ISO/IEC 11179-3:2013-02 (E)

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

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
3.3 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
5.5.1 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
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
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

3:2011 metamodel and basic attributes 138

C.1 Introduction 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

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
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

Annex F (informative) Representation Class as a Concept System 221

F.1 Introduction 221

F.2 Description of Representation Class 221
F.3 Implementation of Representation Class as a Concept_System 222

Annex G (informative) Comparison for Conformance Levels across Editions of this part of G.1 Introduction 223

G.2 Conformance Levels for Edition 2 Level 2 223
G.3 Conformance Levels for Edition 2 Level 1 and Edition 1 223

H.1 Introduction 224
H.2 Profile for Concept Systems Registry 224
H.3 Profile for Extended Concept Systems Registry 224
H.4 Profile for Metadata Registry 224
H.5 Profile for Extended Metadata Registry 224

Bibliography 225

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

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

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

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

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 108 - OWL built-in constructs described in OWL metamodel 195