Australian Standard™

Information technology—Metadata registries (MDR)

Part 1: Framework

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-027, Data Management and Interchange.

This Standard is identical with, and has been reproduced from, ISO/IEC 11179-1:2004, *Information technology—Metadata registries(MDR)—*Part 1: *Framework.*

The objective of this Standard is to provide the basic aspects of data element composition, including metadata, to facilitate electronic data interchange and data sharing for use by electronic commerce and database designers.

This Standard is Part 1 of AS 11179, *Information technology—Metadata registries (MDR)*, which is published in parts as follows:

Part 1: Framework (this Standard)
Part 2: Classification for data elements
Part 3: Registry metamodel and basic attributes
Part 4: Formulation of data definitions
Part 5: Naming and identification principles for data elements
Part 6: Registration

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(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

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Reference to International Standard		*Australian Standard*	
ISO/IEC		AS ISO/IEC	
11179	Information technology—Metadata registries (MDR) (All parts)	11179	Information technology—Metadata registries (MDR) (All parts)

Only international references that have been adopted as Australian Standards have been listed.

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INTRODUCTION

ISO/IEC 11179 - *Metadata registries (MDR)*, 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 ISO/IEC 11179 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 data

— Re-use of the components of data

ISO/IEC 11179 is six part standard. Each part is devoted to addressing a different aspect of the needs listed above. The parts and a short description follow:

— Part 1 – *Framework* – Contains an overview of the standard and describes the basic concepts

— Part 2 – *Classification* – Describes how to manage a classification scheme in a metadata registry

— Part 3 – *Registry metamodel and basic attributes* – Provides the basic conceptual model, including the basic attributes and relationships, for a metadata registry

— Part 4 – *Formulation of data definitions* – Rules and guidelines for forming quality definitions for data elements and their components

— Part 5 – *Naming and identification principles* – Describes how to form conventions for naming data elements and their components

— Part 6 – *Registration* – Specifies the roles and requirements for the registration process in an ISO/IEC 11179 metadata registry

Generally, descriptive data is known as metadata. That is, metadata is data that is used for describing other data. As the use of the term has evolved, metadata now refers, generally, to data that is used for describing some other objects. We limit the scope of the term as it is used here in ISO/IEC 11179 to descriptions of data - the more traditional use of the term.

An MDR is a database of metadata that supports the functionality of registration. Registration accomplishes three main goals: identification, provenance, and monitoring quality. Identification is accomplished by assigning a unique identifier (within the registry) to each object registered there. Provenance addresses the source of the metadata and the object described. Monitoring quality ensures that the metadata does the job it is designed to do.

An MDR manages the semantics of data. Understanding data is fundamental to its design, harmonization, standardization, use, re-use, and interchange. The underlying model for an MDR is designed to capture all the basic components of the semantics of data, independent of any application or subject matter area.

MDR's are organized so that those designing applications can ascertain whether a suitable object described in the MDR already exists. Where it is established that a new object is essential, its derivation from an existing description with appropriate modifications is encouraged, thus avoiding unnecessary variations in the way similar objects are described. Registration will also allow two or more administered items describing identical objects to be identified, and more importantly, it will identify situations where similar or identical names are in use for administered items that are significantly different in one or more respects.

In ISO/IEC 11179 the basic container for data is called a data element. It may exist purely as an abstraction or exist in some application system. In either case, the description of a data element is the same in ISO/IEC 11179. Data element descriptions have both semantic and representational components. The semantics are further divided into contextual and symbolic types.

The contextual semantics are described by the data element concept (DEC). The DEC describes the kinds of objects for which data are collected and the particular characteristic of those objects being measured. The symbolic semantics are described by the conceptual domain (CD). A CD is a set of categories, not necessarily finite, where the categories represent the meaning of the permissible values in a value domain - the allowed values for a data element.

The names, definitions, datatype, and related objects that are associated with a particular object in an MDR give that object meaning. The depth of this meaning is limited, because names and definitions convey limited information about an object. The relationships that object has with semantically related objects in a registry provides additional information, but the additional information is dependent on how many semantically related objects there are.

The representational component is about the permitted values a data element may use. Each value corresponds to one of the categories in the CD. The set of these permitted values is called a value domain (VD). A VD specifies all the values that are allowed either through an enumeration, a rule, or a combination of these. The computational model the values follow is given by their datatype.

The semantic and representational components are described through attributes contained in the conceptual model of a metadata registry as specified in ISO/IEC 11179-3. A metadata registry that conforms to ISO/IEC 11179 can describe a wide variety of data. In fact, the attributes described in ISO/IEC 11179-3 are data elements, and they can be registered in an ISO/IEC 11179 metadata registry. Moreover, any set of descriptors or metadata attributes may be interpreted as data elements and registered in the metadata registry.

There are two main consequences to this:

— The metadata registry can describe itself

— Metadata layers or levels are not defined in ISO/IEC 11179

As a result, ISO/IEC 11179 is a general description framework for data of any kind, in any organization, and for any purpose. This standard does not address other data management needs, such as data models, application specifications, programming code, program plans, business plans, and business policies. These need to be addressed elsewhere.

The increased use of data processing and electronic data interchange heavily relies on accurate, reliable, controllable, and verifiable data recorded in databases. One of the prerequisites for a correct and proper use and interpretation of data is that both users and owners of data have a common understanding of the meaning and descriptive characteristics (e.g., representation) of that data. To guarantee this shared view, a number of basic attributes has to be defined.

The basic attributes specified are applicable for the definition and specification of the contents of data dictionaries and interchanging or referencing among various collections of administered items. The "basic" in basic attributes means that the attributes are commonly needed in specifying administered items completely enough to ensure that they will be applicable for a variety of functions, such as

— design of information processing systems

— retrieval of data from databases

— design of EDI-messages for data interchange

— maintenance of metadata registries

— data management

— dictionary design

— dictionary control

— use of information processing systems

Basic also implies that they are independent of any

— application environment

— function of an object described by an administered item

— level of abstraction

— grouping of administered items

— method for designing information processing systems or data interchange messages

— MDR system

Basic does not imply that all attributes specified in ISO/IEC 11179-3 are required in all cases. Distinction is made between those attributes that are mandatory, conditional, or optional.

AUSTRALIAN STANDARD

Information technology — Metadata registries (MDR) —

Part 1:
Framework

1 Scope

ISO/IEC 11179 specifies the kind and quality of metadata necessary to describe data, and it specifies the management and administration of that metadata in a metadata registry (MDR). It applies to the formulation of data representations, concepts, meanings, and relationships between them to be shared among people and machines, independent of the organization that produces the data. It does not apply to the physical representation of data as bits and bytes at the machine level.

In ISO/IEC 11179, metadata refers to descriptions of data. ISO/IEC 11179 does not contain a general treatment of metadata. This part of ISO/IEC 11179 provides the means for understanding and associating the individual parts and is the foundation for a conceptual understanding of metadata and metadata registries.

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 704:2000, *Terminology work — Principles and methods*

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

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 Definitions of modeling constructs

This sub-clause defines the modeling constructs used in this part of ISO/IEC 11179.

3.1.1
attribute
characteristic of an **object** or **entity**

3.1.2
class
description of a set of **object**s that share the same **attribute**s, operations, methods, **relationship**s, and semantics

[ISO/IEC 19501-1:2001, 2.5.2.9].

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