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Fourth edition
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Information technology — Metadata registries (MDR) —

Part 3: Metamodel for registry common facilities

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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 document 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 or www.iec.ch/members_experts/refdocs).

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For an explanation of 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 www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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

This fourth edition cancels and replaces the third edition (ISO/IEC 11179-3:2013), which has been technically revised. It also incorporates the Amendment ISO/IEC 11179-3:2013/Amd.1:2020.

The main changes are as follows:

— this fourth edition presents a metamodel for the Common Facilities of a Basic Registry which has potential use for more than just metadata;

— the previous edition has been split into multiple parts to make it more manageable;

  — the Basic Attributes (formerly Clause 12) have been moved to ISO/IEC 11179-30: Basic attributes of metadata;

  — the Data Description region (formerly Clause 11) has been moved to ISO/IEC 11179-31: Metamodel for data specification registration;

  — the Concepts region (formerly Clause 9) and the Binary Relations region (formerly Clause 10) have been moved to ISO/IEC 11179-32: Metamodel for concept system registration;

— simplification of the UML used to describe the metamodels, such as:

  — elimination of use of stereotypes;

  — addition of an explicit 'Item' class as the superclass of all types of registry items;

  — removal of role names on associations;

  - removal of redundant specification of attributes and associations in the text;

- refactoring of some of the packages to reduce dependencies, including:

  - moving the Concept class to the Basic and Core package where it is referenced from multiple metamodel regions, including: the Data Specification package in ISO/IEC 11179-31, the Concept System package in ISO/IEC 11179-32, the Data Set package in ISO/IEC 11179-33 and the Model package in ISO/IEC 11179-35;

  - moving the Context class to the Basic and Core package where it is referenced from the Designation and Definition package in this document, the Data Specification package in ISO/IEC 11179-31 and the Data Set package in ISO/IEC 11179-33;

  - moving the Slot class to the Basic and Core package, a more appropriate location than the Identification package;

  - a Classification region has been restored, based on the style of ISO/IEC 11179-3:2003[12], to remove dependency on the Concept System region for classification;

- adding a generic mapping facility among registry items;

- a change to the formatting of the text in Clauses 5 through 11 and Annexes B and C, to better align with ISO Directives and ISO House Style, see 5.3.2.

A list of all parts in the ISO/IEC 11179 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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".

The attributes of data elements and associated metadata can be specified and recorded as registry items in a metadata registry (MDR). The metadata registry is used to keep information about data elements and associated concepts, such as "data element concepts", "conceptual domains" and "value domains" (see ISO/IEC 11179-31). Generically, these are all referred to as "metadata items". Such metadata are necessary to clearly describe, record, analyse, classify and administer data.

ISO/IEC 11179 addresses the semantics of data, the representation of data and the registration of the descriptions of that data. It is through these descriptions that an accurate understanding of the semantics and a useful depiction of the data are found.

The purposes of the ISO/IEC 11179 series are to promote the following:

— standard description of data;

— common understanding of data across organizational elements and between organizations;

— re-use and standardization of data over time, space and applications;

— harmonization and standardization of data within an organization and across organizations;

— management of the components of descriptions of data;

— re-use of the components of descriptions of data.

Each part of ISO/IEC 11179 is devoted to addressing a different aspect of these needs, as described in ISO/IEC 11179-1:2023, Clause 7. This document specifies the information to be recorded in a metadata registry in the form of a conceptual data model. It also specifies common facilities for dealing with identification, designation, definition and registration of any type of registry item. Thus, this document applies to registries other than metadata registries. Other parts of ISO/IEC 11179 extend this model to support specific types of metadata items, such as: data elements, data element concepts, data set specifications, concept systems, etc. (See 1.2.)

NOTE ISO/IEC 11179-30[16] describes the basic attributes of registry items for purposes where a complete metadata registry is not appropriate.

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

ISO/IEC 11179 applies to activities including:

a) the definition, specification and registration of contents of metadata registries, including interchanging or referencing among various collections of data elements[17], including data sets[19] and models[21][29];

b) interchange or reference among various collections of metadata, including models[21][29];

c) the registration and management of semantic artifacts that are useful for data management, data administration and data analysis;

d) the interrelation of concept systems with data held in relational databases, XML databases, knowledgebases, text, and possibly graph databases deriving from natural language text understanding systems;

e) the provision of services for semantic computing: Semantics Service Oriented Architecture, Semantic Grids, semantics-based workflows, Semantic Web, etc;

f) support for addressing semantic web considerations such as AAA (anyone can say anything about anything), non-unique names and open world assumption.

In Clauses 5 through 11 and Annexes B and C, this document uses:

— **bold** font to highlight terms which represent metadata objects specified by the metamodel;

— normal font for terms which represent concepts defined in Clause 3.

EXAMPLE **Concept** (6.4.2.2) is a class each instance of which models a concept.

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Part 3:
Metamodel for registry common facilities

1 Scope

1.1 Structure of a metadata registry

This document specifies the information to be recorded in a metadata registry in the form of a conceptual data model:

— Clause 5 specifies the approach used to model a metadata registry;

— Clause 6 specifies the Core Model of the registry, including basic types and classes to be reused in extending the model. The core model defines a generic "registry item", from which any type of item that needs to registered can be sub-classed;

— Clause 7 specifies the metamodel for Identification of registry items;

— Clause 8 specifies the metamodel for Designation and Definition of registry items;

— Clause 9 specifies the metamodel for Registration of registry items;

— Clause 10 specifies the metamodel for Classification of registry items;

— Clause 11 specifies the metamodel for Mapping among registry items.

1.2 Model extensions

Other parts of ISO/IEC 11179 extend the core model to support additional functionality, including the following:

— ISO/IEC 11179-31[17] provides a metamodel for data specification registration, including support for data elements, data element concepts, conceptual domains and value domains;

— ISO/IEC 11179-32[18] provides a metamodel for concept system registration , including support for concept systems and ontologies;

— ISO/IEC 11179-33[19] provides a metamodel for data set registration;

— ISO/IEC 11179-34[20] (under development) provides a metamodel for computable data registration;

— ISO/IEC 11179-35[21] provides a metamodel for model registration.

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 11179-6:2023, *Information technology — Metadata registries (MDR) — Part 6: Registration*

ISO/IEC 11404:2007, *Information technology — General-Purpose Datatypes (GPD)*