# Research Data Management Framework: Capability Maturity Model

## About the Capability Maturity Model

This table is a summary of the [ANDS Data Management Framework Guide](https://ands.org.au).

This practical Guide is for research institutions which are intending to assess the capability maturity of their current infrastructure supporting the management of institutional research data assets. A Capability Maturity Model is used as the instrument to support institutions to investigate their research data capability maturity using:

- **5 elements of data management capability**: Policies and procedures; IT infrastructure; support services; managing metadata, managing research data
  
  - Checklists

- **and assessed across 5 levels of maturity**: Initial; Development; Defined; Managed; Optimised

This Guide and table are a basic starting point for institutions who wish to assess their **capability maturity** in terms of research data management.

<table>
<thead>
<tr>
<th>Element of Data Management Capability</th>
<th>Maturity Level</th>
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</thead>
<tbody>
<tr>
<td>Policies and procedures</td>
<td>Initial, Development, Defined, Managed, Optimised</td>
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<tr>
<td>IT infrastructure</td>
<td>Initial, Development, Defined, Managed, Optimised</td>
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<tr>
<td>Support services</td>
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<td>Managing metadata</td>
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<tr>
<td>Managing research data</td>
<td>Initial, Development, Defined, Managed, Optimised</td>
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<tr>
<td>Level 1</td>
<td>Level 2</td>
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<tr>
<td>Initial</td>
<td>Development</td>
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<tr>
<td>Process is disorganised &amp; ad hoc</td>
<td>Process is under development</td>
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</table>

### Institutional policies & procedures
- Policies & procedures may be undeveloped, not up to date, and/or inconsistent.
- Policies & procedures are developed & harmonised.
- Policies & procedures are promulgated & absorbed into behaviours.
- Policies & procedures are subject to review & improvement.

### IT infrastructure
- IT infrastructure provision is patchy, disorganised & poorly publicised.
- Funds are invested in technology & skills.
- Management shows active support. Facilities are well-defined & communicated, standardised & integrated.
- Funding adapted to need. Management is actively engaged. Documentation kept up to date.
- Concerted efforts to maintain, update & publicise infrastructure. Metrics & feedback used to optimise services.

### Support services
- Training is ad hoc, curation & preservation services are disorganised, data management planning is unsupported & other services inconsistent & poorly publicised.
- Investment in skills. Services identified & staffed.
- Responsibilities are defined. Documentation & training developed.
- Active participation in training with widespread availability of support services.
- Customer feedback used extensively to update & improve services.

### Managing metadata
- Metadata management is ad-hoc, chaotic & understood by only a few and without established standards.
- Responsibilities are defined & skills developed.
- Processes are established & documented.
- Metadata applied to key datasets & shared externally.
- Processes are standardised & integrated.
- Metadata created for new datasets & shared externally, to ensure data is findable and accessible.
- Metadata quality metrics are collected. All datasets described in machine-readable format & metadata shared. Metadata aligns with the FAIR data principles.
- Continuous improvement applied to processes & capabilities.

### Managing Research Data
- Data is stored in ad-hoc facilities. Only data custodians know where the data is stored and accessible only to the researcher or small group of researchers, Standard formats are not applied and the potential for reusability is limited.
- Institutional data storage facilities are being developed. Data standards established.
- Well defined data storage facilities are established. Data managed using standard open formats widely used. Some connectivity between systems permitting limited reuse and sharing.
- Data routinely stored in established repositories in machine-readable formats using open standards in established facilities according to FAIR principles.
- Continual improvements to maintain update & publicise infrastructure. Metrics & feedback used to optimise services.

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