APS Data Literacy Pathway

APS Data Literacy Pathway

Table of contents

Introduction

Background

Data in the public sector is important. Australian Public Service (APS) agencies are the custodians of a vast array of data sources and our Government's decisions must be based on well managed, good quality data. It is important for all APS staff to be able to treat data as an asset, to manage it well and to harness its value. We all need to build public confidence and trust in our ability to hold, handle and use data, as well as meet community expectations that data assets are managed professionally, securely and effectively[1].

Foundational data literacy is a critical set of capabilities for APS employees, across all levels and roles. Building APS data capability is identified in Delivering for Australians as a key enabler to Government leveraging the benefits of data and delivering quality services and outcomes to Australians. Building data literacy in a workforce goes beyond training and requires leadership, culture, behaviours, and actions throughout an enterprise.

Purpose

The purpose of this document is to inform APS agencies on how to build a data literacy learning pathway in their workforce, which focuses on data learning solutions rather than leadership and culture. The audience of this document are employees seeking guidance to uplift their own data literacy, leaders seeking to build data literacy in their teams, APS HR and learning specialist leaders. This document was a collaborative project through the working group represented by the agencies listed in Appendix A.

Data Literacy Definition

For the purpose of this document, data literacy is defined as per the Australian Public Service Commission's definition:

Data literacy is the ability to identify, locate, interpret, and evaluate information and then communicate key insights effectively[2]

Data is any information that is capable of being communicated, analysed, or processed (whether by an individual or by computer or other automated means)[3]

Data Literacy Pathway mapping matrix

The APS Data Capability Framework (DCF) outlines 26 data-specific capability areas associated with working with data in the APS. Each capability indicator spans across three proficiency levels: foundational, intermediate and advanced. Each of the capability areas were reviewed at the foundational level and, where relevant, were incorporated into the data literacy learning pathway (see Appendix B for the DCF and data literacy matrix).

---

[1] Commonwealth of Australia, Office of the National Data Commissioner, Foundational Four, 2020.
[2] Australian Public Service Commission 2018 definition of data literacy.
[3] Data Availability and Transparency Act 2022,

Personas

Data literacy is an essential skill for all APS staff and your level of data literacy will differ depending on the job role and responsibilities, whatever the job role you will benefit from building your data literacy capabilities and knowledge. The personas help you understand how data literacy relates to you and how to navigate the pathway accordingly.

APS Employee

As an APS employee, I have the opportunity to make an impact on Australian lives by using accurate, reliable data to uncover patterns and insights to help my leaders make an informed decisions or predictions. Data literacy is essential to me and all of my APS colleagues. Foundational data literacy will help me understand and use data, reduce bias in my thinking, and improve decision making in my work. I will be able to increase my confidence and capability when it comes to handling the data I encounter in my role, understanding what it can be used for and who I can share it with. Building data skills enables government to provide better services and to make more informed decisions. Data literacy will strengthen my career advancement prospects across a broad range of roles, with greater relevance for work now and into the future.

APS data professional

As an APS Data Professional, my work involves accessing, collecting, interpreting and communicating the insights to my stakeholders. This requires me to be highly responsive to changing priorities in a complex and dynamic environment and to keep my skills and knowledge up to date and relevant. Due to the speed of change, keeping my specialised data skills up to date is incredibly important. This currently relates to data skills, as well as the knowledge of, and how to apply practices based on the latest approaches to data management, governance, security and legislative frameworks. It is a priority to me, my organisation and the Australian public that I am using data in a way that is secure, ethical and builds public trust.

My foundational data literacy skills involve the ability to translate information so everyone can understand and share a common language. This enables me to communicate and collaborate effectively with colleagues and stakeholders across specialties. Developing my vocabulary and understanding of foundational level data skills is key to conversing with those who do not have a data background.

APS SES and ministerial staff

I lead the effective, appropriate, and safe use of data to support evidence-based decisions that are aligned to agency and government expectations. I use evidence and rely on quality data to address key questions about policy, program and/ or service delivery, and to guide the performance of my agency, Department or Portfolio.

I brief Ministers by providing clear and concise advice based on the evidence and insights from the data. I am held accountable for the information provided to stakeholders including the times when I need to support any parliamentary proceedings and processes. I apply data literacy skills when setting the expectations of staff by asking questions about the data supporting new proposals and policies, being transparent about how data informed my decisions and actively enabling staff to raise their data literacy. Understanding the fundamentals about data enables me to maximise the value we get out of our data assets ensuring that our agency's work is proactive, efficient and effective. It is important to me that I know that data is being used safely and appropriately, in a way that builds public trust.

As a leader, I need to build relationships with key senior data leaders, such as my Chief Data Officer, to escalate risk and issues. Being data literate and championing cultural change in my agency and across the APS is a crucial component of my role.

Team manager/Leader

I am always looking for ways to develop and strengthen my team's data skills and knowledge. I want to ensure that my team is equipped to make data driven decisions that is fit for purpose, trusted and reliable data sources. I need to take a proactive approach on how data can transform our work.

It is essential we have a cohesive level of foundational data knowledge in place as we perform and adapt our work in an ever changing and increasingly data driven landscape. Leading by example helps me to build capability in my team by encouraging them to uplift their data skills and to find innovative solutions using the data correctly. Not only does building my own data literacy offer me the same benefits as my team, it increases my job prospects and supports me to build capability in others.

How to use the Data Literacy Pathway

ESSENTIAL	ESSENTIAL	RECOMMENDED	RECOMMENDED	RECOMMENDED
1. Using data in the APS	2. Data trust and ethics	3. Foundations of data research and analytics	4. Simplifying statistics	5. Communicating data insights

The pathway details:

The essential learning clusters for APS staff to complete:

1. Using data in the APS

2. Data trust and ethics

Highly recommended clusters to complete in addition to the essential clusters:

1. Foundations of data research and analytics

2. Simplifying statistics

3. Communicating data insights

To achieve a foundational level of data literacy, all five learning clusters need to be completed. The reason for separating the highly recommended from the essential learning clusters recognises the fact that not all APS staff will be required to apply these learning clusters in their roles. For example, Simplifying Statistics would be required for staff who are required to provide formal reporting, advice, policy formation, respond to parliamentary processes, analyse options or results, or calculate payments and services. There will be a small sub-set of staff within the APS where these foundational skills would be considered highly desirable, but not essential.

Within the learning cluster there is a short description of the knowledge and skills to help provide context and practical application of what each cluster would look like in practice. The learning objectives are listed to assist agencies and individuals to identify where new learning may apply to each cluster. Learning actions, solutions and resources list credible options through which data literacy can be lifted. Some resources will apply to multiple clusters, such as your generic data literacy training, and some will only apply to individual clusters. This document will be refreshed and updated as new solutions are developed.

Feedback

We would love to continue to hear about your experience using the Data Literacy Pathway. We would appreciate hearing how you are implementing the Pathway in your agency so that we can add this experience to the case studies.

You can contact the APS Data Profession team by emailing: data.profession@abs.gov.au.

Learning Clusters

ESSENTIAL	ESSENTIAL	RECOMMENDED	RECOMMENDED	RECOMMENDED
1. Using data in the APS	2. Data trust and ethics	3. Foundations of data research and analytics	4. Simplifying statistics	5. Communicating data insights

1 Using data in the APS

Learning outcomes

By the end of this cluster you will be able to:

1. Understand the role data plays in improving services, policies and programs delivered by the APS, including its use to simplify resources, target customer experience, inform policy development and improve business processes and outcomes.

2. Understand data management and how it is implemented in government to ensure data is stored, managed, used and shared in an ethical and secure way.

3. Provide awareness and understanding of your agency's relevant data management and legislative frameworks.

4. Understand the elements of data quality.

5. Know your organisation's data access and security protocols, and what to do in the event of a data breach.

Learning resources and activities

Learning resources

- APS Data Literacy – Module 1: Using data in the APS (APS Academy)[4]
- DSS Data Showcase – Data in Action – APS – YouTube
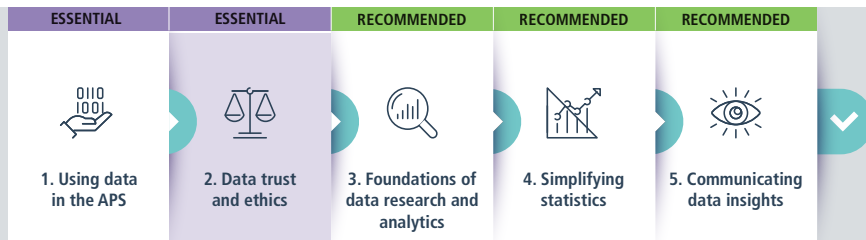- How the APS uses data

Learning activities

- Learn about your agency's data strategy.

Follow the below links to learn about:
- The Australian Data Strategy
- The Office of the National Data Commissioner, and the *Data Availability and Transparency Act 2022*
- Data governance and management
- Building interoperability and the Data Interoperability Maturity Model
- The ABS Data Quality Framework
- The data.gov.au central source of Australian open government data
- Information Matters – YouTube

[4] APS Academy - Access may be restricted by your Agency

| ESSENTIAL | ESSENTIAL | RECOMMENDED | RECOMMENDED | RECOMMENDED |

1. Using data in the APS   2. Data trust and ethics   3. Foundations of data research and analytics   4. Simplifying statistics   5. Communicating data insights

2 Data trust and ethics

Learning outcomes

By the end of this cluster you will be able to:

1. Understand personal and organisational responsibilities with data.

2. Understand the ethical issues that apply to data and personal information.

3. Explain the importance of trust and ethics when collecting, analysing and using data.

4. Describe the 'right to privacy' as a universal human right.

5. Understand the relevant legislative and regulatory requirements for maintaining privacy and integrity of personal data.

Learning resources and activities

Learning resources

- Integrity | Australian Public Service Commission (apsc.gov.au)
- Integrity in the APS
- Introduction to Data Ethics - YouTube
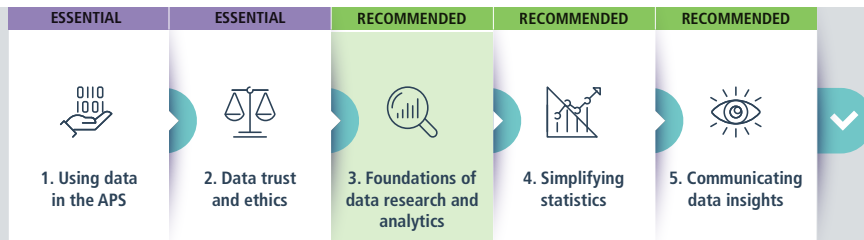- Office of the Australian Information Commissioner

Learning activities

- Learn about your organisation's data ethics, security, and trust policies.
- Identify forums used in your agency to raise, discuss and approve ethical issues.
- Identify the ethical considerations that are particularly relevant to your own work context.

Follow the below links to learn about:
- Building trust in the public record
- The Australian Data Strategy – Earning and maintaining public trust
- The DATA scheme
- The work of the Office of the Australian Information Commissioner and Privacy Commissioner
- Meta…What? Metadata! - YouTube

3 Foundations of data research and analytics

Learning outcomes

By the end of this cluster you will be able to:

1. Use critical thinking to conduct data research and assess evidence.

2. Conduct basic data analysis to produce an output that informs the decision maker.

3. Understand the dimensions of data quality relevant to data use.

4. Use a range of tools and use the most effective one for the intended output, either analytical or visualisation.

5. Apply analytical techniques to identify trends, patterns, and gain insights.

6. Understand and apply the ethical and governance requirements when collecting, analysing, and using data.

Learning resources and activities
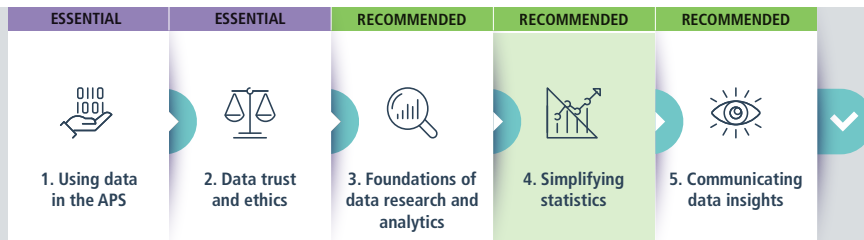
Learning resources

- Data Literacy – Module 2: Undertaking research (APS Academy)[5]
- Data Analysis Essentials | edX
- Analysing Data with Excel | edX

Learning activities

- Identify the analytical tools used at your agency or in your work area and how they are relevant to your work.
- Discuss with your colleagues and team the value of the data you utilise, the data sources and systems, data accuracy and how the insights inform your decision making including the validity, veracity and whether it is fit for purpose.
- Identify the purpose of the data and how it is accessed and used. Are there multiple sources or systems that capture the same or similar data?
- Identify the data quality and data governance frameworks in your agency and discuss how you apply it when using data.

---

[5] APS Academy - Access may be restricted by your Agency

4 Simplifying Statistics

Learning outcomes

By the end of this cluster you will be able to:

1. By the end of this cluster you will be able to:

2. Describe key statistical terms and concepts.

3. Select the most appropriate statistical measures.

4. Accurately interpret, perform and present foundational statistics in a relevant way.

5. Organise basic numerical information and select the most appropriate statistical measure for a purpose.

Learning resources and activities

Learning resources

- Data Literacy – Module 3: Using Statistics (APS Academy)[6]
- Using Statistics to make Evidence Based Decisions (APS Academy)[7]
- High School Statistics | Khan Academy
- www.w3schools.com/Statistics/Index.php
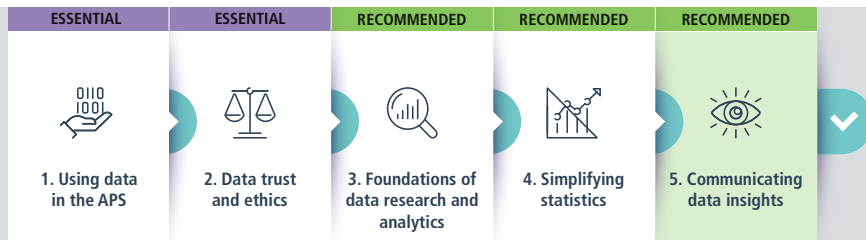- Turning Data into Information

Learning activities

- Learn to perform basic statistical calculations such as the mean, median and mode, and measures of spread.
- Learn to create a report with graphs, tables or charts to communicate the results in informative ways and draw conclusions on the insights presented and why, including any data limitations.

---

[6] APS Academy - Access may be restricted by your Agency
[7] APS Academy - Access may be restricted by your Agency

5 Communicating data insights

Learning outcomes

By the end of this cluster you will be able to:

1. Deliver a simple narrative to communicate insights relating to your data.

2. Communicate the data insights / patterns with relevant stakeholders. This includes understanding the different audiences; using a data storytelling approach to communicate results of data related research; and tailoring the story to increase the audiences' understanding and ability to act.

3. Understand how different data visualisation types, tools and programs are used.

4. Use different data visualisation types, tools, and programs to effectively communicate data insights and narrative.

5. Support communication using visualisations with references to valid, reliable, and accurate sources to support the decision making process.

Learning resources and activities

Learning resources

- Data Literacy – Module 4: Visualising information (APS Learn)[8]
- Data Literacy – Module 5: Providing evidence for decision makers (APS Learn)[9]
- Everything you wanted to know about data visualisation
- Learning Data Visualisation[10]
- Analysing and Visualizing Data with Power BI | edX
- Introduction to Data Visualization | Free Online Course | Alison
- Excel Visualizations Charts and Graphs | Free Online Course | Alison

Learning activities

- Identify who your agency's data stakeholders are and consider their different communication needs.
- Consider who you engage with about data in your work and what format of communication best suits their needs.
- Practice visualising data, using the examples discussed in the learning resources above.

---

[8] APS Academy - Access may be restricted by your Agency
[9] APS Academy - Access may be restricted by your Agency
[10] LinkedIn course - access may be restricted at your Agency

APPENDIX A

Working Group Agencies

Australian Bureau of Statistics

Australian Public Service Commission

Australian Taxation Office

Department of Defence

Department of Foreign Affairs and Trade

Department of Health

Department of Home Affairs

Department of Industry, Science, Energy and Resources

Department of Infrastructure, Transport, Regional Development and Communications

Department of the Prime Minister and Cabinet

Department of Veterans' Affairs

IP Australia

Prime Minister and Cabinet

National Indigenous Australians Agency

Services Australia

The Data Profession would like to acknowledge Services Australia's contributions to leading this project.

Data Literacy Pathway linked to the Data Capability Framework																	
Data Capability Framework capability areas		1 VAL	2 COM	4 GOV	5 AVL	6 ACC	7 SRC	8 COL	10 RSC	13 QUL	14 SCM	15 MGT	17 INT	19 MET	20 USE	23 VIS	24 STS	26 BUS
1	Using Data in the APS	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓		✓	✓
2	Data trust and ethics	✓		✓		✓	✓	✓	✓	✓		✓			✓		✓	✓
3	Foundations of data research and analytics	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
4	Simplifying Statistics		✓			✓					✓					✓	✓	✓
5	Communicating data insights	✓	✓		✓	✓			✓	✓		✓		✓		✓		✓

APPENDIX C

1   VAL – Value organisational data as assets
2   COM – Data Communication
3   IMP – Improvement and innovation - Data processes/systems and tools/products
4   GOV – Data governance
5   AVL – Data availability
6   ACC – Data access
7   SRC – Sourcing and use of administrative data
8   COL - Data collection
9   SMX – Subject matter expertise
10   RSC – Identify research questions
11   OUT – Data outputs, products, or services
12   MTH – Data collection methodology
13   QUL – Data integrity and quality assurance
14   SCM – Statistical concepts and methodologies
15   MGT – Data and information management
16   CLS – Data classification
17   INT – Integrate data
18   EDT – Data editing
19   MET – Metadata - describe and summarise data
20   USE – Data use and re-use
21   PRC – Data processing methodology
22   EXP – Exploratory data analysis
23   VIS – Visualise data
24   STS – Statistical data analysis
25   SPC – Specialist data analysis
26   BUS – Business intelligence data analysis