ARDC Digital Research Capabilities and Skills Framework

What are Capabilities and Skills Frameworks?

Frameworks are used to identify relevant roles within an organisation, the key capabilities and skills needed to work effectively and successfully in those roles, and competencies that can be used to assess the application of those skills at different experience levels.

These Frameworks also outline existing and emerging skills, roles, job profiles and learning pathways, and provide the toolkit for upskilling individual learners to address specific skill needs. They support the design of training programs and resources for skills and career enhancement. Additionally, they can be used as a mechanism for workforce transformation and change management.

Why Create a Digital Research Capabilities and Skills Framework?

Policy development and public investment in digital research infrastructure has enabled greater access to more data being generated and made available through data intensive research and the emergence of new technologies, methods and digital tools. The promise and benefits for researchers, and society as a whole, are more innovation and improvements in the rate, transparency and reproducibility of research. The realisation of these benefits is predicated on matching increases in the data and digital research skills of our research workforce as without a highly capable workforce, investments in digital research infrastructure will be under-exploited.
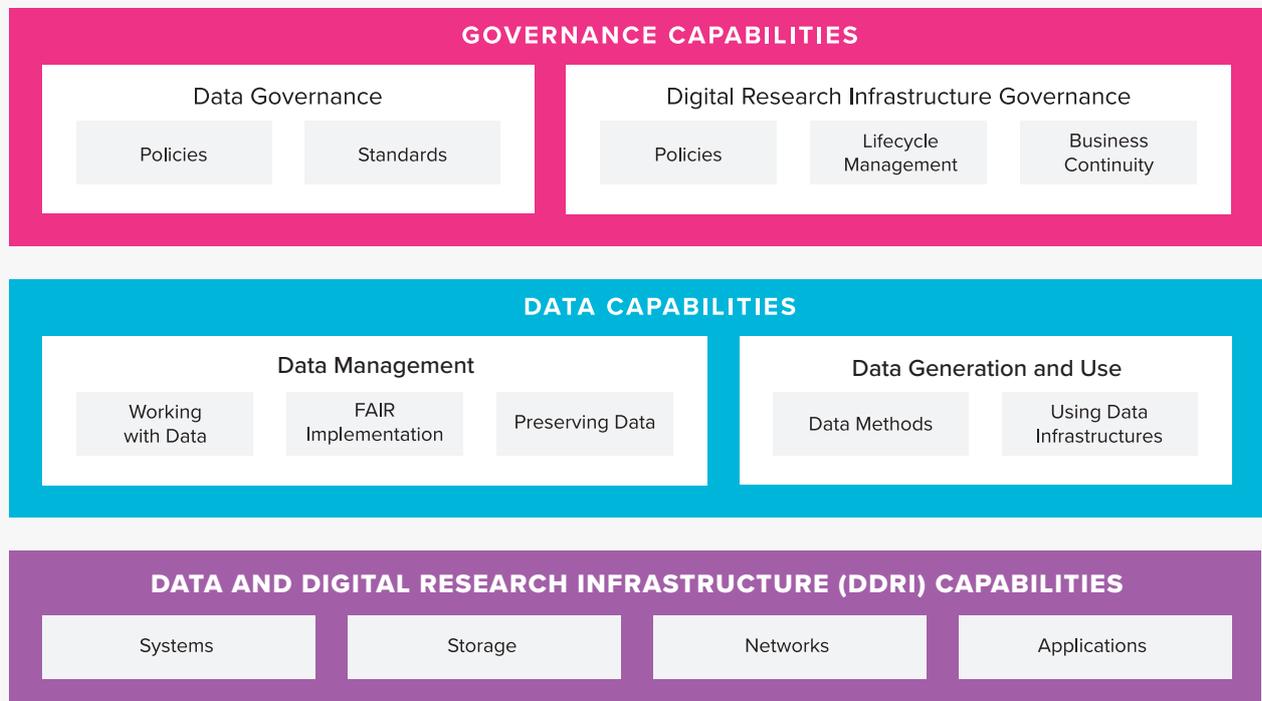
> "
> Internationally, the demand for a skilled research infrastructure workforce is increasing. There is also increasing focus on digital research skills that deliver best practice in research data and software management.
>
> *2021 National Research Infrastructure Roadmap (Department of Education, Skills and Employment)*

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Australian Research Data Commons

What Does the Australian Research Data Commons (ARDC) Capabilities and Skills Framework Look Like?

Working with our partners, we have progressed towards realising a national framework. Components of the Framework include:

1 An evolving **Capabilities and Skills Landscape** (taxonomy) that outlines skills in Governance, Data, Software and Infrastructure Management capabilities.

GOVERNANCE CAPABILITIES

Data Governance

Policies	Standards

Digital Research Infrastructure Governance

Policies	Lifecycle Management	Business Continuity

DATA CAPABILITIES

Data Management

Working with Data	FAIR Implementation	Preserving Data

Data Generation and Use

Data Methods	Using Data Infrastructures

DATA AND DIGITAL RESEARCH INFRASTRUCTURE (DDRI) CAPABILITIES

Systems	Storage	Networks	Applications

2 A **Glossary** that contextually defines the terminology used in the Framework.

3 The Identification of and definitions for generalised **Data and Digital Research Roles**: Data Owner, Data Governor, Data Steward, Data User/Generator, Research Software Engineer, and Data Infrastructure Manager.

4 A set of prototype **Skills/Role Profiles**

5 A series of prototype **Learning Paths** (or Pathways)

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6 A Skills/Data roles **Skills Matrix,** along with the organisations who are potentially best-placed to support those roles and activities

JOBS/ ROLES	Researchers	Data Scientist	Research Software Engineer	Inst Senior Research Manager	Data Infrastructure Manager	Data Manager	Data Librarian	Data Archivist	Data Custodian
LANDSCAPE SKILLS									
GOVERNANCE CAPABILITIES — DATA GOVERNANCE									
Policies									
Standards									
GOVERNANCE CAPABILITIES — INFRASTRUCTURE GOVERNANCE									
Policies									
Lifecycle Management									
Business continuity									
DATA CAPABILITIES — DATA MANAGEMENT									
Working with Data									
FAIR Implementation									
Preserving Data									
DATA CAPABILITIES — DATA GENERATION & USE									
Data Methods									
Data Infrastructures									
DIGITAL RESEARCH INFRASTRUCTURE MANAGEMENT									
Systems Development & Management									
Networking Development & Management									
Storage Development & Management									
Application Development & Management									

"WELL-POSITIONED" ENTITIES

- Universities
- Universities/ARDC
- Universities/NCRIS/ ARDC
- ARDC

COMPETENCY

- Awareness
- Working
- Practitioner
- Expert

What Does the Capabilities and Skills Framework Help Us Do?

The Framework is the starting point in evaluating current approaches to data training. By identifying the relevant capabilities and skills required we start to uncover:

- Siloed skills initiatives, and find ways to build partnerships and improve collaboration

- Skills deficits, and work to address the gaps in data skills

- Areas of skills development for skills stakeholders to strategically invest in.

Who Should Get Involved?

Everyone who wants to understand the skills needed to work with research data, build capability and improve current skills development offerings across their organisations and the digital research sector.
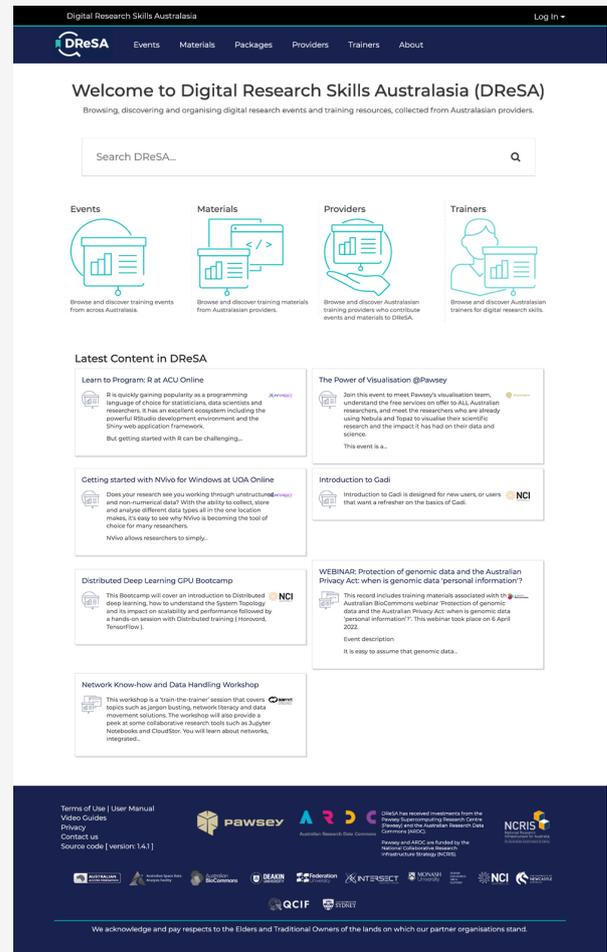
Future planning for integration between the Capabilities and Skills Framework and the Digital Research Skills Australasia (DReSA) training portal.

Learning pathways and role descriptions take the conceptual skills framework and matrix to create actionable applications.

The ARDC Capabilities and Skills Framework Scope

1 The ARDC Capabilities and Skills Framework focuses on digital research and *data-related skills*. Skills such as communication, collaboration, change management and other professional skills are also often required for data stewardship, data generation/use, research software engineering and infrastructure management but are outside the scope of this framework.

2 The ARDC Capabilities and Skills Framework currently focuses on high-level capabilities and skills. As the Framework matures, training for tools and more specific technologies, such as R, Python, MatLab, Tableau, Tensorflow and Regex, may also be represented.

For more information, please email - *contact@ardc.edu.au*.

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