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Information and documentation — Records management processes — Metadata for records —

Part 1: Principles

Information et documentation — Processus de gestion des enregistrements — Métadonnées pour les enregistrements —

Partie 1: Principes

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html

This document was prepared by ISO/TC 46, *Information and documentation*, Subcommittee SC 11, *Archives/records management*.

This second edition cancels and replaces the first edition (ISO 23081-1:2006), which has been technically revised.

A list of all the parts of ISO 23081 can be found on the ISO website.

Introduction

ISO 23081 sets a framework for creating, managing and using records management metadata and explains the principles that govern them.

This document gives guidelines for understanding, implementing and using metadata within the framework of ISO 15489. It addresses the relevance of records management metadata in business processes and the different roles and types of metadata that support business and records management processes. It also sets a framework for managing those metadata.

NOTE   In this part of ISO 23081, business and business activity are used as broad terms, not restricted to commercial activity, but including public administration, non-profit and other activities.

It does not define a mandatory set of records management metadata to be implemented, since these metadata will differ in detail according to organizational or specific requirements for jurisdiction. However, it assesses the main existing metadata sets in line with the requirements of ISO 15489.

ISO 23081-2 and ISO 23081-3 are more explanatory and provide practical guidance on implementation issues and how to assess records management metadata sets against the principles in this document.

Information and documentation — Records management processes — Metadata for records —

Part 1:
Principles

1 Scope

This document covers the principles that underpin and govern records management metadata. These principles are applicable to:

— records and their metadata;

— all processes that affect them;

— any system in which they reside;

— any organization that is responsible for their management.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15489-1:2016, *Information and documentation — Records management — Part 1: Concepts and principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15489-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
agent
individual, workgroup or organization responsible for, or involved in record creation, capture and/or records management processes

Note 1 to entry: Technological tools such as software applications can be considered agents if they routinely perform records processes.

3.2
aggregation
any accumulation of record entities at a level above record object

[SOURCE: ISO 16175-2:2011]

1

3.3
attribute
characteristic of an object or entity

[SOURCE: ISO 23081-2:2009, 3.2]

3.4
business activity
all the functions, activities and transactions of an organisation and its employeesNote 1 to entry: Includes public administration as well as commercial business.

[SOURCE: ISO 16175-2:2011, modified]

3.5
capture
process of lodging a document or digital object into a records management system and assigning metadata to describe the record and place it in context

[SOURCE: ISO 16175-3:2010, modified]

3.6
encoding scheme
controlled list of all the acceptable values in natural language and/or as a syntax-encoded text string designed for machine processing

3.7
entity
concrete or abstract thing that exists, did exist, or might exist, including associations among those things

3.8
fixity
state of quality of being fixed, that is, protected against unauthorised alteration or disposition

[SOURCE: ISO 16175-3:2010, modified]

3.9
metadata for records
structured or semi-structured information, which enables the creation, management, and use of records through time and within and across domains

[SOURCE: ISO 15489-1:2016, 3.12]

3.10
metadata schema
logical plan showing the relationships between metadata elements, normally through establishing rules for the use and management of metadata specifically as regards the semantics, the syntax and the optionality *(obligation level)* of values

4   Records management metadata

Metadata management is an inextricable part of records management, serving a variety of functions and purposes. In a records management context, metadata for records are defined as structured or semi-structured information which enables the creation, management, and use of records through time and within and across domains. (ISO 15489-1:2016, 3.12). Each domain represents an area of intellectual discourse and of social and/or organizational activity with a distinctive or limited group of people who share certain values and knowledge. Metadata for records can be used to identify, authenticate and contextualize records and the people, processes and systems that create, manage, maintain and use them and the policies that govern them (see 9.1).

Initially, metadata define the record at its point of capture, fixing the record into its business context and establishing management control over it. During the existence of records or their aggregates,

new layers of metadata will be added, because of new uses in other business or usage contexts. This means that metadata continue to accrue, over time. Information relating to the context of the records management and the business processes in which the records are used continues to accumulate as the record is managed and used. The record may also undergo structural changes or changes to its appearance. Metadata can be sourced or re-used by multiple systems and for multiple purposes. Metadata applied to records during their active life may also continue to apply when they cease to be required for current business purposes but are retained for ongoing research or other values.

Metadata ensure authenticity, reliability, usability and integrity over time and enable the management and understanding of information objects, whether these are physical, analogue or digital. However, metadata also should be managed.

Records management has always involved the management of metadata. However, the digital environment requires a different expression of traditional requirements and different mechanisms for identifying, capturing, attributing and using metadata. In the digital environment, authoritative records are those accompanied by metadata defining their critical characteristics. These characteristics must be explicitly documented rather than being implicit, as in some paper-based processes. In the digital environment, it is essential to ensure that the creation and capture of records management metadata are implemented in systems that create, manage and use records. Conversely, the digital environment presents new opportunities for defining and creating metadata and ensuring the complete, contemporaneous capture of records. These records can be evidence of transactions or themselves be transactions.

5 Perspectives and purpose of records management metadata

5.1 Purpose and benefits of records management metadata

Metadata support business and records management processes by:

a) protecting records as evidence and ensuring their accessibility and usability through time;

b) facilitating the ability to understand records;

c) supporting and ensuring the evidential value of records;

d) helping to ensure the authenticity, reliability and integrity of records;

e) supporting and managing access, privacy and rights;

f) supporting efficient retrieval;

g) supporting reuse and repurposing of records

h) supporting interoperability strategies by enabling authoritative capture of records created in diverse technical and business environments and their sustainability for as long as required;

i) providing logical links between records and the context of their creation, and maintaining them in a structured, reliable and meaningful way;

j) supporting the identification of the technological environment in which digital records were created or captured, and the management of the technological environment in which they are maintained in order that authentic records can be reproduced as long as they are needed;

k) supporting efficient and successful migration of records from one environment or computer platform to another or any other preservation strategy.

5.2   Records management metadata that should be applied in an organization

5.2.1   General

Organizations should make decisions on which of the metadata requirements outlined in this document are necessary in any or all organizational systems. These decisions will be dependent on:

a)   business needs;

b)   the regulatory environment;

c)   risks affecting business operations.

This assessment may identify which types of metadata need to be applied in different areas of the organization, depending on business risks or needs.

Different perspectives on records management metadata are possible and may coexist. These include:

1)   the business perspective, where records management metadata support business processes;

2)   the records management perspective, where metadata capture the characteristics of records and their business context, and support their management over time;

3)   the use perspective within or outside the records creating business context, where metadata enable the retrieval, understandability and interpretation of records.

Broader levels of contextual detail may be required to understand and use records through time, particularly their use in business environments outside those in which they were created.

Records management metadata consist of:

i)   metadata that document the business context in which records are created or captured, as well as the content, structure and appearance of those records;

ii)   metadata that document records management and business processes in which records are subsequently used, including any changes to the content, structure and appearance.

5.2.2   Metadata at the point of record capture

Metadata at the point of record capture include information about the context of record creation, the business context, the agents involved and metadata about the content, appearance, structure and technical attributes of the records themselves. They allow records to be used in an application or information system and make them readable, usable and understandable. The context of records includes information about the business processes in which they are created. These metadata will allow users to understand the reliability of the record-creating authority, the environment in which records were created, the purpose or business activity being undertaken and their relationships with other records or aggregations. The metadata documenting the business context should be an integral part of the records produced by the records creator and they should be captured at the same time as records are captured into the records system.

The structure of a record consists of:

a)   its physical or technical structure;

b)   its logical structure, i.e. the relationships between the data elements comprising the record.

These aspects are as important as the content itself. Metadata about technical aspects should describe the system with which records are created or captured, and the technical characteristics of the digital components of which they are comprised.

5.2.3 Metadata after record capture

All records management processes performed upon a record, or on an aggregation of records, should be documented. In order to preserve records and guarantee their authenticity, reliability, usability and integrity over time, it is necessary to create metadata that facilitate the triggering or documentation of these records management processes (in this document referred to as "process metadata"). These metadata should include information about the management processes that have been or will be applied to each record. The level of detail for documenting records management processes will vary according to predetermined management needs. Metadata about records management processes can be applied throughout the record's existence. Records management processes also create and use technical metadata for the rendering and reproduction of digital records, which should be recorded. Additionally, any changes in the record content, context and structure caused by management activities should be captured.

Business processes that access records should also be documented in the metadata throughout the record's life. Such business uses include associating records with actions, action triggers and other records.

All metadata about the record and those accruing in its management and use also form a record: the metadata record that also should be managed. It is essential to keep this metadata record at least for as long as the original record exists. In the case of disposition of records, either by transfer of custody or ownership, or by destruction, some metadata about them may still be needed to account for their existence, management and disposition.

6 Roles and responsibilities

Roles and responsibilities with respect to records management metadata should be defined, assigned and promulgated throughout the organization. Where a specific need to create and capture records management metadata is identified, it should be clear who is responsible for taking the necessary action (ISO 15489-1:2016, 6.3).

These responsibilities are a subset of the roles and responsibilities for carrying out business and records management processes and should be assigned to all employees in the organization who create, capture or manage metadata. This includes records professionals, allied information professionals, executives, business unit managers, systems administrators and others who create or capture records and associated metadata as part of their work. Specific leadership, responsibility and accountability for the management of metadata should be assigned to a person with appropriate authority within the organization and should be reflected in job descriptions, policies and similar statements.

Such responsibilities include the following.

a) Records professionals are responsible for the reliability, authenticity, usability and integrity of metadata associated with records, and for training users on capturing, managing and using metadata. Records professionals participate in the definition of metadata requirements, develop related policies and strategies, and monitor the process of metadata creation.

b) All agents are accountable for ensuring the accuracy and completeness of the records management metadata for which they are responsible.

c) Executives are responsible for ensuring that internal controls are in place so that customers, auditors, courts, and other authorized users can rely on the information that the organization produces. Executives are responsible for supporting the use of records management metadata and related policies throughout the organization.

d) Information technology personnel are responsible for the reliability, usability and integrity of the systems used to capture and maintain metadata. They are responsible for ensuring that all records management metadata are linked to the related records and that these links are persistently maintained.

Training programs should support the performance of these responsibilities. Audit procedures should monitor their performance.

7 Records management metadata in relation to other metadata areas

7.1 General

Metadata may be created, captured and managed for a single, particular purpose or for multiple business purposes. These purposes may include e-business, preservation, resource description, resource discovery and rights management. Records management metadata can be shared by all of these purposes. For example, metadata at the point of record capture may inherit and extend the resource description and may be used for resource discovery. Records management metadata can be inherited or extracted from workflow systems, standard office software, e-mail systems and other business systems.

Neither point of record capture metadata nor process-related metadata for records management can exist in isolation. It is therefore appropriate and necessary to consider the creation and capture of metadata for records management within this broader context to ensure that appropriate links and relationships are established and metadata are neither duplicated nor unnecessarily produced.

7.2 Metadata for e-business

Metadata help enable e-business, including e-commerce and e-government. Metadata about all stages of the e-business processes can be captured. This encompasses the location of a product, service, provider and customer, the agreement of business terms and conditions, digital signatures and the business process transactions themselves. These metadata provide information about the business context and may therefore overlap with contextual metadata (see 9.2.1) as well as structural and storage metadata (see 9.2.1), security metadata (see 9.2.4), and some accessibility metadata (see 9.2.3).

7.3 Metadata for preservation

The preservation of information, especially digital information, for continued access is the concern of records management, library and archives communities. Information technology is relatively volatile in comparison with print-to-paper technology. Technical metadata are required to meet the challenge of constantly changing technology. Additional structural and storage metadata (see 9.2.1) and some metadata about records management processes (see 9.6) are needed to support preservation. This includes metadata about records management processes including access and security, migration, conversion and transfer activities to ensure not only the accessibility of records through time, but also their continued authenticity, reliability, usability and integrity.

7.4 Metadata for resource description

One of the primary uses of metadata is for the description of resources. These resources might be books, journals, videos, documents, images and artefacts. They also include records transferred into archival custody. The metadata should identify the resource and can include the title, creator(s), date(s), unique identifier, relationship to other resources (e.g. within the same series) and its extent (e.g. size or length). Some of these metadata elements are also used in a records management context. They are similar to, and may overlap with, elements of the initial metadata at the point of record capture documenting a record's content. However, descriptive metadata for records management and archival purposes are generally broader than standard resource description metadata and can include other elements such as, for example, contextual metadata.

There is a strong relationship between the type of metadata outlined and the archival description. Archival institutions use metadata to describe archival records in order to preserve their meaning over time, to place them in their records management and administrative contexts and to facilitate their use and management. Therefore, the existing standards of archival description, such as ISAD/G and ISAAR(CPF), have an extensive overlap with records management metadata, because both are

concerned with documenting business context and management processes. Archival management, including archival description, is a complementary and continuing activity for those records that are identified as having archival value. Functionality to enable the migration of metadata between organizational records systems and archival control systems is therefore recommended.

7.5 Metadata for resource discovery

Metadata for resource discovery, i.e. information retrieval, overlap with and extend beyond descriptive metadata (see 7.4). Business units, knowledge managers, librarians and the public all depend on metadata to retrieve information. Indexing, classification and location metadata are examples that support resource discovery. Such metadata also support records management objectives to facilitate the discovery of records resources. In a records management context, these metadata are primarily related to accessibility metadata (see 9.2.3).

7.6 Metadata for rights management

Rights management can be considered to be a particular type or aspect of e-business, since it is concerned with the management of the rights over and use of an agent's information resources. It encompasses the description, valuation, trading, monitoring and tracking of those rights and requires metadata that describe the three key entities involved in the use of information resources. These three entities are the parties involved (e.g. creator, publisher and consumer); the content in all its forms; and the rights themselves (e.g. permissions, constraints and rewards for use).

7.7 Metadata for sustainability across system boundaries

To ensure that records remain authoritative when migrated or exchanged between systems, metadata definition is required. Decisions about specifically which metadata elements are needed to support the ongoing business may vary between jurisdictions and particular circumstances, for example an appraisal process may determine that only a subset of recordkeeping process metadata should be transferred to an archival system.

8 Management of metadata

8.1 General

Two areas of metadata management can be distinguished:

a) creating, capturing and managing the records management metadata;

b) creating, implementing, maintaining and managing the rules that govern these processes and the structures that accommodate them in metadata schema.

8.2 Levels of application of metadata

The metadata described in this clause can be applied at different levels, such as to

a) individual records,

b) aggregations of records and/or

c) entire records systems,

depending on organizational needs and requirements. Records systems should be designed to capture metadata at whatever levels are organizationally appropriate. It should be noted that, while certain forms of metadata, such as a title, may need to be applied to every record in a system, other metadata may be applied at a broader level of aggregation than the individual record.

8.3 Points throughout the existence of records when metadata should be created and applied

Creating and applying metadata to records can and should occur at multiple points throughout their existence.

Much of the metadata described in this clause should be created during the record's capture, registration and classification processes, as described in ISO 15489-1:2016, 9.2 (creating records), 9.3 (capturing records), 9.4 (records classification and indexing) and 9.5 (access control). This defines the record at its point of capture, fixing it into its business context and enabling the management processes to take place.

Metadata creation and capture should continue after records generation. Metadata should be updated as records participating in transactions become related to others, as management needs change and when records systems are transferred from one organization to another. Metadata should reflect these changing circumstances. This is referred to as process metadata (see 5.2.3).

Capture and maintenance of these metadata should occur as a normal part of business and records management operations.

NOTE   Metadata schemas for records, as outlined in ISO 15489-1:2016, 8.2, consolidate requirements of other key records controls which can facilitate much of the metadata attribution and inheritance processes required in Clause 9 of this document.

8.4 Processes of metadata management

8.4.1 General

Management of metadata entails the same processes as described in ISO 15489-1:2016, Clause 9: creation, capture, classification, indexing, access, storage, use and reuse, migration and conversion, disposition, definition of policies, strategies and methods.

8.4.2 Defining policies and methods

Agents, including records professionals, should define and document policies and rules for managing metadata and should articulate requirements for metadata structures in line with their business requirements. These policies and rules encompass issues such as assigning responsibilities, what metadata should be created and captured, when and from what sources, what metadata structures will be valid, and what standards and what supporting systems should be used.

8.4.3 Creating and maintaining metadata

Records professionals should identify what metadata need to be created and captured when creating and maintaining records. The process of metadata creation at the time of record creation should be monitored and documented. Whenever possible such processes should be automated.

Metadata about creating or altering metadata about a record should also be defined and maintained. They will support appropriate and consistent documentation of changes in the metadata record.

8.4.4 Creating and maintaining structures for managing metadata

Structures for capturing, storing and managing metadata (see 8.6) should be developed and defined to reflect records and records management requirements.

Relationships between metadata elements, and between them and the information objects they describe should be persistent. These relationships should be correctly and persistently maintained over time with particular attention given to changes caused through migration, conversion and other preservation measures.

8.4.5 Determining when and how metadata should be captured

Agents, including records professionals, should identify what metadata to capture, when to capture them, and from what sources. These metadata requirements should be based on the records management processes defined in ISO 15489-1:2016, Clause 9. Part of this activity is also to determine how metadata should be captured (manually or automatically).

8.4.6 Documenting and enforcing standard definitions

Agents, including records professionals, should document the rules and policies on consistent use of content standards, structures, terms and other related, relevant issues. They should ensure that those metadata structures, terms, entity descriptions, and attributes are used in a consistent way.

8.4.7 Access to metadata

Access to metadata should be limited to authorized persons and managed with approved policies and rules. Access and permissions rules should be in place. Agents should also define a policy and rules for interoperability of records management metadata in order to facilitate exchange and retrieval of records across information systems, organizations or jurisdictions.

There should be a mechanism to track and document access or usage, and any alterations or additions made to metadata.

8.4.8 Storing metadata

Agents, including records professionals, should decide upon the way metadata should be stored. Such decisions should take into account persistent linkage between metadata and the objects to which they relate or belong. Metadata can be stored together with the records or separately in a database(s), or both. Management criteria, such as costs and performance, may affect decisions on how metadata will be stored.

8.4.9 Description

The process of managing metadata is ongoing for as long as records and their relevant aggregates exist. To retain meaningful, reliable and usable records, new metadata should be added where necessary. This should be done through time and across domains, for example, when functions of one organization and the relevant parts of its records system are transferred to another. This can entail adaptation by the receiving organization of its existing metadata structures. Organizations should define procedures and policies for documenting these changes.

Several layers can be distinguished with an ever-expanding scope, depending on how widely records will be shared and used. Records are managed in systems, these systems are managed by organizations and these organizations are part of a broader context (a business sector, a government, a nation, the public or a society). At each of these levels, metadata should provide enough information about the records to make them understandable and accessible to the community concerned.

In time, the original environment will change or disappear and the intellectual discourse and knowledge will evolve. These types of changes require translation of the original context of the creation of records into this newer environment. This, too, will be done through metadata. Over time, this activity will be taken over by individuals in successor organizations who were not present at the point of creation.

8.4.10 Maintenance of metadata

8.4.10.1 Processes and methods

Several methods and techniques are available to organize and maintain metadata and metadata structures. The recommended method is to use metadata schema (see 8.5). Processes included in maintenance are the following.

a) Monitoring to ensure data integrity in maintaining metadata.

b) Security measures controlling access to metadata, such as authorization rules between agents or systems and the entities or objects to which they have access. These include agents with authority to change metadata structures.

c) Recovery mechanisms in the case of system failure.

d) Backup procedures.

e) Migration through information technology environments or changes to or update of systems managing records management metadata.

8.4.10.2 Authenticity and fixity of metadata

Records management metadata are as much subject to authenticity rules or criteria as the records to which they are linked in order to make them trustworthy. Agents should therefore document all policies and rules relating to metadata and developments therein. Changes in structures for metadata, either conceptual or physical, should also be documented.

An important element for ensuring authenticity of metadata and proper metadata management over time is the requirement that captured metadata be fixed. Records management metadata need to be maintained as they are and, in case change is needed, rules should be in place to govern the process. These should include rules to document the reasons for the changes, the changes themselves, and the authorized agents involved. These requirements apply over time and to any organization responsible for the records involved.

Metadata providing details about the creation of or change to the metadata record itself should be maintained. This should include information about any agents associated with the creation or change and the type of activity that was undertaken, for example: created, modified, checked, deleted. In addition, the version of the metadata schema used to define and populate the metadata elements should be identified.

8.5 Metadata structures

In order to facilitate relationships between metadata elements and make them meaningful, they need to be structured by schemas. Agents, including records professionals, should develop schemas for describing the records they create, capture and manage, including contextual information regarding business processes and agents. These schemas should be maintained over time to reflect changes in the organizational and business context. Relationships between new schemas and those they replace should be identified and documented.

Metadata schemas describe entities, their elements and their interrelationships. Schemas also support the description of document structures (e.g. with mark-up languages, such as XML) and are important for managing databases that contain this descriptive information.

Examples include XML schemas for defining document structures, database structures or other objects, and conceptual schemas for relational or object-oriented databases.

Metadata structures and the metadata elements of which they consist can be further defined with an encoding scheme. Encoding schemes define the values or the syntax of a metadata element.

Examples of encoding schemes include the predefined tools for records management defined in ISO 15489-1:2016, 8.3 (business classification schemes), 8.4 (access and permission rules) and 8.5 (disposition authorities).

Benefits of schemas and schemes include:

a)   facilitating integrated and consistent management of metadata;

b)   enabling interoperability by comparing or mapping different sets of metadata;

c)   expressing the interrelationships of elements and their semantics;

d)   controlling the relationships between metadata elements and the inherent semantics;

e)   ensuring and maintaining consistency in information systems (e.g. records systems);

f)   allowing modular development, break-up or linkage of information systems;

g)   providing a basis for the development of information systems or databases.

8.6   Role of systems

Records should be created, captured or managed either by business systems, records systems or by both in combination, such as:

a)   a business system that is designed to create, capture and manage its records independently;

b)   a business system that creates, but does not manage records and therefore works in conjunction with a dedicated records system;

c)   a records system that is designed to create, capture and manage records.

Whatever system or combination of systems is used, it should be capable of using and supplying metadata to manage records in an accountable and effective way.

Records systems should be designed and implemented with an infrastructure necessary to generate, capture and manage appropriate metadata and, where possible, to do so as an automated process.

Records systems should be designed to ensure that records and their metadata remain accessible, authentic, reliable and useable through any kind of system change (see ISO 15489-1:2016, 5.3 (records systems).

One method of recording changes is through the use of audit trails. However, while audit trails for records and business systems are essential for business continuity purposes, they may not fully meet the records management requirements to provide a complete transaction history for specific records.

Records management controls, such as business classification schemes, access and permission rules and disposition authorities, also need to exist to ensure that metadata are drawn from authoritative sources. Records systems should be designed to accommodate these controls and automate their use.

## 9   Types of metadata required to support ISO 15489-1

9.1   Introduction to metadata types

This clause indicates the types of metadata that are required effectively to implement ISO 15489-1. It is a further explanation of Clause 5. It outlines the range of metadata that should be designed and applied within records systems to meet the requirements of ISO 15489-1.

The types of metadata required to support ISO 15489-1 may be broken down into the following components (see Figure 1):

a)   metadata about the record itself;

b)   metadata about the business rules or policies and mandates;

c)   metadata about agents;

d)   metadata about business activities or processes;

e)   metadata about records management processes.

These types of metadata apply equally both before and after record capture.
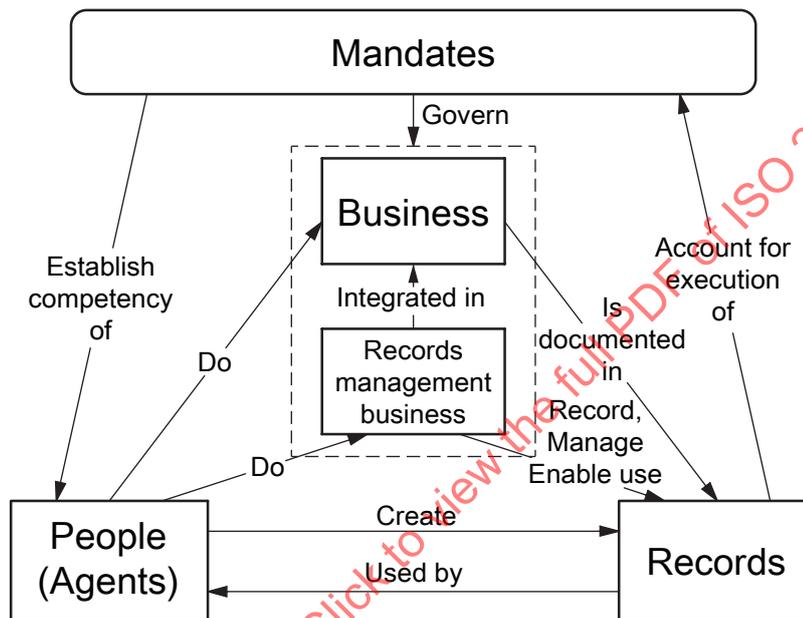
NOTE   Derived from Figure 2, *Recordkeeping*, and Figure 3, *The Business Context*, in Reference.[5]

Figure 1 — Main types and their relationships

Each of these comprises metadata which

1)   are captured with the record, fixing it into its business context and enabling the management processes to take place (i.e. metadata at point of record capture) and

2)   continue to be created and captured (i.e. process metadata); this goes beyond the record creating organization and should be ensured by any organization that will be responsible for the management of the records over time.

This categorization has been used as a framework for this document. A statement is included following each of the metadata requirements in order to indicate from which clause or subclause of ISO 15489-1 they are derived.

9.2   Metadata about records

9.2.1   Metadata about records at the point of record capture

Key elements of structural and storage metadata, such as format and key technical dependencies, should be identified and documented at the point of record capture in order to ensure that the record's

accessibility can be maintained as long as required for business or other needs and to facilitate its long-term preservation and management.

It may also be necessary to capture some of the security and records management metadata outlined below (see 9.2.4 and 9.5) at the point of record capture.

In order to define the content of the record or any aggregation, its logical and physical structure and its technical attributes, and in order to document the relationships that records may have between each other, metadata about the record should

a)   include the date and time when the record was created,

b)   identify and describe the agents involved in record creation,

c)   document record structure,

d)   document record form,

e)   document any chemical and other physical properties,

f)   document record technical characteristics and dependencies,

g)   document the relationship between the data or format elements that comprise the record,

h)   document requirements about making available, reproducing or rendering records,

i)   facilitate migration to different software,

j)   facilitate re-presentation through emulation,

k)   initiate data and format management activities to protect against media deterioration,

l)   document the relationship between the record and the business transaction or activity that generated it and

m)   document the links between records or between an individual record and the broader record aggregation of which it is a part.

9.2.2   Metadata about records after record capture

Metadata about records should accrue on an ongoing basis regardless of the organization that is responsible for the records. These metadata will define changes in the logical and physical structure and technical attributes of the record, as well as describe new contexts in which the record is used. It should also document new relationships with other records or aggregations.

Records of current and previous structural metadata, such as format and key technical dependencies, should continue to be applied to ensure the record's accessibility is maintained through time. It should be maintained to provide evidence of the record's original structure and to facilitate future preservation efforts.

Where processes occur that are initiated by structural and storage metadata, evidence of these should be kept, along with details of any variation in records design and format. See also 9.6.

9.2.3   Metadata supporting the accessibility of records

9.2.3.1   General

Metadata should be used to identify records and facilitate their retrievability and usability in records systems.

A records system should provide ready access to all relevant records and their related metadata. Systems can be designed to use metadata to facilitate this objective.

9.2.3.2 Accessibility metadata at point of record capture

Metadata for accessibility should do the following.

a) Identify information about records or aggregations of records.

b) Identify and document the aggregation, such as a file or series, in which a record or group of records exists.

c) Capture record location information. Systems should be capable of maintaining a variety of metadata details about record location. Record location may be logical and/or physical. Variations to location detail may need to be maintained. A record's home and current locations may need to be recorded to facilitate record tracking.

d) Identify and document links between records, agents and processes.

e) Document descriptive information that facilitates record use and understanding, such as a subject classification, title, descriptive keywords, abstract or précis.

f) Facilitate the classification of business functions, activities and transactions.

g) Facilitate the classification of records.

h) Undertake record indexing.

9.2.3.3 Process metadata supporting accessibility after record capture

Accessibility metadata should be monitored on an ongoing basis to ensure that they are facilitating records accessibility. Changes may be made to these metadata through time as

a) business activity takes place,

b) personnel changes,

c) business focus changes,

d) records management instruments are adopted or changed,

e) record locations are changed,

f) organizational terminology evolves or

g) new business systems are adopted.

Ongoing description is necessary to keep the records meaningful for use. With the expanding availability of records outside the domain in which they were created or captured either within or outside the organization, additional descriptive metadata are needed that explain explicitly the business context of the records. The elapsing of time and the accompanying loss of knowledge about the environment, in which records were created or captured, are other factors requiring additional description.

9.2.4 Metadata supporting the security of records

9.2.4.1 General

All records systems should be capable of deploying security metadata to provide an accountable management environment for records.

High levels of security may be applicable in certain systems. Consequently, the risks and requirements of the business documented within systems should be identified during the appraisal analysis before security metadata are designed and applied.

9.2.4.2 Security metadata at the point of record capture

Key elements of security metadata, such as basic access permission or restrictions, should be identified and applied at the point of record creation and capture in order to facilitate a record's ongoing preservation and management.

Security metadata should

a) identify the access restrictions that apply to records and their aggregations, business processes and agents,

b) ensure that records can only be accessed by authorized personnel,

c) apply time limitations to access restrictions to ensure their regular review and

d) withhold metadata display where data should not be made available for general access.

9.2.4.3 Process metadata supporting security after record capture

Access to records should only be restricted when there is a business need or when the law requires it. Security metadata should be monitored and updated to ensure the ongoing applicability of all identified restrictions.

Security levels and rules will change over time, and metadata that support security and access management should change accordingly. Organizations should ensure that these changes are documented.

Security metadata should be maintained and kept current throughout a record's existence. Changes to these metadata should reflect administrative or personnel changes and consequent changes in security arrangements.

Requirements for the creation, capture, maintenance and access of metadata about the record are contained in the following sub clauses of ISO 15489-1:2016.

5.2.1, Records — General

5.2.2, Records — Characteristics of authoritative records

5.3.1, Records systems — General

5.3.2, Records systems — Characteristics of records systems

9.2, Processes for creating, capturing and managing records - Creating records

9.3, Processes for creating, capturing and managing records – Capturing records

9.4, Processes for creating, capturing and managing records – Records classification and indexing

9.5, Processes for creating, capturing and managing records – Access control

9.6, Processes for creating, capturing and managing records – Storing records

9.7, Processes for creating, capturing and managing records – Use and reuse

9.3 Metadata about the business rules, policies and mandates

9.3.1 Metadata about business rules, policies and mandates at the point of record capture

At the point of record capture, metadata should document the record's compliance with business rules and policies, and regulatory and other requirements for creating and managing records.

These metadata should

a) identify the specific metadata schema used in organizational business systems,

b) capture the business rules or other system controls that regulate record creation and management,

c) capture the business rules or other system controls that regulate metadata creation and management,

d) capture the business rules or other system controls that regulate records management operations,

e) capture the business rules or other system controls that regulate access and rights to records,

f) document the mandate or other regulatory requirement for record creation and/or management,

g) document the mandate or other regulatory requirement for record retention, security or destruction requirements and

h) capture the links between mandate or regulatory information and the records or records management processes to which it relates.

9.3.2 Metadata about business rules, policies and mandates after record capture

On an ongoing basis, metadata should be used to demonstrate that systems have managed records in compliance with business rules and policies, regulatory and other requirements for managing records. For example, metadata identifying who has accessed the records system may be necessary, depending on the business needs of the organization. This includes organizations to which the responsibility for the management of the records has been transferred.

Requirements for the creation, capture and maintenance of business rules, policies and mandates metadata are contained in the following clause and sub-clauses of ISO 15489-1:2016.

5.3.1, Records systems — General

5.3.2.1, Characteristics of records systems – Reliable

5.3.2.2, Characteristics of records systems – Secure

5.3.2.3, Characteristics of records systems – Compliant

5.3.2.4, Characteristics of records systems – Comprehensive

5.3.2.5, Characteristics of records systems – Systematic

7, Appraisal

8, Records controls

9.4 Agent metadata

9.4.1 Agent metadata at point of record capture

At the point of record capture, metadata should include metadata about agents associated with records and their management.

Metadata about agents involved in record creation and management should be captured to ensure proper documentation. These metadata also enable record access to be restricted to appropriate agents, and enable only authorized agents to use records systems or perform records management operations within these systems (see also 9.6).