

APS Data Capability Framework – Production release

(Version 1)



Acknowledgments

The APS Data Professional Stream acknowledges and thanks Stats NZ for the use of their [Data Capability Framework](#). The APS Data Capability Framework has drawn upon this framework, with additional themes included and amendments made to align with the APS context and Data Professional Stream requirements.

We also thank the following agencies who have been pivotal in developing and testing this framework:

Attorney-General's Department

Australian Bureau of Statistics

Australian Public Service Commission

Australian Taxation Office

Department of Foreign Affairs and Trade

Department of Health

Department of Social Services

Geoscience Australia

National Archives Australia

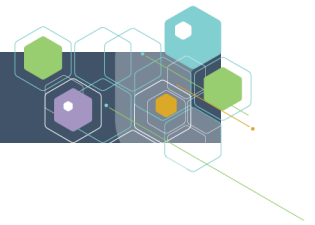
National Indigenous Australians Agency

Services Australia

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Foreword

Colleagues,

As Head of the Data Profession, I am pleased to introduce the APS Data Capability Framework.

Data proficiency is a critical enabler supporting the APS workforce to deliver efficient, effective and responsive service for Australia. All of us, whether we work in policy, regulatory, specialist or service delivery agencies, have a responsibility to build and maintain the data capabilities required to perform our roles now, and into the future.

This Framework establishes the language we will use to define capability areas across the data lifecycle, and sets out the capability indicators that apply to each area. It is relevant to everyone in the APS who works with data in some way, from foundation through to advanced levels of proficiency.

I would like to thank our colleagues in Stats NZ for providing the base upon which we developed our Framework. We released a beta version of the Framework on 30 September 2021 and worked with many agencies – especially those thanked in the Acknowledgements – that contributed their expertise and perspectives to support the development of this, the production release of the Framework. Their input enabled us to ensure the Framework is relevant to the APS as a whole.

I hope you find this Framework useful as you continue to source, develop, and mobilise APS data capability.

Dr David Gruen AO
Australian Statistician
Head of the Data Profession



Introduction

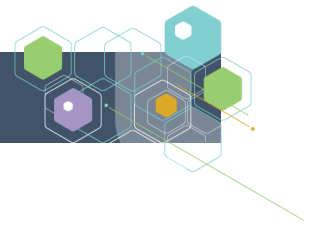
This guide outlines the 26 data capability areas defined in the APS Data Capability Framework. Each has capability indicators that span across three proficiency levels of foundation, intermediate and advanced.

Capability Areas:

1. [VAL - Value organisational data as assets](#)
2. [COM - Data communication](#)
3. [IMP - Improvement and Innovation \(for data\)](#)
4. [GOV - Data governance](#)
5. [AVL – Identifying data availability](#)
6. [ACC – Enabling 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 quality](#)
14. [SCM - Statistical concepts and methodologies – data analysis](#)
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 – Enabling 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](#)

Proficiency Level Definitions

Level 1 - Foundation	<ul style="list-style-type: none">• <i>Basic awareness of concepts and techniques.</i>• <i>Follows guidance, complies with established procedures, seeks advice.</i>
Level 2 - Intermediate	<ul style="list-style-type: none">• <i>Demonstrates a broad understanding of concepts and techniques with experience in applying these.</i>• <i>Demonstrates the skill/knowledge with minimal guidance in routine situations.</i>• <i>Influences, upholds, shares advice, consults.</i>
Level 3 - Advanced	<ul style="list-style-type: none">• <i>Demonstrates an extensive understanding and application of concepts and techniques.</i>• <i>Guides on precedents and/or industry standards; shapes the organisation's approach in the application of this skill/knowledge area.</i>• <i>Sets, leads, designs, innovates, implements, monitors, regulates, develops others.</i>



Navigating the Framework

The Framework can be reviewed in two ways:

1. Referring to the complete list of capabilities, or
2. Filtering the capabilities by data lifecycle category.

Note: The [Framework's Data Lifecycle View](#) assists with filtering by category and is particularly helpful when identifying data capabilities relevant to a role or data-related task.

Data Lifecycle Categories



Plan

The processes and resources are mapped out for the lifecycle of the data. The project's goals are stated, and a full data management plan is created.



Describe

The data is accurately described using the appropriate metadata standards.



Collect/Generate

Data is collected or generated by the individuals/organisation wanting to use it.



Store

The data is stored in a digital repository, is made secure and reusable. This often very quickly follows collection.



Prepare

The data is prepared, made ready for analysis and use.



Analyse/Use/Share

The data is analysed and used for the purpose for which it was collected or generated and reused for additional value.



Preserve/Destroy

Actions are taken to safeguard the long-term viability and availability of the data or destroy it if retention beyond a certain time is undesirable.



The Data Lifecycle View

	PLAN	DESCRIBE	COLLECT / GENERATE	STORE	PREPARE	ANALYSE / USE / SHARE	PRESERVE/ DESTROY
1. VAL - Value organisational data as assets...	✓	✓	✓	✓	✓	✓	✓
2. COM - Data communication	✓	✓	✓	✓	✓	✓	✓
3. IMP - Improvement and innovation (for data)	✓	✓	✓	✓	✓	✓	✓
4. GOV - Data governance	✓	✓	✓	✓			✓
5. AVL – Identifying data availability	✓		✓				
6. ACC – Enabling data access	✓		✓				
7. SRC - Sourcing and use of administrative	✓	✓	✓			✓	
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 quality		✓	✓	✓	✓	✓	
14. SCM - Statistical concepts and methodologies – data analysis		✓	✓	✓	✓	✓	✓
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 – Enabling 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 ...						✓	



1. VAL - Value organisational data as assets

Understanding the value and use of data and treating organisational data accordingly. This includes drawing insights from data for evidence-based decisions and recommendations.

(Organisational data is data that is managed, maintained and owned by an organisation).

Level 1 - Foundation

- *Is familiar with organisational data assets relevant to their work.*
- *Understands how those assets contribute value to the organisation.*
- *Actively looks for opportunities to use data to support decision making, advice and research.*
- *Uses insights from data to make informed decisions.*

Level 2 - Intermediate

- *Knows about various organisational data assets and understands their value to the organisation.*
- *Promotes opportunities for using data to support decision making, advice and research.*
- *Considers the broader environment and context when drawing or interpreting insights from data.*

Level 3 - Advanced

- *Has a comprehensive understanding of the data assets available to the organisation and understands how these assets contribute strategic value.*
- *Looks for new ways to obtain value from organisational data assets.*
- *Can advise how organisational data assets contribute value in broader data contexts.*
- *Has expert knowledge on the broader and strategic environment when drawing insights from data. Uses this expertise to make informed, evidence-based decisions and recommendations and acts accordingly.*

Associated Categories



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2. COM - Data Communication

Effectively communicating with data or about data with a range of audiences.

Level 1 - Foundation

- Can develop and deliver a simple narrative to communicate insights related to their data.
- Can ask and answer a range of questions relating to their data, relevant to the audience.
- Can communicate effectively with a range of stakeholders during data production, management, or use.

Level 2 - Intermediate

- Can develop and deliver an effective narrative to communicate insights drawn from a range of data sources and outputs.
- Can comfortably question data and results they are presented with, and answer technical questions relating to their data, relevant to the audience.
- Can communicate effectively between technical and non-technical experts across data production, management, or use, including clients, managers and data professionals.
- Can effectively communicate the relationship between the data and the context in which it is used.

Level 3 - Advanced

- Can develop and deliver an advanced level narrative to communicate insights drawn from complex data sources and outputs.
- Maintains understanding of new trends and innovations relating to data communication (including Artificial Intelligence-based technologies) and develops skills in these where relevant.
- Understands the importance of translating technical concepts into non-technical language and can adapt communication effectively for a range of audiences.
- Can use innovative approaches to improve the process of summarising data into meaningful narratives.
- Uses high quality analytics and visualisation to communicate insights from data.
- Can effectively listen to technical and business stakeholders and understand and interpret their data needs.

Associated Categories



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3. IMP - Improvement and innovation (for data)

Identifying and implementing change to create efficiencies and new opportunities by making existing processes, systems, tools and products better and/or creating new ones.

Level 1 - Foundation

- Can identify a successful process system or tool/process/product.
- Can identify deficiencies in current processes/systems or tools/products.
- Can support systems testing under guidance and following test plans.

Level 2 - Intermediate

- Can identify deficiencies in current processes/systems and tools/products, gain the required approval to make changes, and lead the implementation of those changes.
- Can identify and harness opportunities to create efficiencies and effective new processes/systems and tools/products.
- Can develop a test scenario and lead systems testing, following organisational procedures and protocols, and analyse the results.

Level 3 - Advanced

- Thinks strategically to assess current processes/systems and tools products across a broad context.
- Develops improvements where needed and encourages others to think critically about processes/systems and tools/products relevant to them.
- Advises those leading changes to processes/systems and tools/products, measures resultant benefits, and makes recommendations.
- Understands the impact of new trends and innovations on organisational data processes, systems and tools, and products.
- Maintains understanding of new trends and innovations relating to data processes, systems and tools, and products within the organisation and externally.
- Provides technical expertise for systems testing, including validating the quality of the testing approach and results.

Associated Categories



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4. GOV - Data governance

Data governance ensures that data is managed properly. It oversees all other data management functions (without directly executing them). It is the exercise of authority and control (planning, monitoring, and enforcement) over the management of data assets.

Level 1 - Foundation

- *Is aware of and understands the implications of data governance frameworks and policies and the relevant legislative requirements that underpins them (includes data access, data security, privacy, and ethics).*
- *Knows where to obtain advice on governance as required.*

Level 2 - Intermediate

- *Can contribute to the creation of internal policies in support of data governance in alignment with current legislative and organisational requirements (includes data access, data security, privacy, and ethics).*
- *Can educate others in the importance of good governance practice.*

Level 3 - Advanced

- *Has expertise in data governance and can formulate and advise on data governance policies and contribute to the structure of organisational data governance frameworks (includes data access, data security, privacy and ethics).*
- *Establishes and maintains links across the organisation to ensure data governance aligns to other governance framework, such as information governance, IT governance and corporate governance.*
- *If applicable, acts as a point of contact for data governance leads in other organisations.*
- *Maintains awareness of new legislative requirements and trends that impact good data governance and ensures organisational compliance with these (includes data access, data security, privacy, and ethics).*
- *Can provide data governance thought leadership and expertise across broader data use contexts.*

Associated Categories



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5. AVL – Identify data availability

Identifying existing and new data sources that can be accessed and used.

Level 1 - Foundation	<ul style="list-style-type: none">• <i>Is aware of available data (both internal and external).</i>• <i>Is aware that data has limitations and gaps and seeks support in evaluating this if needed.</i>
Level 2 - Intermediate	<ul style="list-style-type: none">• <i>Can identify and evaluate internal and external sources of data, including understanding any limitations and gaps.</i>• <i>Can use suitable techniques to evaluate new sources of data.</i>
Level 3 - Advanced	<ul style="list-style-type: none">• <i>Is an expert resource for seeking out new sources of data or identifying new ways of using existing sources of data.</i>• <i>Researches new techniques to assess data availability.</i>• <i>Provides expertise in techniques to evaluate possible new sources of data.</i>

Associated Categories



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6. ACC – Enabling data access

Guiding internal and external stakeholders/clients and provisioning their access to data.

Level 1 - Foundation	<ul style="list-style-type: none">• <i>Is aware of the range of available options to access common data sources.</i>
Level 2 - Intermediate	<ul style="list-style-type: none">• <i>Knows the relevant protocols associated with data access.</i>• <i>Can apply knowledge of relevant data access protocols to enable access as required.</i>
Level 3 - Advanced	<ul style="list-style-type: none">• <i>Can mitigate issues arising from different access approaches.</i>• <i>Can provide actionable strategic advice on data access.</i>• <i>Can make and justify recommendations for data access.</i>

Associated Categories



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7. SRC - Sourcing and use of administrative data

Obtaining and using information which is collected by government departments, businesses and other organisations for a range of reasons such as registrations, sales and record keeping.

Level 1 - Foundation

- *Is aware of the data obtained from administrative sources and the use of administrative data.*
- *Knows where to obtain advice about administrative data sources and use as required.*
- *Understands what administrative data is, including its benefits and limitations.*

Level 2 - Intermediate

- *Is knowledgeable about various sources of administrative data and can explain their limitations.*
- *Can assess the utility of different sources of administrative data for a particular purpose.*
- *Has a strong understanding of the advantages and disadvantages of using administrative data, including in relation to survey data.*
- *Understands and can amend existing code (programming language) to source and combine administrative data.*

Level 3 - Advanced

- *Is knowledgeable about multiple sources of administrative data.*
- *Provides expertise to identify new sources of administrative data as well as uses for that data.*
- *Maintains understanding of new trends and innovations relating to sourcing of administrative data (including Artificial Intelligence-based technologies) and develops capabilities in these where relevant.*
- *Can advise how the data has been used to produce new insights.*
- *Can write custom scripts and code (programming language) to source and combine administrative data.*

Associated Categories



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8. COL - Data collection

Gathering data and useful information, related to a topic of interest, in an established and systematic way. Examples include acquiring administrative data and collecting data through interviews and surveys.

Level 1 - Foundation	<ul style="list-style-type: none"> Understands the role of data collection and the value propositions of different collection approaches. Can collect data by following established processes, systems and tools.
Level 2 - Intermediate	<ul style="list-style-type: none"> Has knowledge of different data collection options, including costs and benefits. Is able to understand and amend existing code (programming language) to collect data. Can mitigate issues arising from different data collection methods.
Level 3 - Advanced	<ul style="list-style-type: none"> Has comprehensive knowledge of all aspects of data collection, including why data is collected and the roles associated with collection. Can write custom scripts and code (programming language) to collect data. Can make justifiable decisions about how data is collected.

Associated Categories



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9. SMX - Subject matter expertise

Applying knowledge and expertise in a specific subject, area, or program.

Level 1 - Foundation	<ul style="list-style-type: none"> Has a general understanding of the subject matter area associated with data use (e.g. small business, healthcare, rural sector, etc).
Level 2 - Intermediate	<ul style="list-style-type: none"> Has knowledge of the subject matter area associated with the data use and can readily identify the parameters of the subject matter that influence the use of the data.
Level 3 - Advanced	<ul style="list-style-type: none"> Has expertise on the subject matter area associated with data use, including understanding, and influencing the effective use of the data within that subject matter area and the relationship between that use and other data use contexts.

Associated Categories



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10. RSC - Identifying research questions

Formulating questions about the topic of interest to guide qualitative and/or quantitative research.

- | | |
|-------------------------------|--|
| Level 1 - Foundation | <ul style="list-style-type: none"> Can formulate research questions with guidance and consider the appropriate approaches and measures to resolve those questions. |
| Level 2 - Intermediate | <ul style="list-style-type: none"> Can identify and structure relevant research questions for specific needs and develop the approach and specific measures to resolve those questions. |
| Level 3 - Advanced | <ul style="list-style-type: none"> Uses a range of techniques, to assess data needs and identify gaps, towards the formulation of appropriate research questions. |

Associated Categories



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11. OUT - Data outputs, products or services

Delivering data-related useable items and services.

- | | |
|-------------------------------|--|
| Level 1 - Foundation | <ul style="list-style-type: none"> Is aware of the steps involved to produce a data output, product or data service and understands the decisions made at each of those steps. Knows where to obtain advice on data outputs, products and/or services as required. |
| Level 2 - Intermediate | <ul style="list-style-type: none"> Is responsible for the production of a data output, product, or service. Can create data outputs or products and deliver data services in accordance with established processes and systems and can explain decisions made at all stages. |
| Level 3 - Advanced | <ul style="list-style-type: none"> Has expert knowledge about the production of a data output, product or service. Provides expertise in developing new products or data services to meet evolving requirements, needs and opportunities. Can build the capability of others in the delivery of data outputs, products or services. |

Associated Categories



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12. MTH - Data collection methodology

The methods and standards relating to designing, developing, and evaluating data collection. Examples of data collection include acquiring administrative data, conducting interviews and surveys.

Level 1 - Foundation	<ul style="list-style-type: none"> • <i>Is aware of relevant data collection methodologies.</i> • <i>Knows where to obtain advice on data collection methodologies.</i>
Level 2 - Intermediate	<ul style="list-style-type: none"> • <i>Has knowledge of a range of relevant data collection methodologies.</i> • <i>Can make and justify recommendations of various collection modes.</i>
Level 3 - Advanced	<ul style="list-style-type: none"> • <i>Has comprehensive knowledge of data collection methodologies.</i> • <i>Can make justifiable recommendations to address data collection issues.</i> • <i>Maintains understanding of new trends and innovations relating to data collection methodologies (including Artificial Intelligence-based technologies) and develops own capabilities in these where relevant.</i>

Associated Categories



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13. QUL – Data quality

Applying measures to ensure that data being used or produced is fit for purpose.

Level 1 - Foundation	<ul style="list-style-type: none"> • <i>Understands the concept of data quality and its importance.</i> • <i>Knows where to access data quality measures for the data they use.</i> • <i>Can follow guidelines and procedures to determine the quality of data.</i>
Level 2 - Intermediate	<ul style="list-style-type: none"> • <i>Can describe and produce data quality measures for the outputs they produce.</i> • <i>Can use knowledge of relevant data quality measures to make accurate assessment of data fitness for purpose.</i>
Level 3 - Advanced	<ul style="list-style-type: none"> • <i>Has expertise in the use of measures for data quality, the interaction of those measures, and their application in conjunction with one another.</i> • <i>Can advise others on the use of data quality measures to make accurate assessments of data fitness for purpose.</i>

Associated Categories



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14. SCM – Statistical concepts and methodologies – data analysis

Understanding and/or applying the statistical methods and principles relevant to data analysis.

Level 1 - Foundation

- *Is familiar with statistical methodologies relevant for their work.*
- *Has a basic understanding of the concepts underpinning the statistical methods relevant to own work.*

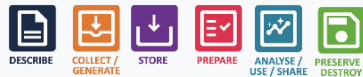
Level 2 - Intermediate

- *Understands a range of statistical concepts, methods, and their application.*
- *Can explain the proper use of a range of statistical concepts and methods.*

Level 3 - Advanced

- *Has comprehensive understanding of a range of statistical concepts and methods and can advise on their proper use.*
- *Leads efforts to apply good statistical practice.*
- *Can build capability of others in understanding and applying a range of statistical concepts and methods*
- *Can understand and apply new or emerging methods.*

Associated Categories



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15. MGT – Data and information management

Involves a range of functions that deliver, control, protect and enhance the value of data and information assets throughout their lifecycle. This includes gathering data, transforming, analysing, categorising, contextualising, and maintaining it (and in some instances accountably destroying it) as an organisational resource.

Level 1 - Foundation

- *Can access and comply with data and information management principles and associated guidelines. This includes requirements relating to data access, data security, data disposal, privacy and ethics.*
- *Knows where to obtain advice on the application of good data and information management practice.*
- *Knows what data is and how it can be used.*

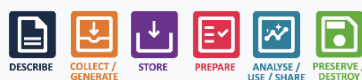
Level 2 - Intermediate

- *Has knowledge of an organisation's data and information management principles and guidelines.*
- *Can apply knowledge to support good data practice. This includes requirements relating to data access, data security, data disposal, privacy and ethics.*

Level 3 - Advanced

- *Can advise others on the proper application of data and information management concepts.*
- *Can advise others on the strategic use of data management good practice.*
- *Can implement and shape the organisation's strategic use of data and information management good practice.*
- *If applicable, acts as a point of contact for data and information management leads in other organisations.*
- *Has expertise in implementing and shaping the organisation's strategic use of data and information management good practice and can advise others. This includes requirements relating to data access, data security, data disposal, privacy and ethics.*

Associated Categories



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16. CLS - Data classification

Grouping a set of related categories in a meaningful, systematic, and standard format, e.g. country or region.

Level 1 - Foundation

- *Is aware of relevant data classifications and coding protocols, and their proper application to data in general.*
- *Knows who to consult for expert knowledge.*

Level 2 - Intermediate

- *Has a comprehensive knowledge of data classifications and coding protocols.*
- *Knows where to obtain expert advice about coding and classifications where needed.*

Level 3 - Advanced

- *Has expertise in data classifications and coding protocols and advises others.*
- *Can employ conceptual frameworks in support of data classification and coding.*

Associated Categories



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17. INT - Integrate data

Combining multiple datasets together to form a larger dataset, aiming to maximise the value of the data.

Level 1 - Foundation

- *Has a basic understanding of how data can be linked with other data.*
- *Understands what data integration is, including its benefits and limitations.*
- *Understands what types of data can be combined for analysis.*

Level 2 - Intermediate

- *Can perform data integration using standard tools and can implement quality controls.*
- *Knows where to obtain expert advice on data integration as needed.*
- *Is able to understand and amend existing code (programming language) to integrate data.*
- *Can assess dataset suitability for linkage and extract appropriately prepared datasets.*

Level 3 - Advanced

- *Can perform and provide expert advice on data integration.*
- *Can build capability of others in understanding and applying good data integration practice and principles.*
- *Can write custom scripts and code (programming language) to integrate data.*
- *Maintains understanding of new trends and innovations relating to integrating data (including Artificial Intelligence-based technologies) and develops skills in these where relevant.*

Associated Categories



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18. EDT - Data editing

Checking data for consistency, errors and outliers, and correcting errors.

Level 1 - Foundation

- *Knows where to access relevant data editing methods and understands the basics of those methods.*
- *Knows who to consult for data editing expert knowledge.*
- *Can edit data following established guidelines and procedures.*

Level 2 - Intermediate

- *Has knowledge of the various data editing methods at their disposal.*
- *Understands the advantages and limitations of different data editing methods.*
- *Knows where to find expert advice about data editing.*

Level 3 - Advanced

- *Has comprehensive knowledge of different data editing methods and can advise others.*
- *Can critically assess current editing methods.*
- *Can build capability of others in data editing concepts and methods.*

Associated Categories



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19. MET - Metadata - Describe and summarise data

Defining and describing data to effectively manage and accurately interpret it. Includes information about data, such as its size or creation date.

Level 1 - Foundation

- Understands there are different ways to summarise data and has a basic understanding of commonly used metadata options.
- Understands the concept of metadata, including its purpose and benefits.

Level 2 - Intermediate

- Can use various summary options to effectively describe data and explain and justify those choices.
- Follows organisational standards and procedures relating to metadata creation, storage, and use.
- Can access metadata and use the descriptors to better understand existing data and effectively use it.

Level 3 - Advanced

- Has expertise in metadata. Can establish standards for metadata and provide oversight and advice to others.
- Maintains knowledge of metadata best practice, including standards and applications.
- Can use a range of tools for storing and working with metadata. Keeps metadata refreshed and updated and can repair items that are incorrect or out of date.

Associated Categories



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20. USE – Enabling data use and re-use

Enabling others to use data for an immediate purpose, and the re-use of data for alternative purposes.

Level 1 - Foundation	<ul style="list-style-type: none"> Understands the data they work with can be used more widely and is aware of relevant data sharing legislation. Is familiar with basic data sharing guidelines and organisational procedures to support the re-use of their data by others.
Level 2 - Intermediate	<ul style="list-style-type: none"> Understands and can articulate the value of data in terms of use and re-use. Implements a variety of techniques to ensure data is open and can be used beyond the specific purpose for which it was collected, in accordance with legislative requirements and organisational guidelines (includes data sharing legislation). Can advise others on approaches to make data re-usable.
Level 3 - Advanced	<ul style="list-style-type: none"> Is a leading strategic adviser on the use of organisational data assets. Has expertise in the design and management of organisational data assets as open data. Promotes re-use and ongoing value of data across wider contexts, in accordance with legislative requirements and organisational guidelines (includes data sharing legislation).

Associated Categories



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21. PRC - Data processing methodology

Understanding and/or applying the statistical methods and standards used to deal with intermediate data and statistical outputs, e.g. weighting schemes, statistical adjustment, or methods for imputing missing values or source data.

Level 1 - Foundation	<ul style="list-style-type: none"> Is aware of the proper processing methodology for the data being used and understands its application. Knows where to obtain advice on processing methodology.
Level 2 - Intermediate	<ul style="list-style-type: none"> Can make and justify suggestions for improvements in how data is processed. Understands how processing methodology affects the quality of the outputs.
Level 3 - Advanced	<ul style="list-style-type: none"> Has comprehensive knowledge of processing methodology and can assess it critically to identify improvements. Can explain how processing methodology relates to the quality of data outputs.

Associated Categories



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22. EXP - Exploratory data analysis

Analysing and investigating datasets to describe their main characteristics, e.g. the distribution of variables.

Level 1 - Foundation

- *Can choose from data analysis techniques.*
- *Can use (or learn how to use) appropriate analytical tools to investigate data.*

Level 2 - Intermediate

- *Can identify and implement suitable techniques and tools and assemble data visualisations for exploratory analysis on large/complex datasets.*
- *Can validate unexpected results.*
- *Is able to understand and amend existing code (programming language) to conduct exploratory data analysis.*

Level 3 - Advanced

- *Is highly competent at performing exploratory analysis on large/complex datasets.*
- *Can build capability of others in exploratory data analysis techniques.*
- *Can communicate findings to a range of audiences.*
- *Can write custom scripts and code in a programming language to conduct complex analytical tasks.*
- *Maintains understanding of new trends and innovations relating to exploratory data analysis (such as Artificial Intelligence-based technologies) and develops skills in these where relevant.*

Associated Categories



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23. VIS - Visualise data

Translating data into a visual context, including maps, charts and graphs, making data easier to interpret.

Level 1 - Foundation

- *Can interpret basic data visualisations like standard charts and explain them to others.*
- *Can create basic visualisations such as tables and graphs.*

Level 2 - Intermediate

- *Can readily produce a range of data visualisation outputs (including complex graphs and map visualisations) and can critically assess and enhance those produced by others.*
- *Can select the most appropriate medium to visualise data.*

Level 3 - Advanced

- *Innovates the development of custom approaches to, and options for, data visualisation, and can incorporate a range of techniques, including automation, interactivity, and animations.*
- *Can advise others on data visualisation options and the best options to present data results.*
- *Can build capability of others in creating and interpreting data visualisations.*

Associated Categories



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24. STS - Statistical data analysis

Conducting analytical tasks on data to produce informative statistics.

Level 1 - Foundation

- *Understands basic statistical measures and their application to data.*
- *Is aware of the analytical methods being used in their work.*
- *Can use appropriate analytical tools.*

Level 2 - Intermediate

- *Can use statistical applications for statistical models.*
- *Is able to understand and amend existing code (programming language) to conduct analytical tasks.*
- *Can identify and implement suitable techniques and tools to explore data.*
- *Can validate unexpected results arising from data analysis.*

Level 3 - Advanced

- *Contributes to the development of novel statistical data analysis models.*
- *Can build capability of others in statistical data analysis techniques.*
- *Has expertise in multiple data analysis techniques and applications.*
- *Can write custom scripts and code in a statistical computing language to conduct complex analytical tasks.*
- *Maintains understanding of new trends and innovations relating to statistical data analysis (such as Artificial Intelligence-based technologies) and develops skills in these where relevant.*

Associated Categories



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25. SPC - Specialist data analysis

Conducting analytical tasks on data in specialist areas such as geospatial analysis and timeseries forecasting to produce informative statistics.

Level 1 - Foundation

- *Understands the need for specialist data analysis methods and tools in some situations (e.g. geospatial analysis and time series forecasting).*
- *Is aware of the analytical methodology being used in their work.*

Level 2 - Intermediate

- *Can develop, fit, diagnose, and troubleshoot a model in a new data analysis scenario that requires a specialist method (e.g. geospatial analysis or time series forecasting).*
- *Is able to understand and amend existing code (programming language) to conduct specialist data analysis.*

Level 3 - Advanced

- *Innovates in developing new methods in specialist areas (e.g. new approaches to geospatial analysis or time series forecasting).*
- *Can write custom scripts and code in a programming language to conduct complex analytical tasks.*
- *Contributes to the development of novel statistical data analysis models.*

Associated Categories



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26. BUS - Business intelligence data analysis

Conducting analytical tasks on data from business operations that inform the organisation's strategic and operational business decisions.

Level 1 - Foundation

- *Can use common applications to generate basic analysis outputs like tables with calculations and static charts.*
- *Understands reports and dashboards created with business intelligence tools.*
- *Is aware of the analytical methods being used in their work.*
- *Can conduct basic analysis on simple data.*

Level 2 - Intermediate

- *Can use business intelligence applications to create complex reports and dashboards.*
- *Is able to understand and amend existing code (programming language) to conduct business intelligence data analysis*
- *Can identify and implement suitable techniques and tools to explore data.*

Level 3 - Advanced

- *Has expertise in multiple business intelligence techniques and applications.*
- *Can build capability of others in developing outputs using business intelligence applications.*
- *Can write custom scripts and code in a programming language to conduct complex analytical tasks.*
- *Contributes to the development of novel statistical models.*
- *Maintains understanding of new trends and innovations relating to business intelligence data analysis (such as Artificial Intelligence-based technologies) and develops skills in these where relevant.*

Associated Categories



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