American National Standard

INCITS/ISO/IEC 11179-3:2013[2014]

(ISO/IEC 11179-3:2013, IDT)

Information technology - Metadata registries (MDR) - Part 3: Registry metamodel and basic attributes

Developed by

Where IT all begins

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.

Adopted by INCITS (InterNational Committee for Information Technology Standards) as an American National Standard.

Date of ANSI Approval: 5/23/14

Published by American National Standards Institute,
25 West 43rd Street, New York, New York 10036

Third edition
2013-02-15

Information technology — Metadata registries (MDR) —

Part 3:
Registry metamodel and basic attributes

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

Partie 3: Métamodèle de registre et attributs de base

Reference number
ISO/IEC 11179-3:2013(E)

COPYRIGHT PROTECTED DOCUMENT

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

Table of Figures

Table of Tables

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 11179-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This third edition cancels and replaces the second edition (ISO/IEC 11179-3:2003) and ISO/IEC 11179-3:2003/Cor 1:2004. The changes are as follows:

Edition 3 of this part of ISO/IEC 11179 includes several enhancements to Edition 2, both in terms of the presentation of the metamodel, and its capabilities, as follows:

From a presentation perspective, these include:

- use of UML 2.4.1 instead of UML 1.4 to describe the metamodel;
- use of UML packages to show dependencies between various regions of the metamodel. (See 5.3.3 and 5.3.4.)

From a capability perspective, these include:

- introduction of different types of metadata items (see 5.5);
- support for registration of Concept Systems (see 9.1);
- finer-grained conformance options (see 4.3).

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

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** (MDR).

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 5 through 11 of this part of ISO/IEC 11179 specify 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 datatypes.

NOTE ISO/IEC 10027:1990, *Information technology — Information resource dictionary system (*IRDS) Framework and ISO/IEC TR 10032:2003, *Information technology —* Reference model for data management explain the concepts of different levels of modelling.

In this part of ISO/IEC 11179, clause 12 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, application developers, business modellers 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 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;

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

f) the interrelation and mapping of concept systems with other concept systems, e.g., to support efforts to converge on consistency through harmonization and vetting activities;

g) 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;

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

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

j) the capture of semantics with more formal techniques (in addition to natural language) -- First Order Logic (e.g., Common Logic), Description Logics (such as OWL-DL);

k) support of Application Development and Maintenance;

l) support of data migration, data mediation;

m) support of portals, data marts, and data warehouses;

n) support of data grids and online transaction networks;

o) ontological reasoning with metadata;

p) ontology entry point for browsing and searching metadata registries;

q) capture of associations between the published identifiers used in the ontology(s), and the concepts registered in the registry;

r) support for Ontology-driven Data Translation;

s) support for data integration & data interoperation.