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ATHENA

Specification for conversion tools

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¹ OJ L 79, 24.3.2005, p. 1.

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1. Introduction

1.1 The purpose of work package 3

Work package 3 of the ATHENA project (WP3) is tasked with:

1. Reviewing the different standards in use by museums;
2. Facilitating the mapping of those standards to a common metadata standard;
3. Assessing the requirements for the persistent identification of digital objects and collections;
4. Producing tools to support the conversion of museums' data into the common harvesting format for ingestion into the main Europeana service.

WP3 also works together with other work packages in the project. In particular WP3 works closely with WP4 and WP7: feeding information about standards for their work. Also the survey which is the basis of this deliverable was extended to include collecting information on IPR issues for use within WP6.

1.2 Background to the deliverable

This deliverable is the result of the work of Task 3.2 of the ATHENA project which was concerned with the “*Review of requirements and specification of tools to support the conversion of proprietary museum data*”. Its objective was to give to the WP7 the information that would allow it to create the ATHENA system (‘plug in’) for the ingestion of metadata into the system and subsequently into Europeana. This ingestion was to be based on a common harvesting standard for metadata.

However because of the need of the *Europeana v1.0* project to ingest content earlier (before July 2010) than was anticipated by the ATHENA project (2011) it was decided, in the spirit of concertation, to bring forward the creation on the ATHENA system. To successfully accomplish this meant that we had to ‘make a virtue of necessity’ and work much more closely and cooperatively with WP7 in delivering what was needed earlier than was planned.

This process was very successful and proves the advantage of flexible team working in contrast to viewing the tasks and deliverables of a work package in isolation to one another. This was expected in the *Description of Work* for the project but the concept was strengthened by its practical application under circumstances unforeseen at the beginning of the project.

The work of the ATHENA project is carried out in the context of the wider Europeana programme

1.3 Overview of the deliverable

Deliverable D3.2 discussed:

- The need for a new harvesting XML schema and came to the conclusion that a new one was needed. One that could record the potentially rich information associated with museum objects;
- The sources for, and an outline of, the new schema – *LIDO* (Light Information Describing Objects).

This deliverable will look at how:

- *LIDO* was created by the activities of WP3;
- The schema will work within the ATHENA system and its relationship to Europeana;
- To map from the recommended collections management use environment standard, *SPECTRUM*, to *LIDO* within the context of the ATHENA system, and then on to *ESE*.

There are two annexes to this deliverable as separate documents:

- The *LIDO* XML schema itself;
- A technical description of *LIDO*.

Both these documents are created and maintained the same using innovative XML technology that is used for the *SPECTRUM* standard.

2. How *LIDO* was created by the activities of WP3

The timetabling and content of the work of WP3 was affected by the need to deliver content to Europeana faster than was originally envisaged. In particular there was a need to deliver a harvesting schema for the ATHENA system. Therefore it was decided to use the results of the ATHENA survey² to identify a possible existing harvesting schema and explore the possibility of using that.

Work done for deliverable D3.2 recognised that Dublin Core based and simple in-house metadata schemas can be directly mapped into the ESE schema. However it was thought that there is a need for a harvesting schema for the museum domain. This should be able to record the maximum detail of information. This is especially the case when metadata for museum objects is created directly from cataloguing data.

The examination of existing standard showed that the most suitable candidates for such a schema can were *museumdat* and *SPECTRUM*. Luckily both the organisations responsible for the standards are partners in the ATHENA so it was possible to explore the suitability of both and any synergies that might be gained by looking at them in relationship to each other.

2.1 Konstanz meeting

The first meeting of the WP3 working group to discuss this issue took place in Konstanz, Germany on May 6th 2009 in the context of an ATHENA project plenary meeting. Here the following issues were discussed and decisions taken

- Do we need a common ‘ATHENA model’? Perhaps not if we can have a mapping between the most common data structures.
- The first task was seen as a mapping between *SPECTRUM* and *museumdat*.
- The ‘National’ standards of Italy, Finland and others need to be taken into account. The London meeting would have representation from at least one national standard.
- WP7, creating the ATHENA system, should implement these mappings in their technical workflow.

It was decided that the mapping between *SPECTRUM* and *LIDO* should be discussed at a meeting in early June in London. This meeting should include representatives of *SPECTRUM* (one of the co-ordinators of WP3) and *museumdat* (one of the co-ordinators of WP2), and representatives from countries with national systems. In the event, due to scheduling difficulties, only a representative from Italy was able to attend.

2.2 Work carried out between meetings

At this stage an important development took place with regards to the team of people involved in the work package.

Collections Trust has had a long relationship with the XML expert Richard Light who also acts as a consultant in the development of the UK-based collections management system MODES. A recent addition to the MODES suite of programmes is ModesXML. This uses XML technology to store

² See ATHENA deliverable D3.1 p57

and manipulate collections data. In 2007 it was also used to hold and publish the *SPECTRUM* using XML technology in any form needed, including as a PDF document and as web pages.

Using XML helped in the process of the translation, and more importantly ‘localisation’, of *SPECTRUM* into Dutch for the Netherlands and Flemish (Belgium) museum communities. This aid came in the form of marking up the UK text so that it is possible to produce a PDF with the UK-specific part clearly distinguishable to a human reader.

ModesXML was also used to create an XML schema for *SPECTRUM* from the standard document itself by embedding appropriate markup. This means that updating the schema when the standard itself is changed is also a relatively easy process. This functionality was seen as an important to the development of a harvesting schema for ATHENA therefore it was seen as appropriate to bring Richard Light into the team creating it.

An important person in the development of *museumdat* was Regine Stein, of Bildarchiv Foto Marburg. Regine, together with her colleagues Carlos Saro (Zuse Institute Berlin) and Axel Vitzthum (digiCULT Schleswig-Holstein), provided much of the intellectual and technical skills for this work. Therefore it was felt important that this team should also become involved in the work.

2.3 London meeting

The meeting took place on June 5th at the offices of Collections Trust (WP3 co-ordinator). It was very much focused on finding a way ahead for the ATHENA project in as short a period of time as possible. In order to do this the first part of the day was spent in presentations on *museumdat* and *SPECTRUM*. This looked at what they were and what museum market they were aimed at. The conclusions were:

- *SPECTRUM* is a standard for collections management for all kinds of collections including natural science and those from archaeological excavation. It deals with the procedures and related information requirements for doing this.

It has been extensively used to develop computer-based collections management systems, both commercially and in-house by individual organisations. There are over 6 thousand licences for its non-commercial use worldwide and about 20 for commercial use by software suppliers. It has been, or is being translated and localised, in a number of countries (including Germany) for practical use.

- *museumdat* is a schema for harvesting data from an organisation’s internal computer system for use and presentation in an aggregated portal. The major example of this is in operation the cross domain BAM Portal³ in Germany. Museumdat is also supported by ARTstor and the Getty Research Institute (J Paul Getty Trust) in the USA and took as input the Getty’s *CDWA Lite* schema. It was also designed using the ‘event model’ of the CIDOC Conceptual Reference Model (*CIDOC CRM*)⁴.

The meeting then compared the *SPECTRUM* ‘Units of information’ (roughly equivalent to elements) and the elements of the *museumdat* schema. Unsurprisingly, given the history of development of both, there was a general concordance between *SPECTRUM* and *museumdat*. Also it was agreed that *museumdat* was a good basis for the ATHENA harvesting schema.

³ See: <http://www.bam-portal.de>

⁴ *SPECTRUM* itself was also used during the creation of the CIDOC CRM.

Where the two differed were:

- *SPECTRUM*'s support for collections management procedures. This is largely out of scope for the harvesting schema.
- *SPECTRUM* has a more generalised approach and is able to record information about natural science and archaeology collections as well as art collections.

The conclusions were that:

- *SPECTRUM* has concepts, events, and detail to offer to the schema and therefore *museumdat* should be updated by being 'informed' by *SPECTRUM*;
- The ModesXML technology being used by *SPECTRUM* should also be used in the development of the updated *museumdat*.

The meeting also looked at the Italian situation. Here cataloguing data for different kinds of cultural heritage object are recorded using ICCD (Italian Central Institute for Cataloguing and Documentation) standard cataloguing charts, authority files (for authors and related Bibliography) and multimedia related entities (such as images, audio and video documentation)⁵.

ICCD standard cataloguing charts have been mapped into the *PICO AP*⁶, which is a Dublin Core application profile created for the harvesting of metadata describing very different kinds of cultural resources (tangible and intangible Italian cultural heritage) published in the Italian Culture Portal – *CulturaItalia*⁷.

The need for recording detailed information on museum objects was met by introducing into the *PICO AP* specific sub-profiles for museum resources, with the creation of encoding schemes (declared in related xsd files). These further detail values of the *PICO AP* elements and refinements, and reproduce the hierarchical organisation of ICCD standard charts in paragraphs, fields and subfields⁸.

Information recorded into ICCD cataloguing charts is very deep and detailed and can be compared with the descriptive information recorded by *SPECTRUM* and *museumdat*. However the cataloguing charts are only available in Italian and not expressed in XML. This prevented them from being among the standards used as a basis for the new harvesting standard.

However analysis of Italian standards showed that it would be possible to map data from the ICCD cataloguing charts and/or metadata from the *PICO AP* both to *ESE* and to the new harvesting standard.

⁵ See ICCD cataloguing rules: <http://www.iccd.beniculturali.it/Catalogazione/standard-catalografici/normative/normative>

⁶ See: <http://purl.org/pico/picoap1.0.xml>

⁷ See: <http://www.culturaitalia.it>

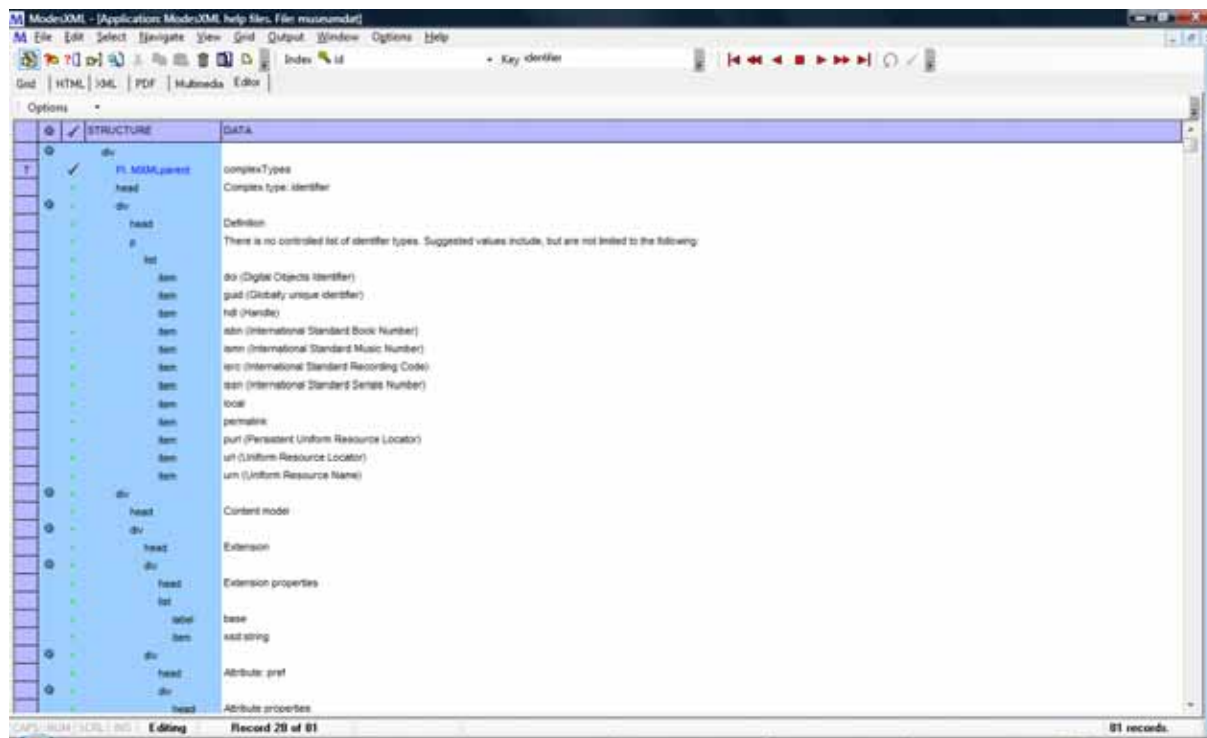
⁸ For specifications for the mapping between ICCD Cataloguing charts and *PICO AP* see: <http://www.iccd.beniculturali.it/cataloguing/cataloguing-standards/metadata/metadata>

2.4 Work carried out between meetings

First Collections Trust provided Richard Light with the set of relevant *SPECTRUM* Units of information that would need to be represented in the revised *museumdat*. Richard and Regine's team then began the task of:

- Adapting *museumdat* to take into account *SPECTRUM*;
- Inputting *museumdat* into ModesXML.

Here is a screenshot of part of *LIDO* (the 'identifier' element) in ModesXML showing an example of the latter:



One important aspect of the new *museumdat* was the inclusion of full support for multilinguality. This could be represented by either indicating, using an XML *lang* attribute, that a whole object record was in a particular language or by marking an individual element(s) within an object record in a similar way.

2.5 Brussels meeting

The meeting took place on July 28th at the Musée du Cinquanteaire (RMAH) (WP3 co-ordinator).

This was a wider meeting with ATHENA partners from Israel, Finland, Germany, Greece, Slovakia and Poland. Also a technical representative from Europeana 'central' was present to give news and their opinion on ATHENA's work in developing a harvesting schema. The wider attendance was also reflected in the agenda which included:

- News from EuropeanaLocal and Collections Trust;
- Introduction to *SPECTRUM*;
- Introduction to *museumdat*;
- Roundtable on situation in attendees' country on metadata and what Europeana is doing;
- Presentation of the revised *museumdat*.

The main purpose of the meeting was to get ‘ATHENA approval’ for the work on developing *museumdat* into the ATHENA harvesting schema. The reaction to the revised *museumdat* was highly positive from all those attending the meeting. The Europeana representative praised the work of the ATHENA project in developing the schema. The decision was taken to carry on and to complete the work.

Also at this meeting it was decided that the revised *museumdat* should be renamed as *LIDO*. This name was already a possibility in the *museumdat* context only but the work of ATHENA gave another reason for the change. Other reasons included:

- The new schema was significantly different from *museumdat*;
- In order to represent its independent existence from the contributions to it (i.e. *museumdat*, *CDWA Lite*, *CIDOC CRM* and *SPECTRUM*).

2.6 Work carried out between meetings

Work creating the *LIDO* schema and a first version of the associated technical documentation was completed using the ModesXML system.

2.7 Amsterdam meeting

The meeting took place on the afternoon of September 13th at the offices of Erfgoed Nederland just before the Europeana v1.0 conference and working groups meetings in Den Hague.

The purpose of this meeting was to get final approval for the use of *LIDO* within the ATHENA system under development within the work of WP7. The agenda included:

- Update on progress on *LIDO* (German partner);
- Demonstration of the ModesXML system and how *LIDO* relates to other standards (UK WP3 co-ordinator);
- Update and demo of ATHENA system (Greek WP7 co-ordinator).

Discussions confirmed that the *LIDO* schema was in an acceptable state for implementation within the ATHENA system by WP7. WP7 agreed to implement it for a testing in the next few months.

Also discussed, and approved, was the suggestion that ATHENA representatives to seek for *LIDO* to be brought ‘under the wing’ of CIDOC (the documentation committee of ICOM). The plan was for *LIDO* to become a working group within CIDOC with membership wider than the ATHENA partners and including countries outside Europe. This proposal was to be put to CIDOC at its forthcoming conference in Santiago, Chile in October.

2.8 After Amsterdam

At the ATHENA plenary in Lund, at the end of October, those from the ATHENA project who had attended the CIDOC Conference in Chile were able to confirm that the proposal for a *LIDO* working group within CIDOC had been accepted.

LIDO had by then been incorporated into the ATHENA system. This was demonstrated in outline in Lund with testing to take place in Athens the following month and user workshops in early 2010.

3. How LIDO will work within the ATHENA system

3.1 General

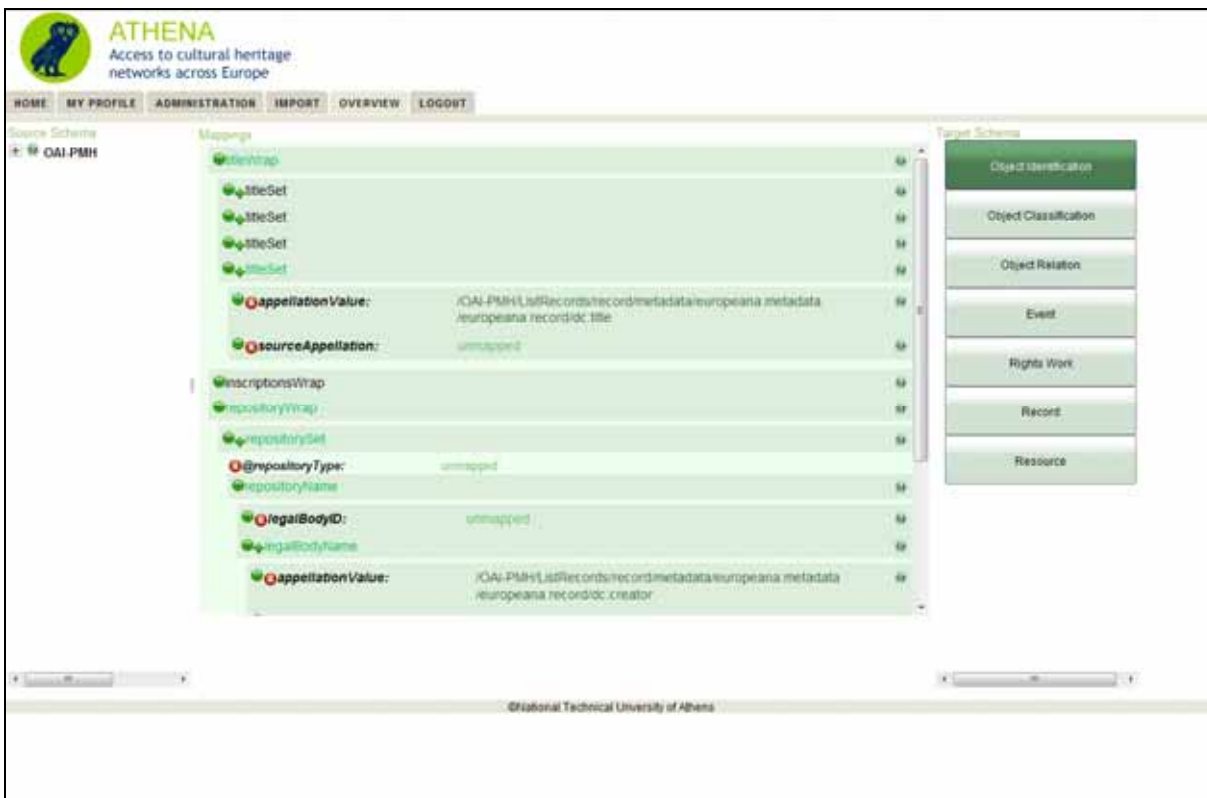
LIDO is at the heart of the ATHENA system. It is the concrete result of ATHENA project's desire to enable the potentially rich metadata that museums have about their objects, together with links to digital surrogates for them, to be used in the service environment of a portal.

Museums will either be able to:

- Provide their metadata in the *LIDO* schema for direct import into the system;
- Map metadata exported from their system. *LIDO* will be the 'mapped to' side (right-hand side) of a mapping process with their own metadata at the 'mapped from' (left-hand side).

The *LIDO* schema itself is the key document for the ATHENA system. It provides the 'rules' that the system uses and also gives the user help in using *LIDO* via its embedded documentation.

Here is a screenshot of an early version of the ATHENA system showing a mapping in progress:



The work of the project is of course focussed on providing digital to Europeana so the mapping given in the next section can be used to transform *LIDO* metadata into the *ESE* format and subsequently into any other more complex form that Europeana will require.

Finally metadata from the ATHENA system can be validated by Europeana and then harvested for ingestion.



3.2 Mapping from SPECTRUM to LIDO in the ATHENA System and ESE

Only *SPECTRUM* ‘Units of information’ (approximately elements) relevant to *LIDO* and the Europeana service and discovery environments are included in the mapping. (People = People (cultural group); Per = Person; Org = Organisation). The *SPECTRUM* Units are arranged into ‘Information groups’. Units in these groups sometimes do not map into the same set of wrapper elements in *LIDO*.

Object identification information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Object number</i>	[Object Identification] ⇒ repositoryWrap ⇒ repositorySet ⇒ workID (no type attribute)	dc:identifier
<i>Other number</i>	[Object Identification] ⇒ repositoryWrap ⇒ repositorySet ⇒ workID (type attribute = data from <i>Other number type</i> Unit)	dc:description [possibly with label]
<i>Other number type</i>	[See above]	[label of above]
<i>Brief description</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (no type attribute) ⇒ descriptiveNoteValue	dc:description [possibly with label]
<i>Comments</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (type attribute = ‘Comments’) ⇒ descriptiveNoteValue	dc:description [possibly with label]
<i>Distinguishing features</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (type attribute = ‘Distinguishing-features’) ⇒ descriptiveNoteValue	dc:description [possibly with label]
<i>Number of objects</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (type attribute = ‘Number-of-objects’) ⇒ descriptiveNoteValue	dc:description [possibly with label]



<i>Object name</i> [if no title only]	[Object Identification] ⇒ titleWrap ⇒ titleSet ⇒ appellationValue	dc:title
<i>Object name</i>	[Object Classification] ⇒ objectWorkTypeWrap ⇒ objectWorkType ⇒ term	dc:type
<i>Title</i>	[Object Identification] ⇒ titleWrap ⇒ titleSet ⇒ appellationValue	dc:title

Object production information

When exporting SPECTRUM data into the LIDO schema data it is necessary to populate the appropriate *term* element with the data = ‘creation’ to indicate the SPECTRUM event type. We have chosen ‘creation’ rather than ‘object production’ to follow *LIDO* practise.

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
[SPECTRUM event type term]	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term (with data = ‘creation’)	[not mapped]

<i>Object production date</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:created
<i>Object production date</i> [earliest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	dcterms:created
<i>Object production date</i> [latest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	[concatenation of <i>LIDO</i> elements data]
<i>Object production date</i> [period]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ periodName ⇒ term	dcterms:created
<i>Object production organisation</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:creator
<i>Object production organisation</i> [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See Organisation information group below]	dc:creator [concatenation of <i>LIDO</i> elements data]
<i>Object production people</i>	[Event] ⇒ eventSet ⇒ event ⇒ culture ⇒ term	dc:creator
<i>Object production person</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:creator
<i>Object production person</i> [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See Person information group below]	dc:creator [concatenation of <i>LIDO</i> elements data]



<i>Object production place</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ displayPlace	dcterms:spatial
<i>Object production place</i> [controlled – for each term]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ namePlaceSet ⇒ appellationValue	dcterms:spatial
<i>Technique</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventMaterialsTech ⇒ materialsTech ⇒ termMaterialsTech (attribute type = ‘Technique’) ⇒ term	dc:subject

Object collection information

When exporting SPECTRUM data into the LIDO schema data it is necessary to populate the appropriate *term* element with the data = ‘field collection’ to indicate the SPECTRUM event type.

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
[SPECTRUM event type term]	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term (with data = ‘field collection’)	[not mapped]
<i>Field collection date</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:temporal
<i>Field collection date</i> [earliest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	dcterms:temporal
<i>Field collection date</i> [latest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	dcterms:temporal
<i>Field collection date</i> [Date - period]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ periodName ⇒ term	dcterms:temporal
<i>Field collection event name</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventName ⇒ appellationValue	dc:subject
<i>Field collection event reference number</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventID	[not mapped?]
<i>Field collection method</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventMethod ⇒ term	[not mapped?]
<i>Field collection number</i>	[Object Identification] ⇒ repositoryWrap ⇒ repositorySet ⇒ workID (type attribute = ‘Field-collection-number’)	[not mapped?]
<i>Field collection place</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ displayPlace	dcterms:spatial
<i>Field collection place</i> [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ [See <i>Place information</i> group below]	dcterms:spatial [concatenation of <i>LIDO</i> elements data]
<i>Field collector</i> (Org or Per) [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:subject
<i>Field collector</i> (Org or Per) [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See	dc:subject



	<i>Organisation information</i> or <i>Person information</i> groups below]	[concatenation of <i>LIDO</i> elements data]
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SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Geological complex name</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ placeClassification (type attribute = ‘Geological-complex’) ⇒ term	dc:subject
<i>Habitat</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ placeClassification (type attribute = ‘Habitat’) ⇒ term	dc:subject
<i>Stratigraphic unit name</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ placeClassification (type attribute = ‘Stratigraphic-unit’) ⇒ term	dc:subject



Object description information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Age</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = 'Age')	dc:description [possibly with label]
<i>Colour</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = 'Colour')	dc:subject
<i>Content - activity</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectConcept ⇒ term (attribute type = 'Content-activity')	dc:subject
<i>Content - concept</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectConcept ⇒ term (attribute type = 'Content-concept')	dc:subject
<i>Content - date</i> [simple string]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectDate ⇒ displayDate	dcterms:temporal
<i>Content - date</i> [earliest]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectDate ⇒ date ⇒ earliestDate	dcterms:temporal [concatenation of LIDO elements data]
<i>Content - date</i> [latest]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectDate ⇒ date ⇒ latestDate	
<i>Content - date</i> [period]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectDate ⇒ date ⇒ periodName ⇒ term	dcterms:temporal
<i>Content - description</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ displaySubject	dc:description [possibly with label]
<i>Content - event name</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectEvent ⇒	dc:subject



	event ⇒ eventName ⇒ appellationValue	
<i>Content - note</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ displaySubject (attribute label = 'Content-note')	dc:description [possibly with label]
<i>Content - object</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectObject ⇒ object ⇒ objectNote	dc:subject



SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Content - organisation</i> [simple string]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectActor ⇒ displayActor	dc:subject
<i>Content - organisation</i> [analysed]	[Object Relations] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectActor ⇒ actor ⇒ [see <i>Organisation Information</i> group below]	dc:subject [concatenation of <i>LIDO</i> elements data]
<i>Content - other</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ displaySubject	dc:subject
<i>Content - people</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectConcept (attribute type = ‘Culture’) ⇒ term	dc:subject
<i>Content - person</i> [simple string]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectActor ⇒ displayActor	dc:subject
<i>Content - person</i> [analysed]	[Object Relations] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectActor ⇒ actor ⇒ [see <i>Organisation Information</i> group below]	dc:subject [concatenation of <i>LIDO</i> elements data]
<i>Content - place</i> [simple string]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectPlace ⇒ displayPlace	dcterms:spatial
<i>Content - place</i> [controlled terms]	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectPlace ⇒ place ⇒ namePlaceSet ⇒ appellationValue [see also <i>Place Information</i> group below]	dcterms:spatial
<i>Content - position</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ extentSubject	dc:description [possibly with label]
<i>Content note</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ displaySubject (attribute label	dc:description [possibly with



	= 'Content-note')	label]
<i>Copy number</i>	[Object Identification] ⇒ displayStateEditionWrap ⇒ displayEdition (attribute label = 'Copy-number')	dc:description [possibly with label]



SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
[single string for dimensions]	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ displayObjectMeasurements	dcterms:extent
<i>Dimension</i> [for each dimension of each part]	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute type = [data for this Unit])	dcterms:extent [concatenation of LIDO elements data]
<i>Dimension measured part</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet ⇒ extentMeasurements	
<i>Dimension value</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute value = [data for this Unit])	
<i>Dimension measurement unit</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute unit = [data for this Unit])	
<i>Dimension value qualifier</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet ⇒ qualifierMeasurements	
<i>Edition number</i>	[Object Identification] ⇒ displayStateEditionWrap ⇒ displayEdition (attribute label = ‘Edition-number’)	dc:description [possibly with label]
<i>Form</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = ‘Form’)	dc:subject
<i>Inscription content</i>	[Object Identification] ⇒ inscriptionsWrap ⇒ inscriptions	dc:description [possibly with label]
<i>Inscription description</i>	[Object Identification] ⇒ inscriptionsWrap ⇒ inscriptions	dc:description [possibly with label]



SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Material</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventMaterialsTech ⇒ materialsTech ⇒ termMaterialsTech (attribute type = ‘material’) ⇒ term	dc:terms:medium
<i>Object status</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = ‘Object-status’)	dc:subject
<i>Phase</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = ‘Phase’)	dc:subject
<i>Physical description</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (type attribute = ‘Physical-description’) ⇒ descriptiveNoteValue	dc:description [possibly with label]
<i>Sex</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = ‘Sex’)	dc:subject
<i>Style</i>	[Object Classification] ⇒ classificationWrap ⇒ classification ⇒ term (attribute type = ‘Style’)	dc:subject

[single string for technical attributes]	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ displayObjectMeasurements	dc:terms:extent
<i>Technical attribute</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute type = [data for this Unit])	dc:terms:extent [concatenation of
<i>Technical attribute measurement</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute value = [data for this Unit])	<i>LIDO</i> elements data]
<i>Technical attribute measurement unit</i>	[Object Identification] ⇒ objectMeasurementsWrap ⇒ objectMeasurementsSet ⇒ objectMeasurements ⇒ measurementsSet (attribute unit = [data for this Unit])	

Object history and association information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Association type</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term	[not mapped]
<i>Association note</i>	[Event] ⇒ eventSet ⇒ event ⇒ culture ⇒ eventDescriptionSet ⇒ descriptiveNoteValue	dc:description [possibly with label]
<i>Associated activity</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectConcept (attribute type = ‘Associated-activity’) ⇒ term	dc:subject
<i>Associated concept</i>	[Object Relation] ⇒ subjectWrap ⇒ subjectSet ⇒ subject ⇒ subjectConcept (attribute type = ‘Associated-concept’) ⇒ term	dc:subject
<i>Associated cultural affinity</i>	[Event] ⇒ eventSet ⇒ event ⇒ culture ⇒ term	dc:subject
<i>Associated date</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:temporal
<i>Associated date</i> [earliest]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	dcterms:temporal
<i>Associated date</i> [latest]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	dcterms:temporal
<i>Associated date</i> [period]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ periodName ⇒ term	dcterms:temporal

<i>Associated event date</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:temporal
<i>Associated event date</i> [earliest]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	dcterms:temporal
<i>Associated event date</i> [latest]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	dcterms:temporal
<i>Associated event date</i> [period]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ periodName ⇒ term	dcterms:temporal
<i>Associated event name</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventName ⇒ appellationValue	dc:subject



<i>Associated event organisation</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ actorInRole ⇒ displayActorInRole	dc:subject
<i>Associated event people</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ culture ⇒ term	dc:subject



SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Associated event person</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:subject
<i>Associated event person</i> [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See <i>Person information</i> group below]	dc:subject [concatenation of LIDO elements data]
<i>Associated event place</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ displayPlace	dcterms:spatial
<i>Associated event place</i> [controlled terms]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ namePlaceSet ⇒ appellationValue [see also <i>Place Information</i> group below]	dcterms:spatial

<i>Associated object</i>	[Event] ⇒ eventSet ⇒ event ⇒ thingPresent ⇒ displayObject	dc:subject
<i>Associated organisation</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:subject
<i>Associated organisation</i> [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See <i>Organisation information</i> group below]	dc:subject [concatenation of LIDO elements data]
<i>Associated people</i>	[Event] ⇒ eventSet ⇒ event ⇒ culture ⇒ term	dc:subject
<i>Associated place</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ displayPlace	dcterms:spatial
<i>Associated place</i> [controlled terms]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ namePlaceSet ⇒ appellationValue [see also <i>Place Information</i> group below]	dcterms:spatial



SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Object history note</i>	[Object Identification] ⇒ objectDescriptionWrap ⇒ objectDescriptionSet (type attribute = ‘Object-history-note’) ⇒ descriptiveNoteValue	dcterms:provenance
[SPECTRUM event type term]	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term (with data = ‘ownership’)	[not mapped]
<i>Owner</i> (Org or Per) [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ displayActorInRole	dc:subject
<i>Owner</i> (Org or Per) [analysed]	[Event] ⇒ eventSet ⇒ event ⇒ eventActor ⇒ actorInRole ⇒ actor ⇒ [See <i>Organisation information</i> or <i>Person information</i> groups below]	dc:subject [concatenation of LIDO elements data]
<i>Ownership dates</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:temporal
<i>Ownership dates</i> [earliest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	dcterms:temporal
<i>Ownership dates</i> [latest date]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	dcterms:temporal
<i>Ownership dates</i> [period]	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ periodName ⇒ term	dcterms:temporal
<i>Ownership place</i> [single string]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ displayPlace	dcterms:spatial
<i>Ownership place</i> [controlled – for each term]	[Event] ⇒ eventSet ⇒ event ⇒ eventPlace ⇒ place ⇒ namePlaceSet ⇒ appellationValue [see also <i>Place Information</i> group below]	dcterms:spatial
<i>Related object number</i>	[Event] ⇒ eventSet ⇒ event ⇒ thingPresent ⇒ object ⇒ objectID	dc:relation



Object rights information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Right begin date</i>	[Rights Work] ⇒ rightsWorkSet ⇒ rightsDate ⇒ earliestDate	dc:rights
<i>Right holder</i> (Org, Peo, Per)	[Rights Work] ⇒ rightsWorkSet ⇒ rightsHolder ⇒ legalBodyName ⇒ appellationValue	[concatenation if no suitable credit line available]
<i>Right type</i> [usually copyright here]	[Rights Work] ⇒ rightsWorkSet ⇒ rightsType	
[Credit line referring to copyright in general]	[Rights Work] ⇒ rightsWorkSet ⇒ creditLine	dc:rights

Acquisition information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
[SPECTRUM event type term]	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term (with data = ‘acquisition’)	[not mapped]
<i>Acquisition date</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ displayDate	dcterms:provenance
<i>Acquisition method</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventMethod ⇒ term	[concatenation of LIDO elements data]



Use of collections information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
[SPECTRUM event type term]	[Event] ⇒ eventSet ⇒ event ⇒ eventType ⇒ term (with data = 'exhibition')	[not mapped]

<i>Exhibition reference number</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventID	dcterms:provenance [concatenation of LIDO elements data]
<i>Exhibition begin date</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ earliestDate	
<i>Exhibition end date</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventDate ⇒ date ⇒ latestDate	
<i>Exhibition title</i>	[Event] ⇒ eventSet ⇒ event ⇒ eventName ⇒ appellationValue	
<i>Venue (Org)</i>	[Event] ⇒ eventSet ⇒ event ⇒ actorInRole ⇒ displayActorInRole	



Reference information

Links to digital content

In order to successfully submit data for ingestion by Europeana a content provider must give URL links that point to their **online** digital content (probably on an organisational website, portal, or in content repository). In Europeana the metadata for these are contained in two elements in *ESE*:

- **europaena:IsShownBy** – Digital content itself (e.g. an image, sound, text, or video file);
- **europaena:IsShownAt** – Digital content in context with descriptive metadata (i.e. a webpage).

Content providers must provide data (i.e. URL links) for one or both of these elements.

Links to thumbnails

The URL link to a thumbnail image of the content, for use within Europeana, is held within the **europaena:object** element. Content providers can provide a thumbnail in one of two ways. They can:

- Give a URL to a suitable online thumbnail on their website;
- Give the same URL as is being given for the **IsShowBy** element.

Europeana prefers the first of these because of the time will take to create thumbnails from the second option.

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Reference</i> [for online digital image of the object]	[Resource] ⇒ resourceSet ⇒ linkResource (type attribute = image_master) AND [Resource] ⇒ resourceSet ⇒ resourceType [with data = 'Digital Image']	europaena:IsShownBy
<i>Reference</i> [for online web page containing digital image of the object in context]	[Record] ⇒ recordInfoSet ⇒ recordInfoLink	europaena:IsShownAt

<i>Reference</i> [for online suitable thumbnail digital image of the object]	[Resource] ⇒ resourceSet ⇒ linkResource (type attribute = image_master) AND [Resource] ⇒ resourceSet ⇒ resourceType [with data = 'Digital Image']	europaena:object
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In a *SPECTRUM*-based system there should be data in the *Reference type* Unit of information which should enable the needed data to be located.

For completeness we include the following mapping from this *SPECTRUM* information group:

<i>Catalogue number</i>	[Object Identification] ⇒ displayStateEditionWrap ⇒ displayEdition (attribute label = 'Catalogue-number')	dcterms:provenance
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Date information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Date - earliest/single</i>	[Wrapper elements] ⇒ date ⇒ earliestDate	dcterms:temporal
<i>Date - latest</i>	[Wrapper elements] ⇒ date ⇒ latestDate	[concatenation of <i>LIDO</i> elements data]
<i>Date - period</i>	[Wrapper elements] ⇒ date ⇒ periodName ⇒ term	dcterms:temporal

Organisation information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
Organisation's additions to name	[Wrapper elements] ⇒ actor ⇒ nameActorSet ⇒ appellationValue (attribute type = 'Additions-to-name')	[part of another element mapping]
Organisation's dissolution date	[Wrapper elements] ⇒ actor ⇒ vitalDatesActor (attribute deathDate = [data from Unit])	
Organisation's foundation date	[Wrapper elements] ⇒ actor ⇒ vitalDatesActor (attribute birthDate = [data from Unit])	



	Unit))	
Organisation's foundation place	[Wrapper elements] ⇒ actor ⇒ nationalityActor ⇒ term	
Organisation's reference number	[Wrapper elements] ⇒ actor ⇒ actorID	

Person information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Person's additions to name</i>	[Wrapper elements] ⇒ actor ⇒ nameActorSet ⇒ appellationValue (attribute type = 'Additions-to-name')	[part of another element mapping]
<i>Person's association</i>	[Wrapper elements] ⇒ actor ⇒ roleActor ⇒ term	
<i>Person's birth date</i>	[Wrapper elements] ⇒ actor ⇒ vitalDatesActor (attribute birthDate = [data from Unit])	
<i>Person's death date</i>	[Wrapper elements] ⇒ actor ⇒ vitalDatesActor (attribute deathDate = [data from Unit])	
<i>Person's forenames</i>	[Wrapper elements] ⇒ actor ⇒ nameActorSet ⇒ appellationValue (attribute type = 'Forenames')	
<i>Person's gender</i>	[Wrapper elements] ⇒ actor ⇒ genderActor	
<i>Person's group</i>	[Wrapper elements] ⇒ actor ⇒ nationalityActor ⇒ term (attribute label = 'Cultural-group')	
<i>Person's nationality</i>	[Wrapper elements] ⇒ actor ⇒ nationalityActor ⇒ term	
<i>Person's reference number</i>	[Wrapper elements] ⇒ actor ⇒ actorID	
<i>Person's surname</i>	[Wrapper elements] ⇒ actor ⇒ nameActorSet ⇒ appellationValue (attribute type = 'Surname')	
<i>Person's title</i>	[Wrapper elements] ⇒ actor ⇒ nameActorSet ⇒ appellationValue (attribute type = 'Title')	



Place information

SPECTRUM Unit of information	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
<i>Place name</i>	[Wrapper elements] ⇒ place ⇒ namePlaceSet ⇒ appellationValue (attribute type = [data from <i>Place name type</i> Unit])	[part of another element mapping]
<i>Place name type</i>	[see above]	
<i>Place reference number</i>	[Wrapper elements] ⇒ place ⇒ placeID (attribute type = [data from <i>Place reference number type</i> Unit])	
<i>Place reference number type</i>	[see above]	

ESE provider and source elements

The content for these elements will have to be supplied by the service giving content and metadata to Europeana. *SPECTRUM* is usually part of the collections management ‘use environment’ of an individual organisation. Therefore these elements are not stored as data but are usually implicit. Content providers for the ATHENA system should try to provide data for the appropriate LIDO elements that are then mapped to ESE. There are two scenarios:

Content from an organisation (not an aggregator):

Data	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
Name of the organisation	[Record] ⇒ recordSource ⇒ legalBodyName ⇒ sourceAppellation	europa:provider



Content from an aggregator with many source organisations:

Data	LIDO elements path in the ATHENA system – element containing data in bold	ESE element
Name of the aggregator	[Record] ⇒ recordSource ⇒ legalBodyName ⇒ sourceAppellation	europeana:provider
Name of the source organisation	[Object Identification] ⇒ repositoryWrap ⇒ repositorySet ⇒ repositoryName ⇒ legalBodyName ⇒ appellationValue	dc:source

4. Note on Annexes

Parts of this deliverable are in annexes as separate documents. These are the:

- LIDO schema (lido-0-8.xsd);
- LIDO Technical Documentation (lido-0-8.pdf)

Both of these were generated by the ModesXML programme.