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Information technology — Metadata registries (MDR) —

Part 2: Classification

Technologies de l'information — Registres de métadonnées (RM) —

Partie 2: Classification

Reference number
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national 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 and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 11179-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This second edition cancels and replaces the first edition (ISO/IEC 11179-2:2000), in order to harmonize with ISO/IEC 11179-3:2003. All normative material in ISO/IEC 11179-2:2000, including the attributes and model of a classification scheme, have been modified and included in ISO/IEC 11179-3:2003. This second edition of ISO/IEC 11179-2 contains some minor elaboration of ISO/IEC 11179-3:2003, 4.10 (Classification Region).

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*

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Introduction

This part of ISO/IEC 11179 focuses on the part of the metadata registry (MDR) model called the *classification region* (ISO/IEC 11179-3, 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 part of ISO/IEC 11179, 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 of ISO/IEC 11179 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 ISO/IEC 11179 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.

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Information technology — Metadata registries (MDR) —

Part 2: Classification

1 Scope

This part of ISO/IEC 11179 restates and elaborates on the procedures and techniques of 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 ISO/IEC 11179 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 ISO/IEC 11179, 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 of ISO/IEC 11179 summarizes the basic attributes and model specified in ISO/IEC 11179-3:2003.

An example in this part of ISO/IEC 11179 shows how selected components of data elements can be associated with a classification scheme through the attributes specified in this part of ISO/IEC 11179. 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 part of ISO/IEC 11179 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 part of ISO/IEC 11179. 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 part of ISO/IEC 11179. They are not, however, included here.

Each Registration Authority, as described and specified in ISO/IEC 11179-6, 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 may use the principles, methods, procedures, and attributes specified in this part of ISO/IEC 11179.

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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 11179 (all parts), *Information technology — Metadata registries (MDR)*

3 Terms and definitions

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

3.1
attribute
characteristic of an object or entity

3.2
Classification Scheme
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
item of content in a Classification Scheme

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

3.5
classification scheme item relationship type description
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
name of the type of the Classification Scheme Item

3.7
classification scheme item value
instance of a Classification Scheme Item

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

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

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

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

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3.12
Terminological Entry
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 datatypes 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

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Attribute	Occurrences	Figure
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

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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

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Annex A
(normative)

Regions of the MDR metamodel containing classification scheme attributes

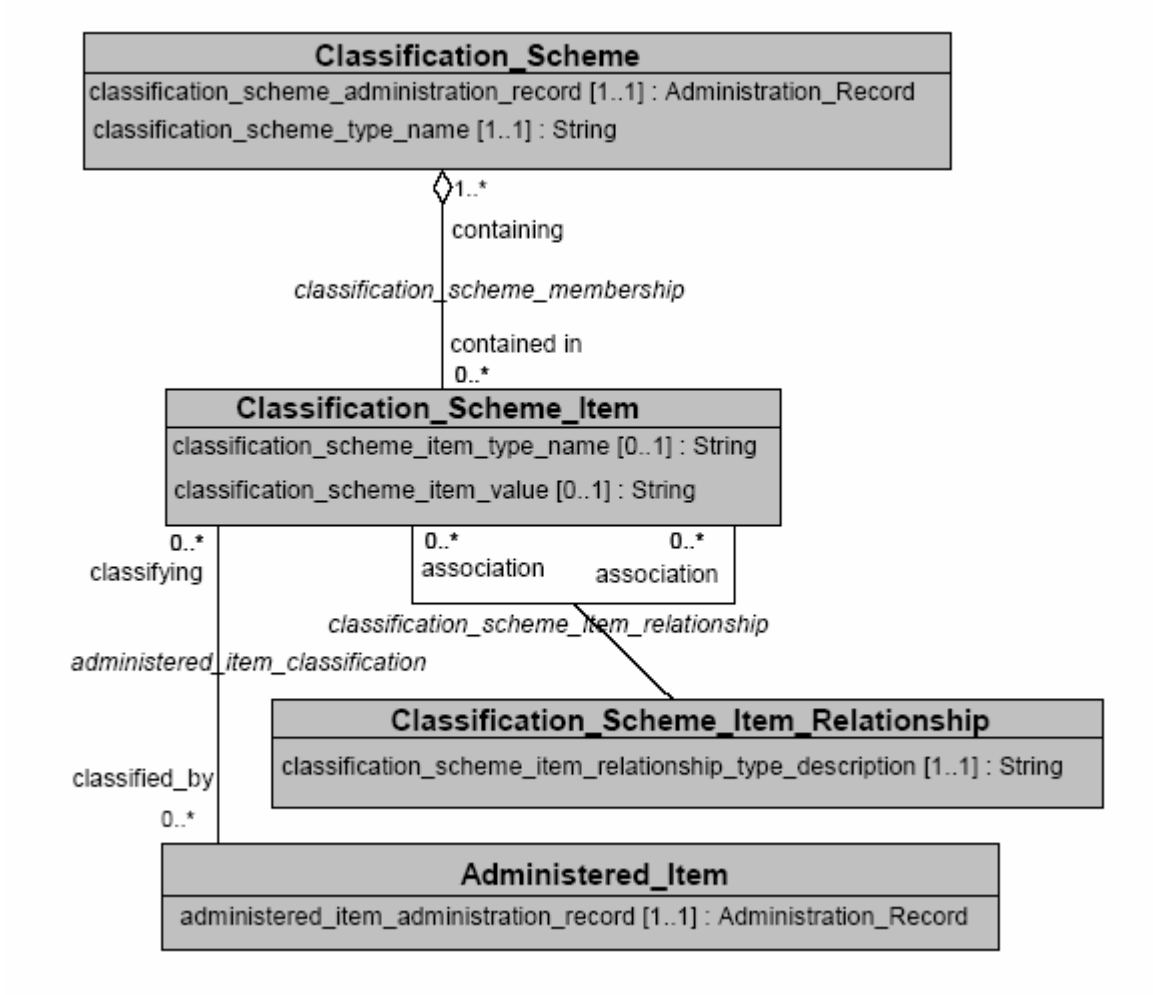

Figure A.1 — Classification metamodel region

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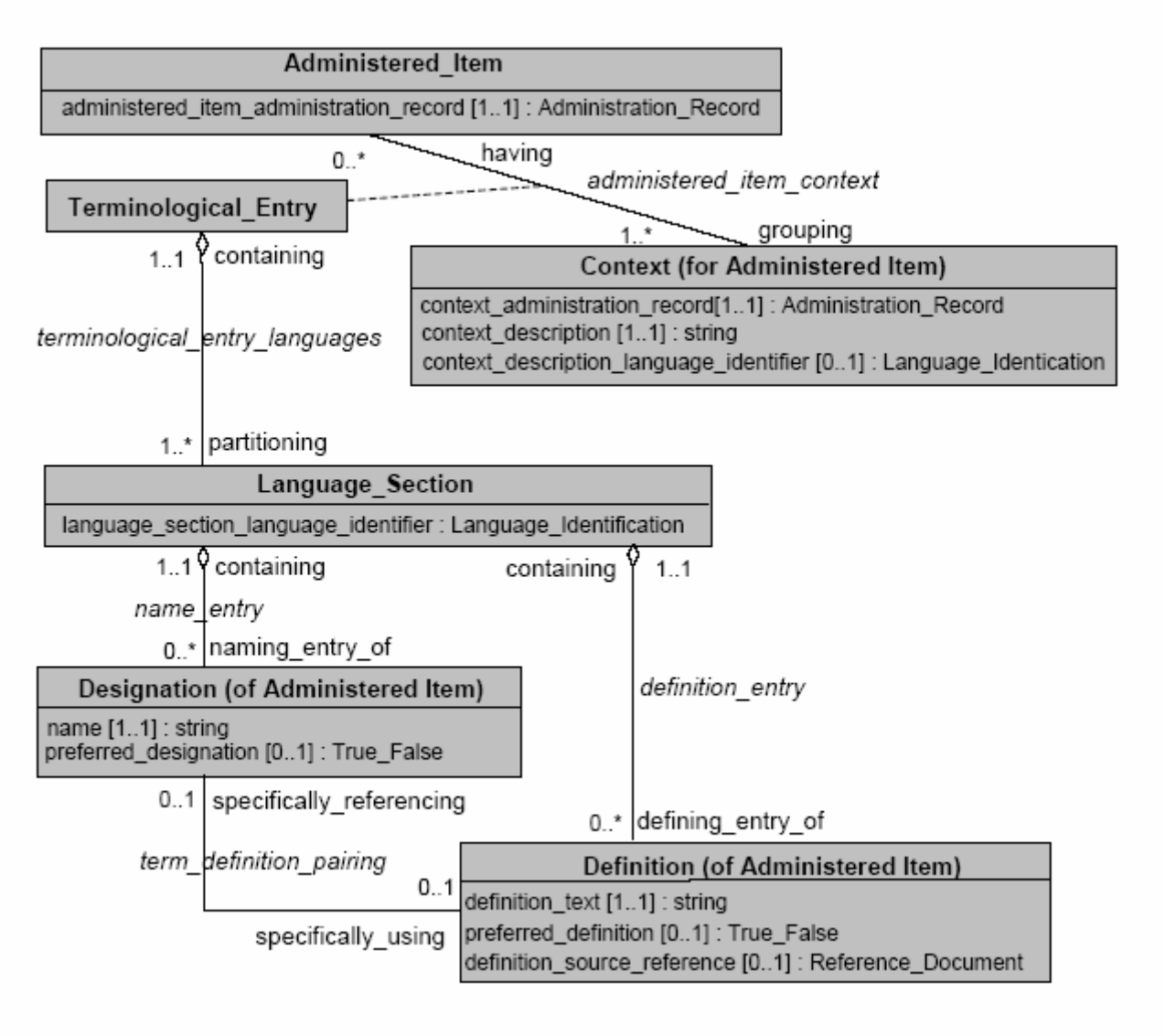

Figure A.2 — Naming and Definition metamodel region

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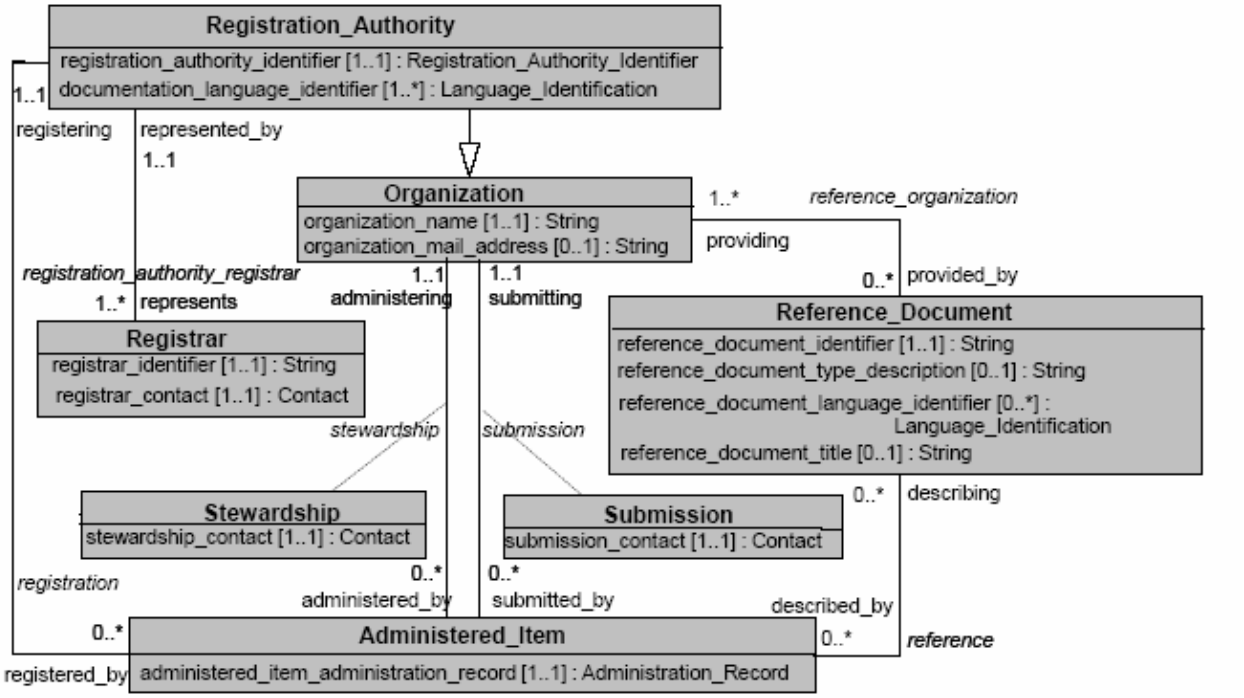

Figure A.3 — Administration and identification metamodel region

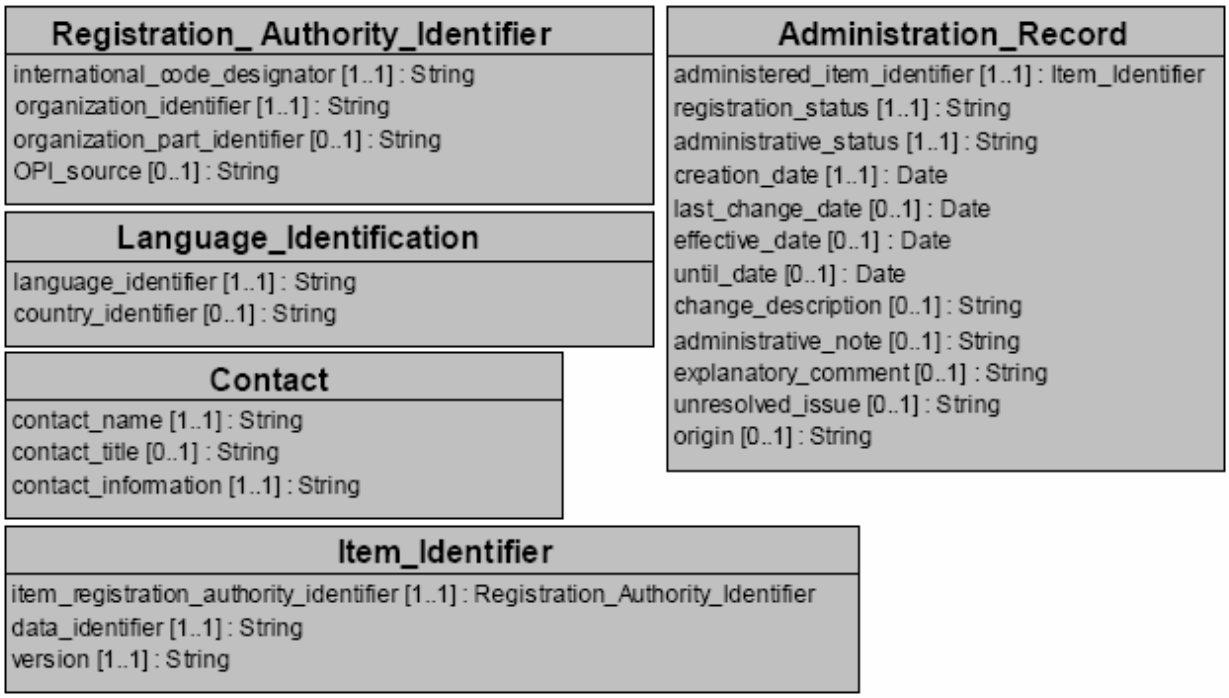

Figure A.4 — Administration and identification region – Classes used as Composite Datatypes

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