
**Information technology — Metadata
registries (MDR) —**

**Part 3:
Registry metamodel and basic attributes**

*Technologies de l'information — Registres de métadonnées (MDR) —
Partie 3: Métamodèle de registre et attributs de base*

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS

© ISO/IEC 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
1.1 Scope – Structure of a Metadata Registry	1
1.2 Scope – Basic attributes of metadata items	2
1.3 Scope – Aspects not currently addressed	2
1.4 Areas of Applicability	2
2 Normative references	2
3 Definitions	3
3.1 Definitions of Metamodel Constructs	3
3.2 Broad Terms used in this part of ISO/IEC 11179	5
3.3 Alphabetical list of metadata objects in the metamodel	8
3.4 List of Abbreviations	27
4 Structure of a Metadata Registry	27
4.1 Metamodel for a Metadata Registry	27
4.2 Application of the metamodel	28
4.3 Specification of the metamodel	28
4.4 Types, Instances and Values	29
4.5 Extensibility	29
4.6 Date References	29
4.7 Description of metamodel	29
4.8 Administration and Identification region	32
4.9 Naming and Definition Region	38
4.10 Classification Region	41
4.11 Data Element Concept Region	43
4.12 Conceptual and Value Domain Region	45
4.13 Data Element Region	49
4.14 Consolidated Metamodel	53
5 Basic attributes	55
5.1 Use of basic attributes	55
5.2 Common attributes	55
5.3 Attributes specific to Data Element Concepts	57
5.4 Attributes specific to Data Elements	58
5.5 Attributes specific to Conceptual Domains	58
5.6 Attributes specific to Value Domains	58
5.7 Attributes specific to Permissible Values	58
5.8 Attributes specific to Value Meanings	59
6 Conformance	59
6.1 Degree of Conformance	59
6.2 Levels of Conformance	60
6.3 Obligation	60
6.4 Conformance to prior editions of this Standard	60
6.5 Implementation Conformance Statement (ICS)	61
6.6 Roles and Responsibilities for Registration	61
Annex A (informative) Alphabetical List of Terms	62

Annex B (informative) **Modelling Notation** 65

B.1 **Modelling symbols** 65

Annex C (informative) **Mapping the ISO/IEC 11179-3:1994 basic attributes
to the ISO/IEC 11179-3:2002 metamodel and basic attributes**..... 69

C.1 **Introduction**..... 69

C.2 **Mapping the Basic Attributes**..... 72

Bibliography..... 99

This document is a preview generated by EVS

Table of Figures

Figure 1 — Common facilities for all Administered Items	30
Figure 2 — Types of Administered Items	31
Figure 3 — High-level metamodel	32
Figure 4 — Administration and identification metamodel region	33
Figure 5 — Administration and identification region – Classes used as Composite Datatypes	33
Figure 6 — Naming and Definition metamodel region	38
Figure 7 — Classification metamodel region	41
Figure 8 — Data Element Concept metamodel region	43
Figure 9 — Conceptual and value domain metamodel region	46
Figure 10 — Data Element metamodel region	51
Figure 11 — Consolidated metamodel	54
Figure B.1 — Sample modelling diagram	65
Figure B.2 — Notation for “Class”	65
Figure B.3 — Notation for “Association”	66
Figure B.4 — Notation for relationship between Classes	66
Figure B.5 — Notation for relationship with Cardinality	66
Figure B.6 — Notation for “Association Class”	66
Figure B.7 — Notation for Supertype / Subtypes	67
Figure B.8 — Notation for Aggregation	67
Figure B.9 — Notation for Composite Aggregation	68
Figure B.10 — Notation for Class with Attributes	68
Figure B.11 — Notation for Composite attributes	68
Figure C.1 — Basic Attributes of Data elements	69

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 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 and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 11179-3 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 11179-3:1994), which has been technically revised.

ISO/IEC 11179 (first edition) consists of the following parts under the general title *Information technology — Specification and standardization of data elements*:

- *Part 1: Framework for the specification and standardization of data elements*
- *Part 2: Classification for data elements*
- *Part 3: Registry metamodel and basic attributes*
- *Part 4: Rules and guidelines for the formulation of data definitions*
- *Part 5: Naming and identification principles for data elements*
- *Part 6: Registration of data elements*

NOTE ISO/IEC 11179 is currently being revised under the general title *Information technology — Metadata registries (MDR)*. The part titles may also change in the process.

Introduction

Data processing and electronic data interchange rely heavily on accurate, reliable, controllable and verifiable data recorded in databases. A prerequisite for correct and proper use and interpretation of data is that both users and owners of data have a common understanding of the meaning and representation of the data. To facilitate this common understanding, a number of characteristics, or attributes, of the data have to be defined. These characteristics of data are known as “metadata”, that is, “data that describes data”. This part of ISO/IEC 11179 provides for the attributes of data elements and associated metadata to be specified and registered as metadata items in a *Metadata Registry*.

The structure of a *Metadata Registry* is specified in the form of a conceptual data model. The *Metadata Registry* is used to keep information about data elements and associated concepts, such as “data element concepts”, “conceptual domains” and “value domains”. Generically, these are all referred to as “metadata items”. Such metadata are necessary to clearly describe, record, analyse, classify and administer data.

When considering data and metadata, it is important to distinguish between types of data/metadata, and instances of these types. Clause 4 of this part of ISO/IEC 11179 specifies the types of metadata objects that form the structure of a *Metadata Registry*. A *Metadata Registry* will be populated with instances of these metadata objects (metadata items), which in turn define types of data, e.g. in an application database. In other words, instances of metadata specify types of application level data. In turn, the application database will be populated by the real world data as instances of those defined data types.

NOTE ISO/IEC 10027:1990 IRDS Framework explains the concepts of different levels of modelling.

This part of ISO/IEC 11179 also describes the basic attributes of metadata items for purposes where a complete *Metadata Registry* is not appropriate.

This part of ISO/IEC 11179 is of interest to information developers, information managers, data administrators, standards developers and others who are responsible for making data understandable and shareable. ISO/IEC 11179 has broad applicability across subject area domains and information technologies.

This document is a preview generated by EVS

Information technology — Metadata registries (MDR) —

Part 3:

Registry metamodel and basic attributes

1 Scope

The primary purpose of ISO/IEC 11179-3 is to specify the structure of a *Metadata Registry* (see 1.1). ISO/IEC 11179-3 also specifies basic attributes which are required to describe metadata items, and which may be used in situations where a complete metadata registry is not appropriate (e.g. in the specification of other International Standards) (see 1.2).

1.3 identifies aspects not currently addressed.

1.4 provides examples of activities where ISO/IEC 11179-3 may be applied.

1.1 Scope – Structure of a Metadata Registry

A comprehensive *Metadata Registry* management function requires a set of rules and procedures. These rules and procedures are set out in the following clauses and Annexes and are complemented elsewhere in this document as follows:

- a) the definitions of metadata objects are in Clause 3.6 of this part of ISO/IEC 11179;
- b) the structure of the registry in the form of a conceptual data model is in Clause 4 of this part of ISO/IEC 11179;

Aspects of the registry are expanded on in other parts of ISO/IEC 11179, as follows:

- a) the overall framework for this family of International Standards is specified in ISO/IEC 11179-1;
- b) rules and guidelines for classifying metadata are in ISO/IEC 11179-2;
- c) rules and guidelines for the formulation of definitions are in ISO/IEC 11179-4;
- d) naming and identifying principles for metadata are in ISO/IEC 11179-5;
- e) rules and guidelines for registering metadata are in ISO/IEC 11179-6.

While the model diagrams are presented in UML notation, this part of ISO/IEC 11179 does not assume nor endorse any specific system environment, database management system, database design paradigm, system development methodology, data definition language, command language, system interface, user interface, computing platform, or any technology required for implementation. This part of ISO/IEC 11179 does not directly apply to the actual use of data in communications and information processing systems.

1.2 Scope – Basic attributes of metadata items

This part of ISO/IEC 11179 also specifies basic attributes which are required to describe metadata items, and which may be used in situations where a complete *Metadata Registry* is not appropriate (e.g. in the specification of other International Standards). These basic attributes are described in Clause 5.

1.3 Scope – Aspects not currently addressed

This part of ISO/IEC 11179 does not currently support the following requirements;

- a) Complex data structures, encapsulation, stereotyping and inheritance;
- b) Ability to enforce uniqueness of names within a Context;
- c) Specification of Naming Conventions for a Context;
- d) Designations other than names (e.g. icons);
- e) Specification of Time in addition to Date;
- f) Prescribed conceptual domains and value domains for the attributes in the metamodel;
- g) Registration of XML documents or XML schemas;
- h) Application Programming Interfaces (APIs) and associated bindings to access a registry;
- i) Multilingual support, except for names and definitions;
- j) Cultural adaptability.

It is anticipated that some or all of these requirements will be addressed in future editions of this part of ISO/IEC 11179, or in companion standards or technical reports.

1.4 Areas of Applicability

This part of ISO/IEC 11179 applies to activities including:

- a) the definition, specification and contents of metadata registries, including interchanging or referencing among various collections of data elements;
- b) the design and specification of application-oriented data models, databases and message types for data interchange;
- c) the actual use of data in communications and information processing systems;
- d) interchange or reference among various collections of metadata.

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 31-0, *Quantities and units — Part 0: General principles*

ISO 639-2:1998, *Codes for the representation of the names of languages — Part 2: Alpha-3 code*

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

ISO/IEC 2382-1:1993, *Information technology — Vocabulary — Part 1: Fundamental terms*

ISO/IEC 2382-17:1999, *Information technology — Vocabulary — Part 17: Databases*

ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 5127:2001, *Information and documentation — Vocabulary*

ISO/IEC 6523-1:1998, *Information technology — Structure for the identification of organization and organization parts — Part 1: Identification of organization identification schemes*

ISO/IEC 6523-2:1998, *Information technology — Structure for the identification of organization and organization parts — Part 2: Registration of organization identification schemes*

ISO 8601:2000, *Data elements and interchange formats — Information exchange — Representation of dates and times*

ISO/IEC 11179-1, *Information technology — Specification and standardization of data elements — Part 1: Framework for the specification and standardization of data elements*

ISO/IEC 11179-2, *Information technology — Specification and standardization of data elements — Part 2: Classification for data elements*

ISO/IEC 11179-4, *Information technology — Specification and standardization of data elements — Part 4: Rules and guidelines for the formulation of data definitions*

ISO/IEC 11179-5, *Information technology — Specification and standardization of data elements — Part 5: Naming and identification principles for data elements*

ISO/IEC 11179-6, *Information technology — Specification and standardization of data elements — Part 6: Registration of data elements*

ISO/IEC 11404:1996, *Information technology — Programming languages, their environments and system software interfaces — Language-independent datatypes*

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

ISO/IEC 19501-1:2002, *Information technology — Unified Modeling Language (UML) — Part 1: Specification*

3 Definitions

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

3.1 defines metamodel constructs, used in specifying the registry metamodel.

3.2 lists broader terms, and their definitions, used in this document that are not included in either 3.1 or 3.3.

3.3 defines metadata objects prescribed by the metamodel itself.

An alphabetical list of terms from all three Clauses is provided in Annex A.

3.1 Definitions of Metamodel Constructs

This subclause defines the metamodel constructs used in specifying the registry metamodel in Clause 4.