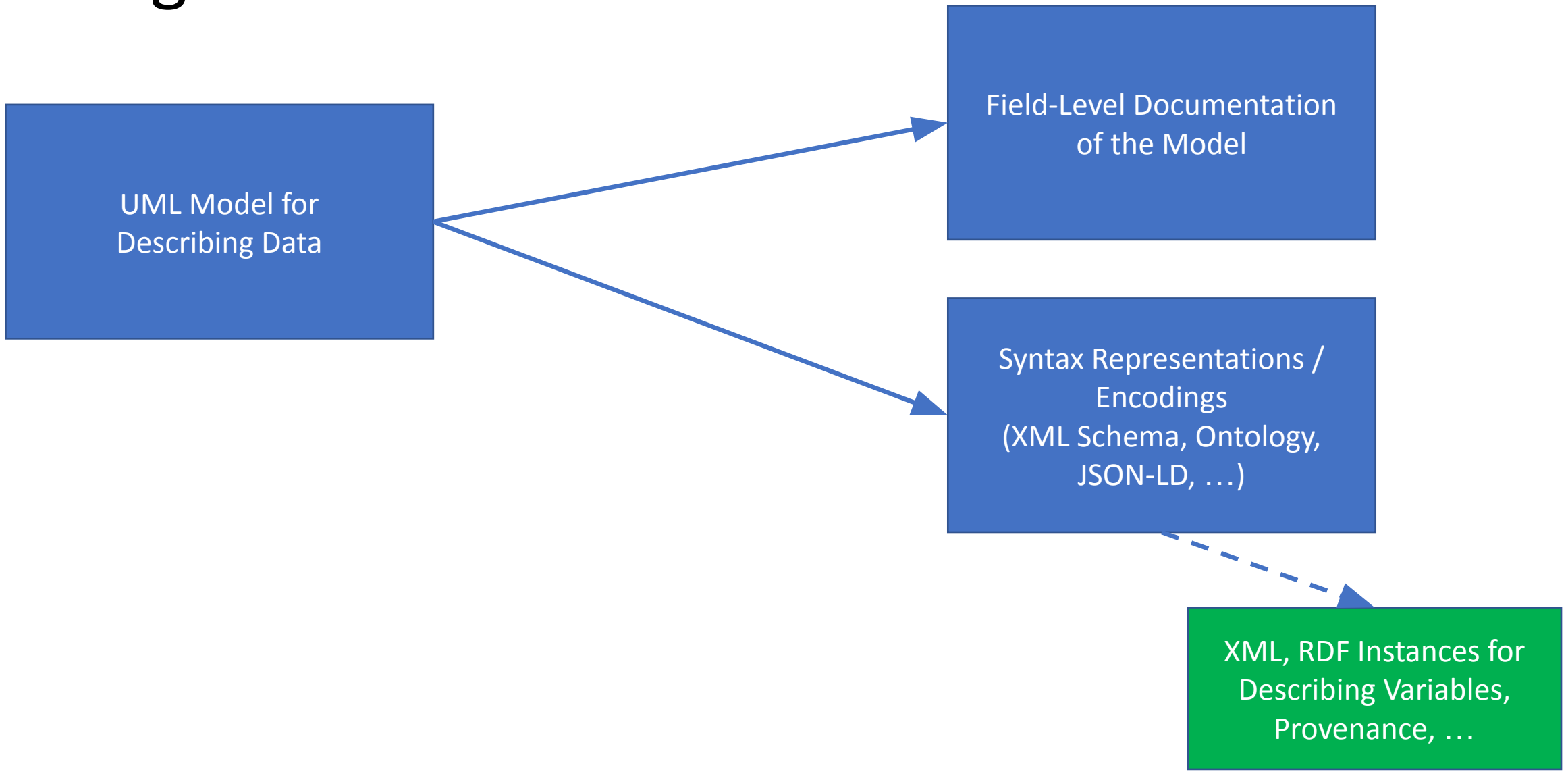
DDI-CDI Specification Model-Driven Development

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

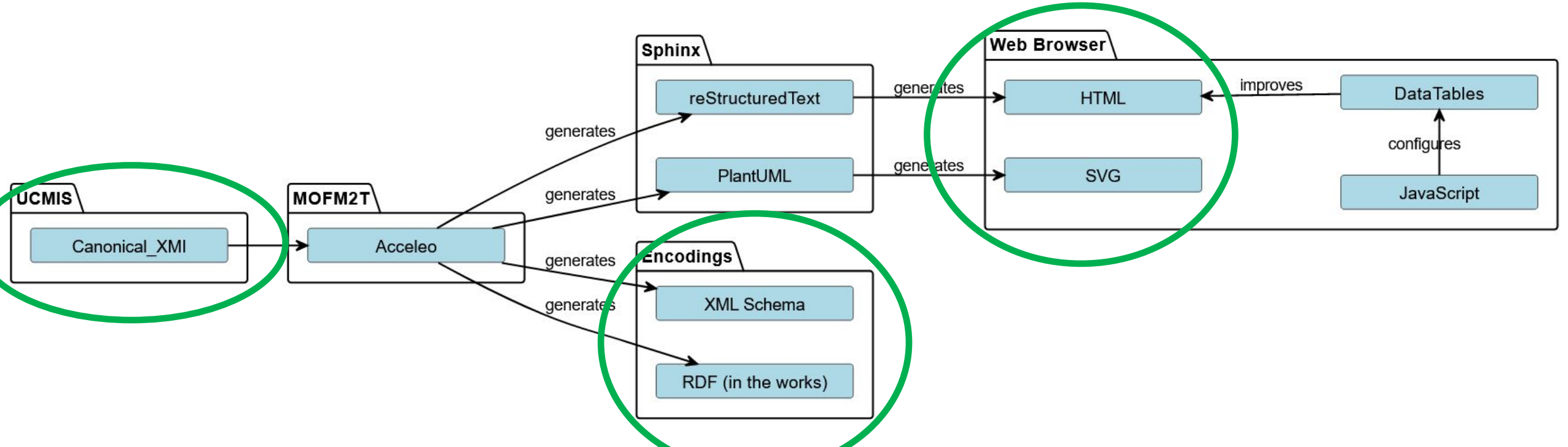
- UCMIS items are implemented in all UML tools
- UCMIS uses single inheritance only
- Only binary associations are used, i.e. two classes are related
- UCMIS items have counterparts in common object-oriented programming
- Can be represented as Canonical XMI (OMG)
  - This enables the import of the model 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

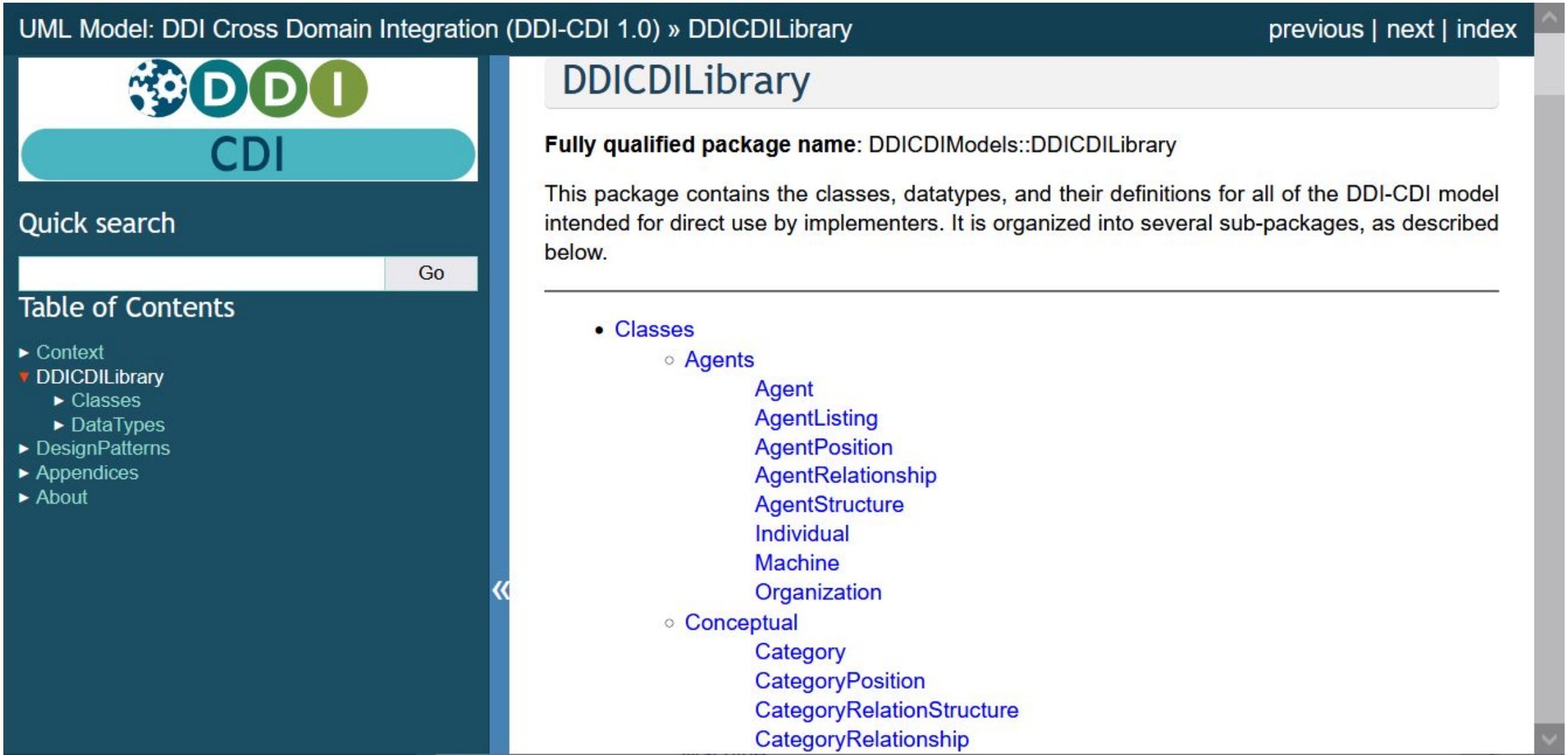
- Structural Items
  - Model
  - Package
  - Class
  - Property
- Relationships
  - Association
  - Generalization
  - Abstraction
    - «Derive», «Refine», «Trace»
- Data Type Definition
  - DataType
  - Enumeration
  - PrimitiveType
  - EnumerationLiteral
  - LiteralInteger
  - LiteralString
  - LiteralUnlimitedNatural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

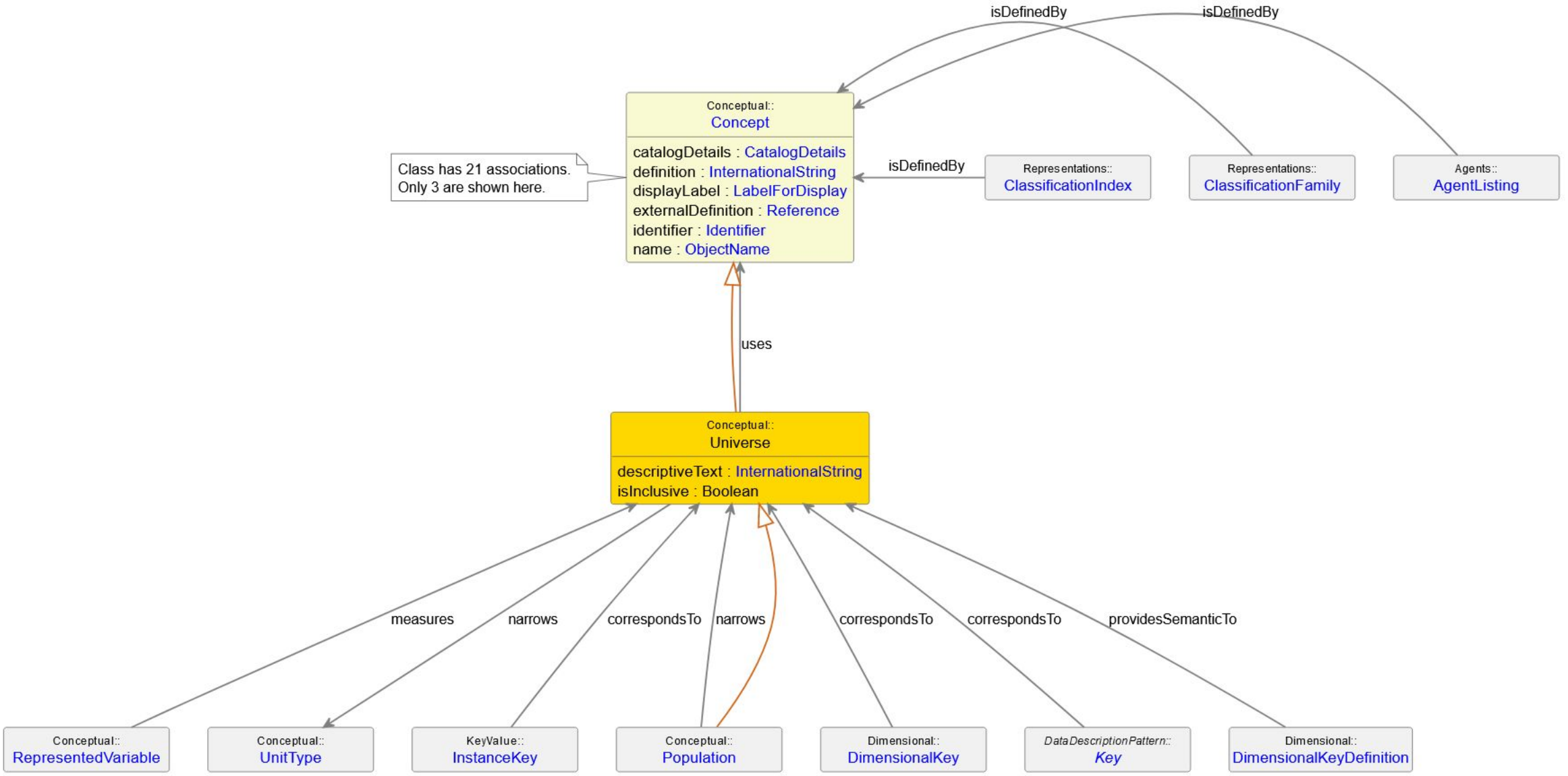


Generated Field-Level Documentation



UML Diagram: Class Universe in Context

Hints
- Move the mouse cursor over a name to see more information.
- Click on a name to go to the corresponding page.
- The arrows of the inheritance tree are colored.



Syntax Representations / Encodings

XML Schema

```
<xs:complexType name="UniverseXsdType" xml:id="UniverseXsdType">
    <xs:annotation>
        <xs:documentation>Definition...</xs:documentation>
    </xs:annotation>
    <xs:complexContent>
        <xs:extension base="ConceptXsdType">
            <xs:sequence>
                <xs:element name="descriptiveText" type="InternationalStringXsdType" minOccurs="0" maxOccurs="1" xml:id="Universe-descriptiveText">
                    <xs:annotation>...</xs:annotation>
                </xs:element>
                <xs:element name="isInclusive" type="xs:boolean" minOccurs="0" maxOccurs="1" xml:id="Universe-isInclusive">
                    <xs:annotation>...</xs:annotation>
                </xs:element>
                <xs:element name="Universe_narrows_UnitType-Target" minOccurs="0" maxOccurs="1" xml:id="Universe_narrows_UnitType-Target">
                    <xs:annotation>...</xs:annotation>
                    <xs:complexType>
                        <xs:complexContent>
                            <xs:extension base="ReferenceXsdType">
                                <xs:sequence>
                                    <xs:element name="typeOfClass" minOccurs="0" maxOccurs="unbounded" xml:id="Universe_narrows_UnitType-Source">
                                        <xs:simpleType>
                                            <xs:restriction base="xs:NMTOKEN">
                                                <xs:enumeration value="UnitType"/>
                                            </xs:restriction>
                                        </xs:simpleType>
                                    </xs:element>
```

Ontology (Turtle)

```
cdi:Universe
  a rdfs:Class, owl:Class, ucmis:Class;
  rdfs:label "Universe";
  rdfs:comment "Definition\n============\nSpecialized unit type, with the specialization b
  rdfs:subClassOf cdi:Concept;
.

cdi:Universe-descriptiveText
  a rdf:Property, owl:ObjectProperty, ucmis:Attribute;
  rdfs:label "descriptiveText";
  rdfs:comment "A short natural language account of the characteristics of the object."@en
  rdfs:domain cdi:Universe;
  rdfs:range cdi:InternationalString;
.

cdi:Universe-isInclusive
  a rdf:Property, owl:DatatypeProperty, ucmis:Attribute;
  rdfs:label "isInclusive";
  rdfs:comment "Default value is True. The description statement of a universe is generall
  rdfs:domain cdi:Universe;
  rdfs:range xsd:boolean;
.


cdi:Universe_narrows_UnitType
  a rdf:Property, owl:ObjectProperty, ucmis:Association;
  # ASSOCIATION
  rdfs:label "narrows";
  skos:altLabel "Universe_narrows_UnitType";
  rdfs:comment "Reference to the unit type that the universe definition narrows."@en;
  rdfs:domain cdi:Universe;
  rdfs:range cdi:UnitType;
```