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# Information technology — Metadata registries (MDR) — Part 1: Classification

*Technologies de l'information —Registre de métadonnées (RM) — Partie 2: Classification*

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# Contents

Page

**Foreword** ..... iv
**Introduction** ..... v
**1 Scope** ..... 1
**2 Normative references** ..... 2
**3 Terms and definitions** ..... 2
**4 Attributes of a Classification Scheme** ..... 4
**5 Mechanism for Classifying an Administered Item** ..... 6
**Annex A (normative) Regions of the MDR Metamodel Containing Classification Scheme Attributes** ..... 7

# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 11179-1 was prepared by Technical Committee ISO/IEC JTC1, *Information Technology*, Subcommittee SC32, *Data Management and Interchange*.

ISO/IEC 11179 consists of the following parts, under the general title *Information technology — Metadata registries (MDR)*:

— *Part 1: Framework*

— *Part 2: Classification*

— *Part 3: Registry metamodel and basic attributes*

— *Part 4: Formulation of data definitions*

— *Part 5: Naming and identification principles*

— *Part 6: Registration*

# Introduction

The purpose of this version of Part 2 of this International Standard is to update the previous version of Part 2 (ISO/IEC 11179-2:1999) so that it is in harmony with the current version of Part 3. All normative material in the old Part 2, including the attributes and model of a classification scheme, have been modified and included in the current version of Part 3. This version of Part 2 contains some minor elaboration of section 4.10 (Classification Region) of the current Part 3.

This Part of this International Standard focuses on the part of the metadata registry (MDR) model called the *classification region* (Part 3, clause 4.10). The classification region permits the registration and administration of all or part of a *classification scheme*. Optionally, a classification scheme may be used to classify *administered items*, the registered artifacts in a metadata registry.

There are many efforts underway to devise classification schemes and to use the schemes to build and populate classification structures. For the purpose of this standard, the following are all considered types of classification schemes of varying discriminatory power: key words, thesauri, taxonomies, and ontologies. These classification schemes have potentially great utility for documenting objects in the real world, including administered items in an MDR.

There are several purposes for applying classification to real world objects. Classification assists users to find a single object from among a large collection of objects, facilitates the administration and analysis of a collection of objects, and, through inheritance, conveys semantic content that is often only incompletely specified by other attributes, such as names and definitions.

When applied to classifying administered items in an MDR, the classification schemes accommodated in this Part have utility for

- deriving and formulating abstract and application administered items,
- ensuring appropriate attribute and attribute-value inheritance,
- deriving names from a controlled vocabulary
- disambiguating
- recognizing superordinate, coordinate, and subordinate administered item concepts
- recognizing relationships among administered items
- assisting in the development of modularly designed names and definitions.

The preparation of this International Standard has also been prompted by the need for standardized data design procedures that will ensure the emergence of data elements capable of supporting electronic data interchange.

Each type of classification scheme mentioned above has particular strengths and weaknesses, and provides the foundation upon which particular capabilities can be built. Keywords, for example, are a quick way to provide users some assistance in locating potentially useful administered items. A thesaurus provides a more structured approach, arranging descriptive terms in a structure of broader, narrower, and related classification

categories. A taxonomy provides a classification structure that adds the power of inheritance of meaning from generalized taxa to specialized taxa. Ontologies, with associated epistemologies, can provide rich, rigorously defined structures (e.g., directed acyclic graphs with multiple inheritance) that can convey information needed by software, such as intelligent agents and mediators that are useful in the provision of intelligent information services.

# Information technology — Metadata registries (MDR) — Part 2: Classification

## 1 Scope

This Part of the International Standard restates and elaborates on the procedures and techniques of the current Part 3 (ISO/IEC 11179-3:2003) for registering classification schemes and classifying administered items in an MDR. All types of administered items can be classified, including object classes, properties, representations, value domains, and data element concepts, as well as data elements themselves

This Part of the International Standard develops a set of principles, methods, and procedures for specifying what is needed (at a minimum) to document the association between the various types of administered items and one or more classification schemes. This includes the names, definitions, and other aspects of the classification scheme and its contents. These can be captured through use of a set of attributes. Particular attributes are specified in this Part of this International Standard, along with a structure for the contents of these attributes. Users may extend the set of attributes as necessary. Additional information may accompany a taxonomy or ontology; for example, to provide a suggested set of qualifiers that could be applied to the object class, property, or representation taxa to more fully qualify the classification of the particular administered item. This Part summarizes the basic attributes and model specified in Part 3 of this International Standard.

An example in this standard shows how selected components of data elements can be associated with a classification scheme through the attributes specified in this International Standard. Use of one or more classification schemes is intended to provide a sound conceptual basis for the development of metadata having enhanced semantic purity and design integrity.

This International Standard does not establish a particular classification scheme as preeminent. Sanction of a particular taxonomic approach and/or a particular epistemology is also beyond the scope of this International Standard. These are addressed by other standards committees and/or tend to be tailored to a particular domain of discourse. The power of the classification scheme and the utility of the content are appropriate areas for competition. Other standards committees are developing or have developed normative languages for use in classification and/or particular techniques and structures that can be accommodated by this International Standard. For example, the National Information Standards Organization (NISO) has developed a standard for development of a thesaurus. It is appropriate for each classification structure to be documented as to how it was developed and how it can be extended and maintained. Such attributes could be added, by the principle of extensibility, to the attributes specified in this International Standard. They are not, however, included here.

Each Registration Authority, as described and specified in Part 6 of this International Standard, may classify administered items according to the classification schemes, structures, and content that it deems appropriate. In documenting the classification aspects of administered items, the Registration Authority shall do so according to the principles, methods, procedures, and attributes specified in this International Standard.

## 2 Normative references

The following referenced documents are indispensable for the application 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/IEC Guide 2, *Standardization and related activities — General vocabulary*

ISO/IEC 11179 (all parts), *Information technology — Metadata Registries (MDR)*

ISO 1087-1:2000, *Terminology work — Vocabulary — Part 1: Theory and application*

ISO 12620:1999, *Computer applications in terminology — Data categories*

ISO 704:2000, Principles and methods of terminology

ISO/IEC 2382-1:1998, Information technology – Vocabulary – Part 1 Fundamental terms

ISO 2788 Documentation – Guidelines for establishment and development of monolingual thesauri

ISO 5964 Multilingual Thesauri

## 3 Terms and definitions

For the purposes of this document, the following terms, abbreviations, and definitions apply.

**3.1**
**attribute**
A characteristic of an object or entity

**3.2**
**Classification Scheme**
the descriptive information for an arrangement or division of objects into groups based on characteristics, which the objects have in common

**3.3**
**Classification Scheme Item**
**CSI**
an item of content in a Classification Scheme

**3.4**
**Classification Scheme Item Relationship**
the relationship among items in a Classification Scheme

**3.5**
**classification scheme item relationship type description**
a description of the type of relationship between a Classification Scheme Item and one or more other

Classification Scheme Items in a Classification Scheme

**3.6**
**classification scheme item type name**
the name of the type of the Classification Scheme Item

**3.7**
**classification scheme item value**
an instance of a Classification Scheme Item

NOTE Metamodel construct is: *Attribute of* ***Classification Scheme Item***

**3.8**
**classification scheme membership**
the relationship of a Classification Scheme with its items

NOTE Metamodel construct is: *Relationship*.

**3.9**
**classification scheme type name**
the name of the type of Classification Scheme

NOTE Metamodel construct is: *Attribute of* ***Classification Scheme***.

**3.10**
**Concept**
unit of knowledge created by a unique combination of characteristics

**3.11**
**name**
The primary means of identification of objects and concepts for humans

**3.12**
**Terminological Entry**
an entry containing information on terminological units for a specific Administered Item within a Context

(subject field)

## 4 Attributes of a Classification Scheme

Classification schemes shall be registered in an MDR by recording their attributes. Minimally, a registered classification scheme shall have an administration record and a classification scheme type name. Optionally, other attributes listed in this clause may be recorded.

The following table lists the attributes of a classification system that may be recorded in an MDR. The figure refers to the UML diagram in Annex A in which the attribute occurs. Attributes in **bold** are data types containing multiple attribute components.

| Attribute | Occurrences | Figure |
|---|---|---|
| *Designation – name* | One per *Terminological Entry Language Section* | A.2 |
| *Designation - preferred designation* | Zero or one per *Terminological Entry Language Section* | A.2 |
| *Designation – **language identifier*** | One per *Language Section in each Terminological Entry* | A.2 |
| *Definition – definition text* | One per *Terminological Entry Language Section* | A.2 |
| *Definition – preferred definition* | Zero or one per *Terminological Entry Language Section* | A.2 |
| *Definition – **source reference*** | Zero or one per *Terminological Entry Language Section* | A.2 |
| *Definition – **language identifier*** | One per *Language Section in each Terminological Entry* | A.2 |
| *Context – **administration record*** | One per *context* | A.2 |
| *Context – description* | One per *context* | A.2 |
| *Context – **description language identifier*** | Zero or one per *context* | A.2 |
| *Classification Scheme – type name* | One per *classification scheme* | A.1 |
| *Classification Scheme Item – value* | One per *classification scheme item* | A.1 |
| *Classification Scheme Item – type name* | Zero or one per *classification scheme item* | A.1 |

| | | |
|---|---|---|
| *Classification Scheme Item Relationship – type description* | One per *classification scheme item relationship type description* | A.1 |
| *Administration Record – **item identifier*** | One per *classification scheme* | A.4 |
| *Administration Record – registration status* | One per *classification scheme* | A.4 |
| *Administration Record – administrative status* | One per *classification scheme* | A.4 |
| *Administration Record – creation date* | One per *classification scheme* | A.4 |
| *Administration Record – last change date* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – effective date* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – until date* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – change description* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – administrative note* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – explanatory comment* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – unresolved issue* | Zero or one per *classification scheme* | A.4 |
| *Administration Record – origin* | Zero or one per *classification scheme* | A.4 |
| *Reference Document – identifier* | One per *reference document* | A.3 |
| *Reference Document – type description* | Zero or one per *reference document* | A.3 |
| *Reference Document – **language identifier*** | Zero or more per *reference document* | A.3 |
| *Reference Document – title* | Zero or one per *reference document* | A.3 |
| *Reference Document – organization name* | One or more per *reference document* | A.3 |
| *Reference Document – organization mail address* | Zero or one per *reference document* | A.3 |
| *Submission – organization name* | One per *classification scheme* | A.3 |
| *Submission – organization mail address* | Zero or one per *classification scheme* | A.3 |
| *Submission – **contact*** | One per *classification scheme* | A.3 |
| *Stewardship – organization name* | One per *classification scheme* | A.3 |
| *Stewardship – organization mail address* | Zero or one per *classification scheme* | A.3 |
| *Stewardship – **contact*** | One per *classification scheme* | A.3 |

| | | |
|---|---|---|
| *Registration Authority – organization name* | One per *classification scheme* | A.3 |
| *Registration Authority – organization mail address* | Zero or one per *classification scheme* | A.3 |
| *Registration Authority –* ***registration authority identifier*** | One per *classification scheme* | A.3 |
| *Registration Authority –* ***documentation language identifier*** | One or more per *classification scheme* | A.3 |
| *Registrar –* ***identifier*** | One or more per *classification scheme* | A.3 |
| *Registrar –* ***contact*** | One or more per *classification scheme* | A.3 |

## 5 Mechanism for Classifying an Administered Item

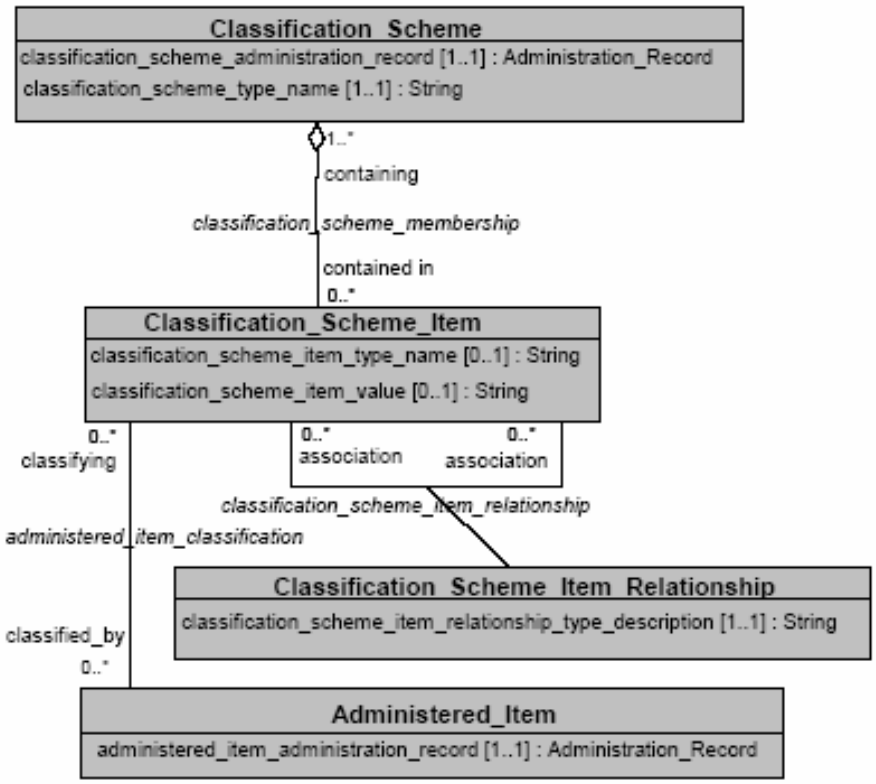
An administered item in an MDR shall be classified by a classification scheme by recording the following relationship:

Administered_item_classification See figure A.1

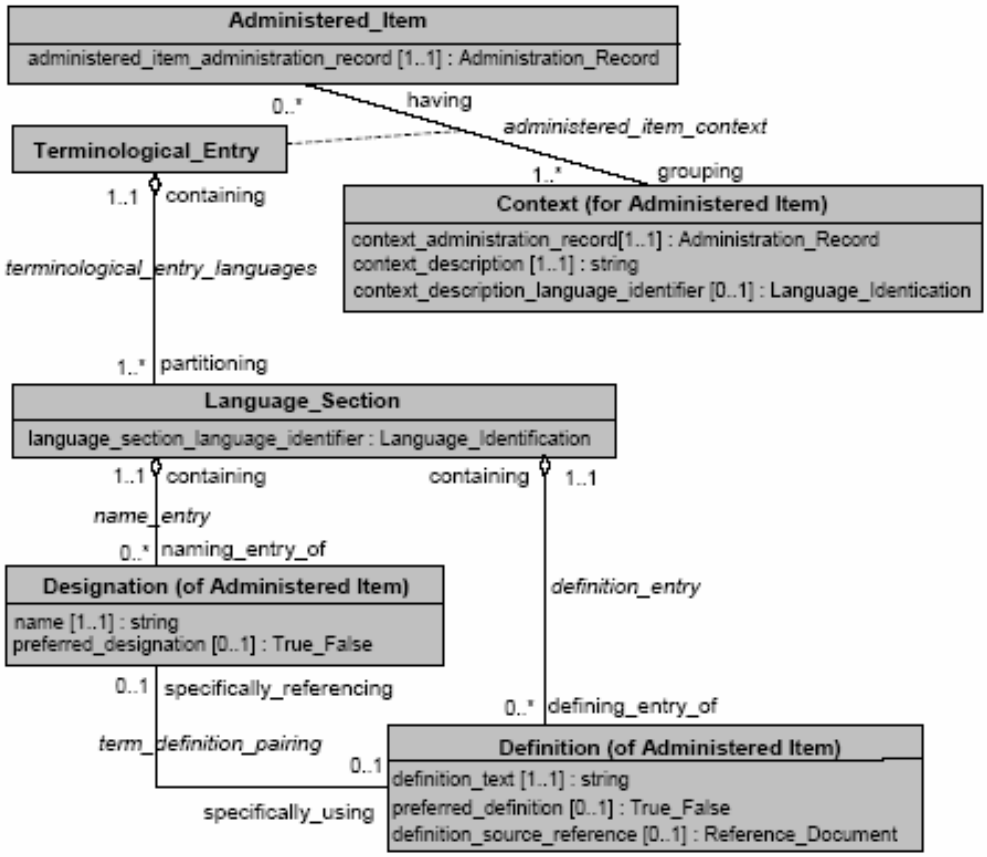
# Annex A
# (normative)

# Regions of the MDR Metamodel Containing Classification Scheme Attributes

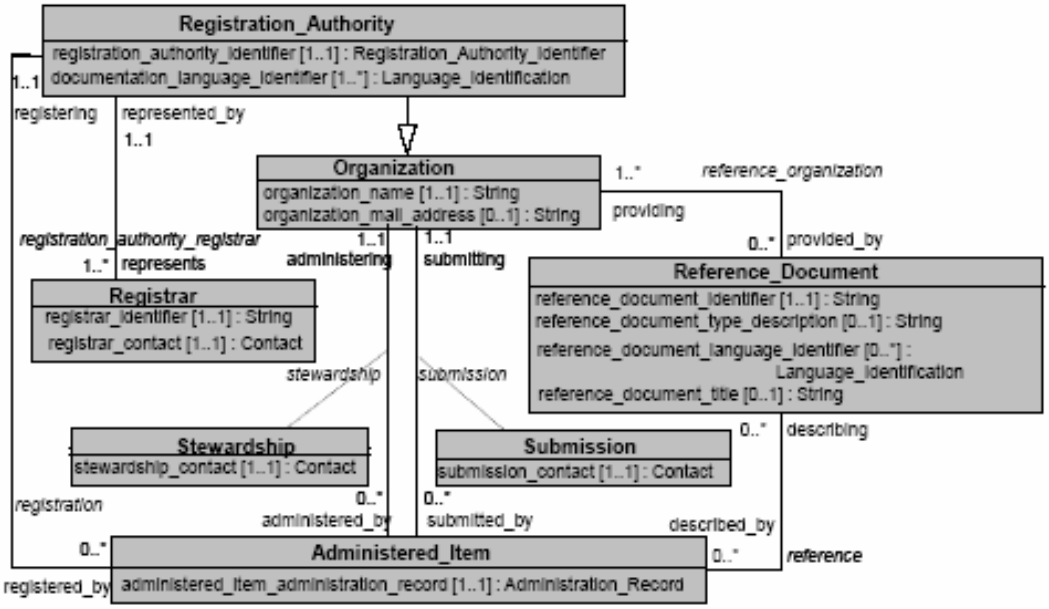
**Classification region**



**Naming and definition region**



**Administration and identification region**



**Attribute Groups**