ISO/TR 22126-2:2025-01 (E)

Financial services - Semantic technology - Part 2: OWL representation of the ISO 20022 metamodel and e-repository

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Abbreviated terms 2

4 Overview **2**
4.1 Graph transformations 2
4.1.1 General 2
4.1.2 Graphs derived from the XML document 4
4.1.3 Conversion to a FIX AE message 4
4.1.4 Graphs aligned with message and business components 4

5 Methods **5**
5.1 Multiple local RDF graphs 5
5.2 Open linked data 6

6 Reconciling differences between Ecore, RDF and OWL **7**
6.1 Introducing Ecore 7
6.2 Differences between Ecore and RDF standards 7
6.3 Separation of schema objects and instances 8
6.4 Python, pyecore and RDF 8
6.5 Ordering and structured data in RDF 9
6.5.1 General 9
6.5.2 Unordered relationships 9
6.5.3 RDF collections 9
6.5.4 RDF containers 10
6.5.5 Blank nodes and triples turned sideways 10
6.6 Internationalization in RDF 11
6.7 SHACL, another RDF schema language 11

7 Processing ISO 20022 instance messages in RDF **12**
7.1 The G_2 graph — Converting an ISO 20022 XML message to RDF instance data 12
7.2 Querying ISO 20022 message data with SPARQL 14
7.3 The G_1 graph — Maintaining ordering information 14
7.4 Compatibility with OWL and RDFS inference — G_4 graph 14
7.5 The G3 graph — Converting the auth.016 message to a FIX AE message 15

8 Mechanical conversion of the e-Repository **18**
8.1 File and namespace prefixes — M_C and B_C graphs 18
8.2 OrganisationIdentification — Business components and attributes 18
8.3 Message components and attributes 21
8.4 CodeSets 23
8.4.1 General 23
8.4.2 Empty CodeSet 23
8.4.3 CodeSet with codes 24
8.5 Coining unique identifiers 25
8.5.1 The problem 25
8.5.2 Composite names 25

8.5.3 Arbitrary disambiguators 25
8.5.4 External id 25
8.5.5 Internal id 26
8.5.6 Random id 26
8.5.7 Skolemization 26

9 Representing the ISO 20022 e-Repository in OWL and RDFS 26
9.1 Methodology 26
9.2 RDFS modelling of a business component 28
9.3 Datatype and object properties in OWL 29
9.4 Representing enumerated types 30
9.5 Restrictions on data types 31
9.6 Disjoint classes 31
9.7 Miscellaneous objects and annotation properties 32
9.8 Containment relationships and inference 32
9.9 OWL inference and its limits 33

10 Instances aligned to the e-Repository 34
10.1 The G_4 graph — Message expressed with message components 34
10.2 The G_5 graph — Abstract instance of a trade 35
10.3 Concepts missing in the business components 37

11 Conclusion 38

Annex A (informative) **A preliminary OWL 2 ontology as a semantic model for ISO 20022 40**

Bibliography 45