RDM Maturity Assessment Model in Canada (MAMIC)
Version 1.0

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Acknowledgements

Introduction

Canadian post-secondary institutions are fundamental to mobilizing knowledge by undertaking critically important research and the training of tomorrow's citizens, leaders and entrepreneurs. Institutions need to have a clear understanding of their capabilities to support their research ecosystem. While Research Data Management (RDM) has evolved as a robust practice for data stewardship in Canada and internationally, institutions are currently formalizing services in this realm to support their researchers. In developing services to support RDM practices, an RDM maturity assessment is helpful: first, to ascertain whether or not the different areas of the research data life-cycle are being supported; and second, to understand who is responsible for the different areas. This task involves coordination between different stakeholders across campus, including, but not limited to, the Library, the Research Office, the Ethics Office, and the IT Department. A robust and representative assessment is developed through consultation and input from all relevant stakeholders to determine the institutional research data assets. This will then ensure that the institution is supporting researchers to enable them to practice effective research data management.

The RDM Maturity Assessment Model in Canada (MAMIC) is intended to be a Canadian-specific tool used for generating discussion amongst the various stakeholders supporting RDM at your institution, and to help everyone better understand the perceptions of various stakeholders of the current RDM service offerings at your institution. Once you have assessed your institution's current state of RDM support, the stakeholders can then determine the gaps and form an institutional strategy going forward. It should be mentioned here that if you have already completed the RISE model, then completing the MAMIC will be relatively easy as many of the questions are similar. If you have not yet completed the RISE model, there is no need to do so, as the MAMIC is intended to help you to determine the current RDM support offered at your institution.

Please note that this framework tool is designed to support *your* Institution - the information gathered will be for your use only and will not be collected.

In completing your MAMIC, you may wish to limit your assessment to institutional RDM efforts. Alternatively, you may also consider adding regional, national or external RDM supports available to your institution.

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Completing the MAMIC

To assess institutional RDM maturity, there are four tables, each for a different category:
- Institutional Policies and Processes
- IT Infrastructure
- Support Services
- Financial Support

Each category contains specific elements to assess. The assessment is calculated based on a 5-level scale, with the highest rating representing a strong maturity for the element and lower ratings indicating room for improvement (or gaps). For each element, choose the "Maturity Level" that best reflects efforts at **your** institution:
- Not applicable (skip Element)
- (0) Does not exist OR Do not know.
- (1) Element is not formalized or is ad hoc.
- (2) Element is under development.
- (3) Element is operationalized and launched.
- (4) Element is robust and focuses on continuous evaluation.

When determining the maturity of the different elements, it is also important to assess the "Scale" at which they apply at **your** institution:
- (0) Not applicable - if 0 or NA are chosen for *Maturity Level*
- (1) Offered only to specific users upon request.
- (2) Available within certain units or cohorts.
- (3) Available to everyone.

The last column in each table is for "*Your Comments*". This will include anything that you think is relevant to this particular element. It could be utilized for any notes you wish to make about reasons for selecting the maturity level and scale, notes about the institutional progress or offerings you have considered, questions or comments to highlight to stakeholder groups, or items you may wish to reflect back on in future assessments. If you have chosen "Do not know or does not exist", you may want to expand on this in the "*Your Comments"* section.

At the bottom of each table, every person(s) who filled it out should include their name and role. As there are different stakeholders filling out your MAMIC, this will enable everyone to know who to direct any questions to concerning any of the categories.

Just a final reminder that this MAMIC is to help you and other stakeholders at your institution to assess your RDM readiness. Once the tables are filled in, you will be better positioned to create your RDM Institutional Strategy (as required by the Tri-Agency RDM Policy) by having a clearer understanding of your priorities and areas of focus for service improvement.

Institutional Policies and Processes

This area of activity covers the development and maintenance of policies related to RDM, and relevant processes that are related to supporting RDM services.

Hints to consider that will impact your assessment:
- Scope (e.g. data stewardship, destruction of records, security and protection, etc.)
- Research Ethics Board guidelines
- Outreach plan
- Other institutional materials that contain relevant components

Maturity levels:
> Not applicable
>> ○ skip this element
>
> 0 - Does not exist OR Do not know
> 1 - Element is not formalized or is ad hoc.
>> - Policies and procedures may be undeveloped, not up to date, and/or inconsistent.
>> - Some related policies may exist but are insufficient.
>
> 2 - Element is under development.
>> - Policies and procedures are being conceptualized and formulated.
>
> 3 - Element is operationalized and launched.
>> - Policies and procedures are defined and standardized.
>
> 4 - Element is robust and focuses on continuous evaluation.
>> - Policies and procedures are subject to review and improvement.

Scale:
> Not applicable - if 0 or NA are chosen for *Maturity Level*
> 1. Offered only to specific users upon request.
> 2. Available within certain units or cohorts.
> 3. Available to everyone.

Category: Institutional Policies and Processes				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
Institutional RDM Strategy	As defined by the Tri-Agency. This includes any Institutional RDM roadmap detailing how the strategy will be implemented.			
Institutional RDM-related Policies	Includes all relevant policies at the institution that may address RDM or components related to RDM.			
Data Management Planning-related Procedures and Guidelines	Any institutional procedures or guidelines that outline how researchers should address data management plans (e.g., expectations of DMP creation, submission and/or review).			
Security and Risk Assessment Policies and Procedures	Any institutional procedures or policies that address security and risk assessment related to research data (e.g., legal and privacy issues, vulnerability assessments, etc.).			

Category: Institutional Policies and Processes				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
Communication and Outreach Plan	Any plans for the promotion of RDM. This may include raising awareness of national policies and guidelines that affect RDM (e.g., Tri-Agency policies, funder policies, journal policies), and providing links and resources for best practices and tools.			

Name(s) and role(s) of person(s) who filled out this table:

Date(s) completed:

IT Infrastructure

This section covers the breadth of an institution's RDM infrastructure. It includes infrastructure provision, file storage, synchronisation, and authentication and access.

Hints to consider that will impact your assessment:
- Storage and computing infrastructure researchers will need throughout the research data life-cycle (e.g., departmental file storage, network drives, cloud computing).
- Locally offered, or regionally/nationally offered infrastructure.
- Usage of third party services.

Maturity levels:
Not applicable
- ○ skip this element

0 - Does not exist OR do not know

1 - Element is not formalized.
- - Provision is patchy, disorganized and/or poorly publicized.

2 - Element is under development.
- - There is a base level of investment in technical infrastructure, with commitment to supporting recurring costs.

3 - Element is operationalized.
- - Roles and responsibilities are defined.
- - Processes are established, defined, and documented.
- - Your institution coordinates investment in the central technical services it deems a strategic priority for research data life-cycle support.

4 - Element is robust and focuses on continuous evaluation.
- - Your institution invests in technical infrastructure for all aspects of the research data life-cycle, interoperating with tools and workflows at the research group level.
- - Metrics and feedback are used to optimise services.

Scale:
Not applicable - if 0 or NA are chosen for *Maturity Level*
1. Offered only to specific users upon request.
2. Available within certain units or cohorts.
3. Available to everyone

Category: IT Infrastructure				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
Access/ Authentication / Authorization	Availability of infrastructure and associated services covering identity management and verification, and mediated access to research data according to security needs.			
High Performance Computing	Offering aggregate computing power that delivers higher performance than a typical desktop workstation.			
Active Storage	Institutionally managed storage space for active projects.			
Active Storage - Sensitive Data	Institutionally managed secure storage space for active projects that have sensitive or confidential data requirements.			
Collaborative Digital Work Space	Private digital space for researchers to collaborate on research projects. This may be within the institution or across institutions.			

Category: IT Infrastructure				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
File Transfer service	Mechanism for securely moving large files within and outside of the institution.			
Repository for Data Deposit	Provided by the institution for data deposit and dissemination upon completion of the research project.			
Sensitive Data Deposit	Provided by the institution for secure data deposit and restricted access upon completion of the research project.			
Preservation / Archival Storage	Commitment and space to maintain data integrity and access over a specified period of time.			
Governance of Enterprise Software	Management of various software packages needed at different stages of the research life-cycle.			

Name(s) and role(s) of person(s) who filled out this table:

Date(s) completed:

Support Services

This section looks at support and advisory services around training and consultation for RDM, Data Management Plans (DMPs), and data curation. It includes in-person and online advice for researchers needing support in the different areas of RDM.

Hints to consider that will impact your assessment:
- The staff who deliver the different types of support.
- The way the information about the support offered is communicated.
- Note:
  - Synchronous offerings can involve either face-to-face or Zoom-type meetings.
  - Asynchronous offerings are resources that can be reviewed at any point in time.

Maturity levels:
　Not applicable
  - skip this element
0 - Does not exist OR do not know
1 - Element is not formalized.
  - Services are ad hoc, disorganized, unsupported, inconsistent and/or poorly publicized.
2 - Element is under development.
  - Could include scoping exercises, needs assessments, stakeholder consultations, program efforts under way, and/or pilot projects.
3 - Element is operationalized.
  - There has been an investment in skills development for service providers.
  - Services and responsibilities are identified, defined and standardized, and staffed.
  - Documentation and training are developed.
  - Guidance offers relevant advice on how to use RDM services.
4 - Element is robust and focuses on continuous evaluation.
  - There is a widespread takeup of services.
  - Guidance is significantly tailored to support the specific needs of your institution.

Scale:
　Not applicable - if 0 or NA are chosen for *Maturity Level*
1. Offered only to specific users upon request.
2. Available within certain units or cohorts.
3. Available to everyone.

Category: Support Services				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
General RDM Training	Builds RDM skills among researchers through workshops, webinars, lectures, etc.			
General RDM Consultation	Individual or group sessions relating to RDM needs.			
DMP Training	Builds skills for researchers to effectively put together a DMP through workshops, webinars, lectures, etc.			
DMP Consultation	Individual or group sessions relating to developing a DMP.			
Data Curation Training	Builds skills for researchers to effectively curate their data through workshops, webinars, lectures, etc.			
Data Curation Consultation	Individual or group sessions relating to curating and preparing data for deposit (including metadata and documentation).			

Category: Support Services				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
RDM-related software training	Builds tool and software skills for working with data across different stages of the research life-cycle through workshops, webinars, lectures, etc.			
RDM-related software consultation	Individual or group sessions relating to the use of enterprise tools and software.			

Name(s) and role(s) of person(s) who filled out this table:

Date(s) completed:

Financial Support

This section is looking at the RDM business plan, capacity and sustainability. It lists considerations that will secure the sustainability of RDM services.

Hints to consider that will impact your assessment:
- Specific RDM roles and responsibilities are outlined in job duties.
- Existence of professional development opportunities.
- Agreements are in place to provide funding for various aspects of RDM.
- Costs of data storage are considered.
- Costs for expertise are considered.
- License costs are considered.

Maturity levels:
    Not applicable
        ○ skip this element
    0 - Does not exist OR do not know
    1 - Element is not formalized.
        - May be ad hoc and/or disorganized.
        - Financial support may be provided for specific requests.
        - Responsibilities may be spread through multiple units or groups, and do not have a formal mechanism to connect activities.
    2 - Element is under development.
        - Review of financial support needs and budget proposals for the formation of new supports to address gaps.
    3 - Element is operationalized.
        - Budgets for RDM support have stable funding.
    4 - Element is robust and focuses on continuous evaluation.
        - Sustainability and review plans are in place.

Scale:
    Not applicable - if 0 or NA are chosen for *Maturity Level*
1. Offered only to specific users upon request.
2. Available within certain units or cohorts.
3. Available to everyone.

Category: Financial Support				
Element	**Definition(s)**	**Maturity Level**	**Scale**	**Your Comments**
Resource allocation for HR capacity	Includes RDM service design, that is, costs for things such as employees to provide the services, professional development costs to expand expertise in RDM, etc.			
Resource allocation for infrastructure	Includes service development, cost models, and investments in infrastructure.			

Name(s) and role(s) of person(s) who filled out this table:

Date(s) completed:

Appendix

Resources used in the composition of the RDM Maturity Assessment Model in Canada (MAMIC):

- [Creating a data management framework](#) (ANDS - Australian National Data Service)
- [The Collaborative Assessment of Research Data Infrastructure and Objectives - CARDIO](#). (Data Curation Centre - DCC)
- [Research Infrastructure Self Evaluation (RISE) Framework](#). (Digital Research Services, University of Edinburgh)
- [Evaluating RDM Tool](#). (SPARC Europe)

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