Māori research, science and innovation activities. NRIS will provide important information for researchers about what is happening in their own field and other related fields. NRIS can also help Māori researchers identify previous work, build their own projects and generate ideas.

In particular, being able to identify who is active in specific fields – and, importantly, who is working with iwi – will help Māori researchers and Māori research organisations identify possible partnerships.

Access to good information and the ability to find people in other fields will be particularly important for Māori researchers starting out in their field. When fully operational, NRIS will include information who is undertaking PhD and Master's research and the topics of their research. There will also be the capacity for Māori funding organisations to feed data about the research, science and innovation they are funding into NRIS, if these funders would like this to occur.

5. What can we learn from international experience?

5.1. Do similar systems exist in other countries?

Many research organisations around the world have invested in a research information management system that connects various systems across the institution. Inspired by these developments at the institutional level, over the last decade some countries have developed systems at a national level that link various systems.

There are typically two types of systems:

- those set up by national-level funding organisations for the research they fund; and
- comprehensive national research information systems that capture data on research from a range of sources within a country.

The trend is towards national systems.[7] National research information systems have been implemented in countries such as Belgium, Sweden, Norway and Portugal.

The United Kingdom and Finland are also developing national systems, although the UK already has a system that covers *some* research. The Research Councils UK Gateway to Research has information about research funded by the Research Councils and, while not a full national system, gives an idea of the type of information that will be available on New Zealand's NRIS.

5.2. What were their motivations?

Systems overseas have taken advantage of developments in technology that make it simple to transfer data between institutions.

The key goal has been improving efficiency by reducing the data collection burden and automating transfer of data. The systems also support open data aims.

5.3. What can we learn from other countries about creating NRIS?

Working with the sector proved crucial to success in other countries so MBIE and the research, science and innovation sector are co-designing NRIS in New Zealand.

In particular, the international experience shows that the key is agreeing common data standards. If everyone collects the data needed in the same way, then regardless of the system any research organisation uses, the data being fed into NRIS will work with the system.

Another challenge faced overseas has been the investment of time and resources for organisations. Because of this, NRIS is planned to be rolled out over several years to give organisations time to adjust systems and practices.

[7] European Parliamentary Research Service: Science and Technology Options Assessment, *Measuring science performance for improved policy making*, April 2014

Privacy and confidentiality concerns often arise in the early stages of these projects. International experience suggests these can be resolved through dialogue and design, and have not proved major barriers to implementation.

International experience also tells us that identifiers are critical to data quality and system interoperability. MBIE is a strong supporter of ORCID adoption in New Zealand and is encouraging the use of the New Zealand Business Number and identifiers for outputs such as digital object identifiers (DOIs).

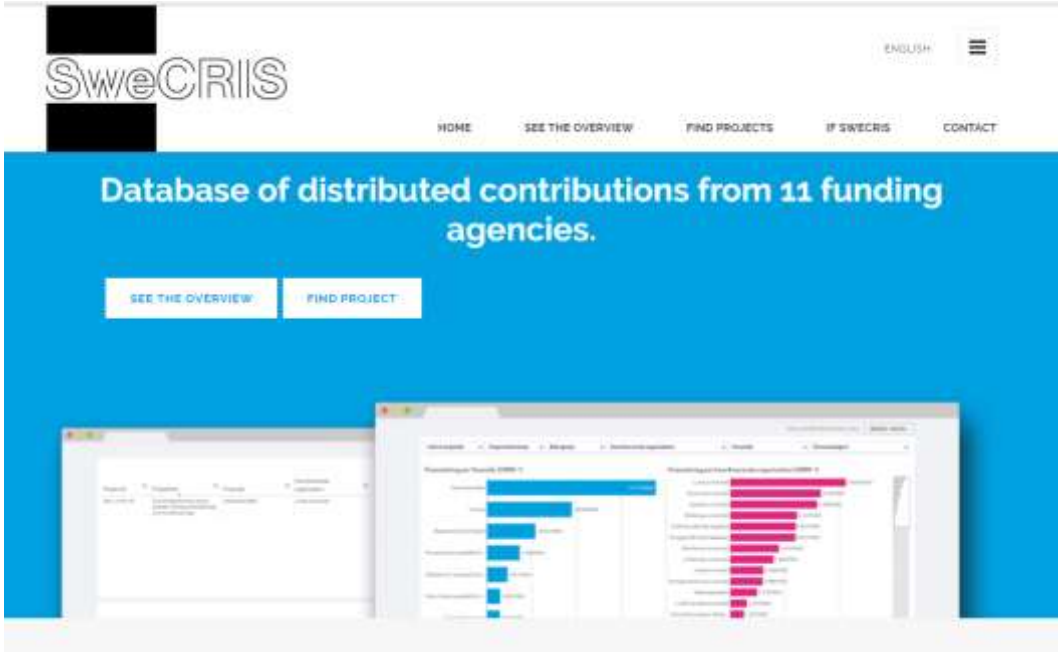
5.4. What do similar systems look like?

5.4.1. Belgium

http://www.researchportal.be/en/index.html

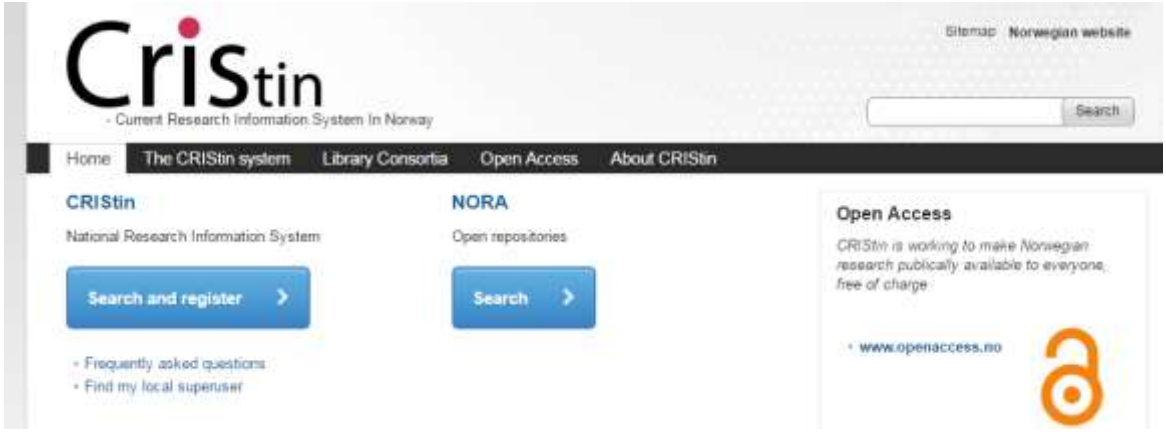
5.4.2. Sweden

http://www.swecris.se/



5.4.3. Norway

http://www.cristin.no/english/



5.4.4. Portugal

https://ptcris.pt/

5.4.5. United Kingdom

http://gtr.rcuk.ac.uk/

6. How will NRIS work?

NRIS will receive and store data about research, science and innovation. Some data is open data and some is protected data. All data within NRIS will be held securely and access will be managed so that open data is readily available and data that needs protection is kept confidential. You can see a diagram of this in Figure 4 *High Level Security Overview for NRIS* and there is more discussion of data security in the sections on security and access.

Data will be transferred to NRIS electronically from organisations that are sharing data. The technical process will be automatic and seamless, and MBIE will work with each organisation to determine the best frequency of data feeds. Regular data feeds will replace other ways of reporting data.

NRIS defines common data standards. This will enable organisations that are sharing data to do so easily from a variety of systems. Data standards are being developed collaboratively[8]. Organisations feeding data into NRIS will use a common Data Transfer Model that is easy to understand and makes clear what data each organisation needs to provide. Figure 1 *High Level Diagram of Data Transfer Model for NRIS* below (page 19) shows the high level Data Transfer Model. More detail is provided in the *NRIS Conceptual Framework*.

Other information sharing systems will be integrated with NRIS. For instance, ORCID iDs will play a key role in uniquely identifying researchers within NRIS. An ORCID iD is a 16-digit number unique to a researcher. They are used around the world to solve the issue of accurately linking research publications, data and other research activities to the right researcher and the need for machine-readable identifiers. More than a name is needed as there might be more than one Jane Smith or someone's name may change.

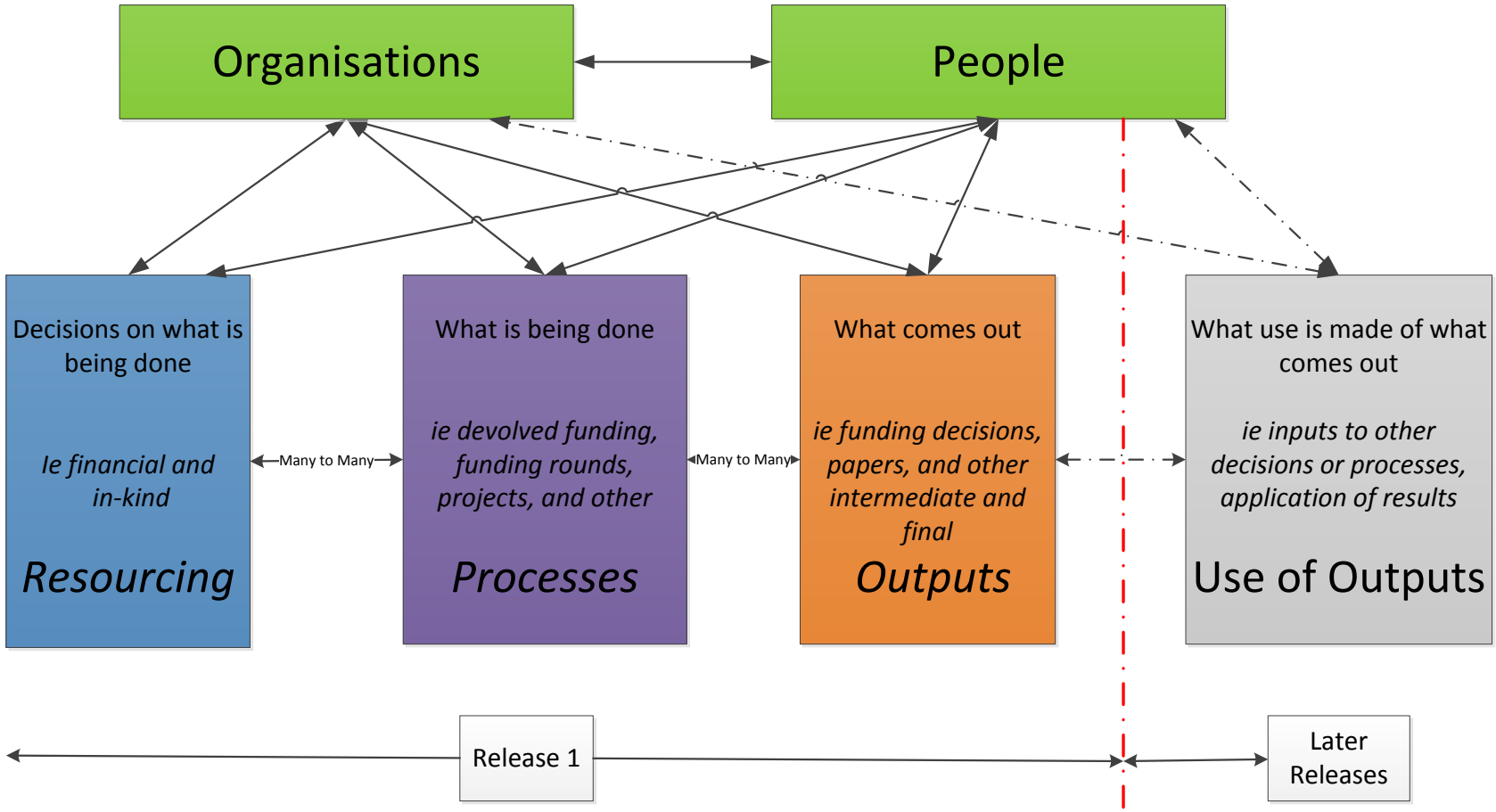
Anyone can sign up to get an ORCID iD. In New Zealand, an ORCID Hub[9] is being developed to allow members of the New Zealand ORCID consortium to write verified information[10] to ORCID records. NRIS will upload information from ORCID records where the ORCID iD owner has authorised this.

NRIS is being designed to be flexible and accommodate changes in the research, science and innovation system and funding processes as well as a wide variety of research processes and outputs.

Once NRIS is fully developed, it will hold data on research resources, processes and outputs from most research organisations and research funders in New Zealand. This will include data from MBIE and other government departments and agencies that fund research, Callaghan Innovation, the Health Research Council, Royal Society Te Apārangi, Crown Research Institutes, universities and other research organisations. This is illustrated in Figure 2.

[8] More information about data standards and the development process can be found in the NRIS Technical documentation and Implementation documentation respectively.
[9] See https://royalsociety.org.nz/orcid-in-new-zealand/
[10] Verified information is information asserted by an educational establishment, employer, funder or publisher that the ORCID holder has permitted to be written to their record.

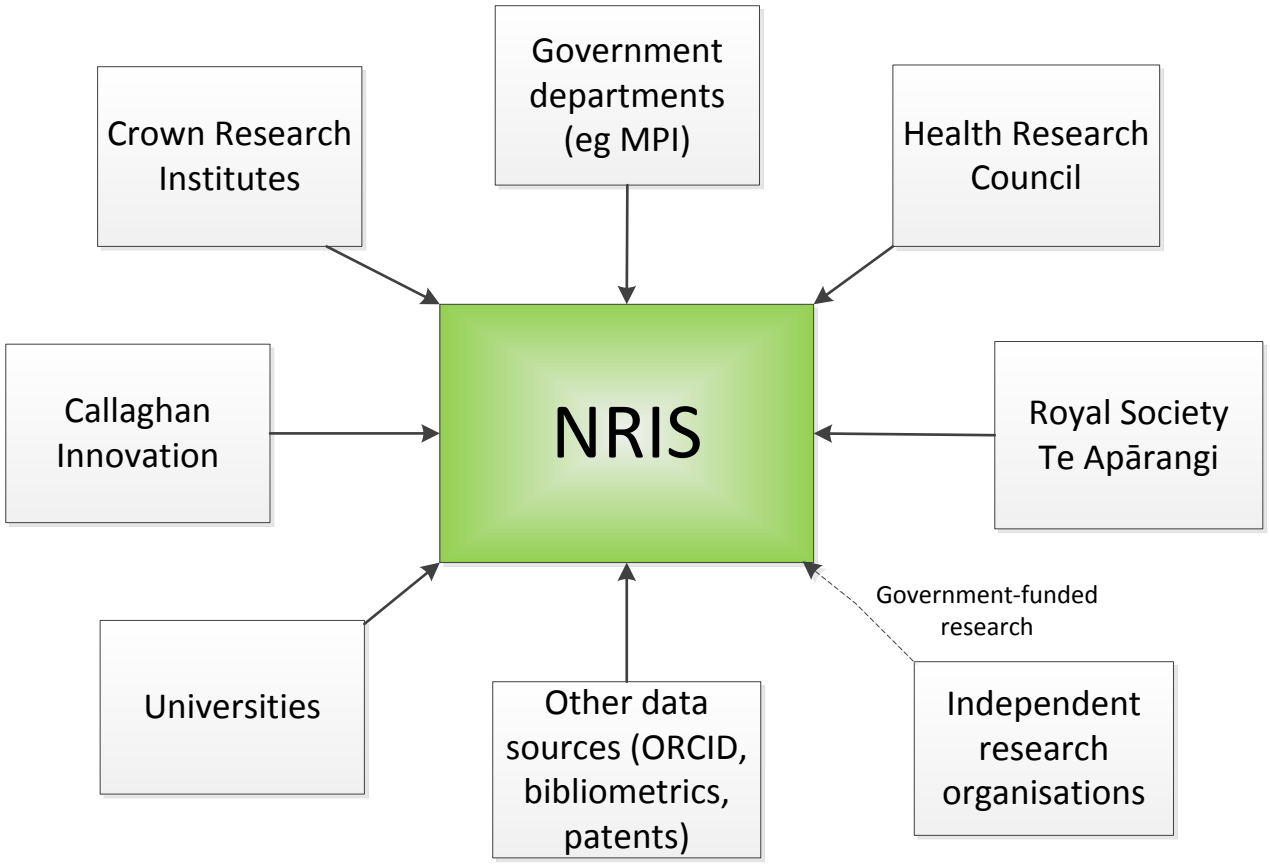
Figure 1 High Level Diagram of Data Transfer Model for NRIS



This sets out the high level data capture model for NRIS. Organisations providing data will be asked to provide data on resourcing and/or, processes and/or outputs for their own work as funder or researcher or both. Each organisation will provide a horizontal slice of data relating to information they have. Unique identifiers will join together information from different sources. More details are provided in the technical documentation and the Conceptual Framework for NRIS.

Figure 2 Flow of data feeds into NRIS

NRIS will initially contain information on publicly-funded research, science and innovation and this is shown below. NRIS aims to incorporate all research by state sector organisations, and encourages others to voluntarily adopt data standards and join NRIS.



6.1. What is the process for developing NRIS?

NRIS is a cooperative endeavour and MBIE has committed to working with the sector in a process of co-governance and co-design. The main focus for collaboration up to now has been on design of concept models and data standards and these have been developed through a process of consultation and dialogue.

In thinking about NRIS, a useful distinction can be made between the

- design and build of NRIS as an IT development project; and
- stewardship of NRIS and the data within it on an ongoing basis.

Through to mid-2018, the focus will remain on the design and build of NRIS. MBIE's first step in developing NRIS was working with the sector on preliminary data standards and a conceptual model of research, science and innovation data, and associated data entities (see the *NRIS Conceptual Framework*). MBIE will continue to work to develop the complete set of initial data standards, and finalise details of the Data Transfer Model for NRIS.

MBIE is working with the Funder-Researcher Working Group, which was set up in 2015 with representatives from key research policy and funding agencies, the research, science and innovation sector, and Stats NZ. Māori representation on the Funder-Researcher Working Group will be strengthened.

The Data Transfer Model and the high-level Concept Model form the NRIS Conceptual Framework. These outline the scope of data to be included in NRIS and start the process of establishing a common set of definitions for concepts and data elements. This material helps organisations plan for data sharing in the future. For more detail see the *NRIS Conceptual Framework*.

MBIE has also started building the IT infrastructure for NRIS and is using data held by MBIE to test how the nascent system works in practice. The next step in this process is to test NRIS using data from the Health Research Council and the Royal Society Te Apārangi. As part of this test phase, MBIE will also work through issues around data security, access and confidentiality with these organisations. Once these are addressed, MBIE will also build and test the web portal enabling external users to interrogate data.

Once the data feeds from MBIE and these organisations are working, NRIS will be operational, although its coverage will be incomplete.

Prior to NRIS becoming operational in 2018, a shared oversight and stewardship structure for NRIS will be established. This is discussed more in the stewardship and oversight section.

In late 2017 and early 2018, MBIE will start talking to research organisations about their capacity and timelines for integrating data. We will help data holders prepare to meet NRIS data collection and quality standards. You can see an indication of phasing in Figure 3 *Indicative phasing of NRIS* on page 24.

The build of the IT infrastructure for NRIS is being funded and managed as an IT development project within MBIE.

6.2. What is the scope of data that NRIS will hold?

NRIS will receive and store data about research, science and innovation in New Zealand.

Some of this will be open data and some will be protected data. This is determined by the organisation supplying the data and by relevant legislation (such as the Official Information Act and the Privacy Act) that apply to the data whether or not the data is held in NRIS.

At first, NRIS will contain information about research funded wholly, or in part, by the New Zealand government. As experience and confidence with the system grows, we expect information on other RS&I activities, such as privately-funded research, could be included. Fully realised, NRIS will be able to hold a wide variety of data about research, science and innovation, and hence be able to generate a broad range of information.

NRIS will initially hold data about resources, processes and outputs, as well as the people and organisations involved with research, science and innovation (see Figure 1 above). As NRIS develops, data about new areas (such as use of outputs) and richer data about existing areas will be brought into the system. More details about the concepts underlying NRIS can be found in the Conceptual Framework for NRIS.

At the moment, the focus is on getting high quality, minimum data sets in the areas of resourcing, processes and outputs. The specifications for data standards in these areas can be found in the Technical Documentation.

6.3. What categories of information will NRIS have the capacity to hold?

From a public perspective, there are three broad categories of data about research, science and innovation (RS&I) in New Zealand:

1. RS&I activities funded in whole or in part by the New Zealand government,
2. RS&I activities performed in New Zealand state sector organisations, such as Crown Research Institutes, universities and Callaghan Innovation, and
3. RS&I activities in New Zealand performed and funded by other organisations and individuals.

NRIS will have the capacity to deal with all three categories of information but will initially focus on the first category. Inclusion of data in the third category will be voluntary; some parties have expressed interest in making use of NRIS. MBIE encourages early adoption of the NRIS data standards by all organisations funding or undertaking research, science and innovation.

6.4. What category of information will NRIS hold first?

Information on research, science and innovation activities funded in whole or in part by the New Zealand government will be the first focus for data incorporated into NRIS (this is category 1 from the list in the previous section).

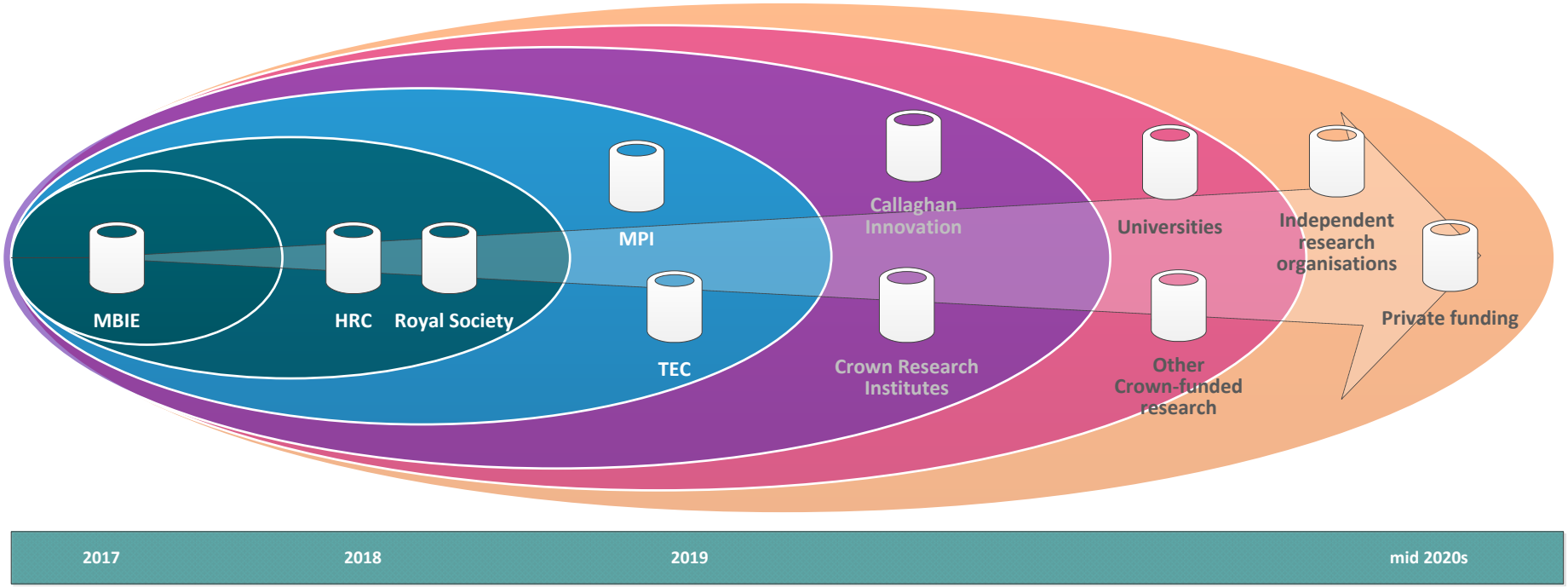
We are beginning with historical data from MBIE itself, and then historical data from the Health Research Council and the Royal Society Te Apārangi will be brought into NRIS. When we have this working well, we will focus on setting up ongoing data feeds. This process will be repeated for other organisations undertaking fully or partly publicly-funded activities over the next few years. This is shown in *Figure 3 Indicative phasing of NRIS*.

Starting with publicly-funded research, science and innovation will allow NRIS to demonstrate its benefits, enable stakeholders to become familiar with its operations, and help the sector gain confidence that confidential information can be securely stored.

Other major areas of information include research, science and innovation undertaken by public institutions with private funding (category 2), and private research, science and innovation (category 3). Where organisations are comfortable to include these classes of information in NRIS now, we will work with them to achieve this. We also welcome the opportunity to include more of these two areas of information as relevant research organisations and funders become comfortable with NRIS operations.

Figure 3 Indicative phasing of NRIS

The figure provides an indicative phasing of the full programme. The first area involving MBIE, HRC and the Royal Society is planned. The remainder is an indication that data holders will be progressively integrated. Phasing will largely depend on the capacity and capability of each data provider. If an organisation is ready, it can join NRIS. We will help organisations prepare to meet data collection and quality standards. Further engagement around phasing will occur in 2018 and detailed planning for the next phase will be part of each prior phase.



7. What is the process for data oversight and stewardship?

7.1. Overview

At present, the nascent NRIS only contains data held by MBIE and this is governed by MBIE's data stewardship processes.

In the next stage of development, historical data from the Health Research Council and Royal Society Te Apārangi will be brought into NRIS. Stewardship of this data will be a matter for joint discussion with these two bodies. Decisions in this context will help inform conversations with other organisations.

As NRIS becomes operational, an NRIS stewardship and oversight structure will be established. Oversight will be a shared endeavour between MBIE and the rest of the research, science and innovation sector, with a strong emphasis on strengthening partnerships with the Māori research community. MBIE will engage with the sector on the details of such a structure over the next few months.

7.2. Stewardship and oversight group

Current thinking is to create a stewardship and oversight group for NRIS. This will initially combine data governance and more operational aspects of oversight. A more layered approach may follow as the system develops and grows.

MBIE will discuss options for such a group with the sector including the Māori research community.

See Appendix A for a proposed concept.

7.3. Data standards and the data collection model

While NRIS is in a development phase, data standards and the data transfer model will be developed and refined by MBIE in collaboration with the research, science and innovation sector through the Funder-Researcher Working Group.

As NRIS becomes operational, changes to the data standards and the data transfer model will be managed through the shared oversight and stewardship structure for NRIS. As the system matures, there is likely to be a structured cycle of proposal, discussion, release and implementation.

7.4. Access protocols

Who has access to data in NRIS is an important area to get right. MBIE will be adopting best practice in terms of access protocols by taking advice from Stats NZ.

During the development process, access to NRIS data will be largely the preserve of the IT development project. The development phase will include creation and testing of Authorised User access for organisations supplying data.

As NRIS becomes operational, protocols for access and the creation of Authorised Users and the scope of open data will be managed, in conjunction with those supplying data, through the shared oversight and stewardship structure for NRIS.

Once NRIS is operational, access for MBIE users will be through the Authorised User system the same as everyone else, with access on the basis of the contractual and legal frameworks applying to MBIE and those who supply data. Protocols for MBIE access will reflect the need for operational separation between NRIS data holdings and other parts of MBIE. In the same way, Stats NZ staff do not have special access to data held by Stats NZ.

8. How will NRIS address the need to keep some data confidential?

8.1. Overview

NRIS will hold both data that can be widely shared – and indeed that people are keen to share – and personal and commercially-sensitive data that needs to be protected.

MBIE will work with data providers to divide data into open data and data that needs to be protected. MBIE will create a system of Authorised Users. Anyone will be able to view open data. Authorised Users will have specific permissions defined for each user. Protected data will only be able to be viewed by Authorised Users who have permission to view that data.

This is summarised in Figure 4 *High Level Security Overview for NRIS*.

8.2. Open data[11]

Open data that is easily accessible and widely used creates many benefits, some of which are only discovered after the data becomes available for use and reuse. Much of the information in NRIS will be open data. Easy creation of new information from this open data will be central to realising NRIS benefits.

Achieving open data and building a data commons for research information requires building a climate of trust, where people and organisations are confident that personal and commercially-sensitive data are protected.

8.3. Protected Data

8.3.1. What is protected data?

NRIS is being designed to securely hold all data. This includes data that needs protection such as:

- Personal data: demographic information (age, gender, date of birth, ethnicity, iwi affiliation) about people within the research, science and innovation sector
- Commercially-sensitive data: data about all aspects of research, science and innovation for which there are commercial reasons to protect the data
- Any other data where disclosure could create risks to personal security or property, or where the availability of that data may enable inferences to be drawn about other commercially-sensitive or personal information

[11] The principles of NRIS draw on the government's overarching data and information management principles: https://www.ict.govt.nz/guidance-and-resources/open-government/new-zealand-data-and-information-management-principles/

8.3.2. Who defines protected data?

Defining data as protected data will, in the first instance, be a matter for those providing data. The decision must also be informed by relevant legislation (such as the Official Information Act and the Privacy Act) that apply to the data whether or not the data is held in NRIS.

NRIS will have the ability to identify protected data at the unit record level. Classes of protected data will also be defined generally by overarching requirements such as the Privacy Act.

8.3.3. When might protected data be accessed?

There are two situations where protected data may need to be accessed within NRIS:

The first is where aggregate information draws on protected data about resources, processes, outputs, people and organisations. MBIE will follow best practice from Stats NZ in terms of confidentiality protocols to limit the inferences that can be drawn about individual data that helps form the aggregate information. MBIE will work with each data provider to address questions and concerns as part of bringing these organisations' data into NRIS.

The second is where a person needs to be authorised to view protected data. This is more common than may first be apparent. Examples of this include:

- where an organisation wants to view all the data it has supplied to NRIS. If this data includes protected data, then a person from that organisation will need to be set up as an NRIS user with authority to view protected data from their organisation.

- where NRIS is used to reduce the regular and ad hoc reporting burden. In most situations, this will be an example of the first case above, however, situations may arise where more detailed information is needed and protected data needs to be accessed directly. The potential for such data to be requested exists with or without NRIS and is included here for completeness.

- where a person wants to obtain a slice of data that includes parts of protected data records. For instance, this might be a researcher wanting to study an aspect of the research, science and innovation sector, just as researchers study Stats NZ data. Those parts of data records they are interested in may, by themselves, be innocuous but because they form part of a protected record, an authorisation process will be needed.

Whatever the specifics of the second situation, approval to view protected data held within NRIS will come from the organisation providing the data. This is the same as the situation if NRIS was not in place. As trust and experience grows, many of these situations will be able to be addressed through business rules and practice guidelines. Initially however, each will be authorised on a case by case basis.

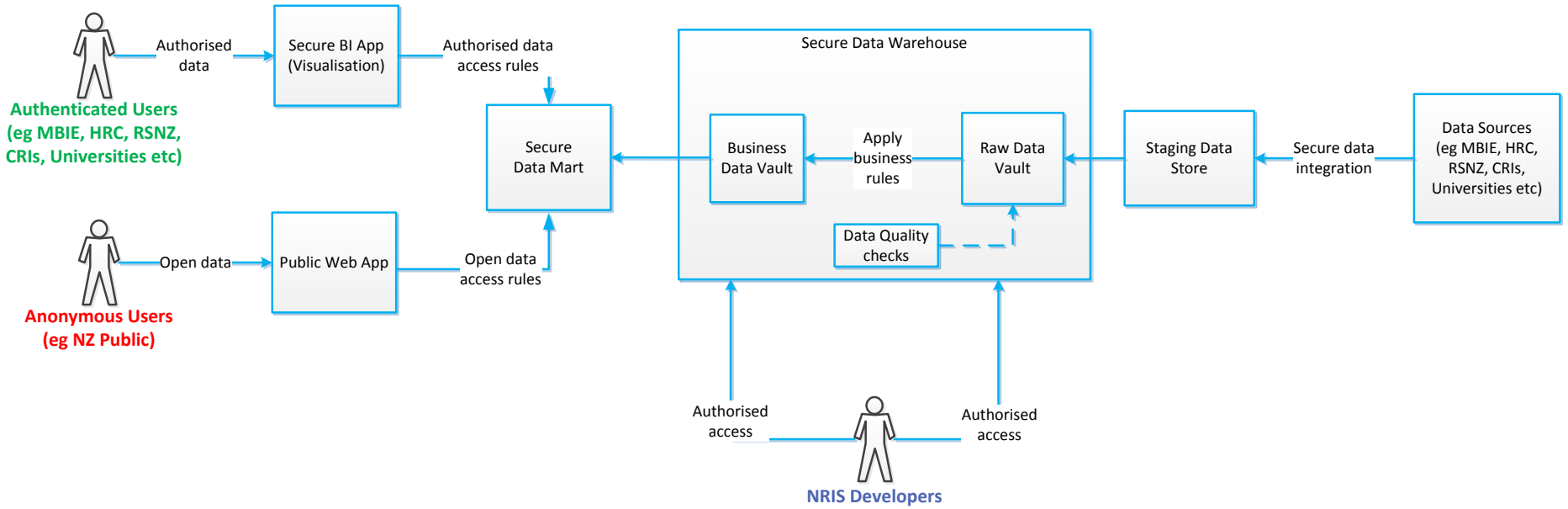
MBIE also appreciates that confidence in these approaches takes time to grow, and we will work through security and confidentiality safeguards in detail with each organisation as their data is brought into NRIS.

9. How will data security be managed within NRIS?

9.1. Overview

Figure 4 provides an overview of NRIS security and access. For more details on security, please see the security view information within the Technical Documentation. MBIE will work through the technical details of security with each organisation as part of discussions on data sharing.

Figure 4 High Level Security Overview for NRIS



9.1.1. Data feed security

As part of normal NRIS operations, MBIE will receive data via an encrypted internet transfer to a secure staging data store and then transfer this data into secure data vaults within the MBIE private data cloud.

9.1.2. Data storage security

NRIS data will be transferred to a raw data vault, quality checks applied and then transferred to a business data vault stored within the MBIE private data cloud. The New Zealand Government uses cloud-based storage due to the combination of high security and cost-effectiveness. Security for this system follows the protocols set out by the New Zealand Government ICT office (www.ict.govt.nz) and MBIE's own data governance and security rules.

MBIE manages data from a wide range of government activities other than research information. MBIE already securely holds confidential data about businesses and individuals and manages access to that data.

9.1.3. Data access security

Access to data within the data vaults is limited to the IT professionals and data analysts managing NRIS. They need access to ensure the smooth and secure operation of the system and run data quality checks.

Prior to any NRIS user being able to access data, the data will be transferred to a secure Data Mart within the Microsoft Azure Public Cloud. Business analysis service Power BI will be used to access the Data Mart.

For public access, a 'public user' interface will be created in Power BI with defined access permissions. Open data will be available to public users through a public web interface. In this way, public access will be one step removed from the actual data mart.

Direct access to the data mart, including potential access to protected data, will be securely managed through a system of Authorised Users who log in through the Power BI interface. Each Authorised User will have access permissions specific to that user.

The system is secure against data alterations as a result of data access. Authorised Users will be able to view data that they have permission to see but not edit it. Even if the data mart was accidentally corrupted in some way, the underlying business data vault would be unaffected, and the data mart can be automatically refreshed.

9.2. What information is excluded from NRIS?

Information which is formally classified by the New Zealand Government as Confidential, Secret or Top Secret will not be contained in NRIS.

9.3. How is privacy managed within the NRIS?

NRIS manages privacy in accord with the principles espoused by the Privacy Commissioner and the government's ICT office. The amount of personal information held by NRIS is limited to data that is relevant to the concept of research, science and innovation information. This personal information includes an individual's name and certain demographic information. NRIS may also hold information about a person's skills and qualifications.

Personal demographic information is protected data in NRIS, unless the person it concerns has consented otherwise, and will be managed in accord with the approach set out for protected data. In most cases, the name of a researcher will be open data as most researchers will want information about their work to be widely available. Information on skills and qualifications drawn from an individual's ORCID iD will reflect the privacy settings an individual has chosen. Again, most data are likely to be open data as a function of both ORCID and NRIS is to make information about skilled researchers more available.

These are the general cases. Discussion of protected data recognises that there may be situations where data about an individual and/or their association with particular work may need to be protected. NRIS will provide for this.

9.4. How can information be reviewed and corrected?

Changes and corrections of data must come from the source. NRIS will provide a mechanism for users to identify errors and communicate these with those providing data. Corrections will then be uploaded to NRIS next time that organisation updates its data. Protocols will be developed to address urgent changes where there are long gaps between regular data feeds.

10. What about the Official Information Act?

10.1. What is the situation now?

Public bodies that conduct or fund research (such as CRIs, universities, wānanga, and government departments) are subject to the Official Information Act (OIA)[1]. The OIA therefore applies to all information, including research, science and innovation information, which these public bodies hold.

The OIA contains a presumption in favour of releasing information when it is requested, unless one of the reasons for withholding it applies. Information cannot be withheld because it is of a particular type or falls within a class or category of information. Instead the OIA requires that *each* request for information must be considered on its merits.

Careful consideration must be given to whether there is a real harm to be protected against by withholding official information. Some of the grounds for withholding are also subject to the public interest test. This means that even if there may be a good reason to withhold the information, this must be balanced against the public interest in its release.

> *For example, if the agency is concerned about privacy or commercial implications of releasing information, a decision-maker needs to consider whether it is truly 'necessary' to withhold the particular information requested. Even if release would be likely to give rise to harm, consideration must then be given to countervailing public interest factors favouring release which might outweigh the need to withhold that information.*

Good practice is to consider whether release in an alternative form to that envisaged by the requester (for example, summary information or inspection) might meet the requester's needs and address the public interest whilst mitigating the harm identified.

Any decision by an organisation can be referred to the Ombudsman for review.[12]

This legal framework is *unaffected* by the existence of NRIS. The Office of the Ombudsman (www.ombudsman.parliament.nz) has extensive resources available on the OIA.

[1] Or, in rare cases, similar provisions in other acts. For a full list of State Sector Agencies see http://www.ssc.govt.nz/state_sector_organisations

[12] The Office of the Ombudsman see www.ombudsman.parliament.nz

10.2. What does NRIS mean for OIA requests?

NRIS does not affect the way OIA requests work for research, science and innovation information.

Where a request is made for information, even if the agency that receives the request directly is subject to the OIA and holds the information itself, the request *'shall'* be transferred to the agency whose functions are *'more closely'* connected with the information[1].

At present for example, if MBIE received an OIA about information held by a CRI, this request would be transferred to the CRI even if MBIE held some or all of the relevant information. Where information comes from several organisations, all organisations would be involved in respect of the particular information most connected with their specific functions, just as is the case without NRIS.

This means that, notwithstanding information sharing (including where there is a pool of shared information), the agency which is best placed to respond to the request is normally the agency that must make the decision on that information. Although MBIE may be in a position to act in a coordinating role, individual organisations will remain responsible for responding to a request about their data even after they share data into NRIS.

Where information might have originated from a third party not subject to the OIA but is now shared between multiple organisations, the question will remain one of determining which agency's functions are most closely connected with the information at issue and hence to whom the request should be transferred for response[13].

[1] Refer s14 Official Information Act 1982.

[13] The Office of the Ombudsman is happy to discuss situations and offer advice in relation to particular requests.

11. Where do I go if I have further questions?

This overview document provides a high level overview of NRIS. Other NRIS documentation provides more detail about data capture and concepts, and technical information about data standards, data security etc.

All NRIS documentation is available on the MBIE website (go to www.mbie.govt.nz and search for 'NRIS').

Information or queries can be emailed to nris@mbie.govt.nz

Appendix A: NRIS Stewardship and Oversight Group – Concept Outline

Functions:

The group will provide oversight and stewardship of the following areas of NRIS:

- Revisions to data standards
- Refinement of the Data Transfer Model
- Data transfer protocols
- Access protocols, and the creation of Authorised Users
- Data security standards

Principles for operation

The group will apply the following principles in its work

Working together: Members of the group will engage with each other and MBIE in a spirit of partnership and co-operation in undertaking the group's function.

Guardianship: An ethic of care and stewardship is applied to both data within NRIS and the creation of a data commons for research information.

Active engagement: All members of the group are active members, undertaking tasks and functions as required to fulfil these the terms of reference and engaging stakeholders through appropriate means with regard to issues of relevance.

Shared value: All members will work together to deliver value to all parties involved with NRIS.

Skills for the group

The group as a whole will need expertise in a range of areas including:

- Data governance in an open data environment
- Sharing data between organisations with disparate systems
- Management of security and access in an open data environment
- Data management implications of legislation
- Kaupapa Māori research and data governance

Composition

Membership of the group will reflect the different roles within the system, and the skills needed for effective oversight. We envisage a group of 9-11 people with the following mix:

Independent Chair, with expertise from

- Research organisations
- Research funders
- NRIS users
- Data expertise
- IT expertise

Support for robust data governance

The group will support NRIS to reflect the following goals in data governance:

- Shared stewardship
- Integrity
- Transparency
- Auditability
- Accountability
- Robust checks and balances
- Develop and maintain social and cultural licence
- Respect indigenous data sovereignty

Relationship with MBIE

The group will have autonomy to make decisions over matters concerning shared stewardship of data.

While MBIE is the sole funder, proposals with financial implications will require approval from MBIE. As MBIE hosts NRIS, proposals will need to comply with MBIE's own data governance and security protocols. Proposals will also need to be compliant with relevant overarching legislation such as the Privacy Act, the Official Information Act and the Crown Entities Act.