

## D4.2: Interim Report on Metadata Creation

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3D ICONS is funded by the European Commission's  
ICT Policy Support Programme



## Revision History

Rev.	Date	Author	Org.	Description
0.1	18/11/13	A. D'Andrea	CISA	Draft
0,2	19/11/13	S. Bassett	MDR	Review and Editing
0.3	22/11/13	K. Fernie	MDR	Review and Editing
0.4	26./11/13	V. Tzouvaras	NTUA	Review
0.5	27/11/13	D. Gavrillis	CETI	Review
1.0	29/11/13	A. D'Andrea	CISA	Second Draft
1.1	29/11/13	S. Bassett	MDR	Review and Editing
2.0	09/06/14	A. D'Andrea	CISA	Third Draft

### Revision: [Final]

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### Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.



3D-ICONS is a project funded under the European Commission's ICT Policy Support Programme, project no. 297194.

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## Executive Summary

Deliverable 4.2 (Interim report on metadata creation) is a first overview of all the aspects concerning the creation of the metadata of the 3D objects that will be supplied to Europeana by the partners. The report concerns the progress of the metadata creation, the problems encountered and the actions undertaken within the framework of the task 4.2. supervised by CISA with the collaboration of MAP. The task, started at the month 12 of the project, is related to all semantic improvements defined in the WP6 and to the analysis of the preexisting legacy data already created by the partners in other research, but not compliant with the standard adopted by the project. Finally, the task aims to identify guidelines for the definition of the relationships between the quality control, established in task 2.2, and new elements introduced in the new CARARE 2.0 schema.

After the approval of the new CARARE 2.0 schema (Deliverable 6.1), some case studies have been chosen and tested. Starting from the analysis of the results obtained and from the activities carried out by the partners, two workshops have been organized in 2013 with the scope to identify a set of common approaches aiming to harmonize the elaboration of a pipeline for the metadata and of a strategy for the definition of paradata and provenance information.

This interim report begins with the progress on metadata creation with a particular focus on the problems encountered and actions undertaken (see Section 1). Section 2 introduces a simplistic approach on creating metadata provided by CETI with the contributions of CISA and MDR, while section 3 deals with a metadata editor tool designed and developed to facilitate the metadata creation by each partner and by the new or future associate partners. The metadata enrichment is provided in the section 4. The mapping and the final publication procedures are discussed in the section 5 with the related tools (MINT2 and MORE2). In the conclusions some proposals are outlined for the further steps of this activity and the definition of a well-consolidated pipeline from the 3D model to the metadata ingested into Europeana. In Appendix A, an XML file is provided as a practical example of a real record encoded according to the CARARE 2.0 schema.

After the annual Technical Review, held in Brussels on 1<sup>st</sup> April 2014, the 5.1 paragraph and the Conclusions have been partially re-written on the basis of the reviewers' recommendations. The paragraphs give an overview on the methodology for the metadata creation, in order to mitigate potential risks with respect to metadata-delivering to Europeana; and shows some tables allowing the monitoring of the publication process. Furthermore, issues concerning statistic and rights are also shown. Two checkpoints, in months 30 and 33, have been introduced in order to undertake an in-depth review and needed remedial actions to reduce possible further delays.

## 1. Metadata creation activities: problems encountered and actions undertaken

In March 2013, CISA, with support from MDR, delivered the new metadata schema (CARARE 2.0) for 3D models (Deliverable 6.1). The original CARARE schema was improved in light of experience gained from ingestion of metadata to Europeana in the CARARE project and mapping to the EDM along with an extension which included provenance and technical data (London Charter paradata). CETI also participated in the evolution of the CARARE schema to CARARE 2.0 and focused on a number of issues related with the collection of 3D digitization metadata and how these will be organized in the extended version of the initial CARARE schema.

After the approval of the deliverable, which occurred at the end of June, CETI dealt with the creation of the XSD schema on the basis of the approved deliverable. Later CETI, in collaboration with CISA and MDR, started some technical tests in order to implement an XML file sample according to the schema and compliant with its cardinalities and compulsoriness. An outline of the mapping on EDM has been also implemented.

The metadata creation activity has not yet started due to various reasons. Firstly, the deliverable on the new metadata schema was submitted in March and approved at the end of June; so tests on the schema started after this. Furthermore, an important issue emerged during period 3; that is when the project began, the overall metadata status of each partner was not clear. Only three partners had participated in CARARE (CAAI, CETI and STARC) and were already experienced with metadata, existing schemas and tools (although some updates must be carried out for 3D-ICONS), while the majority of the other partners were not familiar with creating metadata from scratch or their schemas wasn't compatible with the new CARARE 2.0 without extensive transformations. While the previous CARARE project adopted a schema able to capture automatically, by means of a targeted mapping carried out by the tool MINT, the information included in National or local repositories and archives to CARARE 1.0 and finally to the Europeana model, 3D-ICONS updated the CARARE 1.0 schema mainly for data that wasn't present in pre-existing databases or national standard.

A short summary of the diverse situations of some partners and the existing different issues in terms of metadata, mapping and final publication follows:

**CYI-STARC** has already started with the creation of the metadata files according to its CARARE-compliant schema. CYI-STARC has an estimate of hundreds of deliverable products associated with the corresponding metadata files. However, some of the new

fields introduced into the CARARE 2.0 schema do not map to the existing CYI-STARC schema, an issue which is currently being worked on.

**UJA-CAAI** is revising their metadata to comply with the new CARARE 2.0 schema (they used the original CARARE schema).

**POLIMI** has most of their metadata recorded on the base of a regional standard (SIRBEC) only partially compliant with the CARARE Schema. As their schema does not contain all of the required elements (e.g. there is no information on the acquisition and creation of the 3D model) more metadata will be added. They probably will be able to complete and start mapping their metadata in MINT2 soon.

**DISC** has produced an in-house spreadsheet for the creation of metadata to enable migration as csv file to the Discovery Programme's DSpace repository. Fields within the spreadsheet conform to Dublin Core and associated CARARE mappings as detailed in CARARE V1.0 documentation. Consequently, some additional data will be added to be compliant with CARARE 2.

**MAP** developed, within the framework of other projects and research, its own schema for the 3D data that is incompatible with the CARARE 2.0 schema. MAP will try to map its schema on CARARE 2.0 and add the required new information in relation to provenance and paradata.

**CETI** has completed the post-processing of the Kioutouklou Baba Tekke monument 3D model and the post processing of 3D data from two other monuments (Panagia Kalamou and Kosmosotira) is currently in progress. A CARARE 2.0 schema-based metadata example for the Kioutouklou Baba Tekke monument has been created. The current example carries information about the actual heritage asset but also depicts in detail the relations between the different data collection phases and post-processing phases that were performed in order to create the monument's 3D digital replica.

The remaining content provider partners will start from scratch their activity of metadata creation.

To provide training and overcome the above mentioned difficulties, two workshops were organized. The first was organized by CETI along with NTUA and held in Xanthi, Greece, 27-29 June 2013, the latter in Marseilles on the 30th and 31<sup>st</sup> October 2013, organized by MDR and MAP in the framework of the International Congress DigitalHeritage2003. The training covered the new CARARE metadata schema and the use and functionality of the MINT2 and MoRE2 tools. Furthermore, a metadata creation tool approved in the meeting held in

Naples at the beginning of September and later developed by CETI has been discussed, revisited and tested. After the Marseilles workshop, some partners started creating metadata for import into MINT2 on a test basis, others are testing the metadata editor tool which is not yet completely operational (some final improvements and bug fixes are being implemented).

Consequently, 3D ICONS has had to widen its remit to help partners who have little or no metadata experience by defining a process and providing tools to enable metadata to be created from scratch as efficiently and easily as possible.

## 2. A simplistic approach on creating metadata

At the end of October, after a long revision process, an internal report was provided by CETI in collaboration with CISA and MDR. The report, entitled “Providing XML Metadata in the CARARE 2.0 schema. A simplistic approach on creating metadata for the 3D-ICONS project”, contains some guidelines to assist the partners to generate their metadata files. The report provides a simple procedure for creating metadata complying with the CARARE 2.0 schema.

All 3D digital models provided by the 3D-ICONS project to Europeana are associated with metadata registered according to the CARARE 2.0 schema. Each 3D digital replica is defined as an entity or a detail and it is assigned as a heritage asset according to the CARARE 2.0 schema and thus must be followed by its own metadata (including provenance and paradata).

The simplistic pipeline of metadata creation and provision can be divided into three steps:

1. Creating a blank XML file template utf-8 file preparation and metadata input
2. Upload to MINT 2.0 tool and XML validity check
3. Publication to MORE 2.0 tool

The pipeline can be considered as a solution by a partner that doesn't have legacy metadata (e.g. Database with metadata following a different schema). It is based on the scenario that the content provider wants to create their metadata from scratch. The proposed process is divided into two main phases, the first one is the preparation and the second one is the creation of a template xml file.

The first phase of the process aims at creating a blank XML file. Starting from the XSD file of the CARARE 2.0 schema, a blank file containing a list of all elements can be generated by an

XML software. The generated file corresponds to the schema following its cardinality definitions. The above mentioned report identifies a list of software to facilitate the work of the partners with no (or low) experience in the field of the metadata creation.

Then each partner can reuse this XML file following the procedures in order to create a template (Fig. 1):

1. Opening a generated blank CARARE 2.0 XML file in a text editor and identifying the schema elements that are frequently repeated. The values that are expected to be common for each partner are for example organisation name and address, contact persons, IPR rights, digitisation team members, equipment, methodologies or even digitisation activities. Some other elements could be in common among the partners, e.g. methods, list of terms (for event\_type). Once these elements are identified, the partner can save the file using a different filename. This file can now be considered as the primary XML template file that has been adapted to the partner needs in terms of elements and common content. In the Appendix A it is possible to evaluate the common elements found in the Kioutouklou Baba Teke and how these have been managed.

Finally the template can be opened in an editor and completed. It must be noted that all mandatory elements should be kept in order for the XML file to pass the validation check in MINT 2.0.

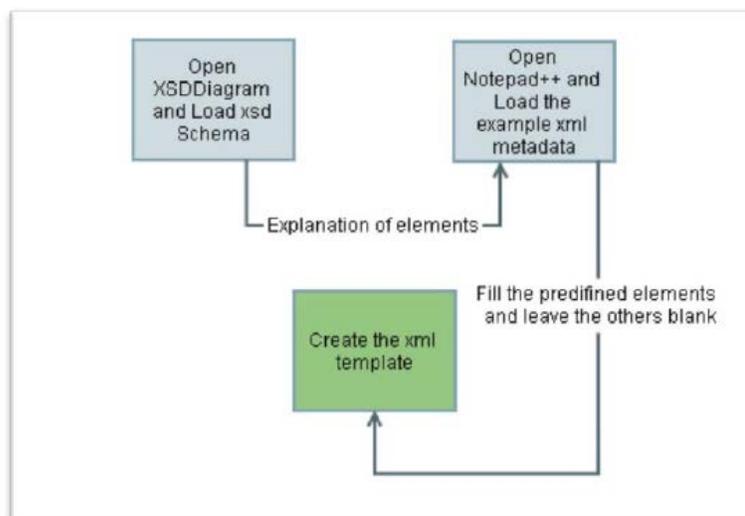


Figure 1 - Adapted XML template creation workflow

The report also deals with the relation between the different themes of the schema. Fig. 2 shows a practical view of how to link correctly the digital replica (Heritage Asset) to specific Activities (Digitization, Post-processing, decimation, etc.) by means of the relation. The name of each relation indicates the type of relationship and the content of these elements, usually Ids or URI, according to the following schema:

### HeritageAssetIdentification

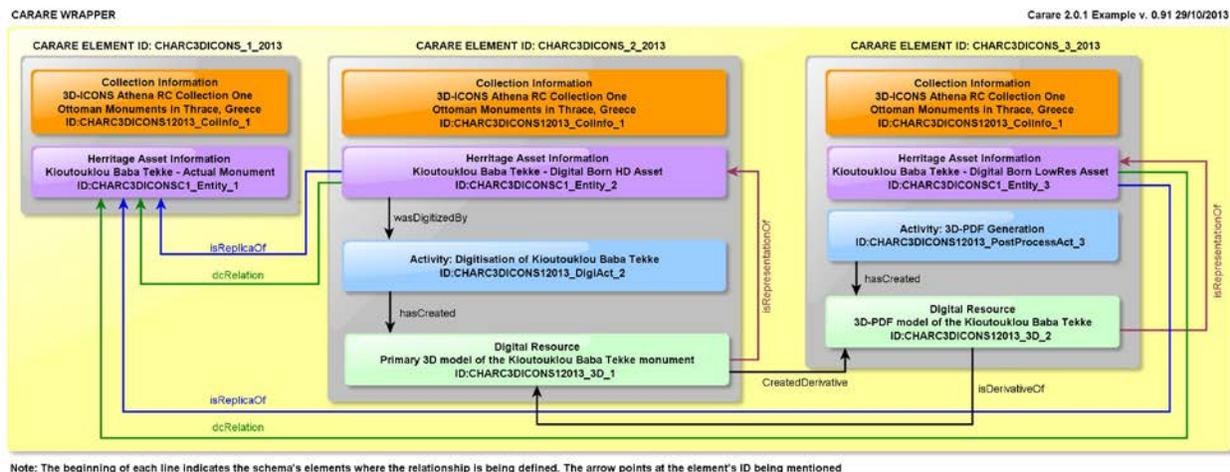
```
<hasRepresentation> </hasRepresentation> <!-- Use Link to URL where the resource is available>
<isSuccessorOf></isSuccessorOf> <!-- Use of HeritageAssetIdentification ID-->
<wasPresentAt></wasPresentAt> <!-- Use of Activity ID-->
<hasPart></hasPart> <!-- Use of HeritageAssetIdentification ID-->
<isPartOf></isPartOf> <!-- Use of HeritageAssetIdentification ID-->
<isReplicaOf></isReplicaOf> <!-- Use of HeritageAssetIdentification ID-->
<wasDigitizedBy> </wasDigitizedBy> <!-- Use of Activity ID-->
```

### DigitalResource

```
<isRepresentationOf> </isRepresentationOf> <!-- ID of the Heritage Asset that the digital resource presents -->
<hasPart></hasPart> <!-- Digital Resource ID-->
<isPartOf></isPartOf> <!-- Digital Resource ID-->
<nextInSequence></nextInSequence> <!-- Digital Resource ID-->
<isPreviousInSequence></isPreviousInSequence> <!-- Digital Resource ID-->
<isDerivativeOf> </isDerivativeOf> <!-- ID of the image set digital resource that was used to produce the
primary 3D model-->
<hasDerivative> </hasDerivative> <!-- ID of the digital resource that is a derivative of this digital resource-->
<createdDerivative></createdDerivative> <!-- Digital Resource ID-->
```

### Activity

```
<occurredAt></occurredAt> <!-- Use of Activity ID-->
<happenedAt></happenedAt> <!-- Place-->
<wasPresentAt></wasPresentAt> <!-- Use of Actor ID-->
<hasPart></hasPart> <!-- Use of Activity ID-->
<isPartOf> </isPartOf> <!-- The data produced has been used in the primary data quality control activity
(This is the activity ID I have used here) -->
<hasCreated> </hasCreated> <!-- Use of Digital Resource ID-->
```



Note: The beginning of each line indicates the schema's elements where the relationship is being defined. The arrow points at the element's ID being mentioned

Figure 2 - Graphical example of the relations among the different themes (Heritage Asset, Digital Resources and Activities) of CARARE 2.0.

### 3. Metadata Editor Tool

The approach described in the previous section is an easy way to create metadata compliant with the schema adopted by those partners with no particular or low competence in the metadata field. Nevertheless, this procedure, based in substance on the copy of the preceding record, could easily lead to some mistakes being made, mainly by those partners having a large quantity of 3D models to be provided to Europeana.

For these reasons, an on-line metadata editor tool (<http://3dicons.dcu.gr/metadata-editor/>), has been designed and implemented to support and facilitate partners in the metadata creation. The results and the experience gained in the test phase during the development of the approach shown previously have been relevant for the design of the tool. Another important consideration in developing a specific tool lies in the possible further utilization of the schema by data providers associated or not associated to 3D-ICONS project dealing with creation and publication of 3D models with a need to create the metadata.

The tool is basically set up on the declarations of blocks or groups of information that are repeated for each record and that the partners can choose from a drop-down list. These are: Organization, Collection, Actor, Activity, Spatial data, Temporal data and Digital Resources (Fig. 3).

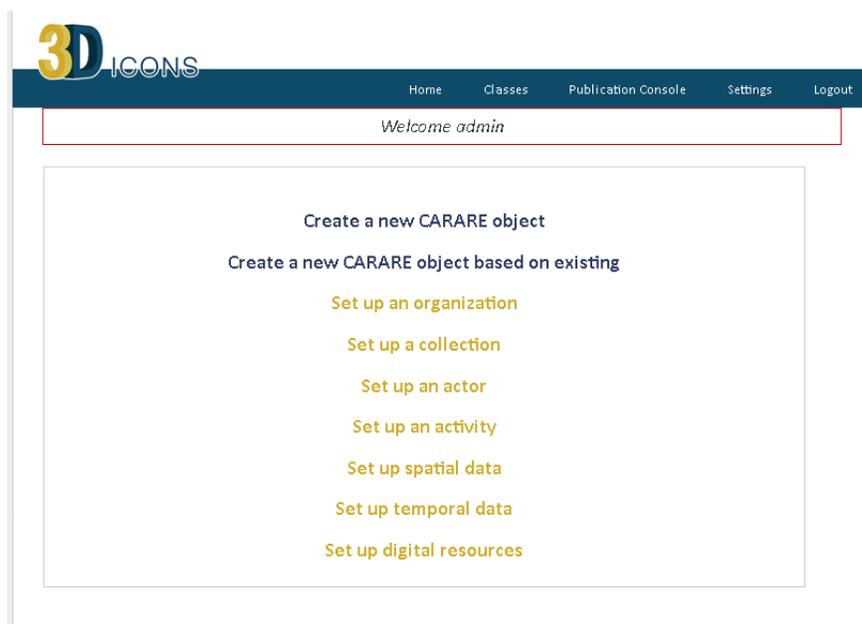


Figure 3 - The setting up of the basic information

The tool is accessible with a password dedicated for each partner. In order to avoid mistakes and confusion, each partner can reuse only the block of information that it filled. In addition to the menu for Home, Classes, the main page includes a Publication Console aimed at giving an important function to control the correctness of the filled data.

After compiling the initial blocks of information, the metadata author can proceed to the adding of a record starting from Heritage Asset. In a few simple steps, it is possible to complete a record. In the first two steps the author can recall (Fig. 4) the information already loaded (Organization, Collection) from an existing list. Before creating a Heritage Asset it is also possible to add information for Digital Resource and this information will be recalled in the specific tabs under the Heritage Asset form (Fig. 5).

If the author wants to create a Digital Resources and Activity independently from the Heritage Asset section, they can use the corresponding forms (Figs 6-8). Later this information will be present in the Heritage Asset form (Fig. 9). At the end of the form filling, the author can visualize the object in a list and browse or export the corresponding XML file (Fig. 10).

Figure 4 - Heritage Asset's form

Figure 5 - Heritage Asset form with specific tabs for Digital Resources and Activities

Digital Resource

Record Information

Actors

Relations

\*\*Appellation Name:  ⊕  
lang: English   
pref: NO

\*\*Description:  ⊕  
lang: English   
pref: NO

\*\*Link:

\*\*Object:

\*Type:  ⊕

\*Format:  ⊕  
lang: English

\*Copyright Credit Line:   
lang: English

Language:  ⊕  
lang: English

Access Rights:   
lang: English

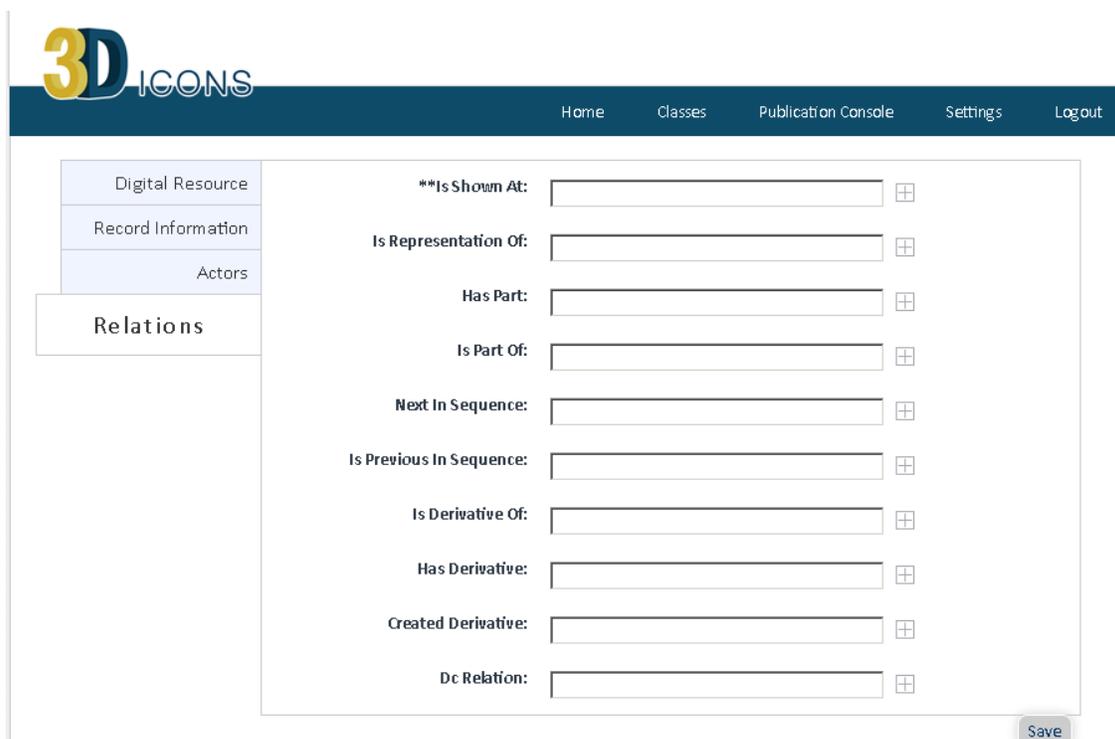
Reproduction Rights:   
lang: English

Licence:   
lang: English

Euro peens Rights:  ⊕

[Additional Information](#)

Figure 6 - Defining a Digital Resource

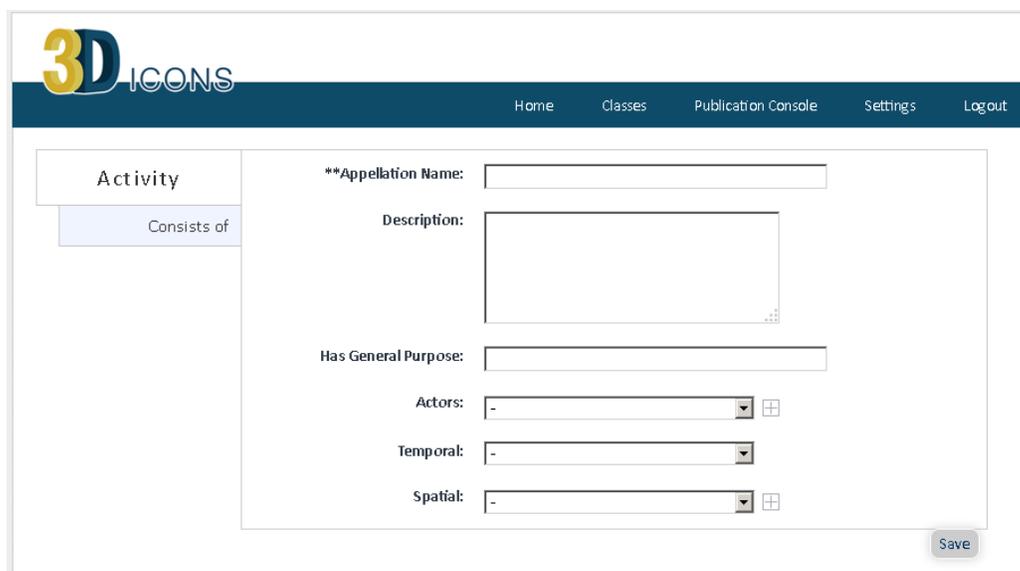


The screenshot shows the '3D ICONS' web application interface. The top navigation bar includes 'Home', 'Classes', 'Publication Console', 'Settings', and 'Logout'. On the left, a sidebar menu has 'Relations' selected. The main content area contains the following fields:

- \*\*Is Shown At:**
- Is Representation Of:**
- Has Part:**
- Is Part Of:**
- Next In Sequence:**
- Is Previous In Sequence:**
- Is Derivative Of:**
- Has Derivative:**
- Created Derivative:**
- Dc Relation:**

A 'Save' button is located at the bottom right of the form area.

Figure 7 - Defining the relations for a Digital Resource



The screenshot shows the '3D ICONS' web application interface. The top navigation bar includes 'Home', 'Classes', 'Publication Console', 'Settings', and 'Logout'. On the left, a sidebar menu has 'Consists of' selected. The main content area contains the following fields:

- \*\*Appellation Name:**
- Description:**
- Has General Purpose:**
- Actors:**
- Temporal:**
- Spatial:**

A 'Save' button is located at the bottom right of the form area.

Figure 8 - Defining an Activity

*Add Heritage Asset information*

Organization   Collection   **Heritage Asset** Step 3 of 3

**Heritage Asset**   Digital Resources   Activities

<p>Heritage Asset</p> <p>*Record Information</p> <p>Designations</p> <p>Conditions</p> <p>*Characters</p> <p>Publication Statement</p> <p>**Rights</p> <p>References</p> <p>Relations</p>	<p><b>**Appellation Name:</b> <input style="width: 80%;" type="text"/> <input type="button" value="⊞"/></p> <p>lang: <input type="text" value="English"/> <input type="button" value="v"/>  pref: <input type="text" value="NO"/> <input type="button" value="v"/></p> <p><b>**General Type:</b> <input style="width: 80%;" type="text"/> <input type="button" value="⊞"/></p> <p>*Spatial: <input style="width: 80%;" type="text"/> <input type="button" value="v"/></p> <p>Description: <div style="border: 1px solid #ccc; height: 40px; width: 100%;"></div> <input type="button" value="⊞"/></p> <p>lang: <input type="text" value="English"/> <input type="button" value="v"/></p> <hr style="border-top: 1px dashed #000;"/> <p style="text-align: center;"><i>Additional Information</i> <input type="button" value="v"/></p>
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Figure 9 - Defining a Heritage Asset



Figure 10 - The registered object and the XML file produced

## 4. Metadata enrichments

In the section 6 of deliverable D6.1 same recommendations on the metadata enrichments and LOD are provided to help partners to create resources by using persistent identifiers or by identifying standardized references (URI). As the standardization will facilitate implementing Linked Open Data, the section 5 of the deliverable gives a list of Thesaurii and Authority Lists (The ICCD/CulturaItalia, The Getty Research Institute, English Heritage, The European Heritage Network (HEREIN), Mérimée, Royal Museum of Art and History of Bruxelles). The use of widely accepted lists and standard will contribute to the development and promoting the use of semantic tools enabling interoperability, integration and reuse of 3D models via Europeana for professional, research and commercial purposes.

During the internal reviews and discussions, some relevant conclusions have been achieved. They represent a common approach about how the partners have to consider the objects and the associated metadata. This approach is also based on an Europeana attempt to enrich data by adding standard and multilingual terms and references to answer who, where and when questions. The following two recommendations, set up to standardized the metadata creation, concerns the element of CARARE that will be mapped on the main classes of Europeana<sup>1</sup>. The use of URI assists the conversion of EDM records in EDM records compliant with the standard LOD.

### **1) Managing the relation between the physical object and one or multiple digital replicas.**

A Heritage Asset (HA) corresponds to the digital object (type=3D). The partner can use online resource or bibliographical references to define the relation between physical object and the digital replica provided to Europeana. It can also use a generic link, e.g. to Wikipedia or whatever, describing the object. In general, it is preferable to use a permanent address or an URI to guarantee long term website links. Each HA will be an EDM:ProvidedCHO. Multiple digital views of the same physical object could be different HAs (e.g. high and/or low resolution; decimation or simplification of the model; different reconstructive hypothesis, etc.) or different DRs (e.g. images 2D of the same 3D Model). This approach will not automatically apply to the all digital objects, but will be decided by the partners in relation to the different provenance and paradata information described and mainly in relation to the copyright agreements signed with the Institution in charge of the safeguard of the archaeological monuments that will be delivered to Europeana. For example, a partner could acquire various statues and small findings and submit a virtual reconstruction of an ancient environment (monument, temple, cemetery, etc.) according to well known hypothesis, or to make available with “Free Access No Reuse” rights statement

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<sup>1</sup> <http://pro.europeana.eu/linked-open-data>

a low resolution model and make accessible that with higher resolution only through specific authorization.

**2) Enrichment data** (see <http://pro.europeana.eu/web/guest/providers-faq>)

For Actors, Concepts, Places, Time the recommendation is to use available ontologies, URI or permanent links. This will ease the migration of the resources in the Linked Open Data format.

**ACTORS:** Person names can be matched to DBpedia (<http://dbpedia.org/About>) entries to give a unique identifier for the name. This links to additional information about the person, and enables the display of multilingual versions of the name in the portal. For the organizations/institutions it is possible to use FOAF (<http://www.foaf-project.org/> or VIAF: <http://viaf.org/>).

**CONCEPTS:** Concepts are matched to the terms in the Gemet thesaurus (<http://www.eionet.europa.eu/gemet>) which provides a unique reference for the concept. It also enables the display of the term in many languages and a display of the references and labels of broader terms. For the Humanities another good reference is the Getty Thesaurus (<http://www.getty.edu/research/tools/vocabularies/aat/>).

**SPACE:** Places are matched to place names in GeoNames (<http://www.geonames.org/>). This gives a unique reference for the place name, enables the display of multilingual versions of the names, the display of geographic coordinates and broader geographic areas associated with the place. For the Ancient places another good reference is the Pleiades (<http://pleiades.stoa.org/>).

**TIME:** time periods can be enriched from a vocabulary developed using the Annocultor tool (<http://annocultor.eu/>) which can now be found at <http://semium.org/time.html>. This establishes a unique reference for the time period with start and end dates and can also connect to the name of historical periods.

## 5. Mapping and publication

For the mapping and the publication (ingestion) of the metadata into Europeana, 3D-ICONS customized two tools (MINT2<sup>2</sup> and MORE2<sup>3</sup>) already developed in other European projects, mainly CARARE. The tool were modified to import, visualize and validate automatically

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<sup>2</sup> <http://mint-projects.image.ntua.gr/3dicons/Login.action>

<sup>3</sup> <http://3dicons.dcu.gr/index.php>

records compliant with the CARARE 2.0 schema or import and map other metadata. The new CARARE 2.0 schema was installed in the two systems and all procedures to validation were accordingly aligned to check the correctness of the metadata creation and their quality on the basis of the cardinalities of the CARARE schema.

NTUA has been focused on setting up the MINT2 tool to provide improved functionality regarding the mapping functionality and dataset upload and publication. In the new version, providers can publish datasets into MoRE2 without having to publish all datasets belonging to one provider. It also includes an improved reporting tool to monitor the progress of the ingestion.

MINT2 services compose a web based platform that was designed and developed to facilitate aggregation initiatives for cultural heritage content and metadata in Europe. It is employed from the first steps of such workflows, corresponding to the ingestion, mapping and aggregation of metadata records, and proceeds to implement a variety of remediation approaches for the resulting repository. The platform offers a user and organization management system that allows the deployment and operation of different aggregation schemes (thematic or cross-domain, international, national or regional) and corresponding access rights. Registered organizations can upload (http, ftp, OAI-PMH) their metadata records in xml or csv serialization in order to manage, aggregate and publish their collections.

A reference metadata model serves as the aggregation schema to which the ingested (standard or proprietary) schemata are aligned to. Users can define their metadata crosswalks with the help of a visual mappings editor for the XSL language. Mapping is performed with simple drag-and-drop or input operations which are then translated to the corresponding code. The mappings editor visualizes both the input and target XSD, in an intuitive interface that provides access and navigation of the structure and data of the input schema, and the structure, documentation and restrictions of the target one. It supports string manipulation functions for input elements in order to perform 1-n and m-1 (with the option between concatenation and element repetition) mappings between the two models. Additionally, structural element mappings are allowed, as well as constant or controlled value (target schema enumerations) assignment, conditional mappings (with a complex condition editor) and value mappings between input and target value lists. Mappings can be applied to ingested records, edited, downloaded and shared as templates between users of the platform.

Preview interfaces present to users the steps of the aggregation including the current input xml record, the XSLT of their mappings, the transformed record in the target schema, subsequent transformations from the target schema to other models of interest (e.g.

Europeana's metadata schema), and available html renderings of each xml record. Users can transform their selected collections using complete and validated mappings in order to publish them in available target schemas for the required aggregation and remediation steps.

In the following three figures the import (Fig. 11), the mapping (Fig. 12) and, finally, the visualization (Fig. 13) of the sample reported in the Appendix A have shown.

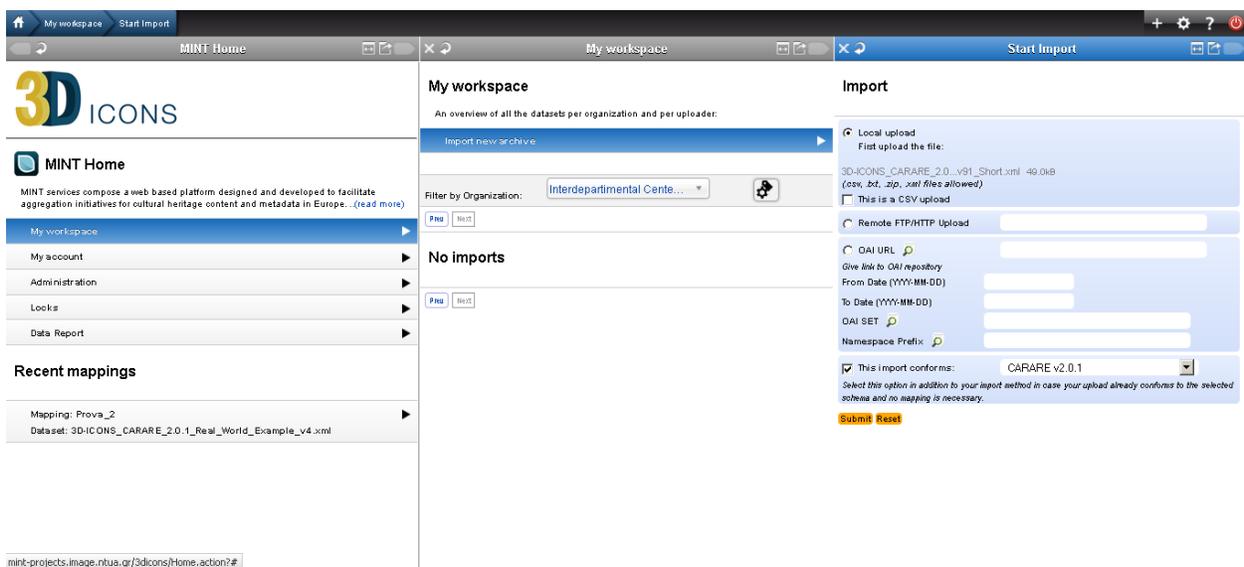


Figure 11 - In the right tab the import procedure

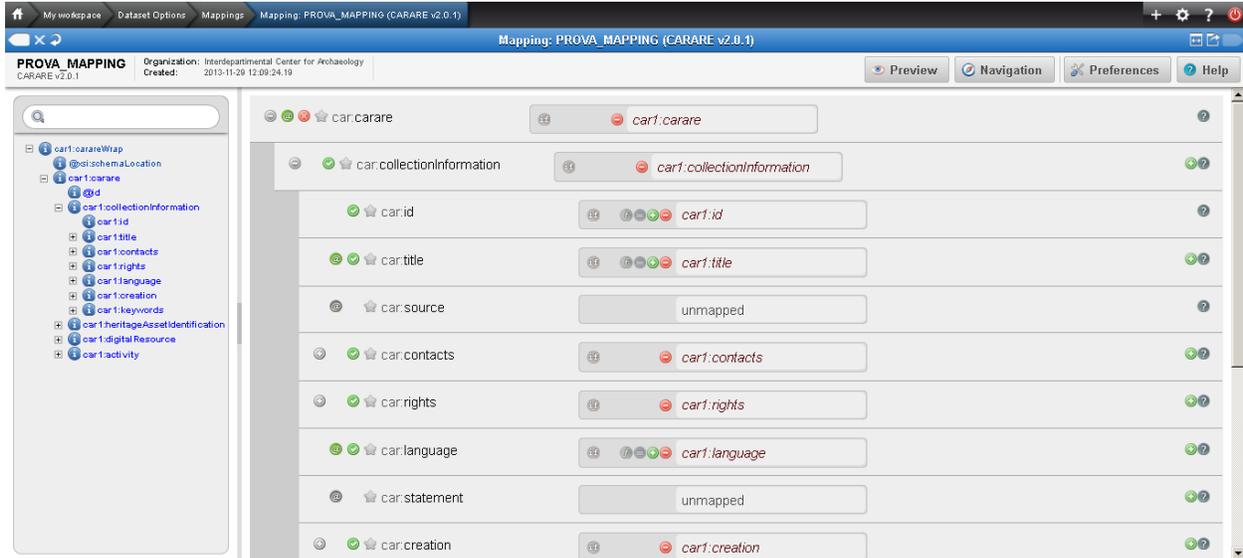


Figure 12 - The mapping procedure

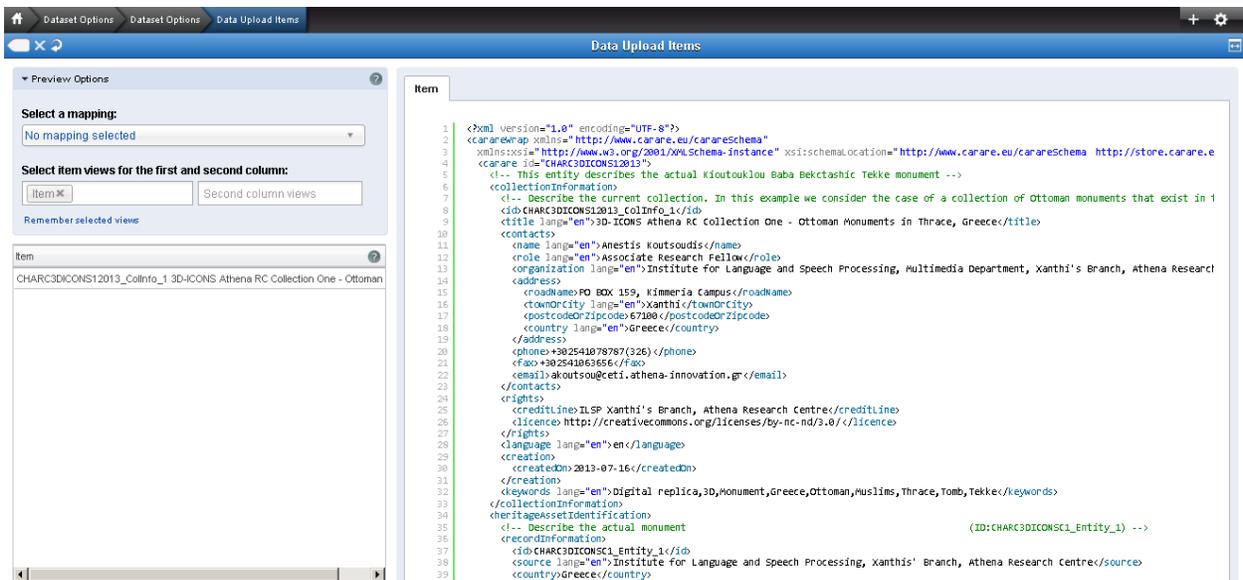
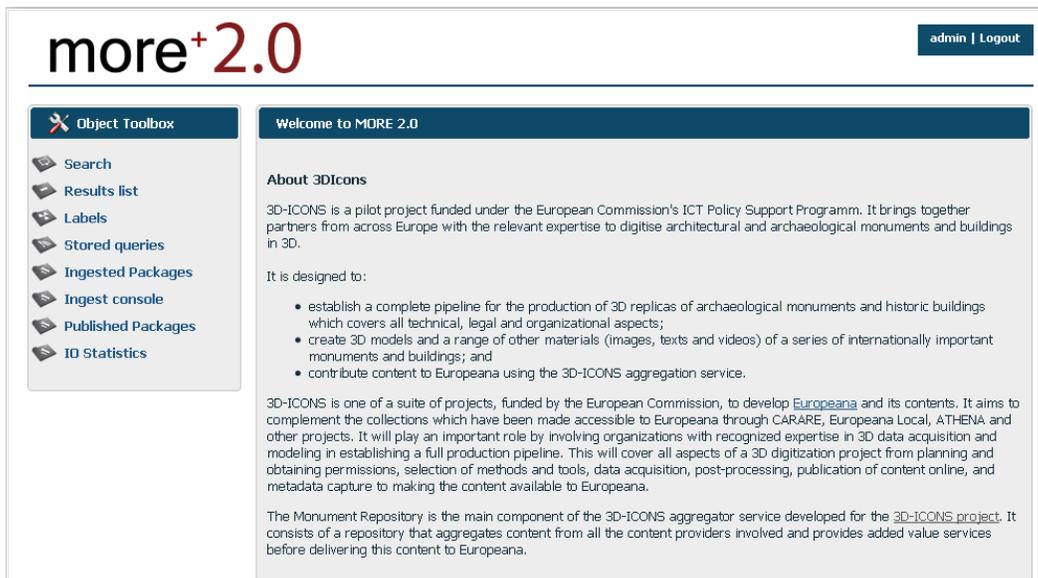


Figure 13 - The visualization of the mapped record

CETI continued on the development of Monument Repository (MORE2) using a new server. The system has been setup to accept information packages from the MINT2 system, transform them and deliver them to Europeana (Figs. 14-16).



**more+2.0** admin | Logout

**Object Toolbox**

- Search
- Results list
- Labels
- Stored queries
- Ingested Packages
- Ingest console
- Published Packages
- IO Statistics

**Welcome to MORE 2.0**

**About 3DIcons**

3D-ICONS is a pilot project funded under the European Commission's ICT Policy Support Programm. It brings together partners from across Europe with the relevant expertise to digitise architectural and archaeological monuments and buildings in 3D.

It is designed to:

- establish a complete pipeline for the production of 3D replicas of archaeological monuments and historic buildings which covers all technical, legal and organizational aspects;
- create 3D models and a range of other materials (images, texts and videos) of a series of internationally important monuments and buildings; and
- contribute content to Europeana using the 3D-ICONS aggregation service.

3D-ICONS is one of a suite of projects, funded by the European Commission, to develop [Europeana](#) and its contents. It aims to complement the collections which have been made accessible to Europeana through CARARE, Europeana Local, ATHENA and other projects. It will play an important role by involving organizations with recognized expertise in 3D data acquisition and modeling in establishing a full production pipeline. This will cover all aspects of a 3D digitization project from planning and obtaining permissions, selection of methods and tools, data acquisition, post-processing, publication of content online, and metadata capture to making the content available to Europeana.

The Monument Repository is the main component of the 3D-ICONS aggregator service developed for the [3D-ICONS project](#). It consists of a repository that aggregates content from all the content providers involved and provides added value services before delivering this content to Europeana.

Figure 14 - The Home page



**more+2.0** admin | Logout

**Published Packages**

**Ingested Packages** **Published Packages**

Package No	Received Tstamp	No of Items	COMPLETENESS			
			0-25%	25-50%	50-75%	75-100%
1510	2013-06-28 08:32:06	15	0	15	0	0

HA=15, DR=15, COL=15, AC=0

Records with possible errors in:

- Spatial coordinates: 0
- Temporal information: 0
- Broken links: 0

0-25% 25-50% 50-75% 75-100%

**Completeness** HA  
Top

Figure 15 - A test for ingested packages



Figure 16 - The visualization of the monitoring of the ingested packages

## 5.1 Monitoring the Metadata

3D-ICONS has to keep track of the metadata created by each provider. The metadata provided by each partner can be uploaded to MoRE2 as individual records or (more commonly) as a batch of records. After checking and transformation (via the XSLT), the records are supplied to Europeana for ingestion. MoRE2 provides a quality check for each package ingested and indicates the status of the package. Those that do not pass the check at this stage are shown in the Not Ingested page. Once uploaded, the Europeana Ingestion team checks for completeness of mandatory elements, the validity of links and other checks before ingestion, and can also enrich the metadata before it is published – this process takes **one month** with publication to the live Europeana service happening once a month. If there is a problem with the metadata, then the Ingestion team will inform the relevant contact (CETI) for the project who will assist the partner(s) to correct the identified issues and reload the corrected metadata into MoRE2. At any point in time, it is possible to see how many records a partner has loaded into MoRE2 and how many have been ingested by Europeana. This means that providers can track their publications across the two systems. When each package is harvested by Europeana, it is marked as delivered.

It is possible to visualize the metadata created and not yet harvested by Europeana through the 3D ICONS portal. In this way the Consortium set up two different checks: the former is based on the quality control process informing the partners of possible errors or data inconsistency of the ingested metadata and a latter, no less important, gives information about the numbers of published metadata created by each partner.

The first trial ingestion was planned for the 15<sup>th</sup> May. Some content providers uploaded metadata packages. A variety of upload methods have been used, the majority of partners using the Metadata Editor (**CISA, DISC, CMC, FBK, CNR, MNIR**) to create their first records. **POLIMI** opted to export from existing databases, adding any required missing fields and to upload the resulting CSV files into MINT2 and map the data to CARARE2 for import into MoRE2. **CYI-STARC** used the standard OAI-PMH method established in the CARARE project to import their existing XML records into MINT2 and MAP these to the CARARE2 schema. No specific problems were identified with the metadata import methods. **KMKG and UJACAI** who have used MINT in previous projects will provide their data in batches from July (exports from existing databases normally create larger batches) onwards. **VisDim** (supplying 50 3D models) have scheduled their ingestion for November to fit in with their current work schedule. **CNRS-MAP** provided records by the second target date and **Archeotransfert** plan their first batch by the third target date of 4<sup>th</sup> July.

According to the CARARE 2.0 and EDM schema and on the statistics given by Europeana the partners considered a digital object as a Carare:DigitalResource mapped on a corresponding EDM:WebResouces. In this way a Carare:HeritageAsset can be transformed into a single EDM:ProvidedCHO or to represent a record grouping different digital objects (3DModel at different resolution, 2DImages, Video) replicating the same physical object. Where downloadable formats such as 3D-PDF are used for the models, partners have been provided a direct link (EDM:IsShownbyto) the digital resource but in most cases, landing pages (EDM:IsShownAt) are preferred as these allow partners to add additional information and group related digital assets as well as their own branding.

In the first trial some partners also tested the carousel format provided by Europeana where the 3D model is a primary digital resource and the related images and videos displayed as related digital resources. As in total more than 18.000 digital objects will be delivered to Europeana, the choice to group a 3DModel with other derivative resources (2D Images and/or videos) represent a good compromise between the final number of item to be delivered whilst allowing the users to find easily what they are searching for, e.g. the physical object and possible derivative digital items.

Packages” in the MORE2 system. Metadata owners login to in MORE2, go to “Ingested Packages”, select “Details” for their Package and set its publication status to “Publish”, and then check the “Submit” tab. This classifies the metadata as publishable ready to be

harvested by EUROPEANA. At the same time, data characterized as publishable will be harvested by the 3D ICONS portal and will appear there within a couple of days. In parallel, the “published” metadata in MORE2 will be checked once more by the Metadata Quality Assessment personnel (MQAC). If any additional problems are found, an email is sent to the owners informing them on the results of the Metadata Quality Control. The metadata owners can view their data by visiting the 3D ICONS portal where almost all the CARARE metadata is displayed in the way visually, similarly to EUROPEANA.

Finally, in approximately one month, the metadata will appear also in EUROPEANA and owners should again check to see if everything is OK. The MQAC will also look at the published metadata as a final check for any possible errors that may have occurred due to mapping in MoRE2.

After the first two trials the complete ingestion process has been set up as follows: Metadata is uploaded to MORE2, either via the Metadata Editor, or via MINT2, and assuming that the data passes the semantic checks, the data will appear as “Ingested”

## 6. Conclusions

This interim report presents a first overview of the metadata creation activities. Starting from the analysis of the existing situation, the experience of the partners in this field and the issues encountered, the report shows the actions and tools the project has planned to overcome all potential difficulties and possible delays as quickly as possible.

Firstly, the report introduces a simplistic approach aimed at giving the partners, with a medium experience in XML, a practical way to create their metadata starting from a template record containing a list of information quite often repeated in each record. Then an on-line tool is shown as a simple way to create metadata and mainly create links between all resources in terms of relation among Heritage Assets, Digital Resources and Activities. The enrichment metadata are analyzed in the section 4. The pipeline to publish data, including two software applications already developed and tested in the previous CARARE project and customized for 3D-ICONS and the new schema, is introduced in the section 5.

In short, Figure 17 shows the approach that content provider has to follow to create metadata for digital replicas from the original monuments or details and identify the corresponding relationships.

The partner has one or multiple 3D digital models as replicas of one physical object

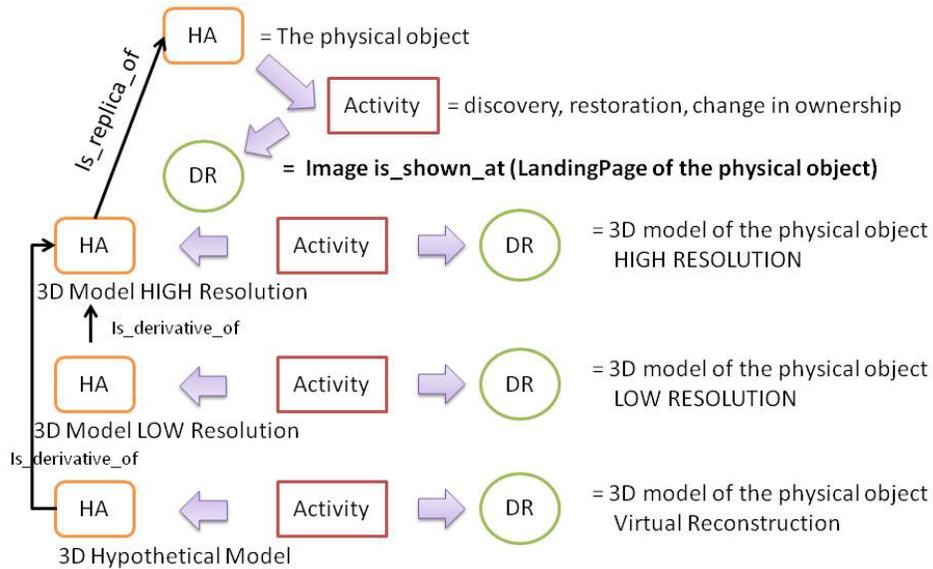


Figure 17 - The approach to metadata creation

The strategy for the metadata creation has to be chosen according to the pre-existing digital resources or legacy data or on the basis of the existing metadata experience of the partners. Figure 18 shows possible different trajectories in the use of the available tools implemented in the framework or the project:

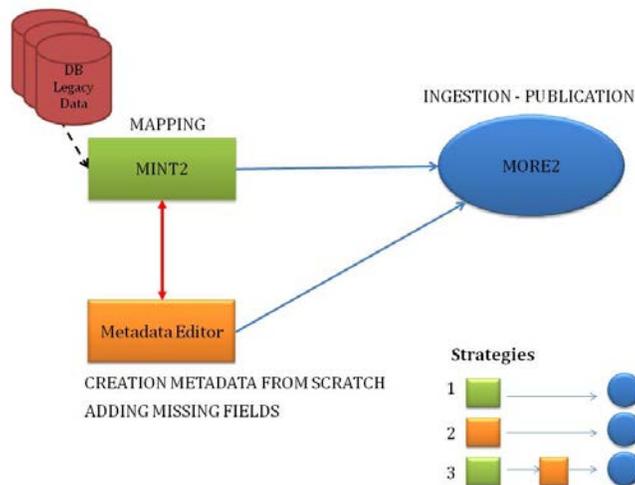


Figure 18 - Different strategies in the implementation of metadata

The two metadata training workshops held in Xanthi in June and Marseilles in October provided valuable feedback for defining the content partner's requirements and led to the development of the metadata editing tool as demonstrated at the second workshop where training was provided for this. All partners have now received training on MINT2 and the Metadata Tool and further support has been provided through individual training sessions held via Skype, an online support forum run via Basecamp. Help within the Metadata tool have been implemented and the Guidelines from CARARE are currently being updated. Further session has been organised in the project meeting, held in Jaen in March 2014, to enable partners to discuss specific issues they have with the metadata and ingestion process and tools with the technical development team (NTUA and CETI) and schema experts (CISA).

The following tables show the time-table for the metadata creation and ingestion for each partners:

#### Targets for 3D-MODELS

Organisation	Target date:									Total
	15-May-14	04-Jun-14	04-Jul-14	05-Aug-14	04-Sep-14	03-Oct-14	04-Nov-14	04-Dec-14	05-Jan-15	
CISA	4	8	10	10	20	20	16	16	16	120
CETI	8	8	12	12	4	8	8	12	0	72
CYI-STARC	30	5	5	5	5	5	5	5	6	71
DISC	1	3	18	33	25	22	11	11	0	124
KMKG	0	0	155	0	150	150	0	0	0	455
UJA-CAAI	0	0	50	0	50	100	100	100	186	586
POLIMI	0	0	100	100	100	100	100	27	0	527
MNIR	0	49	11	10	10	10	10	0	0	100
FBK	1	6	6	15	7	12	6	6	0	59
CMC	1	1	2	6	8	10	4			32
CNRS-MAPS	0	31	50	0	50	100	50	60	12	353
CNR-ITABC	0	7	14	30	5	40	25	25	9	155
CNR-ISTI	4	13	13	25	0	30	35	35	30	185
Archeotransfert			51	30	30	30	30	30	10	211
Visual Dimension							10	40		50
Total	49	131	497	276	464	637	410	367	269	3100

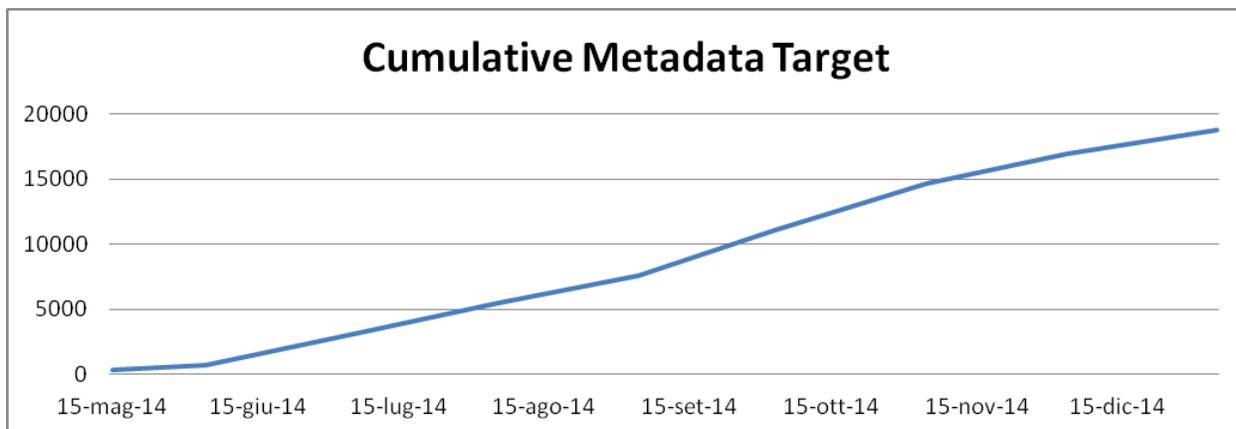
## Targets for Images

Organisation	Target date:									Total
	15-May-14	04-Jun-14	04-Jul-14	05-Aug-14	04-Sep-14	03-Oct-14	04-Nov-14	04-Dec-14	05-Jan-15	
CISA	8	24	36	40		74	80	100	100	462
CETI	7	8	32	40	30	70	70	90	0	347
CYI-STARC	184	41	41	41	41	41	41	41	41	512
DISCOVERY PROGRAMME	15	10	68	106	70	127	55	55	0	506
KMKG	0	0	0	0	0	0	0	0	0	0
UJA-CAAI	0	0	100	0	100	300	300	300	361	1461
POLIMI	0	0	170	170	170	170	153	0	0	833
MNIR	0	26	70	70	74	80	80	50	50	500
FBK	0	0	50	39	26	36	18	21	0	190
CMC	0	0	24	50	100	300	600			1074
CNRS-MAPS	0	30	100	0	100	200	300	200	264	1194
CNR-ITABC	0	0	40	0	150	150	150	150	0	640
CNR-ISTI	20	90	50	100	0	150	150	150	150	860
Archeotrasfer			1000	1500	700	1100	1100	600	600	6600
VisualDimension							50	150		200
Total	234	229	1781	2156	1561	2798	3147	1907	1566	15379

## Targets for Videos

Organisation	Target date:									Total
	15-May-14	04-Jun-14	04-Jul-14	05-Aug-14	04-Sep-14	03-Oct-14	04-Nov-14	04-Dec-14	05-Jan-15	
CISA	0	0	1	1	0	2	1	1	2	8
CETI	2	2	1	1	0	1	0	0	0	7
CYI-STARC	0	0	0	13	0	0	0	0	0	13
DISCOVERY PROGRAMME	0	3	6	34	21	15	11	11	0	101
KMKG	0	0	5	0	5	10	0	0	0	20
UJA-CAAI	0	0	1	0	0	0	0	0	2	3
POLIMI	0	0	10	3	2	2	2	0	0	19
MNIR	0	0	0	0	0	0	0	0	0	0
FBK	0	0	0	4	0	6	1	0	0	11
CMC	0	1	5	12	0	0	0	0	0	18
CNRS-MAPS	0	0	2	0	2	4	2	1	0	11
CNR-ITABC	0	0	0	0	0	10	10	3	0	23
CNR-ISTI	0	1	0	1	0	3	2	1	2	10
Archeotrasfer			0	10	10	5	5	5	5	40
VisualDimension							10			10
Total	2	7	31	79	40	58	44	22	11	294

The following graph visualizes the cumulative metadata target. The incremental curve shows that after an initial slow start, the number of metadata increases rapidly.



Two checkpoints are foreseen at the month 30 and 33:

	Month 30	Month 33
3D Models	677	2.054
2D Images	2.244	8.759
Videos	40	217
<b>TOTAL</b>	<b>2.961</b>	<b>11.030</b>

As the consortium tested the pipeline and the methodology in the first two trials, the targets foreseen for the Months 30 and 33 are easily reachable also considering that the data-acquisition, the process and the post-processing phase will be completed before the summer and all partner will focused their activities in the last six months only on the metadata creation and ingestion.

## Appendix A: Example CARARE 2.0 XML file in for the Kioutouklou Baba Teke monument

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- Sample XML file generated by XMLSpy v2013 rel. 2 sp2 (http://www.altova.com)-->
<!-- Real world example of the CARARE 2.0 Schema for the 3D-Icons project - The case of Kioutouklou Baba
  Bekctashic Tekke -->
<!-- Author: Anestis Koutsoudis (akoutsou@ceti.gr) Multimedia Department, ISLP Xanthi's Branch - Athena
  Research Centre -->
<!-- Contributors: Sheena Bassett (sheena.bassett@mdrpartners.com), Andrea D'Andrea(dandrea@unior.it) ,
  Kate Fernie (kate.fernie@mdrpartners.com), Despoina Tsiafakis (tsiafaki@ipet.gr), Natasa Michailidou
  (amixaili@ipet.gr) -->
<!-- Ver: 0.91 - Implement secondary Andrea's comments Date:29-10-2013 -->
<carareWrap      xsi:schemaLocation="http://www.carare.eu/carareSchema      file:///Y:/_Projects/_3D-
  ICONS/Metadata/carare-v2.0.1.xsd"      xmlns="http://www.carare.eu/carareSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<carare id="CHARC3DICON12013"> <!-- This entity describes the actual Kioutouklou Baba Bekctashic Tekke
  monument -->
<collectionInformation> <!-- Describe the current collection. In this example we consider the case of a
  collection of Ottoman monuments that exist in the region of East Macedonia and Thrace, Greece -->
<id>CHARC3DICON12013_ColInfo_1</id>
<title lang="en">3D-ICONS Athena RC Collection One - Ottoman Monuments in Thrace, Greece</title>
<contacts>
<name lang="en">Anestis Koutsoudis</name>
<role lang="en">Associate Research Fellow</role>
<organization lang="en">Institute for Language and Speech Processing, Multimedia Department, Xanthi's
  Branch, Athena Research Centre</organization>
<address>
<roadName>PO BOX 159, Kimmeria Campus</roadName>
<townOrCity lang="en">Xanthi</townOrCity>
<postcodeOrZipcode>67100</postcodeOrZipcode>
<country lang="en">Greece</country>
</address>
<phone>+302541078787(326)</phone>
<fax>+302541063656</fax>
<email>akoutsou@ceti.athena-innovation.gr</email>
</contacts>
<rights>
<copyrightCreditLine>ILSP Xanthi's Branch, Athena Research Centre</copyrightCreditLine>
<licence>http://creativecommons.org/licenses/by-nc-nd/3.0/</licence>
</rights>
<language lang="en">en</language>
<creation>
<createdOn>2013-07-16</createdOn>
</creation>

```

```

<keywords lang="en">Digital replica, 3D, Monument, Greece, Ottoman, Muslims, Thrace, Tomb,
  Tekke</keywords>
</collectionInformation>
<heritageAssetIdentification> <!-- Describe the actual monument (ID:CHARC3DICONSC1_Entity_1) -->
<recordInformation>
<id>CHARC3DICONSC1_Entity_1</id>
<source lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research
  Centre</source>
<country>Greece</country>
<creation>
<date>2013-07-10</date>
<contacts>
<name lang="en">Despoina Tsiafaki</name>
<role lang="en">Senior Researcher</role>
<organization lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research
  Centre</organization>
<address>
<roadName>PO BOX 159, Kimmeria Campus</roadName>
<townOrCity lang="en">Xanthi</townOrCity>
<postcodeOrZipcode>67100</postcodeOrZipcode>
<country lang="en">Greece</country>
</address>
<phone>+302541078787(224)</phone>
<fax>+302541063656</fax>
<email>dtsiafaki@ceti.athena-innovation.gr</email>
</contacts>
</creation>
<language lang="en">en</language>
<metadataRights>
<licence>http://creativecommons.org/licenses/by-nc-nd/3.0/</licence>
<europeanaRights>Creative Commons - Attribution, Non-Commercial, No Derivatives (BY-NC-
  ND)</europeanaRights>
</metadataRights>
</recordInformation>
<appellation>
<name lang="en">Kioutouklou Baba Bekctashic Tekke</name>
<id>CHARC3DICONSC1_Entity_1_AP_1</id>
</appellation>
<description lang="en">The monument is located in the middle of a cultivable area on the west coast of the
  Vistonida Lake, near Selino village in Xanthi, Greece. It is considered as one of the most important
  Ottoman monuments in the area and it may have been built in the 15th century. It was possibly built on
  the ruins of an Orthodox Christian temple that was dedicated to Saint George Kalamitziotis. According to
  scholars, the term tekke (gathering place for Dervishes) is erroneous as the only remaining monument
  from a possible older building complex (tekke) is a tomb (türbe). Several conjectures have been made
  about the person buried in the monument. Today, for the Muslims it is considered as the grave of a
  Whirling Dervish named Kioutouklou Baba, while for the Christians it is a worshiping place of Saint
  George. It is composed by an octagonal türbe (mausoleum) and a domed antechamber. The türbe has a

```

domed roof, too, and two windows (at the east and south wall) and it is made of hewn stones.</description>  
 <generalType lang="en">Monument</generalType>  
 <designations>  
 <protectionType lang="en">Historical scheduled monument</protectionType>  
 <grade lang="en">A</grade>  
 <dateFrom>1992-07-22</dateFrom>  
 <displayDate lang="en">22nd of July 1992</displayDate>  
 </designations>  
 <conditions>  
 <condition lang="en">Well preserved</condition>  
 <conditionAssessment lang="en">The current conservation status of the monument is very good. This is a result of the recent maintenance and restoration</conditionAssessment>  
 <conditionDate>2012-09-01</conditionDate>  
 <displayDate lang="en">1st of January 2006</displayDate>  
 </conditions>  
 <provenance lang="en">The 15th Ephorate of Byzantine Antiquities refers to all matters concerning the safeguard and protection, the conservation, the reconstruction, the study and the publication of the monument.</provenance>  
 <characters>  
 <heritageAssetType lang="en" namespace="http://thesaurus.english-heritage.org.uk/thesaurus\_term.asp&thes\_no=1&term\_no=69999">Funerary Site</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://thesaurus.english-heritage.org.uk/thesaurus\_term.asp?thes\_no=1&term\_no=92933">Place of worship</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://thesaurus.english-heritage.org.uk/thesaurus\_term.asp?thes\_no=1&term\_no=70087">Mausoleum</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://thesaurus.english-heritage.org.uk/thesaurus\_term.asp?thes\_no=1&term\_no=70092">Tomb</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://thesaurus.english-heritage.org.uk/thesaurus\_term.asp?thes\_no=1&term\_no=159193">Funerary Building</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://www.getty.edu/vow/AATFullDisplay?find=architecture&logic=AND&note=&english=N&prev\_page=1&subjectid=300263552">architecture</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://www.getty.edu/vow/AATFullDisplay?find=ottoman&logic=AND&note=&mp;english=N&prev\_page=1&subjectid=300021614">Ottoman</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://www.getty.edu/vow/AATFullDisplay?find=islamic&logic=AND&note=&mp;english=N&prev\_page=1&subjectid=300073715">Islam</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://www.getty.edu/vow/AATFullDisplay?find=dome&logic=AND&note=&mp;english=N&prev\_page=1&subjectid=300001280">Domes</heritageAssetType>  
 <heritageAssetType lang="en" namespace="http://www.getty.edu/vow/AATFullDisplay?find=octagonal&logic=AND&note=&mp;english=N&prev\_page=1&subjectid=300343771">Octagonal plan</heritageAssetType>

```

<heritageAssetType lang="en"
  namespace="http://www.getty.edu/vow/AATFullDisplay?find=tekke&logic=AND&note=&
  english=N&prev_page=1&subjectid=30000665">Tekkes</heritageAssetType>
<heritageAssetType lang="en"
  namespace="http://www.getty.edu/vow/AATFullDisplay?find=worship&logic=AND&note=&
  mp;english=N&prev_page=1&subjectid=300056005">Worship</heritageAssetType>
<heritageAssetType lang="en"
  namespace="http://www.getty.edu/vow/AATFullDisplay?find=mausoleum&logic=AND&note=
  &english=N&prev_page=1&subjectid=300005891">Mausoleums</heritageAssetType>
<heritageAssetType lang="en"
  namespace="http://www.getty.edu/vow/AATFullDisplay?find=funerary&logic=AND&note=&
  mp;english=N&prev_page=1&subjectid=300005926">Tombs</heritageAssetType>
<heritageAssetType lang="en"
  namespace="http://www.getty.edu/vow/AATFullDisplay?find=funerary&logic=AND&note=&
  mp;english=N&prev_page=1&subjectid=300005866">Funerary Buildings</heritageAssetType>
<temporal>
<timeSpan>
<startDate>1354-01-01</startDate>
<endDate>1920-12-31</endDate>
</timeSpan>
<periodName lang="en">Ottoman period</periodName>
<displayDate lang="en">1354-1920 AD</displayDate>
</temporal>
<materials lang="en">wood</materials>
<materials lang="en">stone</materials>
<materials lang="en">mortar</materials>
<materials lang="en">clay</materials>
<dimensions> <!-- This dimension values are given by an optimised bounding box of the monuments 3D
  digital replica-->
<extent lang="en">bounding box side</extent>
<measurementType lang="en">height</measurementType>
<units>meters</units>
<scale>1:1</scale>
<value valueAccuracy="0.05">10.62</value>
</dimensions>
<dimensions>
<extent lang="en">bounding box side</extent>
<measurementType lang="en">width</measurementType>
<units>meters</units>
<scale>1:1</scale>
<value valueAccuracy="0.05">8.48</value>
</dimensions>
<dimensions>
<extent lang="en">bounding box side</extent>
<measurementType lang="en">depth</measurementType>
<units>meters</units>
<scale>1:1</scale>
<value valueAccuracy="0.05">13.42</value>

```

```

</dimensions>
</characters>
<spatial>
<locationSet>
<namedLocation lang="en" namespace="http://www.geonames.org/733839">Municipality of
  Abdera</namedLocation>
<address>
<townOrCity lang="en">Sidini,Xanthi</townOrCity>
<postcodeOrZipcode>67100</postcodeOrZipcode>
<country lang="en">Greece</country>
</address>
<geopoliticalArea lang="en" type="region">East Macedonia and Thrace</geopoliticalArea>
</locationSet>
<geometry>
<spatialReferenceSystem>WGS84</spatialReferenceSystem>
<quickpoint>
<x>25.058342</x> <!-- Longitude -->
<y>41.075566</y> <!-- Latitude -->
</quickpoint>
<boundingBox>
<minX>25.058041</minX>
<maxX>25.058534</maxX>
<minY>41.075479</minY>
<maxY>41.075698</maxY>
<minZ>0.0</minZ>
<maxZ>0.0</maxZ>
<accuracy>a few meters</accuracy>
</boundingBox>
</geometry>
</spatial>
<rights>
<copyrightCreditLine>15th Ephorate of Byzantine Antiquities</copyrightCreditLine>
</rights>
<references> <!-- This is a reference to a book that contained textual information about the monument -->
<appellation>
<name lang="en">In the Footsteps of the Ottomans: A Search for Sacred Spaces and Architectural Monuments
  in Northern Greece</name>
<id>CHARC3DICONs12013_Ref_1</id>
</appellation>
<actors>
<id>CHARC3DICONs12013_Ref_Actor_1</id>
<name lang="en">Health W. Lowry</name>
<actorType lang="en">Author</actorType>
</actors>
<type lang="en">Book</type>
<publicationStatement>
<publisher lang="en">Mary Martin Booksellers,Bahçesehir University Publications</publisher>
<date>2009-01-01</date>

```

```

</publicationStatement>
<note lang="en">ISBN9789756437865</note> <!-- Use it to include the ISBN number -->
<link>http://www.marymartin.com/web/selectedIndex?mEntry=117122</link>
</references>
<references> <!-- This is a reference to a book that contained textual information about the monument -->
<appellation>
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page with images and textual information about the monument -->
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Kioutouklou Baba Bekctashic Tekke monument -->

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<name lang="en">Anestis Koutsoudis</name>
<role lang="en">Associate Research Fellow</role>
<organization lang="en">Institute for Language and Speech Processing, Multimedia Department, Xanthi's
Branch, Athena Research Centre</organization>
<address>
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<dcRelation>CHARC3DICONSC1_Entity_1</dcRelation> <!-- The relation between a digital replica and the actual monument -->

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</heritageAssetIdentification>
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<role lang="en">Digitisation team member</role>
<organization lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research
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<address>
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that carries colour information using the vertex paint approach. It has been digitised using a multi-image
based 3D reconstruction approach (Structure from Motion/Multi-Image Dense Stereo 3D
Reconstruction).This 3D model is aimed for research applications.</description>
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<name lang="en">Anestis Koutsoudis</name>
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  example; the file doesn't currently exist -->
<object>http://www.ceti.gr/carare/CETI_OTX_1.jpg</object> <!-- This is a thumbnail image to be used by
  Europeana - again I am using a CARARE example here -->
<isShownAt>http://polymnia.ipet.gr/akoutsou/3dsse/PredefinedViewpoints.php?id=1a1</isShownAt> <!--
  This is a link to a Website where the same digital resource appears using different visualisation
  technology -->
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  Centre</reproductionRights>
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<isRepresentationOf>CHARC3DICONSC1_Entity_2</isRepresentationOf> <!-- IDs of the heritage asset and the
  digital resource -->
<createdDerivative>CHARC3DICONSC12013_3D_2</createdDerivative> <!-- IDs of the digital resource that is a
  derivative of this digital resource-->
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<activity> <!-- This activity represents the image-based digitisation process of the Kioutouklou Baba
Bektashic Tekke monument and the creation of the primary 3D model that will be used to produce all
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<contacts>
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<organization lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research
Centre</organization>
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ND)</europeanaRights>
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<name lang="en">Terrestrial and aerial photoshooting of Kioutouklou Baba Bektashic Tekke and primary
3D model generation </name>
<id>CHARC3DICONs12013_DigiAct_2_A_1</id>
</appellation>
<description lang="en">The 3D data collection phase (fieldwork) of the monument included terrestrial and
aerial photo shooting of the monument. For the terrestrial photo shooting session a DSLR Nikon D40 at 6.1
MP with an 18-55 mm lens along with a tripod has been used. On the other hand, for the aerial photo
shooting session, a remote controlled helicopter has been used. The UAV was equipped with a three axis
pan-tilt-roll remote controlled camera head (360o on the horizontal axis, 220o on the vertical axis and a
rolling ability of 600). A DSLR Canon EOS350d at 8.1MP with an 18-55mm lens has been used for the
aerial photo shooting session. The total number of photographs that has been used for the generation of
the 3D model of the monument was 652 (469 terrestrial photos and 183 aerial photos). The average
distance of the camera from the monument's surface was estimated at 4 meters.The primary 3D model
was created using a commercial structure-from-motion/dense multi-stereo 3D reconstruction software

```

Agisoft PhotoScan). The software offers a number of predefined 3D reconstruction levels of detail (LOD). The level of detail affects the density of the reconstructed 3D mesh. In an base case scenario the user provides the software with an image collection, the system almost automatically calibrates the cameras based on the EXIF information found in the images, aligns them into the 3D space and produces a complete and single 3D mesh using a dense multi-view reconstruction algorithm. The total time required for the software to align the images into 3D space was 26 hours.</description>

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<roles lang="en">Digitisation team member</roles>
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<roles lang="en">Data Processing</roles>
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<equipment lang="en">Meshlab (version 1.3.2)</equipment>
<equipment lang="en">Arius 3D Pointstream (version 3.0.2)</equipment>
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  GTX580 3GB RAM graphics card running Microsoft Windows 7 64-bit)</equipment>
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  produced using the data captured from this activity. This activity produced the RAW data.-->
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  collection of Ottoman monuments that exist in the region of East Macedonia and Thrace, Greece -->
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<role lang="en">Associate Research Fellow</role>
<organization lang="en">Institute for Language and Speech Processing, Multimedia Department, Xanthi's
  Branch, Athena Research Centre</organization>
<address>
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<fax>+302541063656</fax>
<email>akoutsou@ceti.athena-innovation.gr</email>
</contacts>
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<licence>http://creativecommons.org/licenses/by-nc-nd/3.0/</licence>
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  to be used in Web-based applications</provenance>

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<contacts> <!-- Metadata Content Creators again -->
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<role lang="en">Digitisation team member</role>
<organization lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research Centre</organization>
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<country lang="en">Greece</country>
</address>
<phone>+302541078787(326)</phone>
<fax>+302541063656</fax>
<email>akoutsou@ceti.athena-innovation.gr</email>
</contacts>
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<licence>http://creativecommons.org/licenses/by-nc-nd/3.0/</licence>
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</metadataRights>
</recordInformation>
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<id>CHARC3DICONSC12013_3D_2_A_1</id>
</appellation>

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```

<description lang="en">This is a 3D-PDF file that contains a 3D digital replica of the monument. It has been
  digitised using a multi-image based 3D reconstruction approach (Structure from Motion/Multi-Image
  Dense Stereo 3D Reconstruction).This 3D model is aimed for dissemination(Web-based)
  applications.</description>
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<name lang="en">Fotis Arnaoutoglou</name>
<actorType lang="en">Digitisation team member</actorType>
<roles lang="en">Data Collection</roles>
<roles lang="en">Data Processing</roles>
<contacts>
<name lang="en">Fotis Arnaoutoglou</name>
<role lang="en">External Scientific Collaborator</role>
<organization lang="en">Institute for Language and Speech Processing, Xanthis' Branch, Athena Research
  Centre</organization>
<address>
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<townOrCity lang="en">Xanthi</townOrCity>
<postcodeOrZipcode>67100</postcodeOrZipcode>
<country lang="en">Greece</country>
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<phone>+302541078787(326)</phone>
<fax>+302541063656</fax>
<email>fotarny@ceti.athena-innovation.gr</email>
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  terms/?v=dcmitype#Dataset">Dataset</type>
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<formatDetails lang="en">The specific file requires the Adobe PDF Reader in order to explore the 3D
  content</formatDetails>
<extent lang="en" namespace="http://en.wikipedia.org/wiki/Megabyte">20MB</extent>
<publicationStatement>
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<place lang="en">Xanthi</place>
<date>2013-09-20</date>
</publicationStatement>
<created>2013-09-19</created>
<language lang="en">en</language>
<link>http://www.ceti.gr/carare/CETI_OTX_1_EN.pdf</link> <!-- This is not the actual 3D-PDF - I am using
  one of ours CARARE 3D-PDF examples here -->
<object>http://www.ceti.gr/carare/CETI_OTX_1.jpg</object> <!-- This is a thumbnail image to be used by
  Europeana - again I am using a CARARE example here -->
<isShownAt>http://polymnia.ipet.gr/akoutsou/3dsse/PredefinedViewpoints.php?id=1a1</isShownAt> <!--
  This is a link to a Website where the same heritage asset appears using different visualisation technology -
  again I am using a CARARE example here -->
<rights>
<copyrightCreditLine>Athena Research Centre</copyrightCreditLine>

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```

<reproductionRights>The material can be reproduced after written permission by the Athena Research
  Centre</reproductionRights>
<licence>http://creativecommons.org/licenses/by-nc-nd/3.0/</licence>
<europeanaRights>Creative Commons - Attribution, Non-Commercial, No Derivatives (BY-NC-
  ND)</europeanaRights>
</rights>
<isRepresentationOf>CHARC3DICONSC1_Entity_3</isRepresentationOf> <!-- ID of the Heritage Asset that the
  digital resource presents -->
<isDerivativeOf>CHARC3DICONSC12013_3D_1</isDerivativeOf> <!-- ID of the high resolution model that was
  used to produce this one -->
</digitalResource>
<activity> <!-- This activity represents the transformation of the primary 3D model from PLY to 3D-PDF (A
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  Centre</source>
<country>Greece</country>
<creation> <!-- Author of the activity record -->
<date>2013-10-07</date>
<contacts>
<name lang="en">Despoina Tsiafaki</name>
<role lang="en">Senior Researcher</role>
<organization lang="en">Institute for Language and Speech Processing, Xanthi's Branch, Athena Research
  Centre</organization>
<address>
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</address>
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<fax>+302541063656</fax>
<email>dtsiafaki@ceti.athena-innovation.gr</email>
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<name lang="en">Kioutouklou Baba Bekctashic Tekke Derivative 3D Model Generation</name>
<id>CHARC3DICONSC12013_PostProcessAct_3_A_1</id> <!-- Record ID of the digital resource that was
  produced using the data captured from this activity. This activity produced the 3D-PDF model.-->
</appellation>

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<description lang="en">A decimated version of the primary 3D model has been created and also converted to
the 3D-PDF file format</description>
<hasGeneralPurpose lang="en">To provide a 3D model that is Web-friendly and meets the project's
specifications</hasGeneralPurpose>
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<actors> <!-- Two persons were involved in the generation of the digital resource -->
<id>CHARC3DICONs12013_Actor_1</id>
<name lang="en">Anestis Koutsoudis</name>
<actorType lang="en">individual</actorType>
<roles lang="en">Digitisation team member</roles>
<roles lang="en">Data Collection</roles>
<roles lang="en">Data Processing</roles>
<contacts>
<role lang="en">Associate Research Fellow</role>
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Centre</organization>
<address>
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<postcodeOrZipcode>67100</postcodeOrZipcode>
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</address>
<phone>+302541078787(326)</phone>
<fax>+302541063656</fax>
<email>akoutsou@ceti.athena-innovation.gr</email>
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</actors>
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<endDate>2012-10-29</endDate>
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</timeSpan>
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model</hadSpecificPurpose>
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<endDate>2012-10-29</endDate>
<methods lang="en">Data Processing</methods>
<techniques lang="en">3D Mesh Decimation</techniques>
<techniques lang="en">3D Data Types Transformation</techniques>
<equipment lang="en">Agisoft PhotoScan (version 0.9.1)</equipment>
<equipment lang="en">Meshlab (version 1.3.2)</equipment>
<equipment lang="en">PC System (8-core Intel i7 processor at 3.50 Ghz, 32GB of RAM and a NVidia Geforce
GTX580 3GB RAM graphics card running Microsoft Windows 7 64-bit)</equipment>
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<hasCreated>CHARC3DICON12013_3D_2</hasCreated> <!-- Record ID of the digital resource that was produced using the data captured from this activity. This activity produced the3D-PDF model.-->
</activity>
</carare>
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