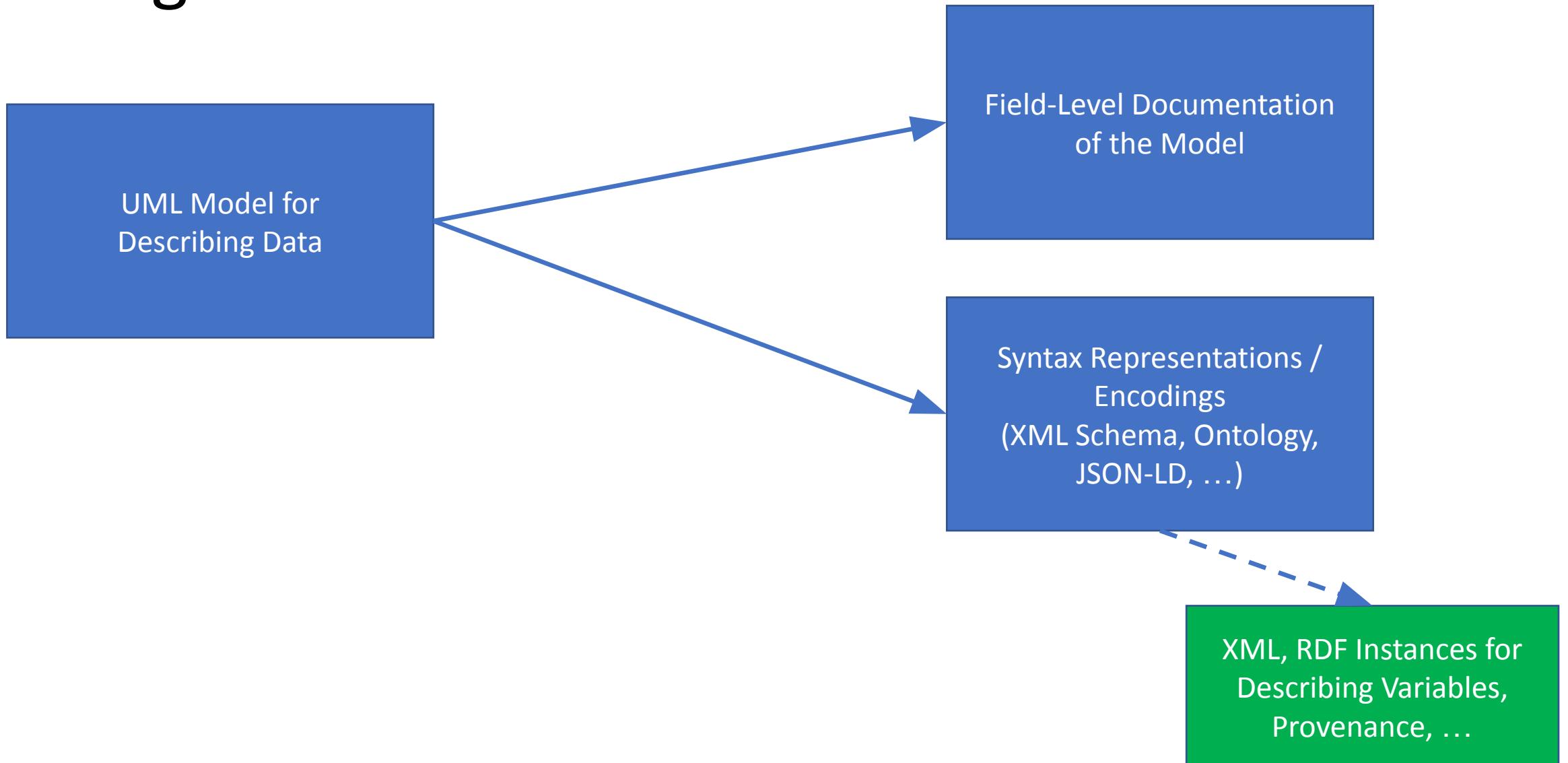


DDI-CDI Specification Model-Driven Development

DDI Alliance

High-Level View



UML Class Model Interoperable Subset - UCMIS

- UCMIS - a subset of UML class diagram items
 - (UML - a graphical language for visualizing and specifying object systems)
- UCMIS is intended for modeling data descriptions
- The used UML subset focuses on items that describe classes, their relationships to each other, and their attributes
- Items have well-defined counterparts in visual UML class diagrams
- Provides robust models
- Interoperable

Interoperability of UCMIS

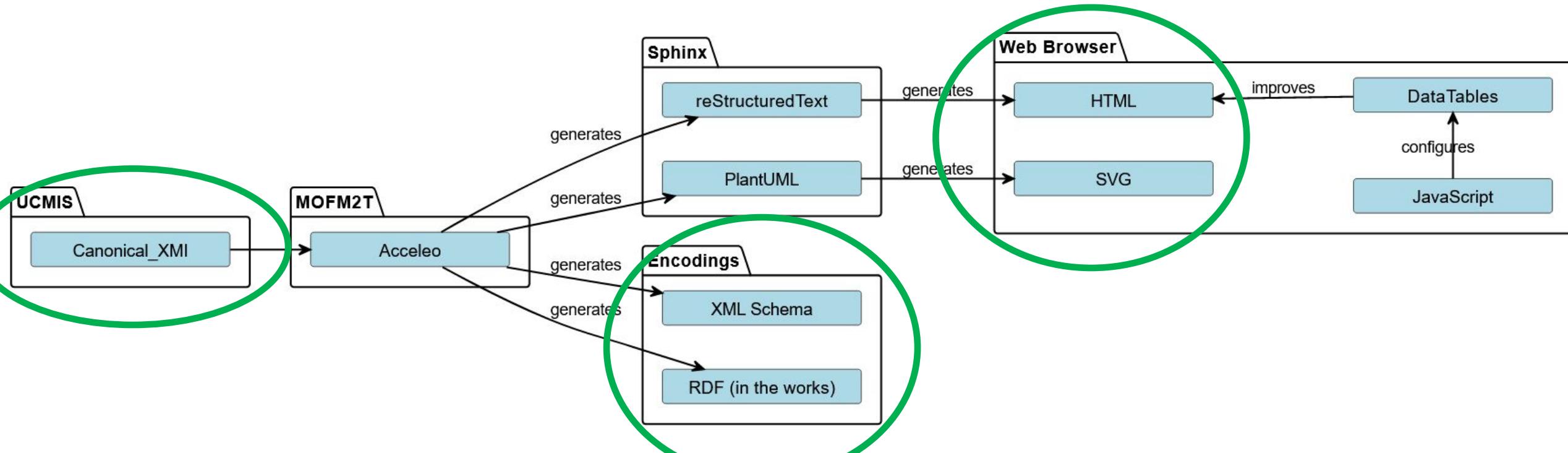
- UCMIS items are implemented in all UML tools
- UCMIS uses single inheritance only
- Only binary associations are used, i.e. two classes are related
- UCMIS items have counterparts in common object-oriented programming
- Can be represented as Canonical XMI (OMG)
 - This enables the import of the model into common UML tools
 - For analyzing the model, relating it to other UML models, and generating syntax representations which are provided by these tools
 - *“Canonical XMI: A specific constrained format of XMI that minimizes variability and provides predictable identification and ordering.”*

UCMIS - List of Items

- Structural Items
 - Model
 - Package
 - Class
 - Property
- Relationships
 - Association
 - Generalization
 - Abstraction
 - «Derive», «Refine», «Trace»
- Data Type Definition
 - DataType
 - Enumeration
 - PrimitiveType
 - EnumerationLiteral
 - LiteralInteger
 - LiteralString
 - LiteralUnlimitedNatural
- Other
 - Comment

Tool UCMIS Model to Text (M2T)

- UCMIS-M2T generated for a UML class model in a model-driven approach documentation and syntax representations (encodings)
- The tool uses [Eclipse Acceleo](#) which is an implementation of the OMG standard [MOF Model to Text Transformation Language](#) (MOFM2T™). This code generation language uses a template based approach.



Generated Field-Level Documentation

UML Model: DDI Cross Domain Integration (DDI-CDI 1.0) » DDICDILibrary

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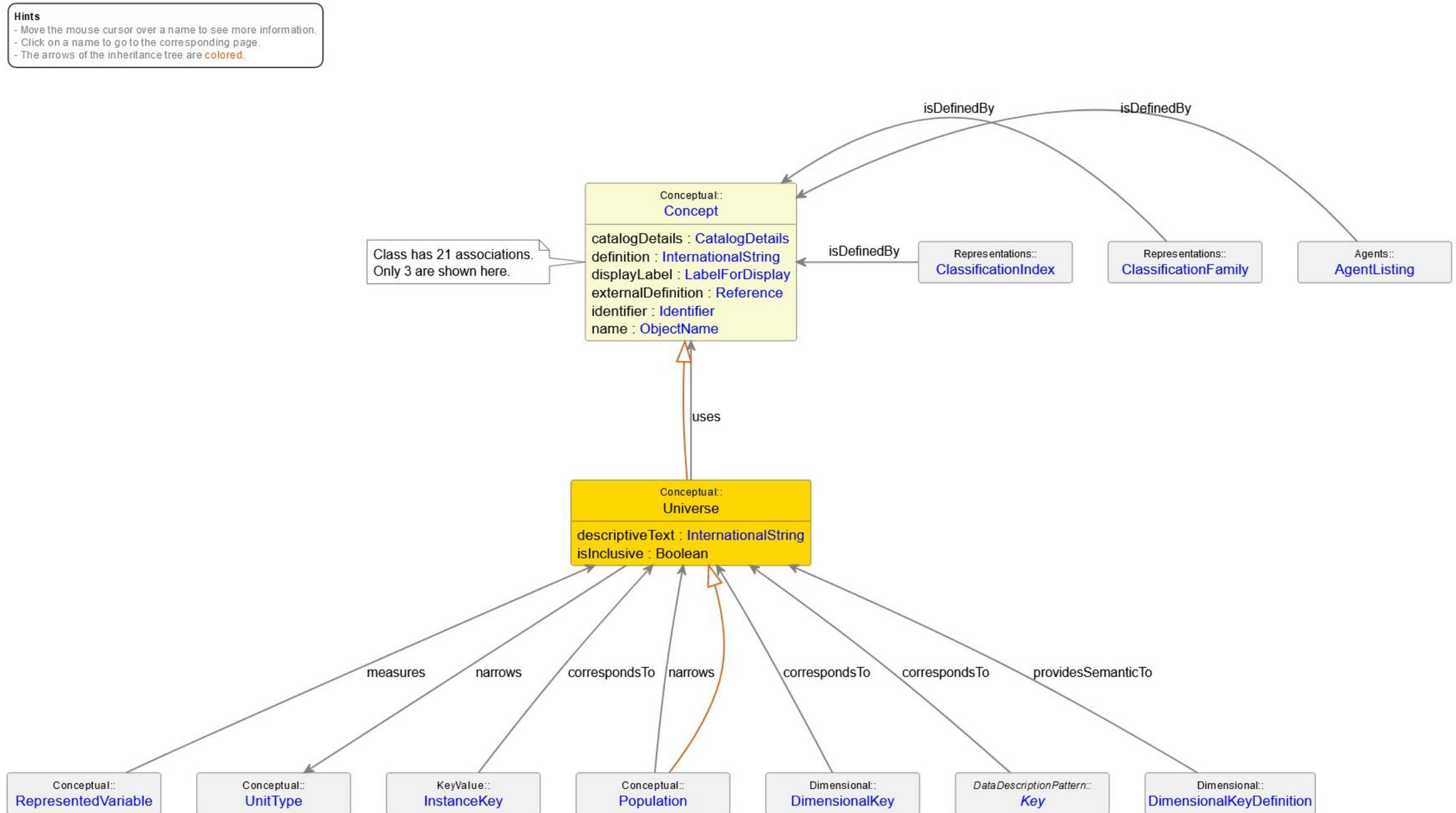
DDICDILibrary

Fully qualified package name: DDICDIModels::DDICDILibrary

This package contains the classes, datatypes, and their definitions for all of the DDI-CDI model intended for direct use by implementers. It is organized into several sub-packages, as described below.

- Classes
 - Agents
 - Agent
 - AgentListing
 - AgentPosition
 - AgentRelationship
 - AgentStructure
 - Individual
 - Machine
 - Organization
 - Conceptual
 - Category
 - CategoryPosition
 - CategoryRelationStructure
 - CategoryRelationship

UML Diagram: Class Universe in Context



Syntax Representations / Encodings

XML Schema

```
1  <xs:complexType name="UniverseXsdType" xml:id="UniverseXsdType">
2    <xs:annotation>
3      <xs:documentation>Definition...</xs:documentation>
20   </xs:annotation>
21   <xs:complexContent>
22     <xs:extension base="ConceptXsdType">
23       <xs:sequence>
24         <xs:element name="descriptiveText" type="InternationalStringXsdType"
25           minOccurs="0" maxOccurs="1" xml:id="Universe-descriptiveText">
26           <xs:annotation>...</xs:annotation>
28         </xs:element>
29         <xs:element name="isInclusive" type="xs:boolean" minOccurs="0"
30           maxOccurs="1" xml:id="Universe-isInclusive">
31           <xs:annotation>...</xs:annotation>
33         </xs:element>
34         <xs:element name="Universe_narrows_UnitType-Target" minOccurs="0"
35           maxOccurs="1" xml:id="Universe_narrows_UnitType-Target">
36           <xs:annotation>...</xs:annotation>
38         <xs:complexType>
39           <xs:complexContent>
40             <xs:extension base="ReferenceXsdType">
41               <xs:sequence>
42                 <xs:element name="typeOfClass" minOccurs="0"
43                 maxOccurs="unbounded" xml:id="Universe_narrows_UnitType-Source">
44                 <xs:simpleType>
45                   <xs:restriction base="xs:NMTOKEN">
46                     <xs:enumeration value="UnitType"/>
47                   </xs:restriction>
48                 </xs:simpleType>
49               </xs:element>
50             </xs:sequence>
51           </xs:extension>
52         </xs:complexContent>
53       </xs:complexType>
54     </xs:extension>
55   </xs:complexContent>
56 </xs:complexType>
```

Ontology (Turtle)

```
3 cdi:Universe
4  a rdfs:Class, owl:Class, ucmis:Class;
5  rdfs:label "Universe";
6  rdfs:comment "Definition\n=====\\nSpecialized unit type, with the specialization b.
7  rdfs:subClassOf cdi:Concept;
8 .
9
10 cdi:Universe-descriptiveText
11 a rdf:Property, owl:ObjectProperty, ucmis:Attribute;
12 rdfs:label "descriptiveText";
13 rdfs:comment "A short natural language account of the characteristics of the object."@en
14 rdfs:domain cdi:Universe;
15 rdfs:range cdi:InternationalString;
16 .
17
18 cdi:Universe-isInclusive
19 a rdf:Property, owl:DatatypeProperty, ucmis:Attribute;
20 rdfs:label "isInclusive";
21 rdfs:comment "Default value is True. The description statement of a universe is generally
22 rdfs:domain cdi:Universe;
23 rdfs:range xsd:boolean;
24 .
25
26
27 cdi:Universe_narrows_UnitType
28 a rdf:Property, owl:ObjectProperty, ucmis:Association;
29 # ASSOCIATION
30 rdfs:label "narrows";
31 skos:altLabel "Universe_narrows_UnitType";
32 rdfs:comment "Reference to the unit type that the universe definition narrows."@en;
33 rdfs:domain cdi:Universe;
34 rdfs:range cdi:UnitType;
```