EDM profile for Annotations

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1. Introduction

Europeana projects such as Europeana Creative, Europeana Sounds, Europeana v3, Europeana Food&Drink, Europeana Space must provide support for annotations. There must be an agreement on how annotations should be represented in order to easily share and exchange them across different platforms. This document presents a metadata profile of the Europeana Data Model (EDM) that seeks to provide an interoperable solution for representing annotations in the Europeana context. It has benefited from the input of a task force from the EuropeanaTech community, which has inventoried representative use cases and their corresponding data requirements[1].

This document is divided into three parts. The first part defines an EDM profile for Annotations. This profile is mostly based on the Web Annotation Data Model[2] (WA), a W3C recommendation for sharing annotations across different platforms, itself based on the previous work of the Open Annotation Community[3]. For further information about WA, see the complete specification of the model. With regards to the exchange format, WA is defined using the RDF data model thus making it possible to be serialized in any RDF format, however, the preferred format for exchange is JSON-LD[4].

The second part presents the application scenarios and provides recommendations on how annotations should be represented and exchanged between the tools employed in these applications and Europeana. The third part presents additional scenarios and considerations that are not being supported by Europeana at this time. Although the points in the third part are not yet planned for implementation, they may be relevant for the future applications of annotations in Europeana.

2. Definition of the EDM profile for annotations

This section lists the classes and properties that are presently part of this profile. It covers only a subset of the ones defined in the WA specification, corresponding to what was found to be needed to support the application scenarios presently identified in the projects contributing annotations to Europeana.

Note: the expression of annotations using this profile in the JSON-LD syntax always requires the declaration of the Web Annotation JSON-LD context[5]. In some cases, elements that have been specifically introduced in this profile have to be used, for example to characterize some contextual entities. Then, the appropriate JSON-LD context MUST be used too. In most cases it will be the EDM JSON-LD context[6] or the JSON-LD profile for contextual entities[7].

2.1. Annotation

In WA, an annotation is essentially a reified relation between two or more resources, typically a body and target, and conveys that the body is related to (i.e., is about) the target. Being reified as a class (`oa:Annotation`) enables an annotation to be further described with motivation and provenance. The following table lists the properties supported for the `oa:Annotation` class:

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[1] https://pro.europeana.eu/project/interoperability-of-annotations-and-user-sets
[2] http://www.w3.org/TR/annotation-model/
[3] See https://www.w3.org/community/openannotation/. A part of this earlier OA model was used in this document related to the representation of graphs.
[4] https://www.w3.org/TR/json-ld11/
[5] http://www.w3.org/ns/anno.jsonld
[6] http://www.europeana.eu/schemas/context/edm.jsonld
[7] http://www.europeana.eu/schemas/context/entity.jsonld

Property	Note	Value type	Card.
`rdf:about`	An IRI which identifies the annotation.	ref	1..1
`rdf:type`	Always with value `oa:Annotation`.	ref	1..1
`oa:hasTarget`	A reference to a resource or just a part of it that is being annotated.	ref	1..*
`oa:hasBody`	A body conveys what is intended to be said about the target(s). A body can also be absent to describe situations where a target is simply bookmarked (highlighted).	ref	0..*
`oa:bodyValue`	The string literal conveying the text for an annotation. This property MUST only be used in combination with `oa:tagging` as motivation or when the language of the tag is not known, otherwise, it is recommended to use the `oa:hasBody` property as defined in [Section 2.5.1](). If the `oa:bodyValue` property is present, then the `oa:body` property MUST NOT be present.	literal	0..*
`oa:motivatedBy`	A reference to a motivation (an instance of class `oa:Annotation`, see [Section 2.3]()) which expresses the reason why the annotation was created.	ref	1..*
`dcterms:creator`	A reference to the user agent of a client application that created the annotation. There MUST be exactly 1 `dcterms:creator` property per annotation	ref	1..1
`dcterms:created`	The time at which the annotation was created by the user. The value MUST be a literal expressed as `xsd:dateTime` with the UTC timezone expressed as "Z".	literal	1..1
`as:generator`	A reference to the software application (typically a client application) which was used by the user to create the annotation.	ref	0..*
`dcterms:issued`	The time at which the annotation was serialized. It corresponds to the time the annotation was first sent to Europeana. The value MUST be a literal expressed as `xsd:dateTime` with the UTC timezone expressed as "Z".	literal	1..1
`dcterms:modified`	The time at which the Annotation was modified, after creation. The value MUST be a literal expressed as `xsd:dateTime` with the UTC timezone expressed as "Z".	literal	0..1
`oa:via`	A reference to the annotation when also available in an external service.	ref	0..*

2.2. User and Software Agents

Typically, an IRI identifying the agents involved in the creation of an Annotation is sufficient. However, further information about the agents may also be supplied within the annotation, i.e. for client applications needing such information. This includes whether they are an individual, a group or a piece of software and properties such as its name.

2.2.1. User Agents

A user agent typically responsible for creating the annotation can be represented either as an individual (`foaf:Person`), or as an organization (`foaf:Organization`). The following table lists the properties supported for both classes.

Property	Note	Value type	Card.
`rdf:about`	An IRI identifying the agent.	ref	0..1
`rdf:type`	Either with value `foaf:Person` or `foaf:Organization`.	ref	1..1
`foaf:name`	The name of the user.	literal	0..*
`foaf:homepage`	The homepage of the user or client application, if available.	ref	0..*

2.2.2. Software Agents

A software application (`oa:SoftwareAgent`) typically responsible for generating the annotation on behalf of the user. The following table lists the properties supported for this class.

Property	Note	Value type	Card.
`rdf:about`	An IRI identifying the software application.	ref	0..1
`rdf:type`	Always with value `oa:SoftwareAgent`.	ref	1..1
`foaf:name`	The name of the software application that generated the annotation.	literal	0..*
`foaf:homepage`	The homepage of the user or client application, if available.	ref	0..*

2.3. Motivation

A motivation expresses the reason why the annotation was created, ie. the "why" rather than the "who" and "when" described in earlier sections. The WA model defines a set of motivations[8] (as instances of `oa:Motivation`) from which only three were included in this profile, based on the application scenarios presently identified for Europeana.

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[8] http://www.w3.org/TR/annotation-model/#motivations

Resource	Note
oa:tagging	The motivation for when the user intends to associate a tag with the Target.
oa:linking	The motivation for when the user intends to link to a resource related to the Target.
oa:describing	The motivation for when the user intends to describe the Target.

Besides these WA motivations, we have coined new motivations to fulfill more specific requirements observed in the Europeana scenarios:

Resource	Note
edm:transcribing	A motivation for annotations, informing when an annotation contains full-text transcribed by automatic means (OCR) or manually transcribed.
edm:captioning	A motivation for annotations, informing when an annotation contains a caption (for audio/visual material).
edm:subtitling	A motivation for annotations, informing when an annotation contains a subtitle (for audio/visual material).

Note: in principle `edm:transcribing`, `edm:captioning` and `edm:subtitling` should be declared as members of a motivation vocabulary maintained by Europeana, as described in the WA specification[9]. This may include attaching the new motivations to existing Web Annotation motivations using `skos:broader`. However, the IIIF[10] community is currently considering for their own needs the creation of similar motivations as a IIIF extension (relating the motivations to IIIF ones such as `iiif:supplementing`). As Europeana is a member of this community, we refrain from creating our own formal definitions at the moment.

2.4. Annotation Targets

An annotation target represents the resource(s) that the annotation is about. In the context of Europeana, a target is typically a Provided Cultural Heritage Object (`edm:ProvidedCHO`), as described in Section 2.4.1 or a Web Resource associated with it, as described in Section 2.4.2. This section may grow to cope with more advanced use cases for annotations that need, e.g., to refer to a part of a web resource, or even, a part of the metadata about a CHO.

2.4.1. Europeana CHOs

For cases where the annotation only needs to reference the object at Europeana, it is sufficient to refer to its URI with `oa:hasTarget`.

2.4.2. Web Resources associated to a Europeana CHO

Annotations that refer to a web resource require that an `oa:SpecificResource` object is defined so that the context in which the annotation was made is captured by the annotation. Besides the context, a Specific Resource can be used to capture any additional information about how a target is used in the Annotation. The following table lists the properties supported for this class.

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[9] https://www.w3.org/TR/annotation-vocab/#extending-motivations
[10] International Image Interoperability Framework, https://iiif.io.

Property	Note	Value type	Card.
`rdf:type`	Always with the value `oa:SpecificResource`.	ref	0..1
`oa:hasSource`	The IRI that identifies the web resource which is the ultimate target of the annotation.	ref	1..1
`oa:hasScope`	The IRI that identifies the CHO to which this web resource is associated. In more general terms, scope is used to define the context in which the annotation was made, in terms of the resources that the annotator was viewing or using at the time.	ref	1..1

Specific Resource "selectors" are also used to refer to specific parts of a web resource. This will be presented in various other sections of this EDM profile.

2.5. Annotation Bodies

A body conveys what is intended to be said about a target. The simplest form of a body is a text literal (without language information) which can be supplied using the `oa:bodyValue` property. Other more complex bodies can also be represented such as a language specific text (Section 2.5.1), a semantic resource (Section 2.5.2), or a graph for more advanced scenarios (Section 2.5.3).

2.5.1. Textual Body

A resource of type `oa:TextualBody` represents the text that the user wishes to express about the target. Representing the text as a fully-fledged (RDF) resource enables one to further describe it with its language and the format that it is conveyed in. The following table lists the properties supported for this class.

Property	Note	Value type	Card.
`rdf:about`	The IRI that identifies the textual body.	ref	0..1
`rdf:type`	Always with the value `oa:TextualBody`.	ref	1..1
`rdf:value`	The literal value conveying the text of the annotation, i.e., the content of the textual body. Language tags are not allowed on this value: `dc:language` should be used instead, see below.	literal	1..1
`dc:language`	The language of the text within the `rdf:value` property. There SHOULD be 1 language associated with a textual body, but there MAY be 0 or more, for example if the language cannot be identified or the resource contains a mix of languages. The value of the property SHOULD be a language code following the BCP 47[11] specification.	literal	0..*

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[11] https://www.w3.org/TR/annotation-model/#bib-bcp47

`dc:format`	The format of the text. It is intended for cases when the text is represented using a specific format, e.g., HTML. The value of the property SHOULD be the media-type of the format, following the RFC 6838[12] specification.	literal	0..*
`edm:rights`	Standardized information about copyright, usage and access rights of the resource. The value must come from the set defined at http://pro.europeana.eu/available-rights-statements.	ref	0..1

2.5.2. Body as a Semantic Resource

The body of an annotation can also be a semantic resource, which is typically used for tagging of resources. When the resource comes from the Linked Data cloud, it is sufficient to use its IRI as value for `oa:hasBody`. When this is not the case, a full description of the resource can be supplied as the body of the annotation. A typical example is a geo-tagging use case with just coordinates. This part of the profile does not prescribe which resources can be used or which information may be supplied as part of the full description of the resource. We refer to Section 3 where each application scenario is described in more detail.

2.5.3. Body as a Graph

Finally, the body of an annotation can also be a named (RDF) graph as allowed by the JSON-LD specification[13] (i.e., the `@graph` construct). This kind of body is typically used to support use cases where the user needs to make elaborate assertions about the target. For examples, see the part on specific application scenarios.

Open question: the `@graph` construct is not explicitly supported in the W3C Web Annotation Model. However, using any resource as body should not be incompatible with it.

3. Modelling annotations for specific application scenarios

This section gathers application scenarios taken from projects related to Europeana and provides recommendations on how annotations should be represented and exchanged between the tools employed in these projects and the Europeana core service.

WA is defined using the RDF data model and can therefore be serialized in any RDF format. The W3C specification recommends the use of JSON-LD as preferred serialization format and provides a JSON-LD context[14], which is also used in this document (see the example below). For the sake of brevity the following examples are shortened to show only the most relevant data, in particular, we omit most provenance information, i.e. the `creator` and `generator` fields and the corresponding dates, as well as the `type`, `id`, and (JSON-LD) `context`.

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[12] https://www.w3.org/TR/annotation-model/#bib-rfc6838
[13] https://www.w3.org/TR/json-ld11/#named-graphs
[14] http://www.w3.org/TR/annotation-model/#json-ld-context

Example 1: A complete annotation for the simple tagging use case represented in the JSON-LD format.

```
{
  "@context": "http://www.w3.org/ns/anno.jsonld",
  "id": "http://data.europeana.eu/annotations/1",
  "type": "Annotation",
  "created": "2015-03-10T14:08:07Z",
  "creator": {
    "type": "Person",
    "name": "John Smith"
  },
  "generated": "2015-04-01T09:00:00Z",
  "generator": {
    "type": "Software",
    "name": "HistoryPin",
    "homepage": "https://www.historypin.org/"
  },
  "motivation": "tagging",
  "bodyValue": "MyTag",
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

3.1. Annotating a CHO

In all these scenarios, the URI of the ProvidedCHO being annotated must appear as the target of the annotation.

3.1.1. Annotate a CHO with a simple tag

Use case: An end-user wishes to tag a CHO using an unlocalized text literal.

The following modelling guidelines apply to annotations addressing this use case:

- The oa:motivation property MUST exist and have the value oa:tagging;
- An oa:bodyValue property MUST exist and be filled with a plain literal expressing the tag. The text of the tag MUST be short, preferably containing just a single word or expression.

Note: It is recommended that the language is indicated for simple tags. If that is the case then the scenario described in Section 3.1.2 MUST be followed.

Example 2: An annotation expressing a simple tag to a CHO with the text "MyTag".

```
{
  "motivation": "tagging",
  "bodyValue": "MyTag",
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

3.1.2. Annotate a CHO with a language-specific tag

Use case: An end-user wishes to tag a CHO using a text literal, expressed in a specific language.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:tagging`.

- The `oa:body` property MUST exist and refer to a resource of type `oa:TextualBody`.

- The tag MUST be defined within the `oa:TextualBody` resource as the literal value of the `rdf:value` property. The text MUST be short, preferably containing just a single word or expression.

- The language of the tag MUST be indicated using the `dc:language` property within the `oa:TextualBody` resource, otherwise the scenario explained in Section 3.1.1 SHOULD be followed.

Example 3: An annotation expressing a simple tag to a CHO with the text "MyTag" defined as English.

```
{
  "motivation": "tagging",
  "body": {
    "type": "TextualBody",
    "value": "MyTag",
    "language": "en"
  },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

3.1.3. Annotate a CHO with a semantic tag

Use Case: An end-user wishes to annotate a CHO using a tag corresponding to a resource from a controlled vocabulary.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:tagging`.

- The `oa:body` property MUST exist and refer to a machine interpretable resource from a controlled vocabulary (e.g., DBpedia, Wikidata, Geonames).

Note: It is not necessary to supply the full description of the resource; its URI is sufficient.

Example 4: An annotation expressing a tag to a CHO with a Geonames resource for the city of Paris.

```
{
  "motivation": "tagging",
  "body": "http://sws.geonames.org/2988507",
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

3.1.4. Annotate a CHO with a geospatial tag

Use case: An end-user wishes to annotate a CHO with a location given in geospatial coordinates (latitude, longitude, and optionally altitude). In addition, the user may wish to indicate a label expressing the name or address of the location.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:tagging`.

- The `oa:body` property MUST exist and refer to a resource of type `edm:Place`, following the EDM guidelines for Places[15]. Some of the properties that can be used are: latitude (`wgs84_pos:lat`); longitude (`wgs84_pos:long`); altitude (`wgs84_pos:alt`); labels (`skos:prefLabel` or `skos:altLabel` when appropriate). Whenever possible, labels SHOULD be set with their respective language. The `wgs` properties MUST NOT be set with a datatype as defined in their specification[16].

At the moment, EDM does not define properties that can express a geographical shape for a location, only the exact coordinate position.

Example 5: An annotation expressing a tag with geospatial information for a CHO.

```
{
  "motivation": "tagging",
  "body": {
    "@context": "http://www.europeana.eu/schemas/context/entity.jsonld",
    "type": "Place",
    "prefLabel": {
      "en": "A label for the location, e.g., an address or place name"
    },
    "lat": "48.85341",
    "long": "2.3488"
  },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

3.2. Link a CHO to another

Use case: An end-user wishes to relate a CHO to another as they believe these two CHOs are somehow related. In addition the user may wish to express that:

- **Unqualified link (3.2.1)**: the type of the relationship is unspecified (most likely to be unknown).

- **Qualified link (3.2.2)**: the type of the relationship is known.

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[15]

http://pro.europeana.eu/files/Europeana_Professional/Share_your_data/Technical_requirements/EDM _Documentation/EDM_Mapping_Guidelines_v2.2.pdf
[16] https://www.w3.org/2003/01/geo/

3.2.1. Link a CHO to another using an unqualified, non-directed link

Use Case: An end-user wishes to relate a CHO to another without specifying the nature of the relation nor privileging a direction for the relationship[17].

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:linking`.

- MUST NOT have a body;

- MUST have at least two `oa:target` properties referring to the ProvidedCHOs being linked together.

Example 6: An annotation expressing a non-directed link between two CHOs.

```
{
  "motivation": "linking",
  "target": [
    "http://data.europeana.eu/item/09102/_UEDIN_214",
    "http://data.europeana.eu/item/09102/_RMAH_119385_NL"
  ]
}
```

3.2.2. Link a CHO to another using a qualified link

Use case: A user wishes to relate a CHO to another, explicitly stating the nature (including the direction) of the relationship between them.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:linking`.

- The `oa:body` property MUST refer to a resource of type `trig:Graph` (in JSON-LD, this means using the `@graph` construct) containing: the URI of the source ProvidedCHO and an RDF property (expressing the semantics of the relation) linking to the target ProvidedCHO.

- The RDF property MUST belong to the following subset of the properties defined in EDM that apply to CHOs:
  `dcterms:hasPart; dcterms:isPartOf; edm:isDerivativeOf; edm:isNextInSequence; edm:isRelatedTo; edm:isRepresentationOf; edm:isSimilarTo; edm:isSuccessorOf; owl:sameAs.`

- An `oa:target` property MUST exist and refer to the ProvidedCHO that is considered as the subject of the relation (typically the item that the user was looking at when creating the annotation). A second `oa:target` property SHOULD exist and refer to the ProvidedCHO being related to, since having both enables a search by target to answer with both inbound and outbound links for a CHO. This is particularly important for use cases where the relation can be interpreted regardless of the direction (e.g., symmetric relations such as skos:related, edm:similarTo or other relations).

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[17] This allows for example one annotation to be pulled (e.g., for display purposes) from either resource involved, without requiring an additional annotation that expresses the link in the reverse direction.

Note: the presence of two targets allows to somehow handle the case of bidirectional (symmetric) relations. Nevertheless, to fit the RDF data model, the pattern chosen requires that implementers assert the relationship with a certain direction in the `@graph` part. Hence, for use cases where the relation can be interpreted regardless of the direction, one of the directions MUST be chosen.

Example 7: An annotation expressing a link between two CHOs, where one is the `edm:isNextInSequence` of the other.

```
{
  "motivation": "linking",
  "body": {
    "@graph": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "id": "http://data.europeana.eu/item/09102/_UEDIN_214",
      "isNextInSequence": "http://data.europeana.eu/item/09102/_RMAH_119385_NL"
    }
  },
  "target": [
    "http://data.europeana.eu/item/09102/_UEDIN_214",
    "http://data.europeana.eu/item/09102/_RMAH_119385_NL"
  ]
}
```

3.3. Annotate a Web Resource

This section expands on Section 2.4.2 for scenarios where the target of an annotation is not a CHO but a web resource, such as an image, sound or video. Besides explaining how the scenarios described in the previous sections can also be applied to a web resource (Section 3.3.1), it also introduces new scenarios.

Ultimately, all the scenarios described in the previous sections can also apply to web resources, for example:

- to tag a web resource to indicate the name of a person or object depicted in an image, or further describing it by indicating the semantic resource corresponding to such person or object. Besides simple and semantic tagging, geo-tagging may also be used to indicate the coordinates of a point, for example in a cartography map.
- to link two web resources together by indicating that a piece of sheet music is played on an audio resource.

Adapting each of these scenarios into annotations of a web resource (instead of a CHO) basically requires the target to change. Hence the modelling guidelines defined in Sections 3.1 and 3.2 apply here, with the following change:

- The `oa:target` property (for each of the web resources addressed by the scenario) MUST refer to an `oa:SpecificResource` with 1) an `oa:hasScope` indicating the CHO with which the web resource is associated and 2) an `oa:hasSource` indicating the actual web resource URL and; 3) MAY have an `rdf:type` indicating that the target is an `oa:SpecificResource`.

Example 8: An annotation tagging the web resource associated with a CHO instead of a CHO in general.

```
{
  "motivation": "tagging",
  "bodyValue": "Animals",
  "target": {
    "type": "SpecificResource",
    "scope": "http://data.europeana.eu/item/5510/_MVoNr_5_987",
    "source":
"https://www.volkskundemuseum.at/jart/prj3/volkskundemuseum/data/collection-exports/
hafnergeschirr/hafnergeschirr_0_000_000_022.jpg"
  }
}
```

3.3.1. Transcriptions

User story: A user, I wish to relate an image (e.g. letter) to a transcription available at Transcribathon (like the one on this page).

In addition to the guidelines defined in Section 3.3, the following guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `edm:transcribing` (see Section 2.3).

- The `oa:hasBody` property MUST exist and use an instance of `edm:FullTextResource` (following the EDM Full-text profile), which includes the transcription as text value and MUST indicate the language of the transcription text with a `dc:language` property, and indicate the rights/licenses using the `edm:rights` property. The format of the webpage MAY be indicated using the `dc:format` property.

Example 9: An annotation expressing a relation between an image and the corresponding transcription text, indicating that the transcription is written in German.

```
{
  "motivation": "transcribing",
  "body": {
    "type": "FullTextResource",
    "language": "de",
    "edmRights": "http://creativecommons.org/licenses/by-sa/1.0/",
    "value": "... complete transcribed plain text ..."
  },
  "target": {
    "scope": "http://data.europeana.eu/item/2020601/contributions_20841",
    "source":
    "http://www.europeana1914-1918.eu/attachments/2020601/20841.235882.full.jpg"
  }
}
```

3.3.2. Captions and subtitles

User story: As a user, I wish to contribute a caption or subtitle for a video or audio resource.

In addition to the guidelines defined in Section 3.3.1, the following guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `edm:captioning` or `edm:subtitling` (see Section 2.3).

- The `oa:hasBody` property MUST exist and use an instance of `edm:FullTextResource` (following the EDM Full-text profile), which MUST include the content of the subtitle resource as text value, indicate the language of the subtitle text using a `dc:language` property, indicate the media (MIME) type reflecting the encoding format of the resource using the `dc:format` property, and indicate the rights/licenses using the `edm:rights` property.

Example 10: An annotation expressing the contribution of an Italian subtitle encoded in WebVTT[18] for a video resource in Europeana.

```
{
  "motivation": "subtitling",
  "body": {
    "type": "FullTextResource",
    "language": "it",
    "format": "text/vtt",
    "edmRights": "http://creativecommons.org/licenses/by-sa/1.0/",
    "value": "
WEBVTT
NOTE Paragraph

00:00:00.988 --> 00:00:03.572
Dolo le ultime novità
della moda per signora


...

00:00:30.359 --> 00:00:33.608
con il grande finale:
Carnevale con il popolo eschimese.

00:00:34.199 --> 00:00:35.780
♪ (musica) ♪"
  },
  "target": {
    "scope":
"http://data.europeana.eu/item/2051933/data_euscreenXL_EUS_D61E8DF003E30114621A92ABD
E846AD7",
    "source":
    "http://www.euscreen.eu/item.html?id=EUS_D61E8DF003E30114621A92ABDE846AD7"
  }
}
```

---

[18] The corresponding media type is defined at https://w3c.github.io/webvtt/#iana-text-vtt.

APPENDIX A. Possible extensions to existing application scenarios

This appendix gathers questions related to possibly extending the scenarios described in Section 3, which may result in changes or extensions of the profile.

Q1: Extending provenance information for User and Software Agents

The information associated with User and Software Agents is currently minimal. Additional information may be required for annotation clients. The Europeana Data Model includes some fields for agents in other contexts, which may be re-used for this purpose.

Q2: Extending provenance information to link to a source/surrogate annotation

There can be two provenance scenarios where a "derived" annotation" has to be connected to an "original version" of it. The first is about linking an annotation to "another identity" for it, namely a representation of the exact same annotation in another system or information space, for example when an annotation from Historypin.org is imported in Europeana. The second scenario is that of an annotation that has served as data source for creating another one, e.g., a human looking at a description to extract a more precise tag, or an automatic enrichment process that creates a semantic tag from a tag in simple text. Depending on the answer, a solution could use the `oa:via` pattern[19] or `dcterms:source` like here:

Example 11: A simple tag referring to the annotation from which it was derived.

```
{
  "motivation": "tagging",
  "bodyValue": "MyTag",
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214",
  "dcterms:source": "SOURCE_ANNOTATION_URI",
}
```

Q3: Extending semantic tagging to capture the user language context

We may want to record the specific language in which a user has created a semantic tag, e.g., if they selected a certain language-specific label when creating the annotation. This would allow them to later get back the exact information provided originally to the system.

If this use case is recognized as being relevant for implementation, and thus be addressed in Section 3.1.3, two alternative solutions can be thought of to support it:

1. **Indicate the language within the body (Example 12):** this solution means extending the existing solution by adding an indirection using `oa:SpecificResource` to append the language information. In this case the body does not refer directly to the URI of the resource as in the "regular" semantic tagging case.

2. **Indicate the language as qualification of the whole annotation (Example 13):** this solution means adding a `dc:language` property directly to the annotation (oa:Annotation class). This is more in line with the established patterns.

---

[19] https://www.w3.org/TR/annotation-model/#other-identities

Example 12: An annotation expressing a tag to a CHO with a Geonames resource for the city of Paris expressing the 'language context' of the annotation.

```
{
  "motivation": "tagging",
  "body": {
    "type": "SpecificResource",
    "source": "http://sws.geonames.org/2988507",
    "language": "en"
  },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

Example 13: An annotation expressing a tag to a CHO with a Geonames resource for the city of Paris expressing the 'language context' of the annotation.

```
{
  "motivation": "tagging",
  "language": "en"
  "body": "http://sws.geonames.org/2988507",
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

One also needs to assess whether recording the language is sufficient or it is also necessary to record the actual label that was displayed to the user upon the creation of the annotation. This could support a better user experience, especially in cases where several labels exist for the same language or when a label is changed (in the target vocabulary) after annotation and therefore becomes different from what the user indicated when annotating the object. In this case, the proposals in Examples 12 and 13 are not sufficient and alternatives should be explored, such as the one below.

Alternative: Add another body to express the term that the user had selected. This makes sure the term is exactly the one that was shown to the user.

```
{
  "motivation": "oa:tagging",
  "body": [
    {
      "@type": "SpecificResource",
      "source": "http://sws.geonames.org/2988507"
    },
    {
      "@type": "TextualBody",
      "value": "Paris",
      "language": "en"
    }
  ],
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

This pattern could also be applied when a simple tag is enriched with a semantic resource, as in a case of an approved named entity recognition that would become in this way part of the annotation.

Another alternative would be to use a kind of "metadata selector" pointing to the statement of the semantic resource which contains the label that was shown to the user, similar to the patterns in Appendices C.2 and C.3. A similar pattern has been mentioned in the context of Getty CONA so that

the description of an artwork captures not only a concept but also the specific term that was used to mention it. That pattern[20] uses the class `E17_Type_Assignment` from CIDOC CRM (the case here would probably use `E13_Attribute_Assignment`).

Q4: Alternative model for unqualified object linking for a directed relationship

The current pattern for representing unqualified object linking (see Section 3.2.1) does not allow one to reflect a sense of direction for the relationship. An alternative to express a directed but otherwise unqualified link is to have a first object (the one that the users has first opened while doing the annotation) as a target and the other(s) as the body, and the motivation `oa:linking` indicating that this is the most general type of linking possible, following the WA pattern associated with `oa:linking`[21] and as shown in the following example:

Example 14: An annotation expressing a directed link between two CHOs.

```
{
  "motivation": "linking",
  "body": "http://data.europeana.eu/item/09102/_UEDIN_214",
  "target": "http://data.europeana.eu/item/09102/_RMAH_119385_NL"
}
```

Q5: Annotating parts of web resources with spatial and temporal dimensions

The reference to a (spatial or temporal) part in an image or media resource can be reflected in the modelling as the reference (i.e., URL) used within the target of an annotation. This can be done by appending a dedicated "media fragment" to the URL of the media resource, according to the Media Fragment URI specification[22].

Note: in theory fragments could be used by the Europeana Annotations API like other URIs. However in its current implementation the API only supports CHO URIs with no fragment.

A time range may be specified with "`#t=START,END`", as shown in the following example.

Example 15: An annotation with a temporal dimension made on a video.

```
{
  "motivation": "transcribing",
  "body": {
    "type" : "TextualBody",
    "value": "...",
  },
  "target": "VIDEO_URL#t=00:00:05.780,00:00:07.000"
}
```

A range of pixels may be specified with "`#xywh=x,y,width,height`", as shown in the following example.

---

[20] See the diagram at https://commons.wikimedia.org/wiki/File:CONA_object_types_using_AAT.png mentioned in the Wikidata discussion page https://www.wikidata.org/wiki/Wikidata:Property_proposal/catalog_label
[21] https://www.w3.org/TR/annotation-vocab/#linking
[22] https://www.w3.org/TR/media-frags/

Example 16: An annotation with a spatial dimension made on an image.

```
{
  "motivation": "transcribing",
  "body": {
    "type" : "TextualBody",
    "value": "...",
  },
  "target": "IMAGE_URL#xywh=13,0,16,10"
}
```

APPENDIX B. Additional application scenarios under discussion

This appendix gathers application scenarios that are still being worked on or awaiting further validation.

B.1 Annotate a CHO with a language-specific comment

Use case: An end-user wishes to make a comment to a CHO.

The following modelling guidelines apply to annotations addressing this use case:

- A motivation MUST be set to `oa:commenting`.
- The body MUST refer to a resource of type `oa:TextualBody` with the value field containing the comment.
- The language of the comment MUST always be indicated, even if it is not certain, and MUST be expressed using the language field.

Note: In Europeana, we agreed that comments should always have a language attached, even for cases where the language is less certain. In such cases, the language should be understood as an indication.

Example 17: An annotation expressing a comment to a CHO.

```
{
  "motivation": "commenting",
  "body": {
    "type" : "TextualBody",
    "value": "my useful comment",
    "language": "en"
  },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

B.2 Suggest a new statement to an existing CHO description

Use case: An end-user wishes to add descriptive information on a CHO.

The following modelling guidelines apply to annotations addressing this use case:

- A motivation MUST be set to `oa:describing`;

- The `oa:body` property MUST refer to a resource of type `trig:Graph` (in JSON-LD, this means using the `@graph` construct) containing: the URI of the source ProvidedCHO and the suggested RDF statement.

Example 18: A new `dc:type` field with the DBpedia resource (http://dbpedia.org/resource/Brass_instrument) as value was suggested as addition to the CHO (http://data.europeana.eu/item/09102/_UEDIN_214).

```
{
  "motivation": "describing",
  "body": {
    "@graph": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "id": "http://data.europeana.eu/item/09102/_UEDIN_214",
      "type": { "id": "http://dbpedia.org/resource/Brass_instrument" }
    }
  },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

Note: having the graph as body is essential to distinguish between the context of the annotation/suggestion from the context of the object description in RDF; otherwise the suggested statement would immediately be part of the object description.

B.3. Assessing a previous annotation

Use case: An end-user wants to express a positive or negative assessment about an existing annotation.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:assessing`.

- The `oa:body` property MUST have one value referring to either `schema:LikeAction` or `schema:DislikeAction`.

- The `oa:target` property MUST refer to an annotation.

Example 19: An annotation rating another annotation with a like value (`schema:LikeAction`)

```
{
  "motivation": "oa:assessing",
  "body": "schema:LikeAction",
  "target": <ANNOTATION_URI>
}
```

B.4. Link a CHO to an external resource

Use case: In the EnrichEuropeana+ project, the Transcribathon platform will notify Europeana when an item is ready to be transcribed, and provide the direct link to the transcription application.

This use case is realized with a generic linking annotation to an external resource. The client application (in this case Transcribathon) sends an annotation to Europeana's Annotation API when the item becomes available for transcription. Once the transcription of the item is concluded, the client application will send to the API a `DELETE` request for the annotation.

The following modelling guidelines apply to annotations addressing this use case:

- The `oa:motivation` property MUST exist and have the value `oa:linking`.

- The `oa:body` property MUST exist and refer to the URL of the external resource.
- The `oa:target` property MUST refer to an `oa:SpecificResource` with 1) an `oa:hasScope` indicating the CHO to which the web resource is associated and 2) an `oa:hasSource`

indicating the actual web resource URL as mandatory properties and; 3) MAY have an `rdf:type` indicating that the target is an `oa:SpecificResource`.

Example 20: An annotation linking a Web Resource of a CHO to an external resource.

```
{
  "motivation": "linking",
  "body": {
      "id": "External_Resource_URL",
  },
  "target": {
    "scope":
"https://www.europeana.eu/pt/item/2020601/https___1914_1918_europeana_eu_contributio
ns_20841",
    "source":
    "http://www.europeana1914-1918.eu/attachments/2020601/20841.235882.full.jpg"
  }
}
```

APPENDIX C. Deprecated use cases and application scenarios

This appendix presents use cases and application scenarios that have been considered during the definition of the EDM profile for Annotations but have not been retained. Although these cases never were realized, they may emerge in the future and therefore they are presented in this section for future reference.

C.1 Link a CHO to an external resource using a qualified link

Use case: An end-user wishes to relate a CHO to another resource which is not held by Europeana, stating the nature of relation between them.

This use case is considered as a specialization of Linking a CHO to another using a qualified link where the target resource is not an Europeana CHO.

In addition to the guidelines defined in Section 3.2.2, the following guidelines apply to annotations addressing this use case:

- The RDF property expressing the semantics of the relation MUST refer to an external resource identified by a URI. This resource MAY be further described with a `dc:title` and `dc:format`.
- The `oa:target` property MUST refer only to the CHO, regardless of the direction of the relation.

Example 21: An annotation expressing a link between a CHO and a discussion about it on TheSession.org.

```
{
  "motivation": "linking",
  "body": {
    "@graph": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "id": "http://data.europeana.eu/item/2059207/data_sounds_T471_5",
      "isSimilarTo": "http://thesession.org/tunes/52"
    }
  },
  "target": "http://data.europeana.eu/item/2059207/data_sounds_T471_5"
}
```

Example 22: The same annotation described in Example 21 but further describing the TheSession.org resource by stating its title and format.

```
{
  "motivation": "linking",
  "body": {
    "@graph": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "id": "http://data.europeana.eu/item/2059207/data_sounds_T471_5",
      "isSimilarTo": {
        "id": "http://thesession.org/tunes/52",
        "format": "text/html",
        "title": "The Kid On The Mountain (slip jig) on The Session"
      }
    }
  },
  "target": "http://data.europeana.eu/item/2059207/data_sounds_T471_5"
}
```

C.2 Suggest a change to an existing statement of a CHO description

Use case: An end-user wishes to correct a specific existing metadata statement for a CHO, indicating a more accurate value.

The following modelling guidelines apply to annotations addressing this use case:

- A motivation must be set to `oa:editing`. Note: this could also use `oa:describing` or a specific type of action like Schema.org's `https://schema.org/ReplaceAction`;
- The annotation needs to target the specific statement instead of the object description, for which the `pundit:MetadataSelector` seems to be an interesting option.

This use case is deprecated because it was not realized in any Europeana related project. In addition, the solution described here is currently unrealizable, since the `pundit:MetadataSelector` was deprecated in Pundit.

Example 23: The value "ca. 1840" was suggested as replacement for the existing dc:date field with the value "Circa 1840" of the CHO (http://data.europeana.eu/item/09102/_UEDIN_214).

```
{
  "motivation": "editing",
  "body": {
    "@graph": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "id": "http://data.europeana.eu/item/09102/_UEDIN_214",
      "dc:date": "ca. 1840"
    }
  },
  "target": {
    "type": "SpecificResource",
    "source": "http://data.europeana.eu/item/09102/_UEDIN_214",
    "selector": {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "type": "pundit:MetadataSelector",
      "rdf:predicate": "dc:date",
      "rdf:value": "Circa 1840"
    }
  }
}
```

C.3 Suggest to remove a statement from a CHO description

Use case: An end-user wishes to remove a specific existing metadata statement for a CHO.

Some remarks on modelling:

- The body should be omitted meaning that no replacement for the specific statement is suggested.
- It would be preferable to use a specific motivation (inheriting from `oa:editing`) to explicitly state that the purpose is to remove the statement that is referenced. We could also use a specific type of action like Schema.org's `https://schema.org/DeleteAction`

***Example 24:** The dc:coverage field of the CHO (http://data.europeana.eu/item/09102/_UEDIN_214) was found incorrect and flagged for removal.*

```
{
  "motivation": "editing",
  "target": {
    "@type": "SpecificResource",
    "source": "http://data.europeana.eu/item/09102/_UEDIN_214",
    "selector" {
      "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
      "@type": "pundit:MetadataSelector",
      "rdf:predicate": "dc:coverage",
      "rdf:object": "Probably France"
    }
  }
}
```

This use case is deprecated because it was not realized in any Europeana related project. In addition, the solution described here is currently unrealizable, since the `pundit:MetadataSelector` was deprecated in Pundit.

C.4 Tag, semantic tag or comment an existing statement from a CHO description

Use case: An end-user wishes to annotate (tagging or commenting) a specific existing metadata statement for a CHO.

Some remarks on modelling:

- Two selectors are required to specifically refer to a given portion of the text. This is accomplished by having two selectors chained together, where the second refines the results of the previous one.
- The remaining pattern is the same as the general case for semantic tag of a CHO.

***Example 25**: The the 'Brass' word in the text of a dc:description field from of the CHO (http://data.europeana.eu/item/09102/_UEDIN_214) was semantically tagged with the DBpedia resource (http://dbpedia.org/resource/Brass_instrument).*

```
{
  "motivation": "oa:tagging",
  "target": {
    "@type": "SpecificResource",
    "source": "http://data.europeana.eu/item/09102/_UEDIN_214",
    "selector" {
          "@context": "http://www.europeana.eu/schemas/context/edm.jsonld",
          "@type": "pundit:MetadataSelector",
          "rdf:predicate": "dc:description",
```

```
        "rdf:object": "Technical description: Brass; ligature fitting on bell
section at joint; stockings on main slides. Bell with one coil, angled to face
forwards. Repair History: Main slide possibly not original (tenon of slide
section of joint is tapered, bell section joint for cylindrical tenon).",
        "refinedBy": {
          "type": "TextQuoteSelector",
          "exact": "Brass",
          "prefix": "Technical description: ",
          "suffix": "; ligature fitting on bell"
        }
    }
  },
  "body": "http://dbpedia.org/resource/Brass_instrument"
}
```

This use case is deprecated because it was not realized in any Europeana related project. In addition, the solution described here is currently unrealizable, since the `pundit:MetadataSelector` *was deprecated in Pundit.*

C.5 TunePal

Use Case: The user posts the transcription or recording for a piece of music (e.g., a song), the service matches it to a list of possible names for the object, does a search of Europeana using those names as a pivot, gives the user an interface to play any matching recordings and then the user indicates if the recordings that were retrieved are the piece of music as their own transcription or recording. If there is a match, this is potentially interesting both to Europeana (in that the piece was used) and to the original data provider (in that it now matches an example of contemporary musical practice). There may also be other narrative context, in that the user validating the matching may also provide other contextual information about the object.

The resources to be connected would be:

- A contemporary transcription or recording which was made by a user (https://thesession.org/tunes/52), which will presumably be listed on another URL corresponding to the place where the identification question was asked, and could be in the format of a user comment or a link to a recording;
- An archival recording from Europeana (as the CHO, not the media resource);

We could know more about the context of the link being made, such as the originating URL and timestamp.

The modelling for this use case would be closely related with the pattern defined for transcriptions in Section 3.3.1. When the connection is to be made with a transcription, the only difference to the pattern described in Section 3.3.1 is that the target of the annotation is the CHO and not the Web Resource. When the connection is to be made with a recording, then the body of the annotation should be the media file of the recording.

C.6 HistoryPin

During the project Europeana Sounds[23], HistoryPin[24] created a geotagging interface to enrich sounds collections on the Historypin.org website.

This interface allows logged in HistoryPin users to suggest more accurate or more precise locations for pins than the existing ones, as shown in Figure 1. When applied to objects with a Europeana ID, these annotations can be pulled into the Europeana Annotations API as geo coordinates through the

---

[23] https://pro.europeana.eu/organisation/europeana-sounds
[24] http://www.historypin.org/

connection that has been established earlier between Historypin and Europeana as part of the Technical Demonstrator app developed during the Europeana Food and Drink project[25].

Use Case: An end-user wishes to geotag a CHO with:

1. A location with geospatial coordinates (latitude/longitude), a radius indicating the approximate circular shape of the entity and possibly a label for the name or address of the place;
2. A named entity from a controlled dataset/vocabulary (e.g., Geonames or DBpedia).

This use case can be supported by the solutions presented for earlier cases: for 1) the scenario addressed in Section 3.1.4 and for 2) the one addressed in Section 3.1.3. If the end-user provides information for both 1) and 2) within the same annotation, then the model should express them both in a single body where the geo tag is provided as presented in Section 3.1.4, and the URI of the entity is provided in a `owl:sameAs` property, as shown in Example 26.
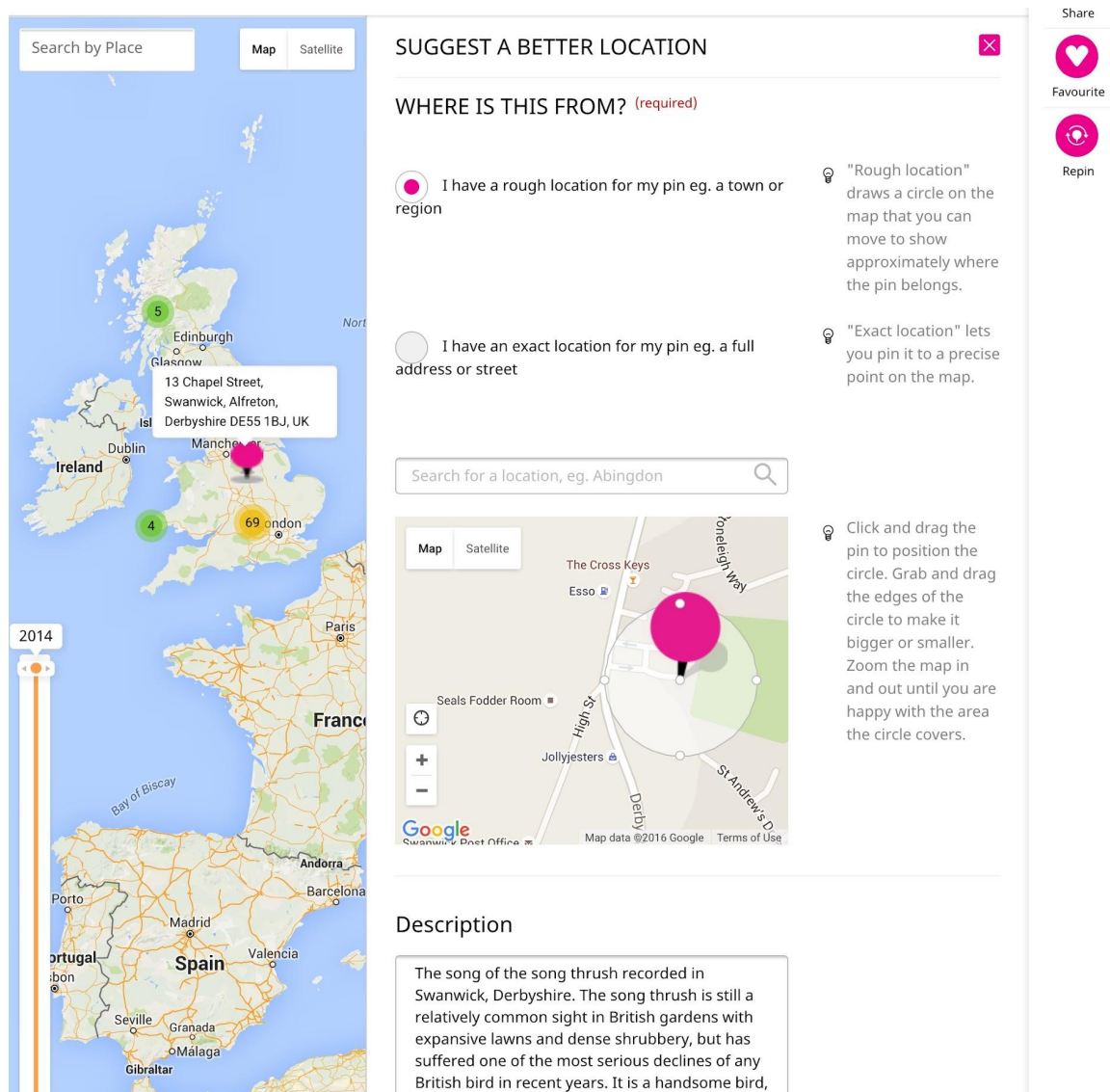
Figure 1: The 'Suggest a Better Location' panel for HistoryPin.

Example 26: An annotation expressing a tag to a CHO with geospatial information together with a reference to a Geonames resource for the city of Paris.

```
{
  "@context": "http://www.w3.org/ns/anno.jsonld",
  "@type": "Annotation",
  "@id": "http://data.europeana.eu/annotations/1",
  "annotatedAt": "2015-03-10T14:08:07Z",
  "annotatedBy": {
    "@id": "https://www.historypin.org/en/person/55376/",
    "@type": "foaf:Person",
    "name": "John Smith"
  },
  "serializedAt": "2015-04-01T09:00:00Z",
  "serializedBy": {
    "@id": "http://data.europeana.eu/provider/historypin",
    "@type": "prov:SoftwareAgent",
    "name": "HistoryPin",
    "homepage": "https://www.historypin.org/"
  },
  "via": "https://www.historypin.org/en/item/136107"
  "motivation": "tagging",
  "body":
    {
      "@context": "http://www.europeana.eu/schemas/context/entity.jsonld",
      "type": "Place",
      "prefLabel": "A label for the location, e.g. an address or place name",
      "lat": "48.85341",
      "long": "2.3488",
      "sameAs": "http://sws.geonames.org/2988507",
      "schema:geoRadius": "1000 meters"
    },
  "target": "http://data.europeana.eu/item/09102/_UEDIN_214"
}
```

Open question: this solution relies on the `schema:geoRadius` property, which is currently neither in EDM nor in the Europeana context for entities.

As part of Europeana v3.0 project, Europeana considered supporting annotations that are retrieved from the HistoryPin platform. This pilot focused on two specific scenarios:

1. **Use Case:** Text tags made to an object provided to Europeana (CHO).
2. **Use Case:** Linking between two ProvidedCHOs.

These scenarios can be supported by the solutions presented for earlier cases: for 1) the scenario addressed in sections 3.1.1 and 3.1.2.; and for 2) the one addressed in Section 3.2.1.

Document History

Version	Editor	Date	Comments
V0.1	Hugo Manguinhas	09/03/2015	First version based on the Open Annotation Data Model
V0.2	Hugo Manguinhas	15/10/2015	Changed to Web Annotation Data Model.
V0.3	Hugo Manguinhas	31/03/2016	Update to reflect the latest changes to the WA from 31st of March
V1.0	Hugo Manguinhas	15/07/2016	Update following changes to the WA from 5 July and added support to geo-tagging and advanced object linking.
v1.1	Hugo Manguinhas	12/07/2017	Changed oa:equivalentTo to oa:via. Added support for annotations of Web Resources and the edm:transcribing motivation.
v1.2	Nuno Freire, Antoine Isaac	22/12/2021	Extensive revision following the completion of the report of the EuropeanaTech Task Force on interoperability of annotations