



Guidance on Metadata Life Cycle Management

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Preamble

This guidance provides advice on how departmental officials can effectively manage metadata consistent with the information and data life cycle in respect of the following:

- section L.2.2.4 of “[Appendix L: Standard for Managing Metadata](#)” of the *Directive on Service and Digital*
- section J.2.2.4 of “[Appendix J: Standard on Systems that Manage Information and Data](#)” of the *Directive on Service and Digital*

1. Metadata and the information life cycle

Like other types of information and data, it is important that metadata is actively managed to ensure its ongoing relevance, usefulness and links to the information and data it describes. The information life cycle can be used

as the basis for outlining metadata life cycle management activities. This guidance offers an approach to managing metadata throughout the phases of its own life cycle that is based on the information life cycle.

2. Metadata life cycle management

The objective of metadata life cycle management is to optimize understanding of information and data, maximize its appropriate use and reuse, and reduce departmental time and effort in managing, locating and understanding information and data holdings. The table below describes activities, expected outcomes and relevant stakeholders that may be associated with each phase of the metadata life cycle. Departmental officials can use this approach to develop processes, procedures, and training to ensure that metadata life cycle management activities are effectively controlled and executed to meet business requirements. A metadata needs assessment (see [*Guidance on Assessing Metadata Needs*](#)) can further aid departmental officials in prioritizing metadata management activities and in focusing effort and energy on those activities that yield the greatest benefit to the department, the Government of Canada and Canadians.

Table 1: Metadata life cycle management activities and outcomes

Life cycle	Activities	Expected outcomes	Stakeholders
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Life cycle	Activities	Expected outcomes	Stakeholders
Plan	<ul style="list-style-type: none"> • Define the business needs and vision • Identify key stakeholders • Complete or review an existing metadata needs assessment (see <i><u>Guidance on Assessing Metadata Needs</u></i>) • Identify current and targeted metadata maturity levels (see <i><u>Guidance on Assessing Metadata Needs</u></i>) • Prescribe (that is, adopt, adapt or create) metadata reference standards as needed, limiting development of bespoke metadata reference standards (see <i><u>Guidance on Prescribing Metadata Reference Standards</u></i> and refer to the inventory of <i>GC Enterprise Metadata Reference Standards</i>) • Develop a phased implementation plan • Plan for organizational and cultural change • Review established governance roles, processes and bodies, and determine suitability for 	<ul style="list-style-type: none"> • Business requirements are understood • Stakeholders are identified • The organizational needs for metadata are understood (for example, create new data, understand existing data, enable data movement, access data, share data and so on) • Agreement on future state and how to get there is reached • Metadata sources are identified • Implementation plan is developed • Privacy assessment is initiated in response to metadata needs and as advised by the privacy assessment team of the institution • Metadata is documented according to a recognized reference standard • A repository for housing/cataloguing metadata is 	<ul style="list-style-type: none"> • Business users/managers • Custodians • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Data architects • Database administrators • Data governance bodies • Data stewards • Librarians • Executive sponsor/champion • Communication and change managers

Life cycle	Activities	Expected outcomes	Stakeholders
	incorporating metadata governance	identified to ensure it is managed throughout its life cycle <ul style="list-style-type: none">• Roles and responsibilities are allocated and understood	

Life cycle	Activities	Expected outcomes	Stakeholders
<p>Create, acquire, capture</p>	<ul style="list-style-type: none"> • Obtain, apply or map to appropriate metadata reference standard(s) that meet(s) business and technical requirements • Obtain or develop metadata application profile, data dictionary or glossary, as required • Develop suitable metadata architecture • Create data model for metadata repository • Develop specific metadata governance processes, assign governance roles, or incorporate into existing governance structure • Leverage existing metadata sources and information and data architectures • Determine the file format for metadata • Identify and consider risks and issues surrounding sharing and publishing metadata • Ensure appropriate metadata quality controls are in place 	<ul style="list-style-type: none"> • Metadata is standardized • Organizational commitment is secured • Agreement on how metadata will be created, maintained, integrated and accessed • Organizational understanding of business terms and usage • Organization’s business concepts and terminology, definitions and the relationship between terms are documented • Metadata is consistently formatted, and files containing metadata are interoperable • Metadata management is incorporated into overall data governance processes or new governance processes are established if none currently exist • Roles and responsibilities are 	<ul style="list-style-type: none"> • Business users/managers • Custodians • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Data architects • Database administrators • Data governance bodies • Executive sponsor/champion • External subject/domain specialists

Life cycle	Activities	Expected outcomes	Stakeholders
		allocated and understood	

Life cycle	Activities	Expected outcomes	Stakeholders
Organize, store	<ul style="list-style-type: none"> • Confirm that the implementation of metadata reference standards supports business and technical requirements • Ensure that the metadata applied enables information and data holdings to be appropriately, easily and efficiently understood, managed, discovered, accessed and used by users • Integrate metadata from diverse sources • Communicate the necessity and value of metadata to stakeholders • Document policies, procedures and work instructions • Document metadata management solutions • Ensure that the systems/technical environments in which metadata is stored support current and anticipated needs • Review metadata security classification to ensure appropriate security controls are in place and that the 	<ul style="list-style-type: none"> • Similarities and differences between different information and data resources are understood • Metadata reference standards no longer fit for purpose are retired • Existing metadata systems are harmonized, resulting in improved business value and usage • Integration of metadata with relevant business processes is enhanced • Metadata quality, consistency, currency and security are ensured • Business is engaged and willing to contribute • Roles and responsibilities are allocated and understood 	<ul style="list-style-type: none"> • Business users/managers • Custodians • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Data architects • Business analysts • Systems analysts • Data governance bodies • Project managers • Librarians

Life cycle	Activities	Expected outcomes	Stakeholders
	security rating of system is sufficient		

Life cycle	Activities	Expected outcomes	Stakeholders
Use, reuse, disseminate	<ul style="list-style-type: none"> • Ensure access to required metadata is maintained, as appropriate, for authorized users and systems • Distribute and deliver metadata to authorized users and systems, as needed • Ensure quality, accessibility, official languages, privacy and security requirements are met and monitored, including declassification as appropriate • Establish processes to support and promote the appropriate sharing, harvesting, indexing, reuse, or publishing of metadata, including through the Open Government Portal • Share, reuse and publish metadata in accordance with applicable policies • Regularly review supporting policies, procedures and work instructions • Query, report and analyze metadata 	<ul style="list-style-type: none"> • A standard way to access information and data is provided • Metadata is successfully delivered to consumers along with the information and data it describes as well as to systems or tools that need it • Those responsible for interpreting metadata have the tools to do so • Metadata is appropriately shared and published to facilitate information and data discovery • Technical metadata with relevant business, process and stewardship metadata is integrated • Workflows are streamlined • Metadata, along with the information and data it describes, is effectively used and reused • Content is more readily and 	<ul style="list-style-type: none"> • Business users/managers • Custodians • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Open data specialists • Data governance bodies • Business users • Technical users • Application developers • Data analysts • Data scientists • Archivists • Librarians • Customers

Life cycle	Activities	Expected outcomes	Stakeholders
	<ul style="list-style-type: none"> • Derive insights from multiple metadata sources • Monitor growth in the use of metadata • Use de-identification to protect personal information, as appropriate • Organize metadata harvested from existing sources (refer to “Organize” life-cycle phase, above) 	<ul style="list-style-type: none"> accurately understood • Information and data are used consistently • Data lineage is documented as it moves between systems • Visibility is enabled through end-to-end lineage • More effective decision-making is facilitated • Productivity is improved • Risk management is improved • Roles and responsibilities are allocated and understood 	

Life cycle	Activities	Expected outcomes	Stakeholders
<p>Maintain, protect, preserve</p>	<ul style="list-style-type: none"> • Apply metadata management strategies to: <ul style="list-style-type: none"> ◦ maintain the current state of metadata or improve the state of metadata (that is, quality, condition) where needed to better support current and future business and technical needs (for example, automation) ◦ respect official language, accessibility, metadata quality, security and privacy requirements ◦ preserve and continue to verify metadata integrity ◦ protect metadata against loss and unauthorized access, alteration or destruction, informing users of their responsibility to maintain, protect and preserve the metadata that has 	<ul style="list-style-type: none"> • Metadata quality and consistency are maintained, or improved where necessary • Metadata availability, accessibility and discoverability are maintained, or improved where necessary • Options for automation (tagging, profiling, semantic reconciliation, harvesting) are explored • Policies, procedures, training, business glossaries and data dictionaries are reviewed to ensure they are fit for current purpose while “research and explore” activity is underway • Market is monitored for new tools and/or approaches and/or additional use cases identified • Metadata is maintained and holds its integrity for the duration of its application to 	<ul style="list-style-type: none"> • Business users • Technical users • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Data governance bodies • Archivists • Librarians • Process owners

Life cycle	Activities	Expected outcomes	Stakeholders
	<p>been entrusted to them</p> <ul style="list-style-type: none"> ○ implement effective access control procedures, ensuring that classified and protected metadata is made available only on a need-to-know basis to those who are authorized to access it, but is not otherwise restricted unnecessarily ○ ensure metadata is preserved using non-proprietary file formats ○ implement processes or procedures to identify when and how to resolve metadata that is incorrect or out of date ○ ensure all phases of the metadata life cycle are considered where metadata is altered in an authorized way (for example, updated) 	<p>information and data</p> <ul style="list-style-type: none"> • Roles and responsibilities are allocated and understood • Users advise when metadata is incorrect or out of date and metadata is corrected or updated accordingly, where appropriate 	

Life cycle	Activities	Expected outcomes	Stakeholders
Dispose	<ul style="list-style-type: none"> • Liaise with business users and other stakeholders when considering retiring/migrating reference standards or disposing of metadata because: <ul style="list-style-type: none"> ◦ the business requirement for using the selected metadata reference standard has significantly changed or no longer exists ◦ the data that the metadata describes has reached the end of its useful life and is being archived or destroyed • Carry out disposition action 	<ul style="list-style-type: none"> • Metadata is retained, archived or disposed in compliance with the <i><u>Library and Archives of Canada Act</u></i> and approved departmental retention and disposal schedules • Roles and responsibilities are allocated and understood 	<ul style="list-style-type: none"> • Business users • Technical users • Records management specialists • Information management specialists • Information technology specialists • Information security specialists • Privacy specialists • Archivists

Life cycle	Activities	Expected outcomes	Stakeholders
Evaluate	<ul style="list-style-type: none"> • In conjunction with usage and in accordance with your information and data management strategy, assess: <ul style="list-style-type: none"> ◦ business impact of metadata: <ul style="list-style-type: none"> ▪ ongoing business value and operational impact of the information and data it supports ▪ scope and frequency of use ▪ fit for current purpose ▪ operational and service delivery it supports ◦ future business impact of metadata: <ul style="list-style-type: none"> ▪ opportunities to support additional use cases ▪ delivery of measurable benefits ▪ potential for risk 	<ul style="list-style-type: none"> • Metadata is assessed (by both business and technical users) to examine its potential to deliver current and future benefits • Metadata management practices are audited and continuously improved • Information and data governance is supported • Efficiencies in metadata management are gained • Roles and responsibilities are allocated and understood and accountabilities upheld • Future metadata life-cycle activities and management plans are informed by findings and lessons learned (refer to “Plan” life - cycle phase, above) 	<ul style="list-style-type: none"> • Business users • Technical users • Information management specialists • Information technology specialists • Information security specialists • Data governance bodies • Privacy specialists • Process owners

Life cycle	Activities	Expected outcomes	Stakeholders
	<ul style="list-style-type: none"> reduction <ul style="list-style-type: none"> ▪ options for growth and enhanced service delivery (for example, process automation) ○ state of metadata management practices and associated governance strategies 		

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