

# American National Standard

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

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

**Developed by**



*Where IT all begins*



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

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## 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*

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## Contents

Page

Foreword .....	xiii
Introduction.....	xv
1 Scope.....	1
1.1 Scope – Structure of a metadata registry .....	1
1.2 Scope – Basic attributes of metadata items .....	1
2 Normative references.....	1
3 Terms, definitions and abbreviated terms .....	1
3.1 Terms and definitions of metamodel constructs used in this part of ISO/IEC 11179 .....	2
3.2 Terms for concepts used in this part of ISO/IEC 11179 .....	4
3.3 Abbreviated terms .....	20
4 Conformance .....	21
4.1 Overview of conformance .....	21
4.2 Degree of conformance .....	21
4.2.1 General .....	21
4.2.2 Strictly conforming implementations.....	22
4.2.3 Conforming implementations .....	22
4.3 Conformance by clause.....	22
4.4 Registry conformance.....	23
4.4.1 Overview.....	23
4.4.2 Standard profiles for edition 3 registries .....	23
4.5 Obligation.....	23
4.6 Implementation conformance statement (ICS).....	23
4.7 Roles and responsibilities for registration .....	24
5 Structure of a metadata registry .....	24
5.1 Metamodel for a metadata registry.....	24
5.2 Application of the metamodel.....	24
5.3 Specification of the metamodel .....	25
5.3.1 Terminology used in specifying the metamodel.....	25
5.3.2 Choice of fonts .....	25
5.3.3 Use of UML Packages .....	25
5.3.4 Package dependencies.....	26
5.3.5 Use of UML Class diagrams and textual description .....	27
5.4 Types, instances and values.....	27
5.5 Types of items in an ISO/IEC 11179 metadata registry .....	28
5.5.1 Overview of types of items.....	28
5.5.2 Rules for types of items.....	29
5.6 Extensibility .....	31
5.7 Date references.....	31
6 Basic package.....	31
6.1 Overview of Basic package .....	31
6.2 Basic Types metamodel region .....	31
6.2.1 Overview of Basic Types .....	31
6.2.2 Boolean datatype.....	31
6.2.3 Date datatype .....	32
6.2.4 Datetime datatype.....	32
6.2.5 Integer datatype.....	32
6.2.6 Natural_Range datatype .....	32
6.2.7 Notation datatype .....	32
6.2.8 Phone_Number datatype .....	32

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6.2.9	Postal_Address datatype .....	32
6.2.10	Sign datatype .....	33
6.2.11	String datatype .....	33
6.2.12	Text datatype .....	33
6.2.13	Value datatype .....	33
6.3	Basic Classes metamodel region .....	33
6.3.1	Overview of Basic Classes .....	33
6.3.2	Contact class .....	34
6.3.3	Document_Type class .....	35
6.3.4	Individual class .....	35
6.3.5	Language_Identification class .....	37
6.3.6	Organization class .....	39
6.3.7	Reference_Document class .....	40
6.3.8	Registration_Authority_Identifier class .....	42
6.3.9	Role class .....	43
7	Identification, Designation and Definition package .....	45
7.1	Overview of this package .....	45
7.2	Identification metamodel region .....	45
7.2.1	Overview .....	45
7.2.2	Classes in the Identification metamodel region .....	46
7.2.3	Associations in the Identification metamodel region .....	51
7.3	Designation and Definition metamodel region .....	52
7.3.1	Overview .....	52
7.3.2	Classes in the Designation and Definition metamodel region .....	53
7.3.3	Association Classes in the Designation and Definition metamodel region .....	59
7.3.4	Associations in the Designation and Definition metamodel region .....	60
8	Registration package .....	62
8.1	Registration metamodel region .....	62
8.1.1	Overview .....	62
8.1.2	Classes in the Registration region .....	62
8.1.3	Classes referenced from the Basic package .....	75
8.1.4	Classes referenced from the Identification, Designation and Definition package .....	75
8.1.5	Association Classes in the Registration region .....	76
8.1.6	Associations in the Registration region .....	76
9	Concepts package .....	78
9.1	Concepts metamodel region .....	78
9.1.1	Overview .....	78
9.1.2	Classes in the Concepts metamodel region .....	79
9.1.3	Associations of the Concepts metamodel region .....	84
9.2	Classification metamodel region .....	87
9.2.1	Overview .....	87
9.2.2	Classes in the Classification metamodel region .....	88
9.2.3	Associations Classes in the Classification metamodel region .....	89
9.2.4	Associations in the Classification metamodel region .....	89
10	Binary Relations package .....	90
10.1	Binary Relations metamodel region .....	90
10.1.1	Overview .....	90
10.1.2	Classes in the Binary_Relations metamodel region .....	90
11	Data Description package .....	93
11.1	High-level Data Description metamodel region .....	93
11.1.1	Overview .....	93
11.1.2	Classes of High-level Data Description metamodel .....	93
11.1.3	Associations of the High Level Data Description metamodel .....	96
11.1.4	Constraints of the High Level Metamodel .....	97
11.2	Data Element Concept metamodel region .....	97
11.2.1	Overview .....	97
11.2.2	Classes in the Data_Element_Concept region .....	98

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11.2.3	Associations in the Data_Element_Concept region .....	99
11.3	Conceptual and Value_Domain metamodel region .....	100
11.3.1	Overview .....	100
11.3.2	Classes in the Conceptual and Value_Domain region .....	102
11.3.3	Associations in the Conceptual and Value_Domain region .....	110
11.3.4	Additional Constraints of the Conceptual and Value_Domain region .....	112
11.4	Measurement metamodel region .....	114
11.4.1	Overview .....	114
11.4.2	Classes in the Measurement region .....	114
11.4.3	Associations in the Measurement region .....	117
11.5	Data_Element metamodel region .....	118
11.5.1	Overview .....	118
11.5.2	Classes in the Data_Element Region .....	118
11.5.3	Associations in the Data_Element region .....	121
11.6	Consolidated Data Description Metamodel .....	123
11.7	Types of Concepts in the Data Description Metamodel .....	124
12	Basic attributes .....	124
12.1	Use of basic attributes .....	124
12.2	Common attributes .....	125
12.2.1	Identifying .....	125
12.2.2	Naming .....	125
12.2.3	Definitional .....	126
12.2.4	Administrative .....	126
12.2.5	Relational .....	126
12.3	Attributes specific to Data_Element_Concepts .....	127
12.4	Attributes specific to Data_Elements .....	127
12.5	Attributes specific to Conceptual_Domains .....	127
12.6	Attributes specific to Value_Domains .....	127
12.7	Attributes specific to Permissible_Values .....	128
12.8	Attributes specific to Value_Meanings .....	128
Annex A	(normative) Alphabetical list of terms and designations .....	129
Annex B	(normative) Consolidated Class Hierarchy .....	137
Annex C	(informative) Mapping the ISO/IEC 11179-3:1994 basic attributes to the ISO/IEC 11179-3:2011 metamodel and basic attributes .....	138
C.1	Introduction .....	138
C.1.1	Overview of Basic Attributes from ISO/IEC 11179-3:1994 .....	138
C.1.2	Description of Table Structures in this Annex .....	139
C.2	Mapping the Basic Attributes .....	141
C.2.1	Common Identifying attributes .....	141
C.2.2	Common Naming attributes .....	143
C.2.3	Common Definitional attributes .....	147
C.2.4	Common Administrative attributes .....	148
C.2.5	Common Relational attributes .....	150
C.2.6	Attributes specific to Data_Element_Concepts .....	154
C.2.7	Attributes specific to Data_Elements .....	157
C.2.8	Attributes specific to Conceptual_Domains .....	164
C.2.9	Attributes specific to Value_Domains .....	165
C.2.10	Attributes specific to Permissible_Values .....	166
C.2.11	Attributes specific to Value_Meanings .....	167
Annex D	(informative) Mapping the ISO/IEC 11179-3:2003 metamodel to the ISO/IEC 11179-3:2011 metamodel .....	169
D.1	Introduction .....	169
D.2	Mapping the Edition 2 Administration and Identification Region .....	169
D.2.1	Administered_Item .....	169
D.2.2	Administration_Record .....	169
D.2.3	Contact .....	170
D.2.4	Item_Identifier .....	170

This is a preview of "INCITS/ISO/IEC 11179...". Click here to purchase the full version from the ANSI store.

D.2.5	Language_Identification .....	170
D.2.6	Organization .....	171
D.2.7	Reference_Document .....	171
D.2.8	Registrar .....	171
D.2.9	Registration_Authority .....	171
D.2.10	Registration_Authority_Identifier .....	172
D.2.11	Stewardship .....	172
D.2.12	Submission .....	172
D.3	Mapping the Edition 2 Naming and Definition Region .....	173
D.3.1	Context (for Administered_Item) .....	173
D.3.2	Terminological_Entry .....	173
D.3.3	Language_Section .....	173
D.3.4	Definition (of Administered_Item) .....	174
D.3.5	Designation (of Administered_Item) .....	174
D.4	Mapping the Edition 2 Classification Region .....	174
D.4.1	Classification_Scheme .....	174
D.4.2	Classification_Scheme_Item .....	175
D.4.3	Classification_Scheme_Item_Relationship .....	175
D.5	Mapping the Edition 2 Data_Element_Concept Region .....	175
D.5.1	Object_Class .....	175
D.5.2	Property .....	175
D.5.3	Data_Element_Concept .....	176
D.5.4	Concept_Relationship .....	176
D.6	Mapping the Edition 2 Conceptual and Value Domain Region .....	176
D.6.1	Conceptual_Domain .....	176
D.6.2	Enumerated_Conceptual_Domain .....	177
D.6.3	Value_Meaning .....	177
D.6.4	Non-enumerated_Conceptual_Domain .....	177
D.6.5	Value_Domain .....	178
D.6.6	Enumerated_Value_Domain .....	178
D.6.7	Permissible_Value .....	178
D.6.8	Value .....	179
D.6.9	Non-enumerated_Value_Domain .....	179
D.6.10	Datatype .....	179
D.6.11	Unit_of_Measure .....	179
D.7	Mapping the Edition 2 Data_Element Region .....	180
D.7.1	Data_Element .....	180
D.7.2	Representation_Class .....	180
D.7.3	Data_Element_Example .....	181
D.7.4	Derivation_Rule .....	181
D.7.5	Data_Element_Derivation .....	181
Annex E	(informative) Concept System Examples .....	182
E.1	Concept System Metamodels .....	182
E.2	SKOS Example .....	183
E.2.1	SKOS Metamodel .....	183
E.2.2	SKOS Example Thesaurus .....	184
E.2.3	Example Value Domain References .....	185
E.3	ORM Example .....	187
E.3.1	ORM Metamodel .....	187
E.3.2	Car Registration Model .....	189
E.4	OWL Example .....	194
E.4.1	OWL Metamodel .....	194
E.4.2	Car Registration Ontology .....	202
E.5	CLIF Example .....	216
E.5.1	CL Metamodel .....	216
E.5.2	CLIF Units Example from ISO/IEC 19763-3 .....	217
Annex F	(informative) Representation Class as a Concept System .....	221
F.1	Introduction .....	221
F.2	Description of Representation Class .....	221

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<b>F.3</b>	<b>Implementation of Representation Class as a Concept_System .....</b>	<b>222</b>
<b>Annex G</b> (informative)	<b>Comparison for Conformance Levels across Editions of this part of ISO/IEC 11179 .....</b>	<b>223</b>
<b>G.1</b>	<b>Introduction.....</b>	<b>223</b>
<b>G.2</b>	<b>Conformance Levels for Edition 2 Level 2.....</b>	<b>223</b>
<b>G.3</b>	<b>Conformance Levels for Edition 2 Level 1 and Edition 1 .....</b>	<b>223</b>
<b>Annex H</b> (Normative)	<b>Standard Conformance Profiles for this part of ISO/IEC 11179.....</b>	<b>224</b>
<b>H.1</b>	<b>Introduction.....</b>	<b>224</b>
<b>H.2</b>	<b>Profile for Concept Systems Registry.....</b>	<b>224</b>
<b>H.3</b>	<b>Profile for Extended Concept Systems Registry .....</b>	<b>224</b>
<b>H.4</b>	<b>Profile for Metadata Registry .....</b>	<b>224</b>
<b>H.5</b>	<b>Profile for Extended Metadata Registry .....</b>	<b>224</b>
	<b>Bibliography.....</b>	<b>225</b>

## Table of Figures

Figure 1 — Package dependencies .....	26
Figure 2 — Types of items .....	28
Figure 3 — Basic types metamodel region .....	31
Figure 4 — Basic classes metamodel region.....	33
Figure 5 — Identification metamodel region.....	45
Figure 6 — Designation and Definition metamodel region.....	53
Figure 7 — Registration metamodel region.....	64
Figure 8 — Concepts metamodel region.....	78
Figure 9 — Classification metamodel region.....	88
Figure 10 — Binary Relations metamodel region.....	90
Figure 11 — High-level Data Description metamodel .....	93
Figure 12 — Data_Element_Concept metamodel region .....	98
Figure 13 — Conceptual and value domain metamodel region .....	101
Figure 14 — Measurement metamodel region.....	114
Figure 15 — Data_Element metamodel region .....	118
Figure 16 — Consolidated Data Description metamodel .....	123
Figure 17 — Types of Concepts in the Data Description package .....	124
Figure 18 — Consolidated Class Hierarchy .....	137

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Figure 19 — Basic Attributes of Data elements.....	138
Figure 20— Car Registration Model in ORM.....	189
Figure 21 — Car Registration Ontology.....	202

## Table of Tables

Table 1 – Rules for Types of Items.....	29
Table 2 – Rules for Types of Items as a Decision Table.....	30
Table 3 – Comparison of Designation to Scoped_Identifier.....	45
Table 4 – Examples of binary relations and their characterization.....	90
Table 5 – Template for attribute mapping.....	139
Table 6 – Attribute mapping for ‘identifier’.....	141
Table 7 – Attribute mapping for ‘Registration Authority’.....	142
Table 8 – Attribute mapping for ‘Version’.....	142
Table 9 – Attribute mapping for ‘Name’.....	143
Table 10 – Attribute mapping for ‘Synonymous name’.....	143
Table 11 – Attribute mapping for ‘designation language’.....	144
Table 12 – Attribute mapping for ‘Context name’.....	144
Table 13 – Attribute mapping for ‘Context identifier’.....	145
Table 14 – Attribute mapping for ‘Context description’.....	146
Table 15 – Attribute mapping for ‘Definition’.....	147
Table 16 – Attribute mapping for ‘Definition language’.....	147
Table 17 – Attribute mapping for ‘Definition source reference’.....	148
Table 18 – Attribute mapping for ‘Comments’.....	148
Table 19 – Attribute mapping for ‘Registration status’.....	148
Table 20 – Attribute mapping for ‘Responsible organization’.....	149
Table 21 – Attribute mapping for ‘Submitting organization’.....	150
Table 22 – Attribute mapping for ‘Classification scheme name’.....	150

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Table 23 – Attribute mapping for ‘Classification scheme identifier’ .....	151
Table 24 – Attribute mapping for ‘Classification scheme item value’ .....	152
Table 25 – Attribute mapping for ‘Related metadata reference’ .....	153
Table 26 – Attribute mapping for ‘Type of relationship’ .....	154
Table 27 – Attribute mapping for ‘Object class name’ .....	154
Table 28 – Attribute mapping for ‘Object class identifier’ .....	155
Table 29 – Attribute mapping for ‘Property name’ .....	156
Table 30 – Attribute mapping for ‘Property identifier’ .....	156
Table 31 – Attribute mapping for ‘Representation category’ .....	157
Table 32 – Attribute mapping for ‘Representation class’ .....	157
Table 33 – Attribute mapping for ‘Value domain name’ .....	158
Table 34 – Attribute mapping for ‘Value domain identifier’ .....	159
Table 35 – Attribute mapping for ‘Datatype name’ .....	159
Table 36 – Attribute mapping for ‘Datatype scheme reference’ .....	160
Table 37 – Attribute mapping for ‘Maximum size’ .....	161
Table 38 – Attribute mapping for ‘Minimum size’ .....	162
Table 39 – Attribute mapping for ‘Layout of representation’ .....	163
Table 40 – Attribute mapping for ‘Permissible data element values’ .....	164
Table 41 – Attribute mapping for ‘Dimensionality’ .....	164
Table 42 – Attribute mapping for ‘Datatype name’ .....	165
Table 43 – Attribute mapping for ‘Datatype scheme reference’ .....	165
Table 44 – Attribute mapping for ‘Unit of measure name’ .....	166
Table 45 – Attribute mapping for ‘Value’ .....	166
Table 46 – Attribute mapping for ‘Permissible value begin date’ .....	167
Table 47 – Attribute mapping for ‘Permissible value end date’ .....	167
Table 48 – Attribute mapping for ‘Value meaning description’ .....	167
Table 49 – Attribute mapping for ‘Value meaning identifier’ .....	168
Table 50 – Attribute mapping for ‘Value meaning begin date’ .....	168
Table 51 – Attribute mapping for ‘Value meaning end date’ .....	168
Table 52 – Mapping Edition 2 Administered_Item to Edition 3 .....	169

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Table 53 – Mapping Edition 2 Administration_Record to Edition 3 .....	169
Table 54 – Mapping Edition 2 Contact to Edition 3 .....	170
Table 55 – Mapping Edition 2 Item_Identifier to Edition 3 .....	170
Table 56 – Mapping Edition 2 Language_Identification to Edition 3 .....	170
Table 57 – Mapping Edition 2 Organization to Edition 3 .....	171
Table 58 – Mapping Edition 2 Reference_Document to Edition 3 .....	171
Table 59 – Mapping Edition 2 Registrar to Edition 3 .....	171
Table 60 – Mapping Edition 2 Registration_Authority to Edition 3 .....	171
Table 61 – Mapping Edition 2 Registration_Authority_Identifier to Edition 3 .....	172
Table 62 – Mapping Edition 2 Stewardship to Edition 3 .....	172
Table 63 – Mapping Edition 2 Submission to Edition 3 .....	172
Table 64 – Mapping Edition 2 Context to Edition 3 .....	173
Table 65 – Mapping Edition 2 Terminological_Entry to Edition 3 .....	173
Table 66 – Mapping Edition 2 Language_Section to Edition 3 .....	173
Table 67 – Mapping Edition 2 Definition (of Administered_Item) to Edition 3 .....	174
Table 68 – Mapping Edition 2 Designation (of Administered_Item) to Edition 3 .....	174
Table 69 – Mapping Edition 2 Classification_Scheme to Edition 3 .....	174
Table 70 – Mapping Edition 2 Classification_Scheme_Item to Edition 3 .....	175
Table 71 – Mapping Edition 2 Classification_Scheme_Item_Relationship to Edition 3 .....	175
Table 72 – Mapping Edition 2 Object_Class to Edition 3 .....	175
Table 73 – Mapping Edition 2 Property to Edition 3 .....	175
Table 74 – Mapping Edition 2 Property to Edition 3 .....	176
Table 75 – Mapping Edition 2 Property to Edition 3 .....	176
Table 76 – Mapping Edition 2 Conceptual_Domain to Edition 3 .....	176
Table 77 – Mapping Edition 2 Enumerated_Conceptual_Domain to Edition 3 .....	177
Table 78 – Mapping Edition 2 Value_Meaning to Edition 3 .....	177
Table 79 – Mapping Edition 2 Non-enumerated_Conceptual_Domain to Edition 3 .....	177
Table 80 – Mapping Edition 2 Value_Domain to Edition 3 .....	178
Table 81 – Mapping Edition 2 Enumerated_Value_Domain to Edition 3 .....	178
Table 82 – Mapping Edition 2 Permissible_Value to Edition 3 .....	178

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Table 83 – Mapping Edition 2 Value to Edition 3 .....	179
Table 84 – Mapping Edition 2 Non-enumerated_Value_Domain to Edition 3.....	179
Table 85 – Mapping Edition 2 Datatype to Edition 3 .....	179
Table 86 – Mapping Edition 2 Unit_of_Measure to Edition 3 .....	179
Table 87 – Mapping Edition 2 Data_Element to Edition 3.....	180
Table 88 – Mapping Edition 2 Representation_Class to Edition 3 .....	180
Table 89 – Mapping Edition 2 Data_Element_Example to Edition 3 .....	181
Table 90 – Mapping Edition 2 Derivation_Rule to Edition 3.....	181
Table 91 – Mapping Edition 2 Data_Element_Derivation to Edition 3 .....	181
Table 92 – Correspondences of ISO/IEC 11179-3 concept system metamodel to selected notations .....	182
Table 93 – SKOS-CORE as an ISO/IEC 11179 Concept System .....	183
Table 94 – SKOS relations as ISO/IEC 11179 Binary Relations .....	184
Table 95 – SKOS Thesaurus Example – ISO/IEC 11179 Concept System .....	184
Table 96 – SKOS Thesaurus Example – ISO/IEC 11179 Concepts.....	185
Table 97 – SKOS Thesaurus Example – ISO/IEC 11179 Links.....	185
Table 98 – SKOS Thesaurus Example – ISO/IEC 11179 Conceptual Domains .....	186
Table 99 – SKOS Thesaurus Example – ISO/IEC 11179 Value Domains .....	186
Table 100 – ORM as an ISO/IEC 11179 Concept System .....	187
Table 101 – ORM Relations as ISO/IEC 11179 Binary Relations.....	188
Table 102 – ORM Roles as ISO/IEC 11179 Relation Roles .....	188
Table 103 – Car Registration Model in ORM – ISO/IEC 11179 Concept System .....	191
Table 104 – Car Registration Model in ORM – ISO/IEC 11179 Concepts.....	191
Table 105 – Car Registration Model in ORM – ISO/IEC 11179 Binary Relations.....	192
Table 106 – Car Registration Model in ORM – ISO/IEC 11179 Links .....	193
Table 107 – OWL constructs with directly corresponding ISO/IEC 11179-3 metamodel elements.....	194
Table 108 – OWL built-in constructs described in OWL metamodel.....	195
Table 109 – OWL as an ISO/IEC 11179 Concept System.....	195
Table 110 – OWL Concepts as ISO/IEC 11179 Concepts.....	196
Table 111 – OWL Binary Relations as ISO/IEC 11179 Binary Relations .....	197
Table 112 – OWL Relations (except Binary Relations) as ISO/IEC 11179 Relations.....	198

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Table 113 – OWL Constructs as ISO/IEC 11179 Relation Roles.....	198
Table 114 – OWL Constructs as ISO/IEC 11179 Links.....	200
Table 115 – Car Registration Model in OWL – ISO/IEC 11179 Concept System.....	207
Table 116 – Car Registration Model in OWL – ISO/IEC 11179 Concepts .....	207
Table 117 – Car Registration Model in OWL – ISO/IEC 11179 Binary Relations .....	208
Table 118 – Car Registration Model in OWL – ISO/IEC 11179 Relation Roles.....	208
Table 119 – Car Registration Model in OWL – ISO/IEC 11179 Links .....	209
Table 120 – Car Registration Model in OWL – ISO/IEC 11179 Assertions.....	214
Table 121 – CL Metamodel – ISO/IEC 11179 Concept System .....	216
Table 122 – CL Metamodel – ISO/IEC 11179 Binary Relations.....	216
Table 123 – CLIF Units Example – ISO/IEC 11179 Concept System.....	217
Table 124 – CLIF Units Example – ISO/IEC 11179 Concepts .....	218
Table 125 – CLIF Units Example – ISO/IEC 11179 Binary Relations .....	218
Table 126 – CLIF Units Example – ISO/IEC 11179 Relations Roles.....	219
Table 127 – CLIF Units Example – ISO/IEC 11179 Links.....	219
Table 128 – CLIF Units Example – ISO/IEC 11179 Assertions .....	220
Table 129 – Comparison for Conformance Levels across Editions of this part of ISO/IEC 11179 .....	223

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## 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*

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— *Part 5: Naming and identification principles*

— *Part 6: Registration*

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## 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;

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- 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.