# INTERNATIONAL STANDARD

ISO/IEC 11179-35

First edition 2023-01

# Information technology — Metadata registries (MDR) —

Part 35:

# Metamodel for model registration

Technologies de l'information — Registres de métadonnées (RM) — Partie 35: Métamodèle pour l'enregistrement du modèle



## ISO/IEC 11179-35:2023(E)



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office CP 401 • Ch. de Blandonnet 8 CH-1214 Vernier, Geneva Phone: +41 22 749 01 11 Email: copyright@iso.org Website: www.iso.org

Published in Switzerland

Contents		Page
Fore	eword	vii
Introduction		viii
1	Scope	
2	Normative references	
3	Terms and definitions	
4	Abbreviated terms	2
5	Conformance	3
	5.1 Overview of conformance	3
	5.2 Degree of conformance	3
	5.2.1 General	
	5.2.2 Strictly conforming implementations	
	5.2.3 Conforming implementations	
	5.3 Conformance by feature	
	5.4 Standard profiles for edition 4 registries	
	5.5 Implementation conformance statement (ICS)	
6	Relationship to ISO/IEC 11179-3	
	6.1 Metamodel for a metadata registry	
	6.2 Specification of the metamodel	
	6.3 Use of UML Class diagrams and textual description	
	6.4 Package dependencies	
7	Model package	
	7.1 Overview of the Model package	
	7.2 Model metamodel region	
	7.2.1 Overview of the Model metamodel region	
	7.2.2 Classes in the Model metamodel region	
	7.2.3 Associations in the Model metamodel region	
Ann	nex A (informative) Consolidated Class Hierarchy	20
Ann	nex B (informative) Use of the model registration facilities	21
Ann	nex C (informative) Examples of model registration	23
Ann	nex D (informative) Relationship to ISO/IEC 19763	64
Rihl	liography	66

# ISO/IEC 11179-35:2023(E)

# **List of Figures**

Figure 1 — Package dependencies	6
Figure 2 — Model metamodel region	7
Figure A.1 — Consolidated Class Hierarchy	20
Figure B.1 — Registration of models and metamodels	21
Figure C.1 — Create Repair Order example in BPMN	23
Figure C.2 — Sales order processing example expressed as a UML Class Diagram	27
Figure C.3 — Example form design	35
Figure C.4 — Form design metamodel (from ISO/IEC TS 19763-13:2016)	36
Figure C.5 — UML class diagram for the student registration scenario	46
Figure C.6 — JSON schema for the student registration scenario (3 of 3)	48
Figure C.7 — Metamodel for the Ellis-Barker entity-relationship notation	53

# **List of Tables**

Table 1 — Attributes of the Model_Element_Characteristic class	11
Table 2 — Attribute of the Concept_Annotation class	13
Table C.1 — Modelling_Language class for the BPMN example	24
Table C.2 — Model class for the BPMN example	24
Table C.3 — Model_Element_Type class for the BPMN example	24
Table C.4 — Model_Element class for the BPMN example	24
Table C.5 — Model_Element_Characteristic_Type class for the BPMN example	25
Table C.6 — Model_Element_Characteristic class for the BPMN example	25
Table C.7 — Model_Element_Model_Relationship_Type class for the BPMN example	26
Table C.8 — Model_Element_Model_Relationship class for the BPMN example	26
Table C.9 — Model_Element_Relationship_Type class for the BPMN example	26
Table C.10 — Model_Element_Relationship class for the BPMN example	26
Table C.11 — Modelling_Language class for the UML Class Diagram example	27
Table C.12 — Model class for the UML Class Diagram example	28
Table C.13 — Concept class for the UML Class Diagram example	28
Table C.14 — Concept_Annotation class for the UML Class Diagram example	28
Table C.15 — Model_Element_Type class for the UML Class Diagram example	28
Table C.16 — Model_Element class for the UML Class Diagram example	28
Table C.17 — Model_Element_Characteristic_Type class for the UML Class Diagram example	29
Table C.18 — Model_Element_Characteristic class for the UML Class Diagram example	30
Table C.19 — Model_Element_Relationship_Type class for the UML Class Diagram example	33
Table C.20 — Model_Element_Relationship class for the UML Class Diagram example	33
Table C.21 — Model class for the Form Design example	36
Table C.22 — Model_Element_Type class for the Form Design example	37
Table C.23 — Model_Element class for the Form Design example	37
Table C.24 — Model_Element_Characteristic_Type class for the Form Design example	39
Table C.25 — Model_Element_Characteristic_Type_Acceptability class for the Form Design example	40
Table C.26 — Model_Element_Characteristic class for the Form Design example	40
Table C.27 — Model_Element_Relationship_Type class for the Form Design example	43
Table C.28 — Model_Element_Relationship class for the Form Design example	44
Table C.29 — Modelling_Language class for the JSON Schema example	48
Table C.30 — Model class for the JSON Schema example	48
Table C.31 — Model_Element_Type class for the JSON Schema example	49
Table C.32 — Model_Element class for the JSON Schema example	49
Table C.33 — Model_Element_Characteristic_Type class for the JSON Schema example	50
Table C.34 — Model_Element_Characteristic class for the JSON Schema example	50

## ISO/IEC 11179-35:2023(E)

Table C.35 — Model_Element_Relationship_Type class for the JSON Schema example	51
Table C.36 — Model_Element_Relationship class for the JSON Schema example	52
Table C.37 — Modelling_Language class for the Ellis-Barker metamodel example	54
Table C.38 — Model class for the Ellis-Barker metamodel example	54
Table C.39 — Model_Element_Type class the Ellis-Barker metamodel example	54
Table C.40 — Model_Element class for the Ellis-Barker metamodel example	54
Table C.41 — Model_Element_Characteristic_Type class for the Ellis-Barker metamodel example	56
Table C.42 — Model_Element_Characteristic class for the Ellis-Barker metamodel example	57
Table C.43 — Model_Element_Relationship_Type class for the Ellis-Barker metamodel example	61
Table C.44 — Model_Element_Relationship class for the Ellis-Barker metamodel example	62

#### **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.

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 <a href="www.iso.org/directives">www.iso.org/directives</a> or <a href="www.iso.org/directives">www.iso.org/directives<

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see <a href="https://patents.iec.ch"><u>www.iso.org/patents</u></a>) or the IEC list of patent declarations received (see <a href="https://patents.iec.ch"><u>https://patents.iec.ch</u></a>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 <a href="https://www.iso.org/iso/foreword.html">www.iso.org/iso/foreword.html</a>. In the IEC, see <a href="https://www.iec.ch/understanding-standards">www.iec.ch/understanding-standards</a>.

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

This first edition of ISO/IEC 11179-35 is part of the 4th Edition modularization of ISO/IEC 11179. This document brings into ISO/IEC 11179 the ability to register models and metamodels. As such, it provides alternative facilities to those specified in ISO/IEC 19763 (see References [4] to [14]).

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 <a href="https://www.iso.org/members.html">www.iso.org/members.html</a> and <a href="https://www.iso.org/members.html">www.iso.org/members.html</a

#### Introduction

In the ISO/IEC 11179 series, the structure of a Metadata Registry is specified in the form of a conceptual data model. ISO/IEC 11179-3 specifies a metamodel for registry common facilities, which is intended to be extended by other parts of ISO/IEC 11179 for specific purposes.

This document provides a specification of the extensions to the registry metamodel specified in ISO/IEC 11179-3 to enable the registration of metadata about models and their associated metamodels. These models can be information or data models, process models, models of web services or any other type of models used in software engineering or information processing. All such models can be considered as metadata.

In <u>Clauses 6</u> and <u>7</u> and <u>Annex C</u>, 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 <u>Clause 3</u>.

EXAMPLE **Model\_Element** (7.2.2.3) is a class each instance of which models a model element.

## Information technology — Metadata registries (MDR) —

## Part 35:

## Metamodel for model registration

### 1 Scope

This document provides a specification for an extension to a Metadata Registry (MDR), as specified in ISO/IEC 11179-3, in which metadata that describes models, and their associated metamodels, can be registered.

The specification in this document, together with the relevant clauses of the specification in ISO/IEC 11179-3, provides the ability to record metadata about:

- a) models used in software engineering or information processing, for example, information or data models, process models, models of web services or any other type of models used to develop software systems or the processing of information;
- b) the concepts associated with the various elements within the models;
- c) the metamodels associated with the models;
- d) the mappings identified between the models, between the metamodels, and between the models and their associated metamodels this is achieved by using the mapping facilities specified in ISO/IEC 11179-3.

This document is applicable to the formulation of models and metamodels to be shared among people and machines, independent of the organization that produces the model or metamodel. It is not applicable to the physical instantiation of any model.

#### 2 Normative references

The following document is referred to in the text in such a way that some or all of their content constitutes requirements 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 11179-3:2023, Information technology — Metadata registries (MDR) — Part 3: Metamodel for registry common facilities