LIDO
Lightweight Information Describing Objects

CIDOC
ICOM international committee for documentation

Joint session of LIDO WG and Linked Art WG

Emmanuelle Delmas-Glass, Barbara Fichtl,
Rob Sanderson, Regine Stein

CIDOC 2022, 24 May
CIDOC LIDO Working Group
CIDOC Linked Art Working Group

LIDO
Lightweight Information Describing Objects

Agenda

- Welcome
- LIDO and Linked Open Data
    - Questions
- Introduction to Linked Art
    - Alignment of LIDO data with Linked Art
        - Questions
- Discussion
- Future steps

LIDO

Lightweight Information Describing Objects

LIDO

Lightweight Information Describing Objects

LIDO
links

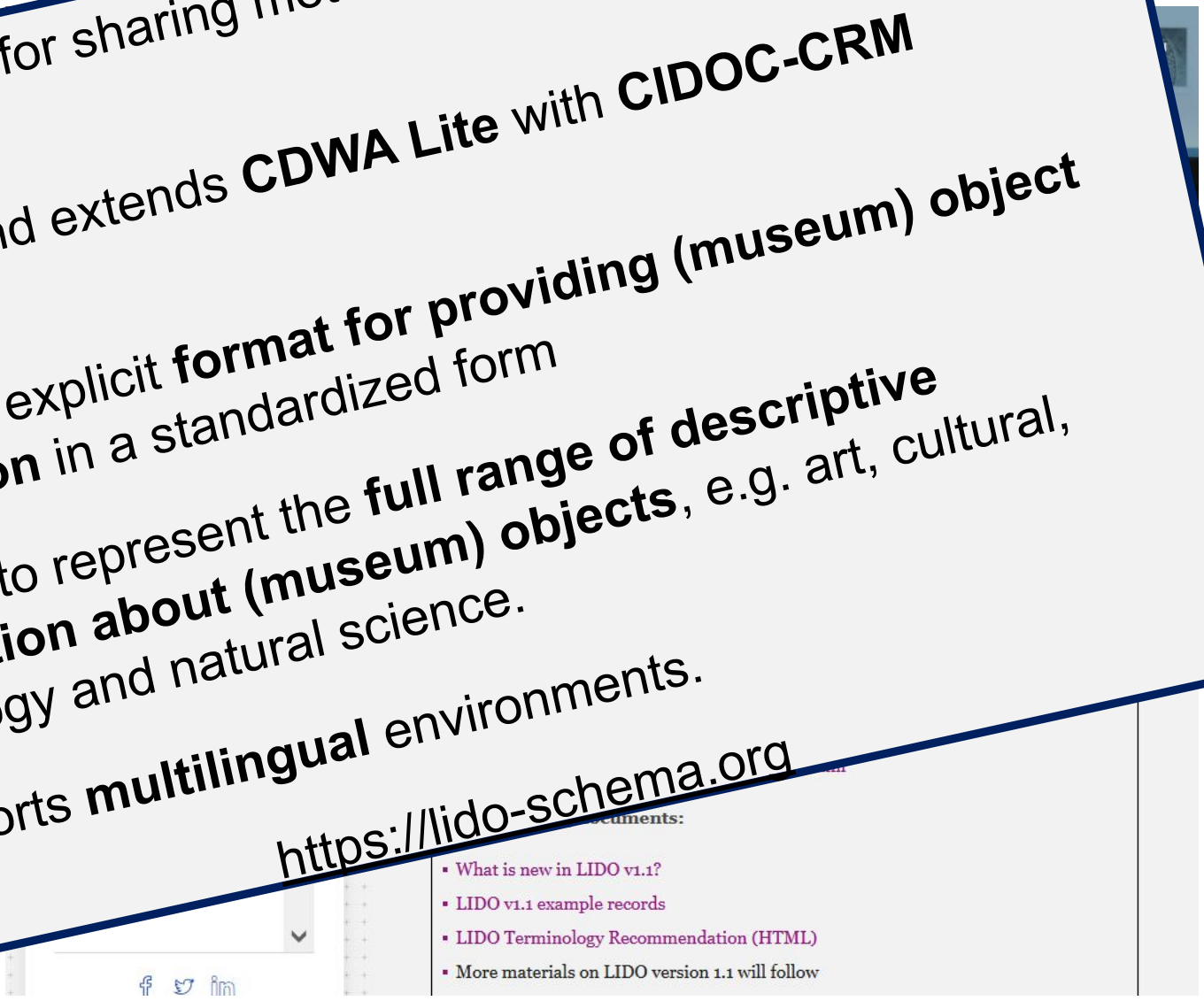
https://pad.gwdg.de/RlikcUEKQbeasJq0LNzGlA#

LIDO

Lightweight Information Describing Objects

- **XML schema** for sharing metadata in repositories and online services
- Integrates and extends **CDWA Lite** with **CIDOC-CRM** elements
- Defines an explicit **format for providing (museum) object information** in a standardized form
- Intended to represent the **full range of descriptive information about (museum) objects**, e.g. art, cultural, technology and natural science.
- It supports **multilingual** environments.

https://lido-schema.org



LIDO
Lightweight Information Describing Objects

Background

CDWA Categories for the Description of Works of Art
set of guidelines for the description of art, architecture, and other cultural works

CIDOC-CRM Conceptual Reference Model
formal domain ontology for cultural heritage information

Spectrum
collections management standard

LIDO

Lightweight Information Describing Objects

LIDO v1.0 (2010)
LIDO v1.1 (2021)

Information areas

LIDO Record Identifier (mandatory)

DESCRIIPTIVE METADATA

Object Classifications

- Object / Work Type (mandatory)
- Classification

Object Identifications

- Title / Name (mandatory)
- Inscriptions
- Repository / Location
- State / Edition
- Object Description
- Measurements

Events

- Event Set

Relations

- Subject Set
- Related Works

ADMINISTRATIVE METADATA

Rights

Record (mandatory)

Resource

Mandatory Elements

LIDO Record Identifier (mandatory)

DESCRIIPTIVE METADATA

Object Classifications

- Object / Work Type (mandatory)
- Classification

Object Identifications

- Title / Name (mandatory)
- Inscriptions
- Repository / Location
- State / Edition
- Object Description
- Measurements

Events

- Event Set

Relations

- Subject Set
- Related Works

ADMINISTRATIVE METADATA

Rights

Record (mandatory)

Resource

Events

LIDO Record Identifier (mandatory)

DESCRIIPTIVE METADATA

Object Classifications

- Object / Work Type (mandatory)
- Classification

Object Identifications

- Title / Name (mandatory)
- Inscriptions
- Repository / Location
- State / Edition
- Object Description
- Measurements

Events

- Event Set

Relations

- Subject Set
- Related Works

ADMINISTRATIVE METADATA

Rights

Record (mandatory)

Resource

LIDO
Lightweight Information Describing Objects

- Event Identifier
- **Event Type**
- Role in Event
- Event Name
- **Event Actor**
- Culture
- **Event Date**
- Period
- **Event Place**
- Event Method
- Materials / Technique
- Thing Present
- Event Related
- Event Description

title: **The Honeysuckle Bower**

event
  eventType **Production**
  eventActor
    actor
      nameActor **Rubens, Peter Paul**
    roleActor **painters (artist)**
  eventDate
    earliestDate **1609**
    latestDate **1610**
  eventMaterialsTech
    termMaterialsTech **Ölfarbe**
    termMaterialsTech **Leinwand**
    termMaterialsTech **Eichenholz**

event
  eventType **Exhibition**
  eventPlace
    displayPlace
Alte Pinakothek, München, OG Saal VII (Rubens-Saal)
    place
    namePlace **Alte Pinakothek**
    partOfPlace
      namePlace **München**
event
  eventType **Acquisition**
  eventDate
    earliestDate **1806**
    latestDate **1806**

Peter Paul Rubens, Rubens und Isabella Brant in der Geißblattlaube, um 1609/10, Bayerische Staatsgemäldesammlungen - Alte Pinakothek, München, URL: https://www.sammlung.pinakothek.de/de/artwork/o5xrMEr47X (Zuletzt aktualisiert am 17.05.2020)

LIDO

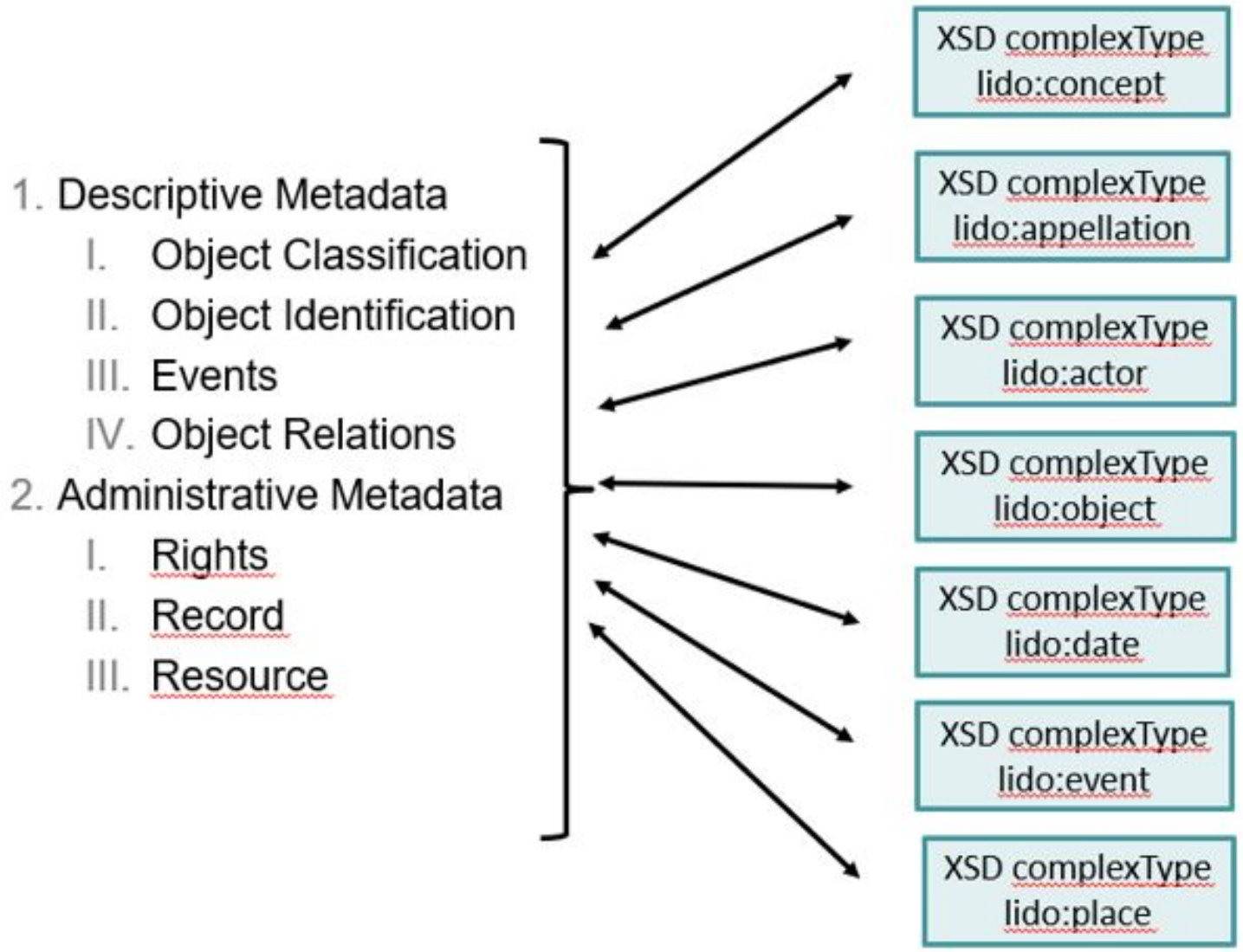
Lightweight Information Describing Objects

LIDO Profile Painting and Sculpture Example

Peter Paul Rubens and Isabella Brant in the Honeysuckle Bower

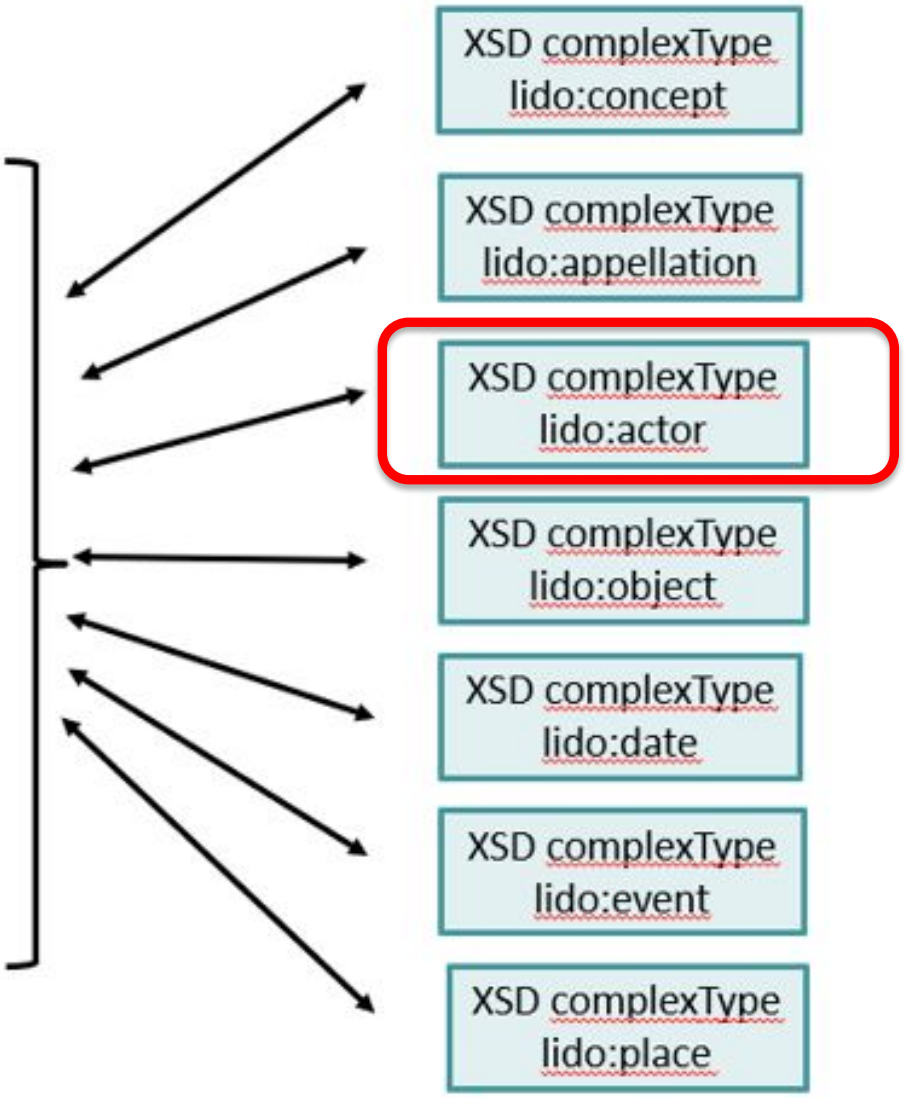
https://doi.org/10.11588/data/CHEPS6/FQ3GP5

complexType

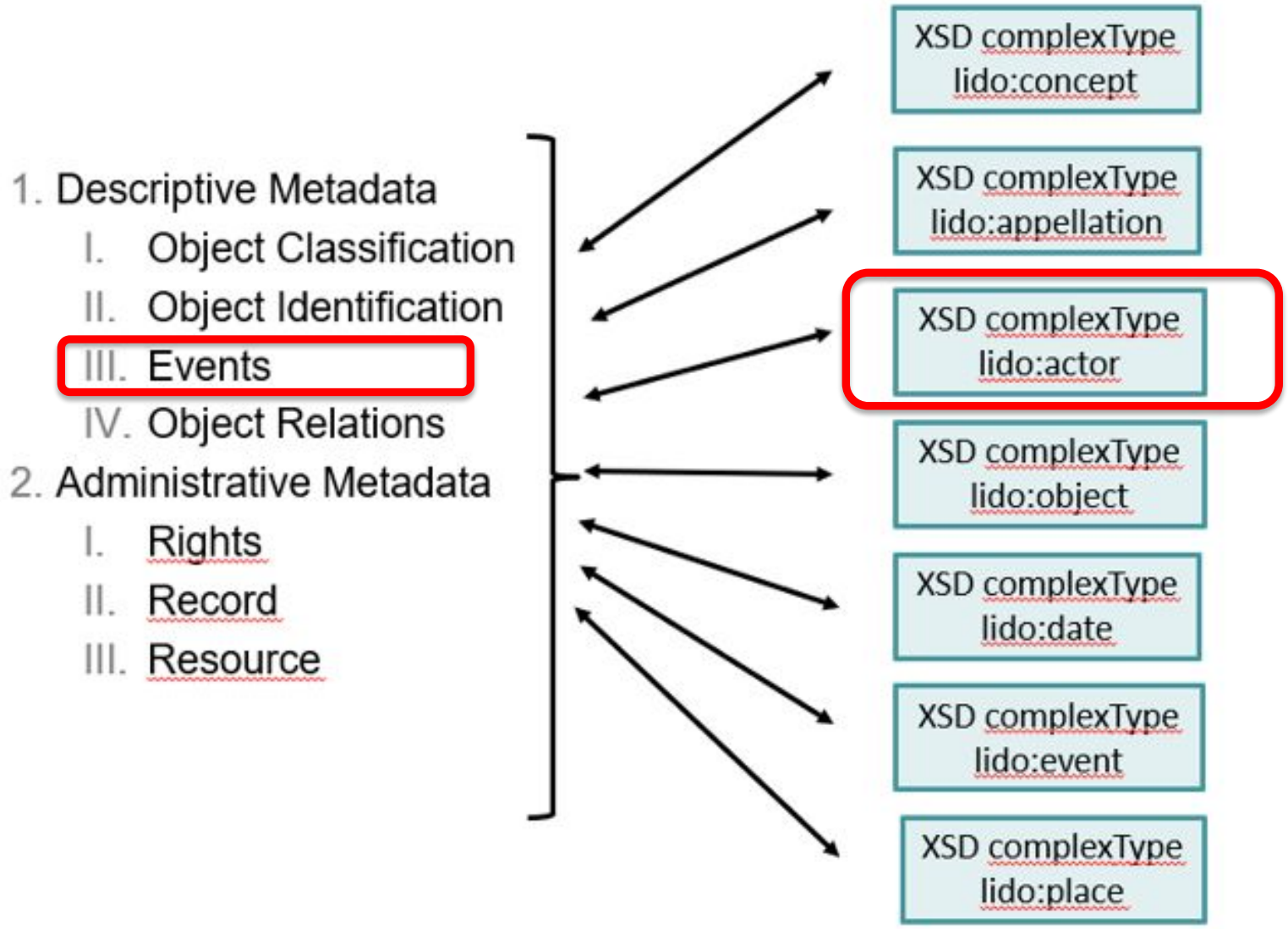


actorComplexType

1. Descriptive Metadata
   I. Object Classification
   II. Object Identification
   III. Events
   IV. Object Relations
2. Administrative Metadata
   I. Rights
   II. Record
   III. Resource

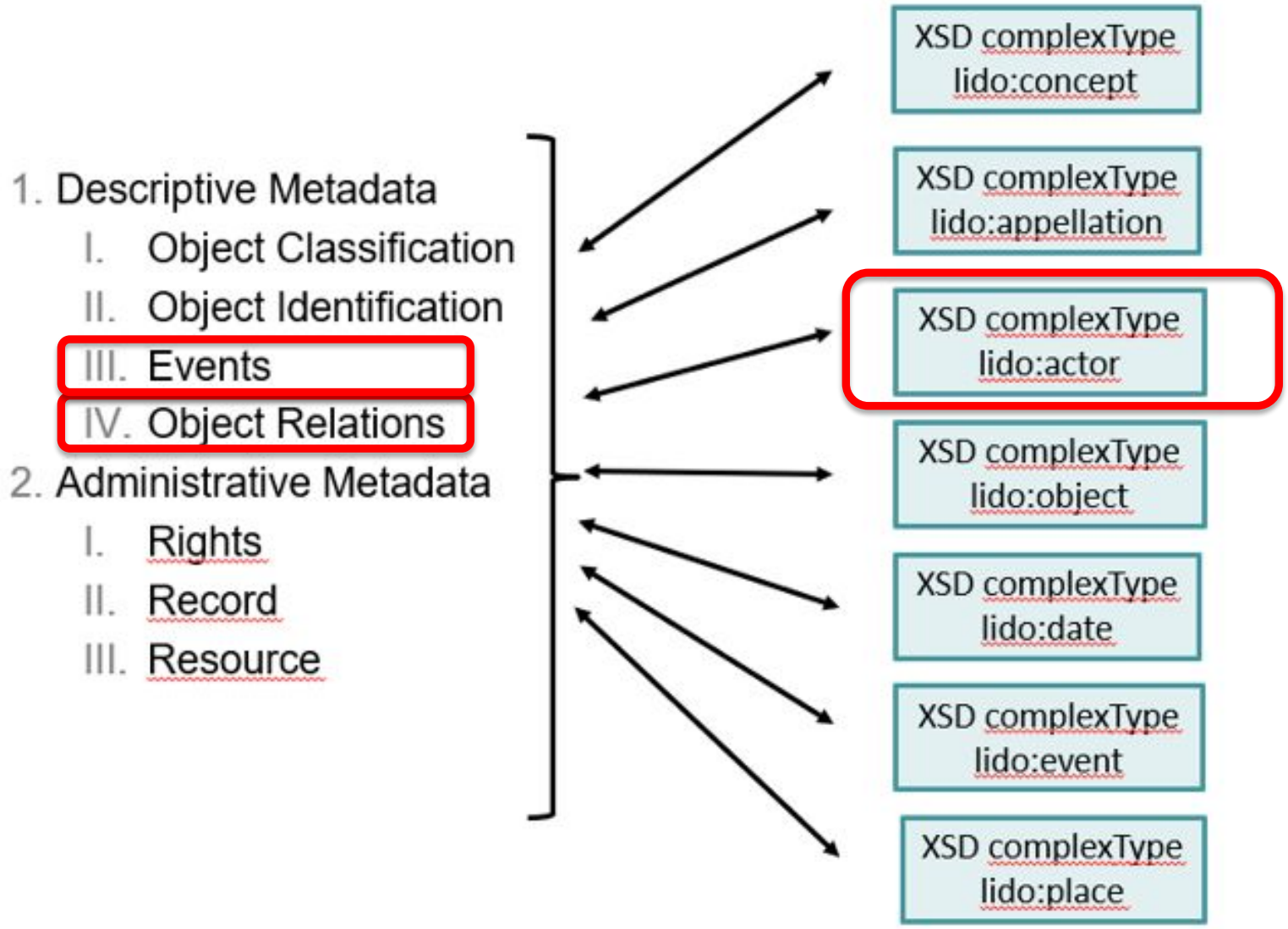


actorComplexType



actorComplexType

actorComplexType



actorComplexType

Lightweight Information Describing Objects

actorComplexType

Description

Defines identifying and indexing information about an actor.

type attribute

An attribute indicating whether the actor is an individual *person* or a *group of persons*, such as a an *organization* or a *family*.

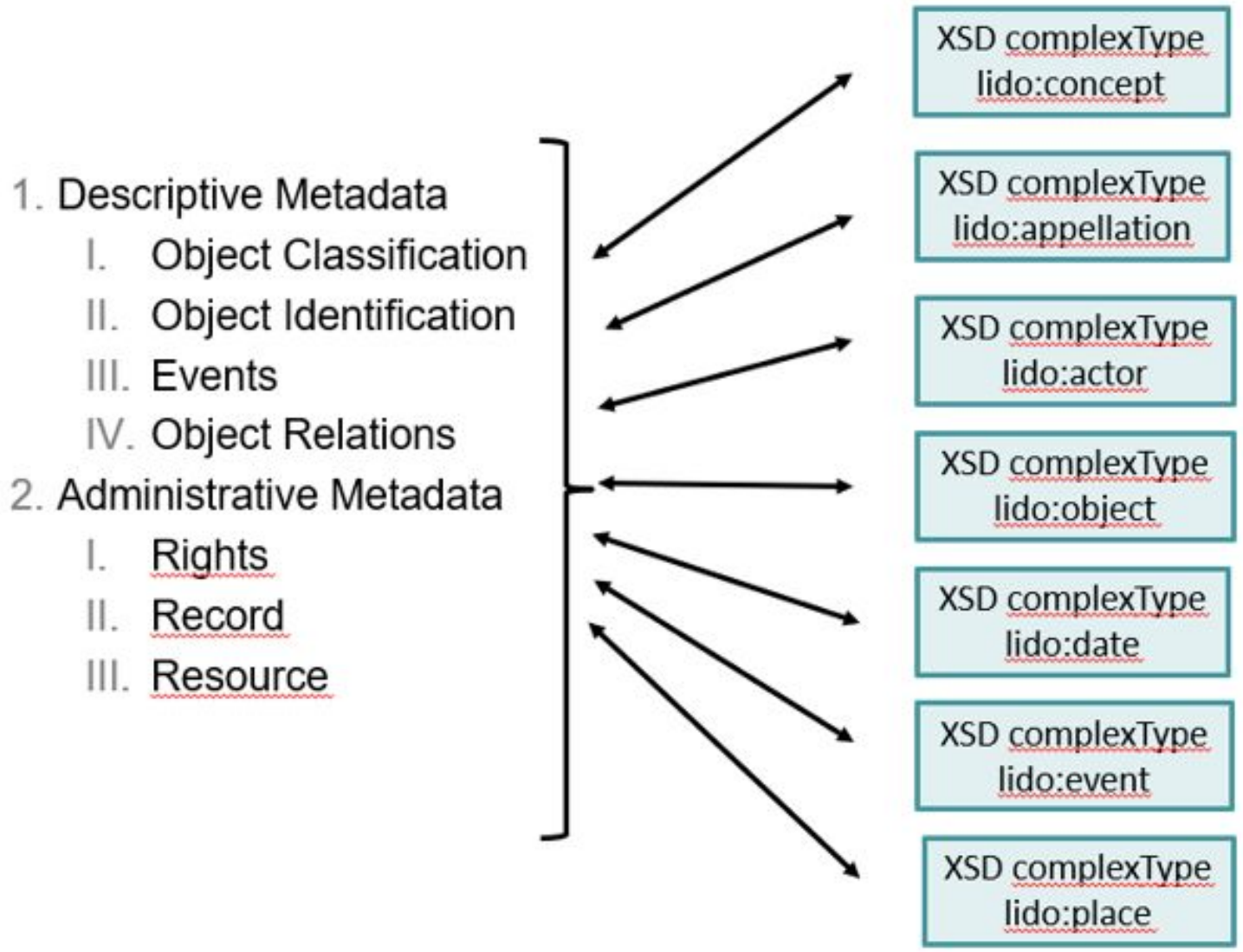
Structure

Sequence
actorID
owl:sameAs as defined in OWL namespace
nameActorSet (required)
nationalityActor
vitalDatesActor
vitalPlaceActor
genderActor


```
−<lido:event>
  −<lido:eventType>
    −<skos:Concept rdf:about="http://terminology.lido-schema.org/lido00007">
       <skos:prefLabel xml:lang="en">Production</skos:prefLabel>
     </skos:Concept>
   </lido:eventType>
  −<lido:eventActor>
     <lido:displayActorInRole xml:lang="en">Painter: Peter Paul Rubens (1577–1640)</lido:displayActorInRole>
    −<lido:actorInRole>
      −<lido:actor lido:type="http://terminology.lido-schema.org/lido00163">
        <lido:actorID lido:type="http://terminology.lido-schema.org/lido00099">http://vocab.getty.edu/ulan/500002921</lido:actorID>
        <owl:sameAs>http://www.wikidata.org/entity/Q5599</owl:sameAs>
       −<lido:nameActorSet>
          <lido:appellationValue lido:pref="http://terminology.lido-schema.org/lido00169" xml:lang="en">Rubens, Peter Paul</lido:appellationValue>
        </lido:nameActorSet>
        <lido:nationalityActor>[...]</lido:nationalityActor>
        <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00786">[Birth date]</lido:vitalDatesActor>
        <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00787">[Death date]</lido:vitalDatesActor>
        <lido:vitalPlaceActor lido:type="http://terminology.lido-schema.org/lido00780">[Birth place]</lido:vitalPlaceActor>
        <lido:genderActor lido:type="http://terminology.lido-schema.org/lido00867">[Sex or gender]</lido:genderActor>
      </lido:actor>
      <lido:roleActor>[...]</lido:roleActor>
    </lido:actorInRole>
  </lido:eventActor>
  [...]
</lido:event>
```

actor (in actorInRoleComplexType)

complexType



LIDO

Lightweight Information Describing Objects

```
−<lido:event>
  −<lido:eventType>
    −<skos:Concept rdf:about="http://terminology.lido-schema.org/lido00007">
       <skos:prefLabel xml:lang="en">Production</skos:prefLabel>
     </skos:Concept>
   </lido:eventType>
  −<lido:eventActor>
     <lido:displayActorInRole xml:lang="en">Painter: Peter Paul Rubens (1577–1640)</lido:displayActorInRole>
    −<lido:actorInRole>
      −<lido:actor lido:type="http://terminology.lido-schema.org/lido00163">
         <lido:actorID lido:type="http://terminology.lido-schema.org/lido00099">http://vocab.getty.edu/ulan/500002921</lido:actorID>
         <owl:sameAs>http://www.wikidata.org/entity/Q5599</owl:sameAs>
        −<lido:nameActorSet>
           <lido:appellationValue lido:pref="http://terminology.lido-schema.org/lido00169" xml:lang="en">Rubens, Peter Paul</lido:appellationValue>
         </lido:nameActorSet>
         <lido:nationalityActor>[...]</lido:nationalityActor>
         <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00786">[Birth date]</lido:vitalDatesActor>
         <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00787">[Death date]</lido:vitalDatesActor>
         <lido:vitalPlaceActor lido:type="http://terminology.lido-schema.org/lido00780">[Birth place]</lido:vitalPlaceActor>
         <lido:genderActor lido:type="http://terminology.lido-schema.org/lido00867">[Sex or gender]</lido:genderActor>
       </lido:actor>
       <lido:roleActor>[...]</lido:roleActor>
     </lido:actorInRole>
   </lido:eventActor>
   [...]
 </lido:event>
```

language

for display

for indexing

LIDO

Lightweight Information Describing Objects

LIDO v1.1 – Released in December 2021!

LIDO

Lightweight Information Describing Objects

LIDO v1.1 – Backwards compatible with v1.0!

LIDO v1.1

LIDO v1.1 XML Schema Definition (XSD):
www.lido-schema.org/schema/v1.1/lido-v1.1.xsd

LIDO v1.1 Documentation (HTML):
www.lido-schema.org/schema/v1.1/lido-v1.1.html

What is new in LIDO v1.1?

LIDO v1.1 example records

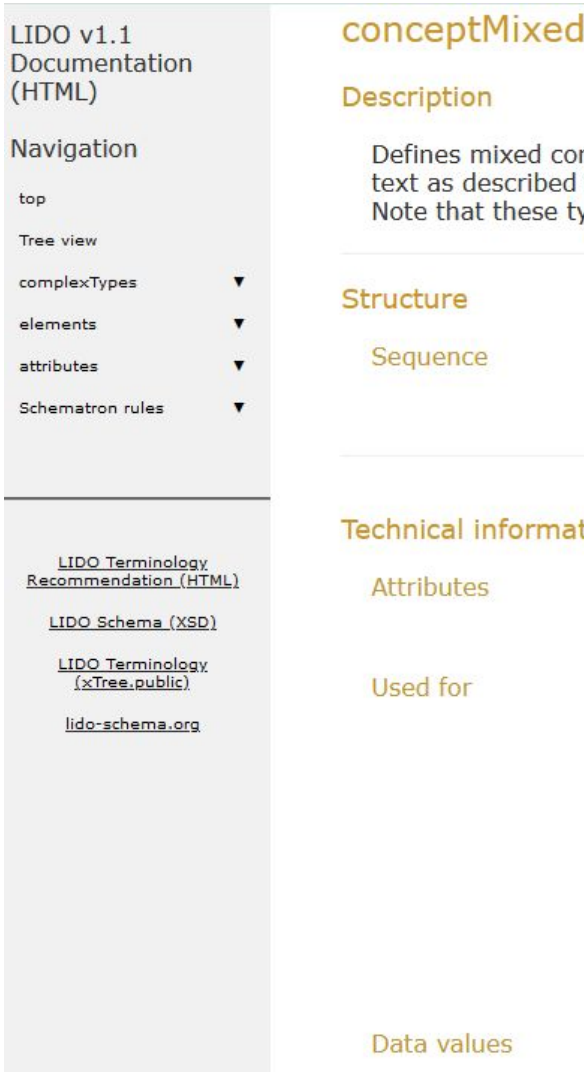
LIDO Terminology Recommendation (HTML)

What‘s new in LIDO v1.1?

- HTML Documentation revised and extended
- New elements and attributes
- **Content model extension**
- **RDF namespaces**
- LIDO goes Gitlab
- Schematron
- **LIDO Terminology Recommendation**

LIDO v1.1 – Content model extension

LIDO v1.1 conceptMixedComplexType



Content model extended **from free text elements to controlled terms** where appropriate

LIDO v1.1
conceptMixedComplexType

```
<lido:measurementType>width</lido:measurementType>
```

```
−<lido:measurementType>
  −<skos:Concept rdf:about="http://www.wikidata.org/wiki/Q208826">
      <skos:prefLabel xml:lang="en">height</skos:prefLabel>
      <skos:prefLabel xml:lang="de">Höhe</skos:prefLabel>
      <skos:mappingRelation>http://vocab.getty.edu/aat/300055644</skos:mappingRelation>
    </skos:Concept>
  </lido:measurementType>
```

LIDO
Lightweight Information Describing Objects

LIDO v1.1
conceptMixedComplexType

Used for

attributionQualifierActor
extentActor
extentMaterialsTech
extentMeasurements
extentSubject
formatMeasurements
genderActor
measurementType
measurementUnit
qualifierMeasurements
scaleMeasurements
shapeMeasurements

LIDO

Lightweight Information Describing Objects

LIDO v1.1 – RDF namespaces

https://cidoc.mini.icom.museum/working-groups/lido/lido-overview/about-lido/what-is-new-1-1/namespaces/

LIDO v1.1
skos:Concept

Embedding of skos:Concept from the SKOS namespace to enable a seamless and lossless representation of authority data within a LIDO record.

LIDO v1.1
owl:sameAs

The sameAs property from the Web Ontology Language namespace is used to express that two named entity identifiers refer to the same individual in the real world.

W3C Recommendation

5.2.1 owl:sameAs

The built-in OWL property owl:sameAs links an individual to an individual. Such an

```
—<lido:actor lido:type="http://terminology.lido-schema.org/lido00163">
    <lido:actorID lido:type="http://terminology.lido-schema.org/lido00099">http:
    //vocab.getty.edu/ulan/500002921</lido:actorID>
    <owl:sameAs>http://www.wikidata.org/entity/Q5599</owl:sameAs>
  —<lido:nameActorSet>
      <lido:appellationValue lido:pref="http://terminology.lido-schema.org
      /lido00169" xml:lang="de">Rubens, Peter Paul</lido:appellationValue>
      <lido:appellationValue lido:pref="http://terminology.lido-schema.org
      /lido00526">Peter Paul Rubens</lido:appellationValue>
    </lido:nameActorSet>
```

In OWL Full, where a class can be treated as instances of (meta)classes, we can use the `owl:sameAs` construct to define class equality, thus indicating that two concepts have the same intensional meaning. An example:

LIDO Terminology Recommendation

- LIDO Terminology
- Further Terminology Recommendations

LIDO Terminology Recommendation (HTML)

LIDO Terminology Recommendation

LIDO
Terminology
Recommendation

Navigation

top

elements ▼

attributes ▼

LIDO v1.1
Documentation (HTML)

LIDO Schema (XSD)

LIDO Terminology
(xTree.public)

lido-schema.org

LIDO Terminology Recommendation

The Terminology Recommendation document is part of the LIDO accompanying documents. For a number of schema elements and attributes, it contains links to recommended terms from the LIDO Terminology, or suggests the usage of descriptors from other linked open vocabularies, such as the Art & Architecture Thesaurus (AAT), Union List of Artist Names (ULAN), or Wikidata items.

The Art & Architecture Thesaurus® is the most elaborate and reliable source for indexing in the cultural heritage domain. Therefore, whenever possible, a link to suitable AAT terms for a LIDO element or attribute is provided. The link leads to the top-most concept of an AAT hierarchy serving as an access point to a list of appropriate subordinate descriptors that can be perused. AAT vocabulary items referenced by their URI are suitable for processing in any Linked Data application or environment.

The Terminology Recommendation document complements terminology or format proposals in the set of Getty Editorial Guidelines, including Categories for the Description of Works of Art (CDWA), and Cataloging Cultural Objects (CCO).

LIDO was originally introduced for the purpose of harvesting and merging metadata from local catalogs. The release of these terminology recommendations addresses the difficulties arising from a lack of alignment between users of the LIDO schema. To this end, the principal goal of the terminology recommendations is to achieve consistency in indexing not only within an institution, but also across portals and aggregators. Such consistency is expected to have a profound impact on retrieval quality with

http://lido-schema.org/documents/terminology-recommendation.html

LIDO Terminology Recommendation

relatedWorkRelType

Go to the schema documentation for relatedWorkRelType

Terminology recommendations

For the Related Work Relationship Type element choose a LIDO Term URI from the Related Work Relationship Type Vocabulary.

LIDO Terminology

repositoryName

Go to the schema documentation for repositoryName

Terminology recommendations

For the Repository Name element choose a concept URI from the ISIL- and Library Codes Agency or a linked open authority file aggregated in VIAF, or in Wikidata.

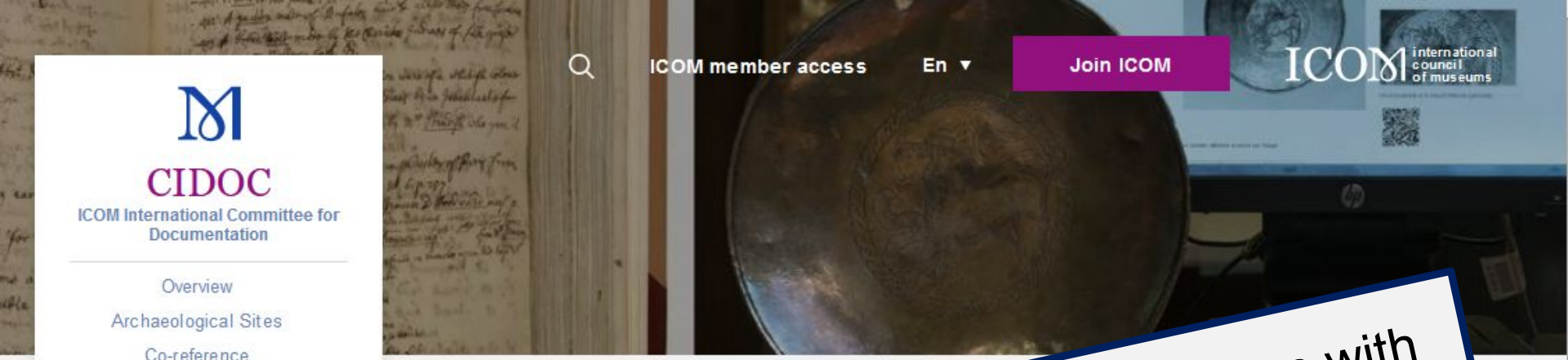
other linked open vocabularies

http://lido-schema.org/documents/terminology-recommendation.html

LIDO

Lightweight Information Describing Objects

LIDO Terminology



CIDOC
ICOM International Committee for Documentation

- Overview
- Archaeological Sites
- Co-reference
- CRM (Conceptual Reference Model)
- Digital Preservation
- Digital Strategy Development
- Documentation Standards

- **LIDO Terminology** supplements LIDO specification with controlled vocabulary for specific LIDO elements and attributes
- Available as LOD Service
  - Webinterface: http://terminology.lido-schema.org/
  - SPARQL: http://terminology.lido-schema.org/sparql
  - Documentation

Terminolo

…ology.lido-schema.org/

…element or attribute. The primary objective of …pport data providers in adapting or mapping their data structures to …, thus facilitating the processing of LIDO data for service providers, increasing the interoperability of LIDO data, and supporting information retrieval across different collections.

Go to LOD Interface

What is in the LIDO Terminology?

LIDO Terminology

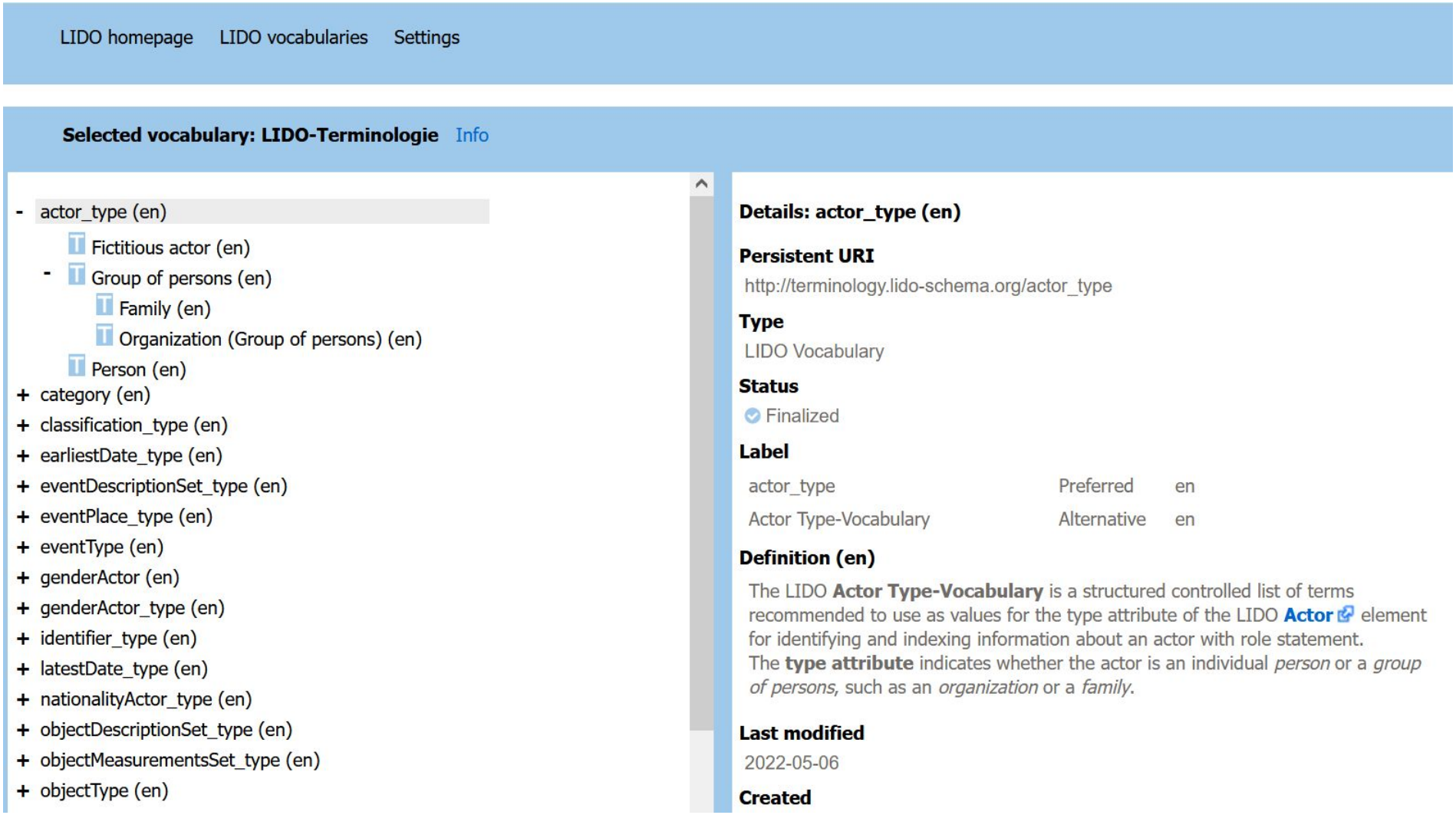
LIDO Terminology
Person: http://terminology.lido-schema.org/lido00163
Organization: http://terminology.lido-schema.org/lido00413
…

```
–<lido:actorInRole>
  –<lido:actor lido:type="http://terminology.lido-schema.org/lido00163">
    <lido:actorID lido:source="Bildindex-KUE-Datei"
    lido:pref="http://terminology.lido-schema.org/lido00170"
    lido:type="http://terminology.lido-schema.org/lido00100">per
    11002142</lido:actorID>
```

LIDO Terminology
URI: http://terminology.lido-schema.org/lido00099
Local Identifer: http://terminology.lido-schema.org/lido00100
…

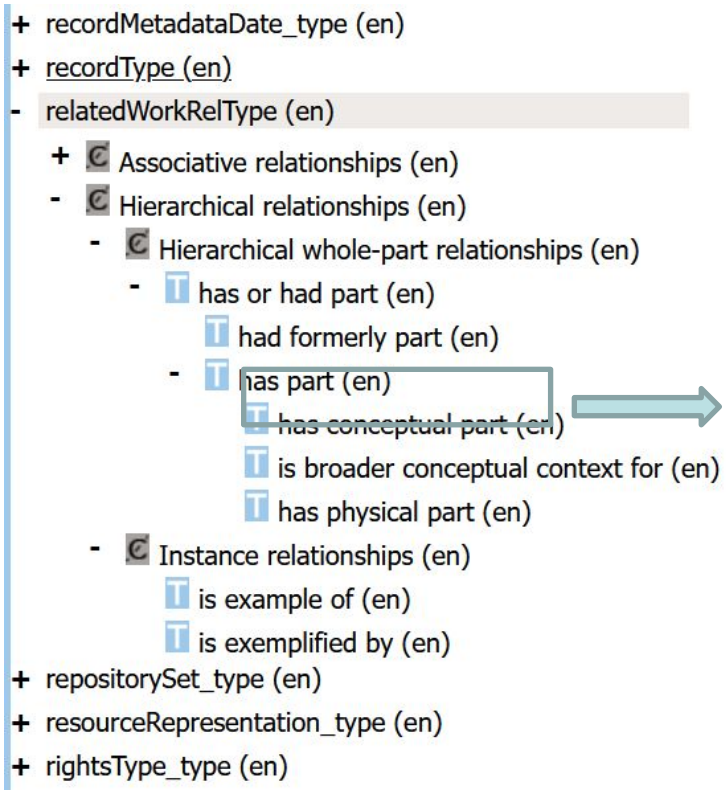
LIDO Terminology actor_type (attribute)

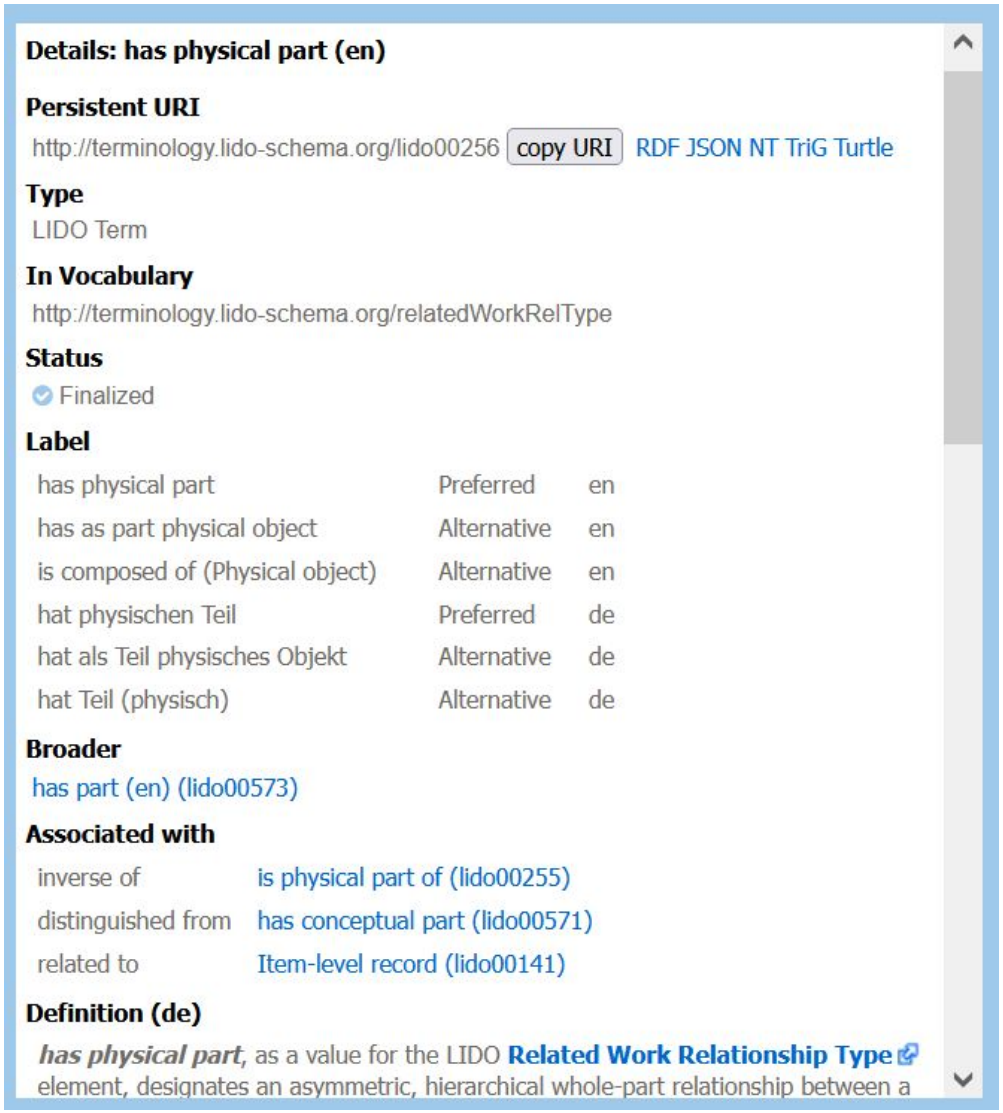
http://terminology.lido-schema.org/actor_type



LIDO Terminology relatedWorkRelType (element)

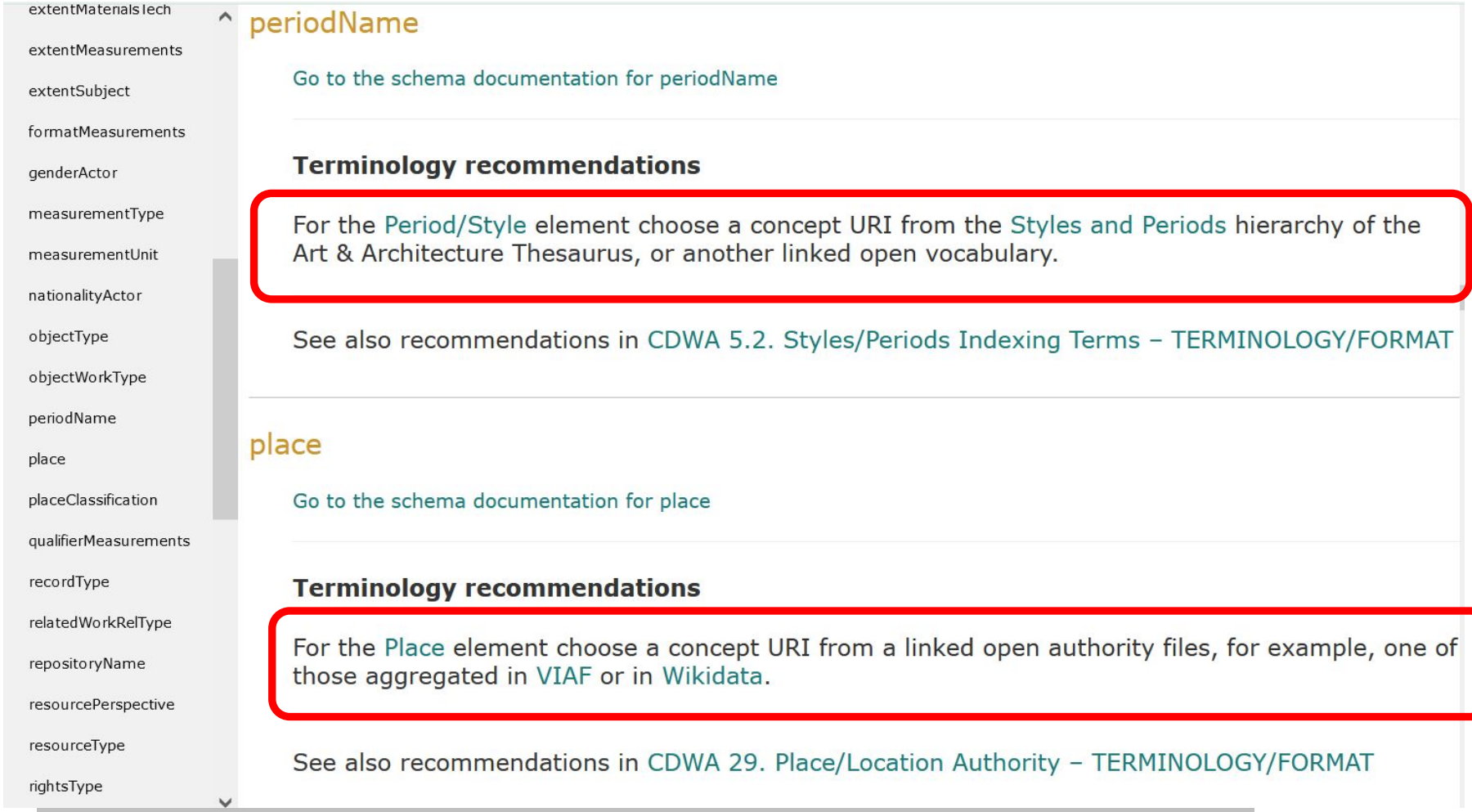
http://terminology.lido-schema.org/relatedWorkRelType





Further Terminology Recommendations

Terminology Recommendations



http://lido-schema.org/documents/terminology-recommendation.html

LIDO

Lightweight Information Describing Objects

LIDO & Linked Open Data

What is Linked Data?

LIDO

Lightweight Information Describing Objects

Linked (Open) Data

“The Semantic Web isn't just about putting data on the web. It is about **making links**, so that a person or machine can explore the web of data. With linked data, when you have some of it, you can find other, related, data.”
Tim Berners-Lee, 2006/2009
https://www.w3.org/DesignIssues/LinkedData.html

“When data is linked and open, it means that data is **structured and published according to the principles of Linked Data**, so that it can be both interlinked and made openly accessible and shareable on the Semantic Web. **The goal of linked open data is to allow data from different resources to be interconnected and queried, thus making it more useful**.”
https://www.getty.edu/research/tools/vocabularies/lod/index.html#definition

LIDO

Lightweight Information Describing Objects

Linked Data

1. Use URIs (Uniform Resource Identifiers) as names for things
2. Use HTTP URIs so that people can look up those names.
3. When someone looks up a URI, provide useful information, using the standards (RDF*, SPARQL)
4. Include links to other URIs. so that they can discover more things.

https://www.w3.org/DesignIssues/LinkedData.html

LIDO
Lightweight Information Describing Objects

Linked Data

1. Use URIs (Uniform Resource Identifiers) as names for things

2. Use HTTP URIs so that people can look up those names.

=> HTTP URIs for LIDO elements
http://lido-schema.org/schema/v1.1/lido-v1.1.html#eventType
http://lido-schema.org/schema/latest/lido.html#eventType
=> HTTP URIs for LIDO Terms
http://terminology.lido-schema.org/lido00163

LIDO
Lightweight Information Describing Objects

Linked Data

3. When someone looks up a URI, provide useful information, using the standards (RDF*, SPARQL)
=> LIDO Terminology LOD Interface
Web Interface: http://terminology.lido-schema.org/
SPARQL: http://terminology.lido-schema.org/sparql
http://terminology.lido-schema.org/lido00163.rdf JSON NT TriG Turtle

4. Include links to other URIs. so that they can discover more things.
=> many LIDO elements allow or strongly recommend the use of URIs
@lido:type=" http://terminology.lido-schema.org/lido00099"
=> skos:Concept, owl:sameAs

LIDO => LOD

LIDO

Lightweight Information Describing Objects

LIDO & CIDOC CRM

Stein, Regine & Balandi, Oguzhan. (2019).
Using LIDO for Evolving Object Documentation into CIDOC CRM. Heritage. 2. 1023-1031.
https://doi.org/10.3390/heritage2010066

LIDO

Lightweight Information Describing Objects

NFDI4Culture – Consortium for Research Data on Material and Immaterial Cultural Heritage

LIDO data => NFDI4Culture Knowledge Graph?

NFDI InfraTalk: Wikibase - knowledge graphs for RDM in NFDI4Culture
(7 March 2022)
https://www.youtube.com/watch?v=RPMkuDxHJtI
(16:16) Harald Sack: nfdi4Culture - Knowledge Graphs (and Wikibase) for Research Data Management

https://nfdi4culture.de/

LIDO
Lightweight Information Describing Objects

LIDO => Linked Art

```
−<lido:event>
  −<lido:eventType>
    −<skos:Concept rdf:about="http://terminology.lido-schema.org/lido00007">
       <skos:prefLabel xml:lang="en">Production</skos:prefLabel>
     </skos:Concept>
   </lido:eventType>
  −<lido:eventActor>
     <lido:displayActorInRole xml:lang="en">Painter: Peter Paul Rubens (1577–1640)</l
    −<lido:actorInRole>
      −<lido:actor lido:type="http://terminology.lido-schema.org/lido00163">
         <lido:actorID lido:type="http://terminology.lido-schema.org/lido0009
         <owl:sameAs>http://www.wikidata.org/entity/Q5599</owl:sameAs>
        −<lido:nameActorSet>
           <lido:appellationValue lido:pref="http://terminology.lido-schema.org/lido00169" x
         </lido:nameActorSet>
         <lido:nationalityActor>[...]</lido:nationalityActor>
         <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00786">[Bir
         <lido:vitalDatesActor lido:type="http://terminology.lido-schema.org/lido00787">[Dea
         <lido:vitalPlaceActor lido:type="http://terminology.lido-schema.org/lido00780">[Birt
         <lido:genderActor lido:type="http://terminology.lido-schema.org/lido00867">[Sex or
       </lido:actor>
       <lido:roleActor>[...]</lido:roleActor>
     </lido:actorInRole>
   </lido:eventActor>
   [...]
 </lido:event>
```

?

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://linked.art/example/Production/0",
  "type": "Production",
  "timespan": {
    "type": "TimeSpan",
    "_label": "ca. 1604",
    "begin_of_the_begin": "1603-01-01T00:00:00Z",
    "end_of_the_end": "1606-01-01T00:00:00Z"
  },
  "carried_out_by": [
    {
      "type": "Person",
      "_label": "Rubens, Peter Paul",
      "born": {
        "type": "Birth",
        "timespan": {
          "type": "TimeSpan",
          "_label": "1577",
          "begin_of_the_begin": "1577-01-01T00:00:00Z",
          "end_of_the_end": "1578-01-01T00:00:00Z"
        }
      },
```

LIDO

Lightweight Information Describing Objects

QUESTION TIME

LIDO

Lightweight Information Describing Objects

Lightweight Information Describing Objects

Feedback welcome!

lido-feedback@sub.uni-goettingen.de

www.lido-schema.org