

		Project title: Automatic publication under Linked Data paradigm of library and museum data
		Acronym: ALIADA Grant Agreement No: 610927 EU FP7- ICT-2013 – SME-DCA Collaborative project

Deliverable D 3.6

ALIADA Published Datasets v1

Work Package 3

Date: 30.04.2015

Version: 1.0

Leading Beneficiary:	SCANBIT (SCA)
Editor(s):	Cristina Gareta (SCA)
Author(s) (alphabetically):	Cristina Gareta (SCA), Andrea Gazzarini (@CU), Adam Pogány (MFA), Elena Roseras (ART), Elena Turienzo (SCA)
Dissemination level:	PU

Versioning and contribution history

Version	Date issued	Description	Contributors
0.1	13.04.2015	TOC , main sections and work distribution	Cristina Gareta (SCA)
0.2	24.04.2015	Contributions form partners	Andrea Gazzarini (SCA), Elena Turienzo (SCA), Idoia Murua (TEC), Adam Pogány (MFA)
1.0	30.04.2015	First version	Cristina Gareta (SCA)

Executive summary

This deliverable is about the publication of cultural heritage datasets using ALIADA 1st release. These datasets are metadata from public libraries and museums, initially the ones in the Consortium, that were traditionally stored as 'silos' of information due to their specific creation and codification system. ALIADA aims to help these institutions to automatically publish their metadata under the Linked Data paradigm to make them reusable for data enrichment or for other innovative uses.

ALIADA first release was deployed in the library and museum management systems of ARTIUM and of the Museum of Fine Arts Budapest, as part of the task 3.1 (Deployment of first release). The deployment of this first release was monitored by staff from the cultural institutions with experience in the management system. The SMEs supported technically the testing.

During this first deployment, the librarians from ARTIUM and curators and IT staff from the Museum of Fine Arts Budapest, selected the MARC or LIDO metadata to convert to RDF and to link to other external datasets. The datasets were generated and stored in the Virtuoso RDF store, but they are not yet officially published on the DataHub repository, because the Publishing module of ALIADA is scheduled for the second prototype.



Table of contents

EXECUTIVE SUMMARY	3
TABLE OF CONTENTS.....	4
1 INTRODUCTION	5
1.1 PURPOSE OF THE DOCUMENT	5
1.2 DETAILED OVERVIEW OF OBJECTIVES	5
1.3 AUDIENCE	6
2 CULTURAL HERITAGE DATASETS	7
3 CROSSWALK TO RDF	8
4 PUBLICATION OF DATASETS USING ALIADA 1ST RELEASE.....	12
4.1 SELECTION, VALIDATION AND IMPORT.....	13
4.2 CONVERSION TO RDF.....	13
4.3 LINKING TO EXTERNAL DATASETS	14
4.4 CREATION OF URIS	14
5 SPARQL QUERIES	16
6 CONCLUSIONS.....	18

1 Introduction

1.1 Purpose of the document

This document contains the D3.6 “Published Datasets v1”, a report about the first publication of the datasets under the Linked Data paradigm. This deliverable is part of Task 3.1 (Deployment of first release):

“(…)ALIADA first release (coming from T2.1) will be deployed and customised in ART and MFAB with respect to their current management software, in order to be experimented by these two cultural institutions. Supporting activities will be carried out by @CU staff (as users guidance during process and IT support: communications, SW installation).”

It's expected a second version of this report after the deployment of ALIADA 2nd release, just before the publication of the final prototype of ALIADA (October 2015).

1.2 Detailed overview of objectives

The main purpose of this report, specified in the previous section, can be broken down in the following objectives:

- This document includes a report on progress in publishing the datasets from ARTIUM and the Museum of Fine Arts Budapest (MFAB) under the Linked Data paradigm
- Standards, schemas, formats and conceptual models used in the creation of metadata from libraries and museums
- Description of the dataset creation process in ALIADA first release
- SPARQL queries used to get the linked data from the generated dataset

This document is structured in the following sections:

- Introduction. The purpose and audience of the document are described in this section.
- Cultural heritage datasets. This section describes what data are created in the libraries and museums, as cultural heritage institutions
- Crosswalk to RDF. This section explains the process of mapping from MARC and LIDO (library and museum standards) to RDF, according to the ALIADA ontology
- Publication of the datasets using ALIADA first release. This section describes the required steps in the end-user interface to generate the dataset to be published.
- SPARQL Queries. This section includes a list of SPARQL queries valid for querying the dataset created by ALIADA.
- Conclusions

1.3 Audience

The intended audience of this document are all the stakeholders of the ALIADA project who are, in particular, interested in the datasets published by the museums in the Consortium after the deployment of ALIADA 1st release. Within this deliverable it is distinguished the following target groups:

1. ALIADA project members / partners.
2. The European Commission, who supports, and partially funds, the ALIADA project.
3. External stakeholders interested in the datasets published by the museums in the Consortium after the deployment of ALIADA 1st release and in the results achieved from the deployment of this innovative tool.

2 Cultural Heritage Datasets

The metadata created by the Cultural Heritage institutions as a result of the cataloguing of their collections, are encoded according the specific standards, schemes and formats for libraries and museums. These data are traditionally stored as ‘silos’ of information and neither the web, nor other third party applications, can reach them. As the report of the W3C Library Linked Data Incubator Group¹ says, it’s necessary to help libraries and other cultural institutions from the GLAM industry (Galleries, Libraries, Archives and Museums) to increase global interoperability of library data on the Web, using the Semantic Web standards and Linked Data principles to make those valuable information assets (resources such as bibliographic data, authorities, and concept schemes) more visible and re-usable outside of their original library context on the wider Web. Moreover, as public bodies, this cultural heritage institutions should expose their data as open data.

In this context, ALIADA helps libraries and museums to automatically publish their data as Linked Open Data. ALIADA is integrated in the current library or museum management system and is compliant with the standards from libraries and museums. ALIADA is multilingual and open source to be widely disseminated among the GLAM community. ALIADA focuses on non-expert users, such as librarians, curators, documentalists and IT staff from cultural institutions.

The current approach on publishing datasets from libraries and museums in the Linked Data Cloud using ALIADA can be seen as individual and independent efforts, where datasets to be published are directly selected from the databases, initially from the systems developed and used in the Consortium, because in general the library and museum management software vendors lock the databases access and consultancy should be hired.

¹ <http://www.w3.org/2005/Incubator/lld/XGR-lld-20111025/>

3 Crosswalk to RDF

The metadata from libraries are encoded using MARC21² schema (for bibliographic or for authorities) and they contains descriptions, controlled access points and descriptors added to the institution's catalogue. The collection of resources catalogued by the libraries in their library management system is very vary: books, sound recordings, maps, videos, photos, ... all of them provide cultural heritage information about general or local topics, organizations, persons, places, events, ages, ... The cataloguing process is carried out following the current conceptual model and standards. The most extended conceptual model for bibliographic and authority data in Europe is based on the Functional Requirements for Bibliographic Records³ (FRBR) and on the International Standard Bibliographic Description ISBD⁴. But there are other emerging conceptual and description models, such as BIBFRAME⁵ or RDA⁶.

The metadata from museums are encoded using LIDO⁷ schema. Museums use LIDO to catalogue their museum collections and the contents of their repositories. The CIDOC-CRM⁸ conceptual reference model is the model that follows these type of cultural heritage institutions.

Both library and museum management systems are able to export their catalogue to a XML file.

The following are examples of MARC and LIDO XML records:

² <http://www.loc.gov/marc/>

³ <http://www.ifla.org/publications/functional-requirements-for-bibliographic-records>

⁴ <http://www.ifla.org/publications/international-standard-bibliographic-description>

⁵ <http://www.loc.gov/bibframe/>

⁶ <http://www.loc.gov/aba/rda/>

⁷ <http://www.lido-schema.org/schema/v1.0/lido-v1.0-schema-listing.html>

⁸ <http://www.cidoc-crm.org/>



```

</marc:record>
- <marc:record>
  <marc:leader>01210nam a2200301 4500</marc:leader>
  <marc:controlfield tag="001">00000146113</marc:controlfield>
  <marc:controlfield tag="003">CaOAMICUS</marc:controlfield>
  <marc:controlfield tag="005">20140722114652.0</marc:controlfield>
  <marc:controlfield tag="008">140716s2013 sp o 000 0dspa u</marc:controlfield>
  <marc:datafield tag="020" ind2="1" ind1="1">
    <marc:subfield code="a">978-84-616-3200-8</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="040" ind2="1" ind1="1">
    <marc:subfield code="a">BCD</marc:subfield>
    <marc:subfield code="b">spa</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="041" ind2="1" ind1="1">
    <marc:subfield code="a">spa</marc:subfield>
    <marc:subfield code="h">rus</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="100" ind2="1" ind1="1">
    <marc:subfield code="a">Aksiónov, Iván?d1884-1935.</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="240" ind2="0" ind1="1">
    <marc:subfield code="a">Picasso y alrededores</marc:subfield>
    <marc:subfield code="l">Español</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="245" ind2="0" ind1="1">
    <marc:subfield code="a">Picasso y alrededores /</marc:subfield>
    <marc:subfield code="c">Iván Aksiónov ; traducción del ruso y notas de Olga Korobenko ; corrección de Marta Rebón.</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="260" ind2="1" ind1="1">
    <marc:subfield code="a">Málaga :</marc:subfield>
    <marc:subfield code="b">Fundación Pablo Ruiz Picasso-Museo Casa Natal :</marc:subfield>
    <marc:subfield code="b">Ayuntamiento de Málaga,</marc:subfield>
    <marc:subfield code="c">D.L. 2013.</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="300" ind2="1" ind1="1">
    <marc:subfield code="a">107 p. :</marc:subfield>
    <marc:subfield code="b">il. ;</marc:subfield>
    <marc:subfield code="c">27 cm</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="520" ind2="1" ind1="1">
    <marc:subfield code="a">Primera monografía escrita en el mundo sobre el pintor malagueño Pablo Picasso.</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="546" ind2="1" ind1="1">
    <marc:subfield code="a">Texto en español y ruso</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="590" ind2="1" ind1="1">
    <marc:subfield code="a">BCD4</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="600" ind2="4" ind1="1">
    <marc:subfield code="a">Picasso, Pablo,</marc:subfield>
    <marc:subfield code="d">1881-1973</marc:subfield>
    <marc:subfield code="x">Crítica e interpretación.</marc:subfield>
  </marc:datafield>
  <marc:datafield tag="700" ind2="1" ind1="1">

```

Figure 1 MARCXML record

```

<lido:lido xsi:schemaLocation="http://www.lido-schema.org http://www.lido-schema.org/schema/v1.0/lido-v1.0.xsd">
  <lido:lidoRecID lido:source="Deutsches Dokumentationszentrum für Kunstgeschichte - Bildarchiv Foto Marburg" lido:type="local">DE-Mb112/lido-obj00154983</lido:lidoRecID>
  <lido:category>
    <lido:conceptID lido:type="URI">http://www.cidoc-crm.org/crm-concepts/E22</lido:conceptID>
    <lido:term xml:lang="en">Man-Made Object</lido:term>
  </lido:category>
  <lido:descriptiveMetadata xml:lang="en">
    <lido:objectClassificationWrap>
      <lido:objectWorkTypeWrap>
        <lido:objectWorkType>
          <lido:term lido:encodinganalog="5230/5230">painting</lido:term>
          <lido:term lido:addedSearchTerm="yes" lido:encodinganalog="5230/523a">visual work of art</lido:term>
        </lido:objectWorkType>
      </lido:objectWorkTypeWrap>
    </lido:objectClassificationWrap>
    <lido:classificationWrap>
      <lido:classification lido:type="europeana.type">
        <lido:term>IMAGE</lido:term>
      </lido:classification>
    </lido:classificationWrap>
    <lido:classificationWrap>
      <lido:term lido:encodinganalog="5220/5220">panel painting</lido:term>
      <lido:term lido:addedSearchTerm="yes" lido:encodinganalog="5220/520a">painting</lido:term>
    </lido:classificationWrap>
  </lido:descriptiveMetadata>
  <lido:objectClassificationWrap>
    <lido:objectIdentificationWrap>
      <lido:titleWrap>
        <lido:titleSet>
          <lido:appellationValue lido:pref="preferred">La Primavera / Spring</lido:appellationValue>
          <lido:appellationValue lido:pref="preferred" xml:lang="en">La Primavera / Spring</lido:appellationValue>
        </lido:titleSet>
      </lido:titleWrap>
      <lido:inscriptionsWrap/>
    </lido:objectIdentificationWrap>
  </lido:objectClassificationWrap>
  <lido:repositoryWrap>
    <lido:repositorySet lido:type="current">
      <lido:repositoryName>
        <lido:legalBodyName>
          <lido:appellationValue>Galleria degli Uffizi — Pinacoteca (Florence)</lido:appellationValue>
          <lido:legalBodyName>

```

Figure 2 LIDO XML record

To convert those metadata into Linked Data it was necessary to previously define the crosswalk from MARC and LIDO elements to RDF statements (the “mapping”), according to the ALIADA ontology, mainly based on the FRBRoo ontology⁹:

“The FRBRoo is a formal ontology intended to capture and represent the underlying semantics of bibliographic information and to facilitate the integration, mediation, and interchange of bibliographic and museum information. The FRBR model was originally designed as an entity-relationship model by a study group appointed by the International Federation of Library Associations and Institutions (IFLA) during the period 1991-1997, and was published in 1998. Quite independently, the CIDOC CRM model was being developed from 1996 under the auspices of the ICOM-CIDOC (International Council for Museums – International Committee on Documentation) Documentation Standards Working Group. The idea that both the library and museum communities might benefit from harmonising the two models was first expressed in 2000 and grew up in the following years. Eventually, it led to the formation, in 2003, of the International Working Group on FRBR/CIDOC CRM Harmonisation, that brings together representatives from both communities with the common goals of: a) Expressing the IFLA FRBR model with the concepts, tools, mechanisms, and notation conventions provided by the CIDOC CRM, and: b) Aligning (possibly even merging) the two object-oriented models with the aim to contribute to the solution of the problem of semantic interoperability between the documentation structures used for library and museum information (...)”

The others ontologies and vocabularies in the same domain included in the ALIADA ontology and used in the Semantic web, are the following: Foaf (Friend of a Friend, ontology describing persons, their activities and their relations to other people and objects), SKOS (Simple Knowledge Organization System, a W3C recommendation designed for representation of thesauri, classification schemes, taxonomies, subject-heading systems, or any other type of structured controlled vocabulary) or WGS84 (RDF vocabulary for describing the location of resources).

This mapping work was carried out by the cataloguers from the cultural institutions in the Consortium and by the consultants from the SMEs, following the recommendations from the CIDOC-CRM¹⁰ and from the Library of Congress¹¹ (in charge of the MARC standards maintenance).

Once the mapping was finished by the experts in the library and museum systems, those mapping rules were added to the ALIADA’s RDFizer to create an internal DSL based on the ALIADA ontology easy to adapt to future changes.

Before automatizing the process, the most important thing was to identify the main entities in each domain. According the FRBR, the entities of the bibliographic records are the following:

Works	Authorities	Subjects
F1 Work	F10 Person	F6 Concept
F2 Expression	F11 Corporate body	F7 Object
F3,F4 Manifestation		F8 Event
F5 Item		F9 Place

⁹ http://www.cidoc-crm.org/frbr_intro.html

¹⁰ http://www.cidoc-crm.org/crm_mappings.html

¹¹ <http://www.loc.gov/standards/>

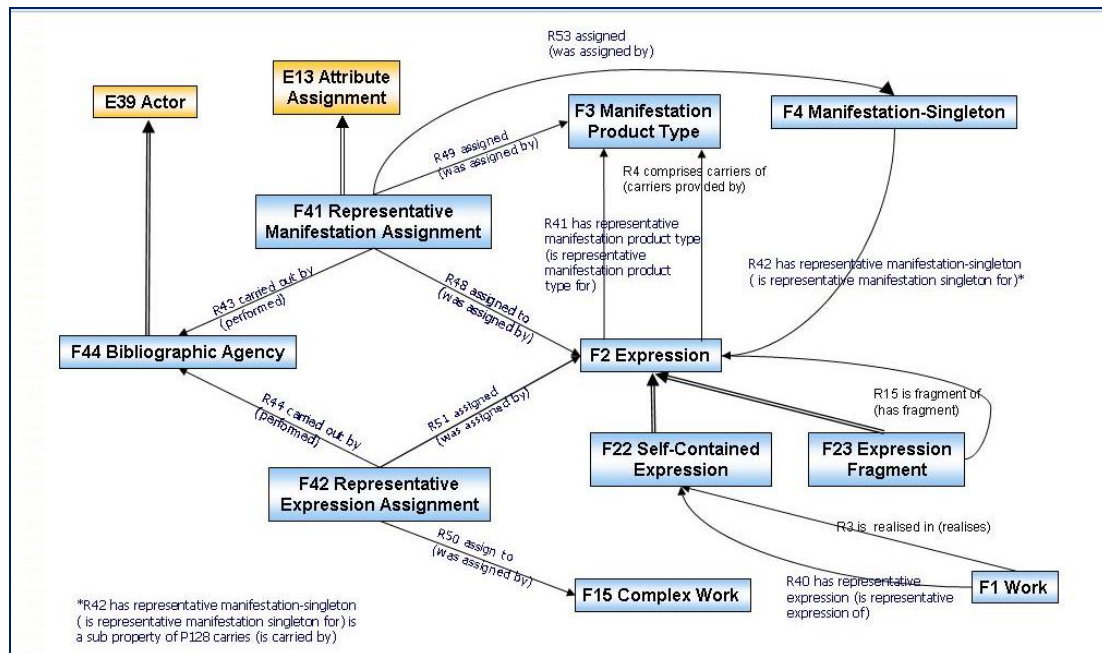


Figure 3 FRBRoo: How to identify a work¹²

And in the FRBRoo, they have equivalences with the corresponding CRM entities from the domain of the museum collections:

- E39 Actor, E21 Person
- E18 Physical thing, E24 Physical-made thing
- E28 Conceptual objects, E75 Information object
- E4 Period
- E5 Event
- E7 Activity, E65 Creation
- ...

After the conversion to RDF, the triples are stored, thereby creating the dataset.

¹² http://www.cidoc-crm.org/frbr_graphical_representation/graphical_representation/how_tp_identify_work.html

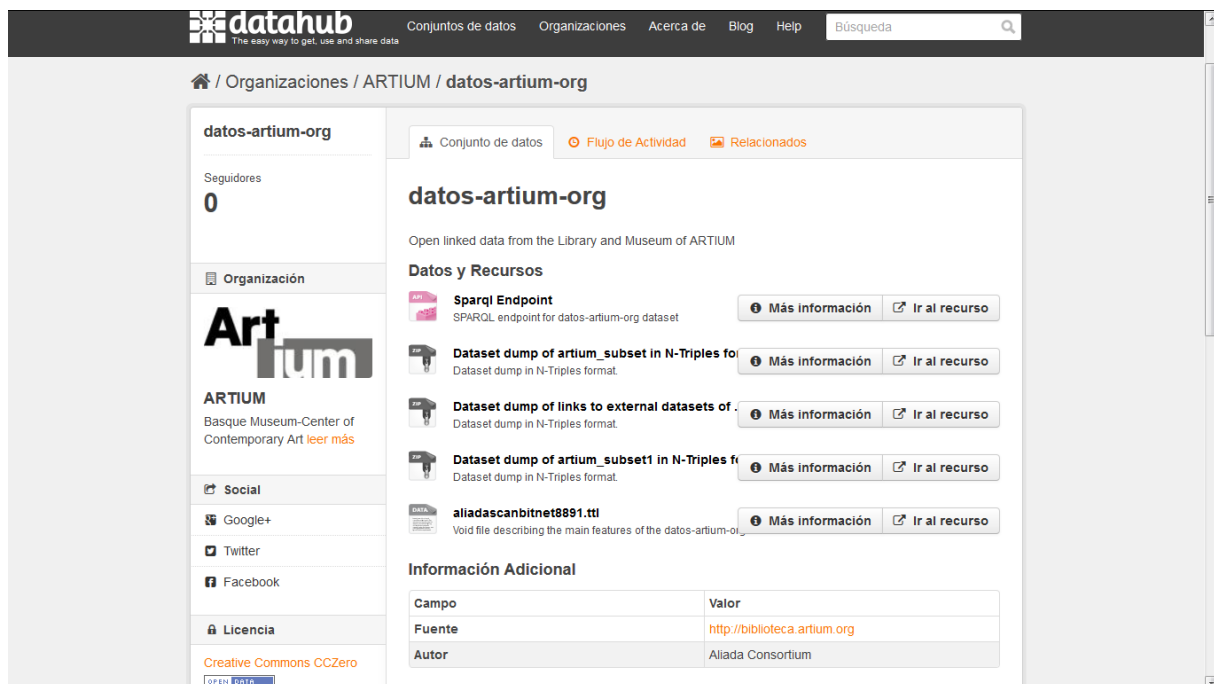
4 Publication of datasets using ALIADA 1st release

ALIADA first release includes the following functions:

- Selection, validation and import of Bibliographic MARC records and LIDO records.
- Conversion to RDF
- Linking
- URI creation

The remaining functions, Links discovery, Publication (CKAN) and Update of the published datasets, are scheduled for the second prototype.

The deployment of this release has allowed the cultural institutions involved in the project (ARTIUM and Museum of Fine Arts Budapest-MFAB) to create their datasets under the Linked Data paradigm in their local RDF stores. Only the organization pages have been created on the DataHub, because is a required step in the configuration process. As the second prototype of ALIADA is being developed in parallel, some test files might appear on those pages:



The screenshot shows the DataHub interface for the organization 'datos-artium-org'. The page includes a sidebar with the organization's logo and social media links, and a main content area with a list of datasets and an 'Información Adicional' table.

Campo	Valor
Fuente	http://biblioteca.artium.org
Autor	Aliada Consortium

Figure 4 Datahub: ARTIUM's organization page

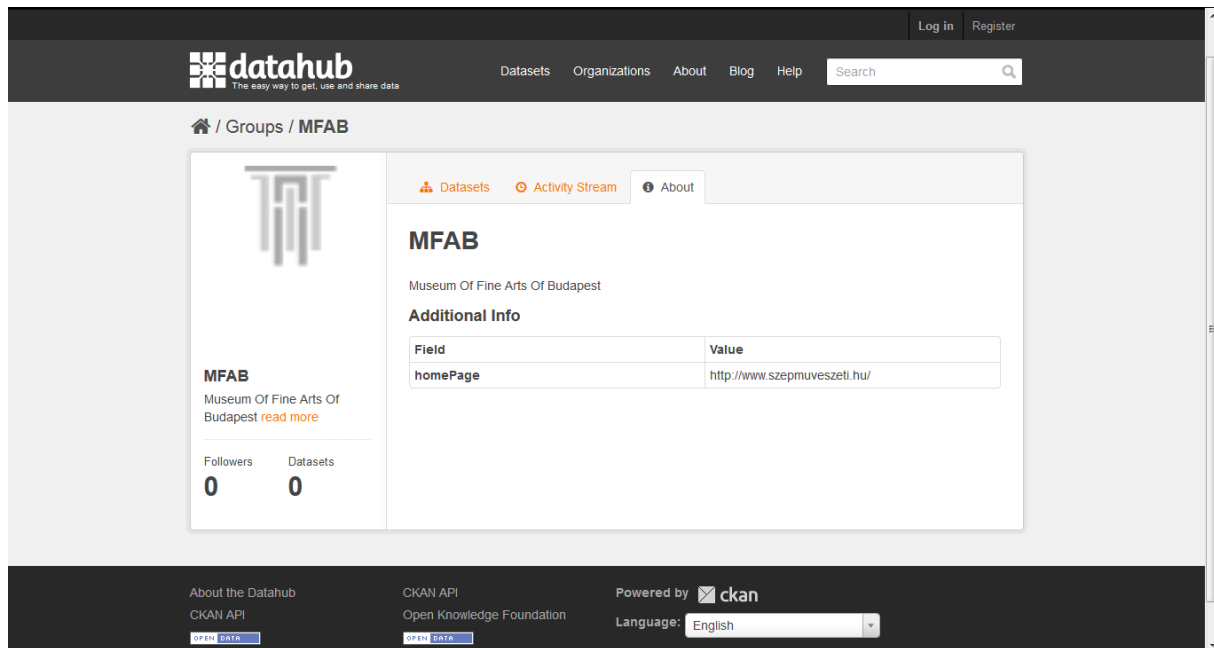


Figure 5 Datahub: MFAB's organization page

Therefore, the first step before creating and publishing the dataset is to configure the details for the organization that publishes the dataset.

4.1 Selection, validation and import

ALIADA is integrated with the library management system (LibriSuite) and with the collection management system (TMS) used by the cultural institutions in the consortium. In the second prototype it's expected that ALIADA will be completely integrated as a plugin in the ILS developed by the SMEs in the Consortium.

In the first release, ALIADA is able to browse the MARCXML and LIDO XML files in a directory containing the export from the library or museum management system. Before importing the file, the user has to select a profile from a list of profiles to perform the validation of the imported file. If the file has the mandatory tags and the correct XML format according to the selected profile, it will be uploaded.

4.2 Conversion to RDF

Once imported the file containing the metadata, the user will be able to select the dataset (graph) to add more metadata to it, if it exists. If not, it will be created. There will be a dataset for each type of metadata: MARC bibliographic, MARC for authorities, LIDO, and Dublin Core (2nd. Prototype). The different datasets, called 'graphs', can be removed from.

In addition to the graph, the user has to select a template to tell the RDFizer what kind of metadata will be processed and converted to RDF, in order to use the correct mapping rules. ALIADA's RDFizer generates the RDF statements applying the selected mapping to the input data file and stores the generated triples in the RDF triple store (Virtuoso)

4.3 Linking to external datasets

Once the institution has generated its own dataset, the next step is to link it to a predefined list of external open datasets. The purpose is to link the institution's dataset to other open datasets published in the Semantic Web to achieve 'open linked data'. The ALIADA's list of external datasets for links discovering is the following:

- DBPedia
- GeoNames
- FreeBase
- BNE
- BNB
- Europeana
- NSZL
- MARC

Finally, the dataset is ready to be published in the Linked Open Data Cloud.

4.4 Creation of URIs

The use of URIs is a key aspect in the Semantic web and in the Linked Data technology. ALIADA creates two types of URIs during the generation of the dataset:

- URI serving RDF, for machines
- URI for a HTML page devoted to human consumption using the appropriate profile setting

Some examples of URIs:

- Bibliographic entities: work, expression (this URI is configured to redirect the user to the library's online resource)

http://aliada-artium.scanbit.net:8890/id/resource/F1_Work/91a501a2c5573d8b9a6fc9777d196d76

http://aliada-artium.scanbit.net:8890/id/resource/F2_Expression/74e6a8b111ea3da1a7d0a596f4c35208

- Actor entity

http://aliada-artium.scanbit.net:8890/id/resource/E39_Actor/Routledge



The screenshot shows the ALIADA web interface. At the top left is the ALIADA logo. On the right, there are navigation tabs: 'Facets (new session)', 'Description', 'Metadata', and 'Settings' (highlighted in green). Below the tabs, the main content area displays the following information:

About: http://aliada-artium.scanbit.net:8890/id/resource/E39_Actor/Routledge [Sponge](#) [Permalink](#)
An Entity of Type : http://erlangen-crm.org/current/E39_Actor, within Data Space : [aliada-artium.scanbit.net:8890](#) associated with source [dataset\(s\)](#)
Type: http://erlangen-crm.org/current/E39_Actor

Attributes	Values
rdf:type	http://erlangen-crm.org/current/E39_Actor
http://erlangen-crm.org/current/E39_Actor is identified by	http://aliada-artium.scanbit.net:8890/id/resource/E82_Actor_Appellation/Routledge
is http://erlangen-crm.org/current/E39_Actor carried out by of	http://aliada-artium.scanbit.net:8890/id/resource/E30_Publication_Event/197143040778929 http://aliada-artium.scanbit.net:8890/id/resource/E30_Publication_Event/197143040778965 http://aliada-artium.scanbit.net:8890/id/resource/E30_Publication_Event/197143040778994 http://aliada-artium.scanbit.net:8890/id/resource/E30_Publication_Event/197143040776999

Faceted Search & Find service v1.13.54
Alternative Linked Data Views: [ODE](#) [Raw Data in: CXML | CSV | RDF \(N-Triples N3/Turtle JSON XML \)](#) | [OData \(Atom JSON \)](#) | [Microdata \(JSON HTML \)](#) | [JSON-LD](#) [About](#)

OpenLink Virtuoso version 07.10.3211, on Linux (x86_64-unknown-linux-gnu), Standard Edition
Data on this page belongs to its respective rights holders.
Virtuoso Faceted Browser Copyright © 2009-2013 OpenLink Software

Figure 6 Entity Actor (human-readable URL)

5 SPARQL Queries

Despite the fact that ALIADA provides preconfigured SPARQL queries to check the generated statements from the end-user interface, the tool has also a SPARQL endpoint for querying the dataset, provided by Virtuoso:

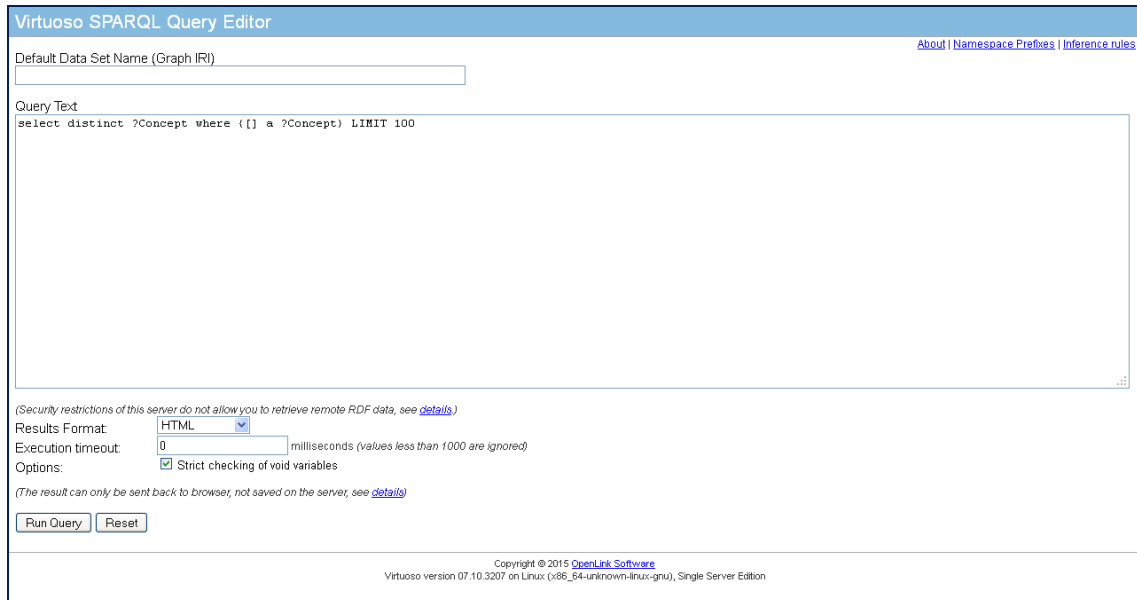


Figure 7 SPARQL Query editor

In addition, the dataset is navigable using a Linked Data Browser.

The most common SPARQL queries to the datasets generated by ALIADA are the following:

- Query to find the actors/authors:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX ecrm: <http://erlangen-crm.org/current/>
PREFIX efrbroo: <http://erlangen-crm.org/efrbroo/>
select ?actor ?name where { {?actor rdf:type ecrm:E39_Actor} UNION {?actor rdf:type
ecrm:E21_Person} UNION {?actor rdf:type efrbroo:F10_Person} . ?actor
ecrm:P131_is_identified_by ?apel. ?apel ecrm:P3_has_note ?name }
```

- Query to find the objects:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX ecrm: <http://erlangen-crm.org/current/>
PREFIX efrbroo: <http://erlangen-crm.org/efrbroo/>
```



```
select ?object ?name where { ?object rdf:type ecrm:E18_Physical_Thing . OPTIONAL {?object ecrm:P1_is_identified_by ?apel. ?apel ecrm:P3_has_note ?name }}
```

- Query to find the manifestations:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX ecrm: <http://erlangen-crm.org/current/>
PREFIX efrbroo: <http://erlangen-crm.org/efrbroo/>
select ?manif ?name where { ?manif rdf:type efrbroo:F3_Manifestation_Product_Type .
?manif ecrm:P102_has_title ?apel. ?apel ecrm:P3_has_note ?name }
```

- Query to find the works:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX ecrm: <http://erlangen-crm.org/current/>
PREFIX efrbroo: <http://erlangen-crm.org/efrbroo/>
select ?work ?expr ?manif ?title ?dimensions ?extension ?author ?place_publication
?date_publication ?edition where { ?work rdf:type efrbroo:F1_Work . ?work
efrbroo:R40_has_representative_expression ?expr . ?expr efrbroo:R4_carriers_provided_by
?manif . ?manif ecrm:P102_has_title ?apel . ?apel ecrm:P3_has_note ?title . OPTIONAL {
?manif ecrm:CLP43_should_have_dimension ?dim . ?dim ecrm:P2_has_type <http://aliada-
project.eu/2014/aliada-ontology/id/resource/Concept/MARC/6> . ?dim ecrm:P3_has_note
?dimensions . } OPTIONAL { ?manif ecrm:CLP43_should_have_dimension ?ext . ?ext
ecrm:P2_has_type
<http://aliada-project.eu/2014/aliada-
ontology/id/resource/Concept/MARC/5> . ?ext ecrm:P3_has_note ?extension . } OPTIONAL {
?expr ecrm:P148_has_component ?lingobj1. ?lingobj1 ecrm:P2_has_type <http://aliada-
project.eu/2014/aliada-ontology/id/resource/Concept/MARC/1> . ?lingobj1
ecrm:P3_has_note ?author . } ?publexpr efrbroo:R14_incorporates ?expr . ?publexpr
ecrm:P106_is_composed_of ?lingobj . OPTIONAL { ?lingobj ecrm:P2_has_type <http://aliada-
project.eu/2014/aliada-ontology/id/resource/Concept/MARC/3> . ?lingobj ecrm:P3_has_note
?place_publication . } OPTIONAL { ?lingobj ecrm:P2_has_type <http://aliada-
project.eu/2014/aliada-ontology/id/resource/Concept/MARC/4> . ?lingobj ecrm:P3_has_note
?date_publication . } OPTIONAL { ?lingobj ecrm:P2_has_type <http://aliada-
project.eu/2014/aliada-ontology/id/resource/Concept/MARC/2> . ?lingobj ecrm:P3_has_note
?edition . } }
```

- Query to find the links to the external datasets:

```
select ?aliada_dataset ?external_dataset where { ?aliada_dataset ?rel ?external_dataset }
```

6 Conclusions

Libraries and museums, as cultural heritage institutions, provide the general public with access to the objects and collections they preserve. Publishing metadata about the actual objects on the Internet available for everybody to re-use can play a significant role making cultural heritage more accessible. However, the re-use of the cultural heritage data can be not only a recommendation coming from the legislation¹³, but also a challenge, an opportunity to expose datasets published under the Linked Data Paradigm to exploit them not only in the cultural heritage sector, but also in other related sectors.

Metadata are data about an object rather than to the object itself. So, those data can be published under an open license, to can be re-used or linked to other open datasets or collections. This way, the libraries or museums' resources can be found more easily and gain added value through being put in a new context by linking it with other collections. At the same time, the institutions will not lose any rights (unless they choose to) to those objects they actually hold intellectual property rights to. Europeana, initiated in November 2008, has showcased successfully the importance of making metadata about cultural heritage freely available for everybody. By today almost all cultural heritage institutions acknowledge the importance of publishing their metadata as Linked Open Data on the Web.

ALIADA allows every single library or museum to automatically generate and publish their own linked open data in the Linked Data Cloud.

In this stage of the project, the first release of ALIADA has been deployed in ARTIUM and in the Museum of Fine Arts Budapest and configured according to their current management software. Those cultural institutions have generate, for the first time, a dataset under the Linked Data paradigm using the metadata exported from their current library or collection management system. The dataset and the links to the external datasets are only in the RDF triple store of their ALIADA installation, because the first release of ALIADA doesn't include the Publishing module (it's scheduled for the 2nd prototype). However, ALIADA has a SPARQL endpoint for querying the dataset, provided by Virtuoso.

In parallel with the deployment of the first release, the Consortium started the development of the second prototype. During the month 18 (April 2015) it's expected a release of this second prototype, that will be available for deployment in May 2015. This second release includes the publishing feature of ALIADA.

¹³ <http://ec.europa.eu/digital-agenda/en/european-legislation-reuse-public-sector-information>

