



**ECP-2005-CULT-38074-EDL**

**EDL Project**

**Towards Metadata Interoperability between  
Archives, Audio-Visual Archives, Museums and  
Libraries: *What can we learn from The European  
Library metadata interoperability model?***

<b>Deliverable number</b>	D 1.1
<b>Dissemination level</b>	Public
<b>Delivery date</b>	31 <sup>st</sup> August 2007
<b>Status</b>	Version 1.4
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***eContentplus***

This project is funded under the *eContentplus* programme<sup>1</sup>,  
a multiannual Community programme to make digital content in Europe more accessible, usable and  
exploitable.

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<sup>1</sup> OJ L 79, 24.3.2005, p. 1.



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### 1 Foreword

Very early on in the project it became apparent that the work envisaged in the EDLproject Description of Work for WP1, T4 “*to undertake the exercise of mapping and harmonising the known metadata schemas and repositories in use across libraries, museums and archives and to create a prototype metadata registry.*”<sup>1</sup> was a very ambitious, albeit important task. The European Library Office project team soon became aware that the significant expectations for this task for D1.1 - a European Metadata Schema/Registry - needed to be balanced with what is possible given the time (12 months) and resources (0,2 FTE) available for the task.

In parallel, in the relatively early stages of the project, the European Commission organised a series of three technical meetings with experts “*to discuss issues of interoperability and multilingualism in the context of the ‘European Digital Library’.*” The aim of these meetings was to “*establish a technical roadmap for developing a longer-term framework [ ... ] to feed into appropriate actions under the eContentplus programme.*”<sup>2</sup> The European Library Office was invited to participate in the i2010 Interoperability Expert Group, and due to her work with metadata interoperability through EDLproject, Sally Chambers became the official representative on this group from The European Library Office. This work has proved to be invaluable for WP1-T4 of EDLproject.

By the end of the series of technical meetings (in May 2007), the i2010 Interoperability Expert Group recommended that, to ensure metadata interoperability, a *higher-level interoperability application profile* (or schema) *should NOT be created, but instead that Semantic Interoperability techniques should be employed to implement semantic mappings and the cross-searching of descriptive metadata.* This recommendation therefore invalidated the creation of a Metadata Schema, as outlined in the EDLproject plan and it was therefore proposed to The European Commission, that Deliverable 1.1 should instead be produced as a report. This proposal was accepted.

The aim of this report is to provide an assessment of the model in which *metadata interoperability* has been accomplished between the National Libraries in Europe through The European Library. The report will then go forward to discuss how metadata interoperability between museums, archives, audio-visual archives and libraries could be approached in order to make the European Commission’s vision for a European digital library “a multilingual internet access point to cultural collections from all Member States”<sup>3</sup>. This discussion will draw on both the work of the Metadata Sub-group of the European Commission’s i2010 Interoperability Expert group and the initial consultations that have taken part with potential “content providers” from the 2005 eContentplus call (DISMARC, VideoActive and Bernstein).

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<sup>1</sup> EDLproject, Description of Work.

<sup>2</sup> Invitation from the European Commission to The European Library office to participate in Interoperability and Multilingualism Expert Group (December 2006).

<sup>3</sup> For further information about the European Commission’s i2010 Digital Library initiative see: [http://ec.europa.eu/information\\_society/activities/digital\\_libraries/index\\_en.htm](http://ec.europa.eu/information_society/activities/digital_libraries/index_en.htm)



## 2 Metadata interoperability between European national libraries

From the very beginning *metadata* interoperability has been an essential element in the development of The European Library. As we move towards the development of a European digital library it will be useful to assess how *metadata interoperability* between the full-partner libraries in The European Library has been achieved. In this way, we can propose some initial suggestions as to how we could build upon The European Library's *metadata interoperability* models in order to move towards *metadata interoperability* between museums, archives, audio-visual archives and libraries.

### 2.1 The European Library Application Profiles

The development of The European Library Application Profiles began during the TEL Project<sup>1</sup>. As part of the TEL project there was an entire Work Package (WP3) dedicated to the development of Metadata. As part of this work package a TEL Metadata Working Group was formed of metadata specialists from each of the partner libraries<sup>2</sup>. One of the core aims of this Metadata Working Group was to “reach a wider agreement on [metadata] among the national libraries ... [including] ... [metadata] standardisation and a common terminology”<sup>3</sup>. Through the use of questionnaires, on metadata standards and practices in use in the partner libraries, a consensus was reached between the partner libraries. Also at that time the Dublin Core Library Application Profile was being developed<sup>4</sup>. It was felt that “TEL will use a collection of namespaces, among which the Dublin Core Library Application Profile (DC-Lib) will be the most important, although this will probably not be sufficient for TEL.”<sup>5</sup> Therefore, the decision was made for the TEL project to develop its own Application Profiles, based on the Dublin Core Library Application Profile; one for objects and one for collections. The development of these application profiles “resulted from consultation between the TEL participants in the metadata work package [...] all the participants in TEL represented on the metadata working group have agreed to provide metadata in compliance with these application profiles. The nature of the profiles is dynamic to allow for evolving functionality of the TEL portal and evolving services.” From the very beginning, achieving consensus on Metadata Standards, through a representative Metadata Working Group, was fundamental to

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<sup>1</sup> The European Library (TEL) Project was funded under the European Commission's 5<sup>th</sup> Framework Programme. It was a 30 month project beginning on 1.2.2001. More information about the TEL project can be found on the Cordis website at:

[http://cordis.europa.eu/fetch?CALLER=PROJ\\_IST&ACTION=D&DOC=35&CAT=PROJ&QUERY=1188803618463&RCN=60643](http://cordis.europa.eu/fetch?CALLER=PROJ_IST&ACTION=D&DOC=35&CAT=PROJ&QUERY=1188803618463&RCN=60643)

An archive of the TEL project website is available on The European Library website at:

[http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject\\_archive/telproject\\_archive.html](http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject_archive/telproject_archive.html)

<sup>2</sup> The European Library (TEL) project was coordinated by The British Library with the National Libraries of Germany, Finland, Italy (Florence), Netherlands, Portugal, Slovenia, Switzerland and the Central Institute for the Union Catalogue of Italian Libraries (ICCU) as partners.

<sup>3</sup> Minutes of the TELproject (WP3: Metadata Development) meeting, 1<sup>st</sup> February 2002.[unpublished]

<sup>4</sup> The first version of the Dublin Core Libraries Application Profile was published in August 2001: <http://dublincore.org/documents/2001/08/08/library-application-profile/>

<sup>5</sup> Minutes of the TELproject (WP3: Metadata Development) meeting, 1<sup>st</sup> February 2002. [Unpublished]



successful *metadata interoperability* within the TELproject and later within The European Library itself.

### 2.1.1 The European Library Application Profile for Objects

The European Library Application Profile for Objects<sup>1</sup> is a list of all the metadata terms that are permitted to be used in The European Library portal. Currently, there are over 95 permitted terms, term refinements and encoding schemes. The vast majority of these terms come directly from the Dublin Core Library Application Profile<sup>2</sup> with additional “TEL” terms, such as *RecordID* (the unique identification of the record in the source database); *Thumbnail* (linking to small image meant for display as part of the object or collection description in the portal) and *RecordSchema* (name of the xml schema of the metadata describing the objects of the resource (e.g. MARC XML)) that have been developed to provide specific functionality within The European Library. For example, the term *RecordID*, provides the “Availability in Library” functionality in the portal, which allows the user to see the same metadata record in the library catalogue of the owner library in order that the user can find holdings information and if they are a member of that library request a book. The European Library Application Profile for Objects is not a static document. With each new release of The European Library portal (currently 2-3 times per year) the Metadata Working Group will assess the applicability of the Application Profile with the user functionality that will be developed in the portal. If necessary the relevant changes are made to the Application Profile. For example, in the November 2007 release of the portal, the display order of the metadata fields in the full-record display is being evaluated.

### 2.1.2 The European Library Application Profile for Collection Descriptions

The European Library Application Profile for Collection Descriptions<sup>3</sup> is a list of all the metadata terms that are permitted to be used in The European Library portal for describing collections. As explained by Theo van Veen in Deliverable 3.3 of the TEL Project<sup>4</sup> the original development of The European Library Application Profile for Collection Descriptions “is based on the TEL Application Profile for Objects version 1.1. and the Research Support Libraries Programme (RSLP) collection description schema<sup>5</sup>. Since then, both the Dublin

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<sup>1</sup> The current version of The European Library Application Profile for Objects is available in The European Library Metadata Registry at:  
[http://www.theeuropeanlibrary.org/handbook/Metadata/tel\\_ap.html](http://www.theeuropeanlibrary.org/handbook/Metadata/tel_ap.html)

<sup>2</sup> The current version of the Dublin Core Library Application Profile is available on the Dublin Core website at: <http://dublincore.org/documents/2004/09/10/library-application-profile/>

<sup>3</sup> The current version of The European Library Application Profile for Collection Descriptions is available in The European Library Metadata Registry at:  
[http://www.theeuropeanlibrary.org/handbook/Metadata/tel\\_ap\\_cld.html](http://www.theeuropeanlibrary.org/handbook/Metadata/tel_ap_cld.html)

<sup>4</sup> An archived version of the TEL project Deliverable 3.3 is available at:  
[http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject\\_archive/doc/D3.3v1.0.doc](http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject_archive/doc/D3.3v1.0.doc)

<sup>5</sup> Further details about the Research Support Libraries Programme (RSLP) Collection Descriptions Schema can be found on the UKOLN website at: <http://www.ukoln.ac.uk/metadata/rslp/schema/>



Core Collections Application Profile<sup>1</sup> and the NISO Metadata Search Initiative's draft Collection Description Specification<sup>2</sup> have been developed. The ongoing development of The European Library Application Profile for Collection Descriptions has involved the consideration of both these standards. In the future, with the development of the European Digital Library, further harmonisation will be needed between The European Library Application Profile for Collection Description and other Cultural Heritage Collection Description standards, such as the Data Model from the Michael project.<sup>3</sup>

## 2.2 The European Library Metadata Registry

Like the Library Application Profiles, The European Library Metadata Registry<sup>4</sup> was developed as part of the TEL project<sup>5</sup> (Work package 3: Metadata Development). Originally as part of the TEL Metadata Handbook, in January 2007, it was launched as a standalone website. One of the central components of the Metadata Registry is the *Directory of Terms*. This is the central point for storing and describing all the metadata terms that are in use in The European Library. Until recently (May 2007) all terms in the Metadata Registry were stored in a flat XML file. However, in May 2007, a database for those terms was developed. Not only does this make the terms easier to administer (a special terms administration web interface has been developed), but it is also hoped that *Directory of Terms* will become more user friendly as users of the Registry now have the option both the browse and search for metadata terms. In addition to the terms, crosswalk information between commonly used metadata schemas (e.g. MARC 21 and UNIMARC) to The European Library Application Profile for Objects is also provided. The maintenance and development of The European Library Metadata Registry is the responsibility of the Metadata Working Group.

**On the following pages there are some screenshots showing the development of the Metadata Registry from the TEL project to present day:**

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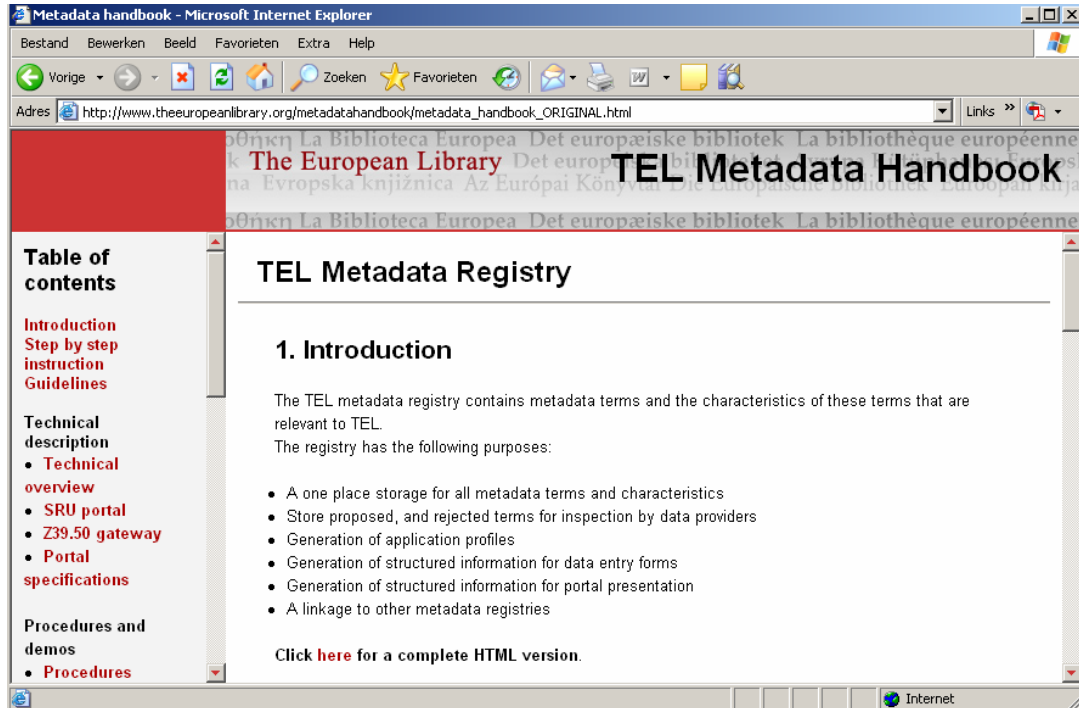
<sup>1</sup> The latest version of the Dublin Core Collections Application Profile is available at: <http://dublincore.org/groups/collections/collection-application-profile/>

<sup>2</sup> For further information about the NISO Metasearch Initiative's draft Collection Description Specification is available on the NISO website at: <http://www.niso.org/standards/resources/Z39-91-DSFTU.pdf>

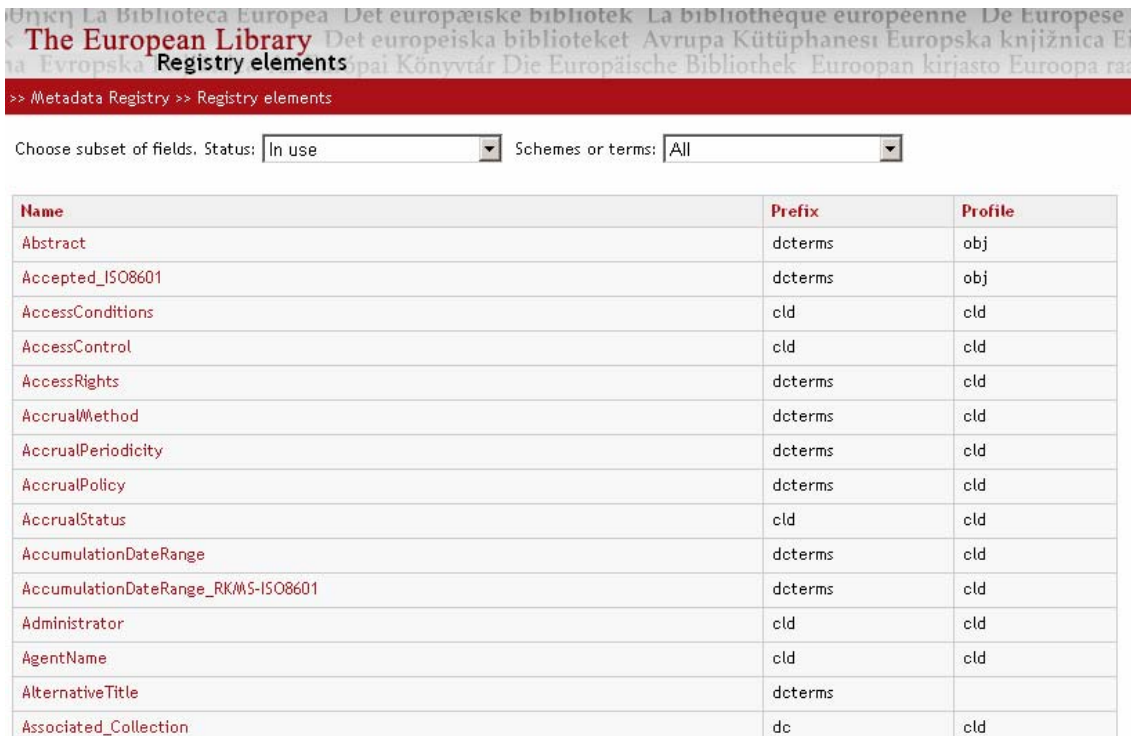
<sup>3</sup> The Data Model from the Michael project is available at: [http://www.michael-culture.eu/documents/MICHAELDataModelv1\\_0.pdf](http://www.michael-culture.eu/documents/MICHAELDataModelv1_0.pdf)

<sup>4</sup> For the latest version of The European Library Metadata Registry please see: <http://www.theeuropeanlibrary.org/metadataregistry/>

<sup>5</sup> An archived copy of the original TEL Metadata Registry Deliverable (3.4) from the TEL project is available online at: [http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject\\_archive/doc/D3.4v1.0.doc](http://www.theeuropeanlibrary.org/portal/organisation/cooperation/archive/telproject_archive/doc/D3.4v1.0.doc)



The original European Library Metadata Registry (a section in the TEL Metadata Handbook)



The second version of The European Library Metadata Registry (here all the terms are stored in a flat HTML file)



The European Library Metadata Registry

>> Metadata Registry Log out | Handbook

Home: Metadata Registry <<

Using the Metadata Registry <<

Directory of terms <<

Search

View all

View collection profile

View object profile

View history

Terms administration <<

Crosswalks <<

Metadata Working Group <<

Author: TEL MWG  
Last update: June 27 2007

## View all

This page show you all the properties and their encoding schemes or refinements. You can choose the type of terms and the status using the two filters below. Click on the [+] in front of a property to view the related encoding schemes or refinements. Click on the name of the term to see its full description.

Choose your view

Display: Properties Term status: in use

### Properties in use in the Metadata Registry

Collection	<input type="checkbox"/> Identifier <a href="#">+URL</a> <a href="#">+SRUbaseURL</a> <a href="#">+OAIbaseURL</a>	SpatialCoverage
Creator	Language	Subject
Date	Publisher	Title
Description	RecordSchema	
Format	Relation	

**The current version of The European Library Metadata Registry  
(here all the terms are stored in a MySQL database)**

## 2.3 The Metadata Working Group

The importance of having a group of keen and interested people with an interest and working knowledge of metadata issues and standards has been central to success of metadata interoperability in The European Library since its beginnings in the TELproject. In addition to the Metadata Working Group members having a working-knowledge of the metadata standards, it is also important that they know how these standards are implemented within their own organisations. Since January 2006, when it was decided to publish a new version of the metadata registry, a metadata registry review group was set up.

The first two meetings of this group in 2006 were to scope the review of the metadata registry and also to discuss the future development of a European Metadata Registry. From the meeting of the group in July 2006, it became apparent that an ongoing Metadata Working Group should be established with the responsibility of maintaining and developing The European Library Metadata Registry and The European Library Application Profile for Objects. It was therefore agreed that the Metadata Working Group<sup>1</sup> should become an on-going sub-group of The European Library's Technical Working Group (TWG) and will meet physically prior to each release of The European Library, which is approximately 2-3 times per year. Following this decision a paper was submitted to The European Library Contacts

<sup>1</sup> The current members of The European Library Metadata Working Group are: Robina Clayphan, The British Library (Chair), Sally Chambers, The European Library Office (Secretary), Corine Deliot, The British Library, Christine Frodl, The German National Library, Cristina Magliano, Central Institute for the Union Catalogue of Italian Libraries and Mirna Willer, The National Library of Croatia.



at their meeting in June 2007<sup>1</sup>, which outlined formal responsibilities of the Metadata Working Group:

**The Formal Responsibilities of The European Library Metadata Working Group are:**

- Overall responsibility for the Metadata Registry
  - Layout of registry
  - Functionality of registry
  - Control of term proposals process
  - Implementation of decisions relating to the application profiles
- Specific responsibility for Application Profile for Objects and any related issues
- Overall responsibility for the metadata standards used in Registry including awareness of new and developing standards
- Responsibility for harmonisation between the Application Profiles and with other sectors
- Responsibility for how the Registry appears in the Handbook
- Editorial Responsibility for the “Preparing my metadata” module in The European Library Handbook: <http://www.theeuropeanlibrary.org/handbook/>

It was proposed that alongside the Metadata Working Group, a working group should be set up to improve the user experience with relation to the Collection Descriptions that are in use in The European Library portal. This proposed group would also have a remit to for the maintenance and development of The European Library Application Profile for Collections Descriptions. However, after detailed discussion, the MWG recommended that instead of a separate collection descriptions working group being established that the Metadata Working Group should be strengthened. With this expansion, The European Library Application Profile for Collection Descriptions would also become the responsibility of the Metadata Working Group - alongside the Metadata Registry and The European Library Application Profile for Objects.

From the beginnings with the TEL project, it became clear that consensus on the metadata standards in use in the partner libraries was an essential element to *metadata interoperability* in The European Library. To ensure that this consensus is ongoing it is proposed that input from the metadata specialists in each of the partner libraries is solicited. It has been agreed therefore that the work of the Metadata Working Group should be supported by two “virtual” groups composed of the staff in each of the National Libraries who are responsible for the mapping their data to the Objects Application Profile and for writing the Collection Level Descriptions. This new Metadata Working Group structure will be in place in The European Library from October 2007.

With the setup of the new Metadata Working Group structure the importance of maintaining good communication between the members of the Metadata Working Groups and The European Library Contacts and Technical Working Groups is essential. For example, the minutes and documents of Metadata Working Group meetings are added to “partners-only” section of The European Library website. In addition, alongside the existing Metadata Working Group email discussion list, there will be an additional list for the “virtual groups” who are responsible for providing practical input into the development and maintenance of

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<sup>1</sup> Taken from Clayphan, R (2007) Maintenance and Development of The European Library Metadata Registry and Profiles - proposed working group structure [Unpublished.]



the Application Profiles. The use of web-conferencing and online, distributed document sharing space has already become a useful tool for communication between partner libraries in The European Library. These tools will also be used by the Metadata Working Groups where appropriate. It is also important that The European Library partners and other interested partner have a central contact point for The European Library Metadata Working group. A centralised email address ([metadata@theeuropeanlibrary.org](mailto:metadata@theeuropeanlibrary.org)) has been set-up for this purpose.

To emphasise the importance of *metadata interoperability* in The European Library, from 1st September 2007, The European Library office will have a dedicated member of staff for *metadata interoperability*. *The European Library Interoperability Manager* will be responsible for the:

- Coordination of The European Library Metadata Working Groups.
- The European Library Metadata Registry.
- The maintenance and development of The European Library Application Profiles in line with portal releases.
- Developing and maintaining the metadata-related sections of The European Library Handbook.
- Responsible for maintaining current awareness of international standards related to metadata.

It is anticipated that a similar dedicated Interoperability Manager will also be employed as part of the EDLnet project.

A screenshot of the 'The European Library Metadata Registry' website. The page title is 'The European Library Metadata Working Group'. The main content area includes a description of the group's role, a list of members (Robina Clayphan, Chair and Sally Chambers, Secretary), and their biographies. There are two portrait photos: one of Robina Clayphan and one of Sally Chambers. A sidebar on the left contains navigation links like 'Home: Metadata Registry', 'Using the Metadata Registry', 'Directory of terms', 'Crosswalks', and 'Metadata Working Group'. The top of the page has a header with the site name in multiple languages and a navigation bar with 'Log out' and 'Handbook' links.

**Draft of the new Metadata Working Group page in The European Library Metadata Registry**



## 2.4 The European Library Handbook

Providing support to European Library partner libraries is an essential task of The European Library Office. One of the key online support tools is The European Library Handbook<sup>1</sup>. The European Library Handbook was extensively redesigned in 2006 as an online tutorial to help partners in The European Library to do what is necessary to provide access to their collections in The European Library portal. As metadata is an essential part of this task two *metadata-specific* sections in the Handbook have been developed. The first, *Preparing my Metadata* aims to help partner libraries make their local metadata records comply with The European Library Application Profile for Objects. The second, *Describing my Collections* helps partners in creating high-quality collection descriptions for use in The European Library portal. This module also included two web-tools, to help partners to submit new or edit existing collection descriptions.

Here are some screen-shots from the current version of The European Library Handbook:

A screenshot of the 'Preparing my metadata' module in the European Library Handbook. The page has a red header with the title 'The European Library Handbook' and a navigation bar with a red background and white text. A sidebar on the left contains a list of menu items, with 'Preparing my metadata' selected and highlighted in red. The main content area is titled 'Preparing my metadata' and lists several topics: 'The European Library Application Profile', 'Metadata compliance with The European Library Application Profile', 'Choosing metadata elements', 'Character sets and my metadata', 'Providing additional services to users', 'Testing my metadata', 'Completing the Implementation Plan', 'FAQs about Preparing my Metadata', and 'Further questions? Contact the relevant technical manager'.

The “preparing my metadata” module

<sup>1</sup> The current version of The European Library Handbook is available at: <http://www.theeuropeanlibrary.org/handbook/>



Θνηκη La Biblioteca Europea Det europæiske bibliotek La bibliothèque européenne De Europe  
 The European Library Det europeiska biblioteket Avrupa Kütüphanesi Europska knjižnica  
 a Evropska Handbook Az Európai Könyvtár Die Europäische Bibliothek Euroopan kirjasto Euroopa

>> Handbook Log o

Home: Handbook

Using The European Library Handbook

Including my Collections

Accessing my Collections

Preparing my metadata

**Describing my Collections**

What is a collection description?

What are collection descriptions for?

Describing my collection for The European Library?

Submitting my collection descriptions to The European

## Describing my Collections

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What is a collection description?

What are collection descriptions for?

Describing my collection for The European Library

Submitting my collection descriptions to The European Library office

Updating my collection descriptions

In what languages do I need to describe my collections?

Completing the Implementation Plan: Describing my collections

FAQs about Describing my collections

Further questions? Contact the relevant technical manager in The European Library Office

**The “describing my collections” module**

Θνηκη La Biblioteca Europea Det europæiske bibliotek La bibliothèque européenne De Eur  
 The European Library Det europeiska biblioteket Avrupa Kütüphanesi Europska knjižr  
 a Evropska Collection Description Editor Az Európai Könyvtár Die Europäische Bibliothek Euroopan kirjasto Euroo

>> Handbook >> Add new collection

**Step 1. Submit new collection description**

Add more elements by using the elements table below this one

Enter a value and the choose language it is in.  
 Add elements through the element list below. Delete items by pressing the bin of that row.

Element	Value	Language	
update_date: *	2007-09-03		
Title: *	<input type="text"/>	en	
Title:	<input type="text"/>	en	
Description: *	<input type="text"/>	en	
Description:	<input type="text"/>	en	

**The Collection Descriptions Editor**



### 3 Metadata Interoperability with EC-funded projects

As part of the work for *Work package 3 – Developing the European digital library* of EDLproject, a workshop on developing the European digital library, took place in Vienna, Austria in November 2006. The aim of this workshop “was to provide a framework for dialogue with other 2005 call eContentplus projects about a possible participation in a network based on *The European Library*. This first workshop provided a forum for members of EDLproject and other eContentPlus projects to reach a first understanding of possible cooperation scenarios and to outline a plan for next steps<sup>1</sup>.”

At this meeting Sally Chambers gave a presentation entitled *Metadata in The European Library: current status, future developments* at the *first EDLproject Workshop* at the National Library of Austria in Vienna. This presentation was intended to help the eContentplus understand both how metadata is used and managed within *The European Library* with a view to discussing whether the existing metadata models can be extended to include metadata from their projects. During the workshop a *metadata interoperability* break-out session was held. This workshop was particularly useful for this task as practical steps toward *metadata interoperability* were identified with the eContentplus projects: Bernstein, Video Active and DISMARC.<sup>2</sup>

#### 3.1 Discovering Music Archives: the DISMARC project

DISMARC<sup>3</sup>, discovering music archives, is a two year targeted project, which began in September 2006 and is funded under eContentplus. The aim of DISMARC is to address “European cultural, scientific and scholarly music audio and music-related objects (video, film, instruments, transcriptions, etc) in archives accessible only to visitors to the archive itself. Project also merges content catalogues of broadcasters, museums, archives and universities. TEL-compliant and TEL-integrate-able.” As described at the EDLproject workshop in Vienna, the DISMARC portal will be like a “European Library for music”.

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<sup>1</sup> Agenda for the First EDLproject Workshop on developing the European digital library, November 2006

<sup>2</sup> As commented in the foreword to this report, shortly after the EDLproject Workshop in Vienna had taken place, the European Commission set up the i2010 Interoperability Expert Group. This being the case, less dialogue with the other eContentplus projects than was originally anticipated was able to be undertaken. In parallel, preparations were being made for the EDLnet Thematic Network. EDLnet (from 1<sup>st</sup> July 2007) is considered to be a more appropriate forum for the various eContentplus projects and stakeholders from the broader archives, audio-visual archives, museums and libraries communities to work towards a practical implementation of *metadata interoperability* for the European digital library. This work will be a central work item in WP2 (*Technical and Semantic Interoperability*) of EDLnet. This work will build on the recommendations on *metadata interoperability* from both EDLproject and the EC's Interoperability Expert group. It is also noted that appropriate projects from eContentplus including DISMARC, Video Active and Bernstein have been invited to join EDLnet as Project Contributors.

<sup>3</sup> For more information about the DISMARC project, please refer to their project website:  
<http://www.dismarc.org/>



Following on from the Workshop in Vienna, contact was made between The European Library Office and the Music Archive of the Ethnological Museum in Berlin, who are leading the DISMARC Metadata Work Package. One of the targets of the DISMARC project is the “interoperability between DISMARC with The European Library on the level of metadata. In order to achieve future content exchanges between both databases we try to facilitate high level of compliances with the TEL/EDL metadata architecture.” The initial phase of work was to provide DISMARC with the information about the TEL Applications profiles and to answer any particular questions they had.

The initial questions that DISMARC had regarding metadata were related to understanding more about The European Library Application Profiles; in particular which standards were the Application Profiles based on, and the current status of the terms in the Metadata Registry. This information was required as the DISMARC project needed to set up their own Application Profile that would be interoperable with The European Library Applications Profiles. One of the first things that became apparent was that if organisations, who are not partners in The European Library, were to use The European Library Metadata Registry and related Application Profiles, that, it is of paramount important that this information contained there is current and well maintained. [The European Library Handbook](#) was also shared with the DISMARC team, with especially the modules *Preparing my metadata* – about compliance with The European Library Objects Application Profile and the module *Describing my collections* - which is designed to help European Library partners create collection descriptions for making their collections available in The European Library. It was noted at this stage that as this handbook has been written for library partners in The European Library, subsequently a version for museums, archives, audio-visual archives and libraries would need to be created to support the needs for such for cultural heritage partners. DISMARC was also interested in further guidance as how The European Library encodes the Application Profiles and the terms and elements within the Metadata Registry in XML. This information is something that is not currently available in The European Library Handbook or Metadata Registry.

One of the key metadata deliverables for the DISMARC project is to create a DISMARC Audio Objects Application Profile. The DISMARC Audio Objects Application Profile uses metadata terms from the Dublin Core Metadata Initiative plus the Dublin Core Libraries Application Profile (DC-Lib). As the DC-Lib Application Profile is what The European Library Application Profile for Objects was originally based on, this provides a good basis for interoperability between the two Application Profiles. It is not anticipated that there will be any significant *metadata interoperability* issues between the DISMARC content and the future European Digital Library metadata standards.

### **3.2 Video Active: Creating access to Europe’s Television Heritage**

One of the main aims of the Video Active project<sup>1</sup> is to stimulate “use and re-use of a huge body of digitised television archive content consisting of selected, comparable programme

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<sup>1</sup> More information about the Video Active project can be found on their project website: <http://videoactive.eu/>



material”<sup>1</sup>. During the EDLproject Meeting, Johan Oomen from the Video Active project team explained how television archives are not usually publicly accessible, as often the archives are *production archives*. By the end of the project, Video Active intends to make 10,000 items available via the Video Active portal. Video Active has already expressed their keen interest to collaborate with the EDLproject on the way to contributing to the future European digital library.<sup>2</sup> Regarding *metadata interoperability* the descriptive metadata for Video Active is Qualified Dublin Core and for technical metadata it is MPEG 7. As for The European Library, the metadata in the Video Active central index will be harvestable using OAI-PMH. The first version of the Video Active portal is scheduled for release in November 2007 with the second version in November 2008. It is not anticipated that there will be any significant *metadata interoperability* issues between the Video Active content and the future European Digital Library.

### 3.3 The Bernstein Consortium: the memory of papers

The aim of the Bernstein project is to “produce a digital infrastructure for the expertise and history of paper based on images visualising the paper’s structure. The individual resources are databases of watermarks and other annotated features, image measurement software, contextual resources for cartography and bibliography, and an integrated workspace.”<sup>3</sup> Already a prototype [Watermark Search Engine](#) has been developed using the digital watermark content. At the EDLproject meeting in Vienna the Bernstein project agreed that they are ready to adopt The European Library Application Profile for Objects and also to create a collection description for their digital content. Due to the lack of current agreement on standardisation in the Paper History domain it is difficult to anticipate at this stage whether a Dublin Core-based Application Profile would be suitable for the digital content to be made available from the Bernstein project.

### 3.4 MultiMatch and metadata in cultural heritage domain

In addition to the DISMARC, Video Active and Bernstein projects the Deliverable D2.1<sup>4</sup> *First Analysis of metadata in the cultural heritage domain* from the European Commission’s 6<sup>th</sup> Framework Programme project, MultiMatch<sup>5</sup> is potentially a useful report regarding *metadata interoperability* in the cultural heritage domain. The deliverable includes “an overview of the metadata schemas and controlled vocabularies that widely used in the cultural heritage sector”. Usefully it divides the “cultural heritage sector into six specific “sub-domains” of the cultural heritage sector: *archives, libraries, museums and the educational, audio-visual and*

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<sup>1</sup> Taken from the Video Active project overview presentation, available online at: <http://videoactive.wordpress.com/presentations/>

<sup>2</sup> See Video Active blog entry from 2<sup>nd</sup> December 2007 <http://videoactive.wordpress.com/2006/12/02/collaboration-with-edlproject-established/>

<sup>3</sup> Further information about the Bernstein project is available on their project website at: <http://www.bernstein.oeaw.ac.at/>

<sup>4</sup> The MultiMatch deliverable First Analysis of metadata in the cultural heritage domain is available online at: <http://www.multimatch.org/docs/publicdels/D2%201-FINAL-2006-23-10.pdf>

<sup>5</sup> Further information about the MultiMatch project is available on their project website at: <http://www.multimatch.org/>



*geospatial sectors*". It is recommended that this report is considered in the future stages of developing *metadata interoperability* as part of the EDLnet project.

### 4 The European Commission's i2010 Interoperability Expert Group

In early 2007, the European Commission organised a series of three technical meetings with experts to discuss issues of interoperability and multilingualism in the context of the 'European Digital Library'. The aim of these meetings was to establish a technical roadmap for developing a longer-term framework to feed into appropriate actions under the eContentplus programme. Furthermore, the expert group was tasked to deliver short term agenda issues to be fed into the i2010 Digital Library agenda for 2008/2010.<sup>1</sup>

The aim of the group was to be able to clearly distinguish those aspects of interoperability and multilingualism that can be tackled with good chances of success of obtaining operational results by the year 2008 from those working areas that require long term commitment and sometimes even fundamental research to yield such operational results. By the end of series of meetings, a short list of ten minimum interoperability criteria for the European digital library were identified by the expert group. It was clear from the first meeting of the Interoperability Expert Group that *metadata interoperability* is fundamental to the success of the European digital library. So much so that during the second meeting of the group, on 9<sup>th</sup> March 2007, Sally Chambers was asked to lead a small sub-group on metadata and packaging standards<sup>2</sup>. It was necessary for this sub-group to meet in addition to the three Expert Group meetings, which they did, and produced a series of recommendations, which they reported back to the Interoperability Expert Group at their final meeting on 4<sup>th</sup> May 2007.

#### 4.1 Metadata Interoperability Recommendations

As identified during the Interoperability Expert Meetings the 'problem description' with regards to metadata standards was that a *common standard metadata format or at least unambiguous mappings between different standard formats are a basic requirement for search and retrieval operations to be effective across federated resources as well as for the exchange of objects*. With this problem description in mind, the Metadata sub-group at their meeting on 29<sup>th</sup> March 2007, discussed the problem and proposed the following recommendations:

- Domain-specific Dublin Core Application Profiles are developed to enable the EDL to

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<sup>1</sup> For further information about the i2010 Interoperability Expert Group see:

Gradmann, S (2007): *Interoperability of Digital Libraries: Report on the work of the European Commission working group on Digital Library interoperability*: <http://bnd.bn.pt/seminario-conhecer-preservar/doc/Stefan%20Gradmann.pdf>

<sup>2</sup> The members of the Metadata sub-group were Sally Chambers (The European Library Office), Robina Clayphan (The British Library), David Dawson (Museums, Libraries and Archives Council (MLA) in the UK), Stefanos Kollias (National Technical University of Athens) and Olivier de Solan (Directions des Archives de France).



provide object-level search and retrieval across digital collections from libraries, museums, archives, institutional repositories, (inter-)national portals and other cultural heritage organisations by 2008. These application profiles will be based, as far as possible, on the existing descriptive metadata standards that are already in use within the domains (e.g. EAD for archives etc.) Organisations wishing to provide their digital collections via the EDL will need to map their object level descriptive metadata to one of the domain-specific application profiles. Future versions of the Domain-specific Dublin Core Application Profiles should consider conceptual models, such as FRBR and CIDOC CRM. However, it is unlikely that such work will be implemented by 2008.

- For the provision of collection level descriptive metadata existing collection description formats (e.g. Michael, The European Library, Archival Grid [www.archivegrid.org](http://www.archivegrid.org) etc.) should be harmonised for use in the EDL<sup>1</sup>. A third-party repository (such as Talis' Silkworm directory) could be piloted to externally house and share all collection-level metadata.
- Semantic Interoperability techniques should be employed to implement semantic mappings and the cross-searching of descriptive metadata. A higher-level interoperability application profile should not be created, but the application profiles should be harmonised using semantic web technologies. (See also: Recommendation 2.10 – Basic Semantic Interoperability). However, this may be fairly basic level in 2008, but should reach its full potential by 2010.
- A Metadata Registry for EDL should be developed. This should be an authoritative source of information about the Domain-specific Application Profiles. It may be useful to explore the work that DCMI is undertaking on the use of semi-structured Wikis to perform this role. The Metadata Registry should include a Directory of Terms, which provides definitions of the metadata terms (including properties and encoding schemes) that are used in the EDL. If new EDL-specific terms are created, the registration of an EDL namespace should be considered. The Metadata Registry should also provide guidance (and if feasible software tools) for organisations wishing to map their metadata to the Domain-specific Application Profiles so that they can provide access to their digital collections via EDL.
- A Metadata Working Group for EDL should be developed. This group should have overall responsibility for the EDL Metadata Registry. Its members should be those people who are responsible for the development and maintenance the domain-specific application profiles, plus experts in technical, structural and administrative metadata. It should be a sub-group of the EDL Interoperability Group. A sub-group on collection-level metadata may also be required.
- The Metadata Working Group for EDL should work closely with the EDL Semantic Interoperability Working Group to ensure that the metadata recommendations are suitable for semantic interoperability to be applied. Shared understanding is required between librarians, curators and archivists and the semantic interoperability community. (see also Recommendation 2.11: Awareness Building regarding Semantic

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<sup>1</sup> It is noted that some initial work on the mapping of the Michael*plus* and The European Library Collection Descriptions Application profiles has been undertaken. This work was initially undertaken by Corine Deliot of the British Library and was subsequently further developed by Henk Matthezing from the National Library of the Netherlands.



Interoperability)

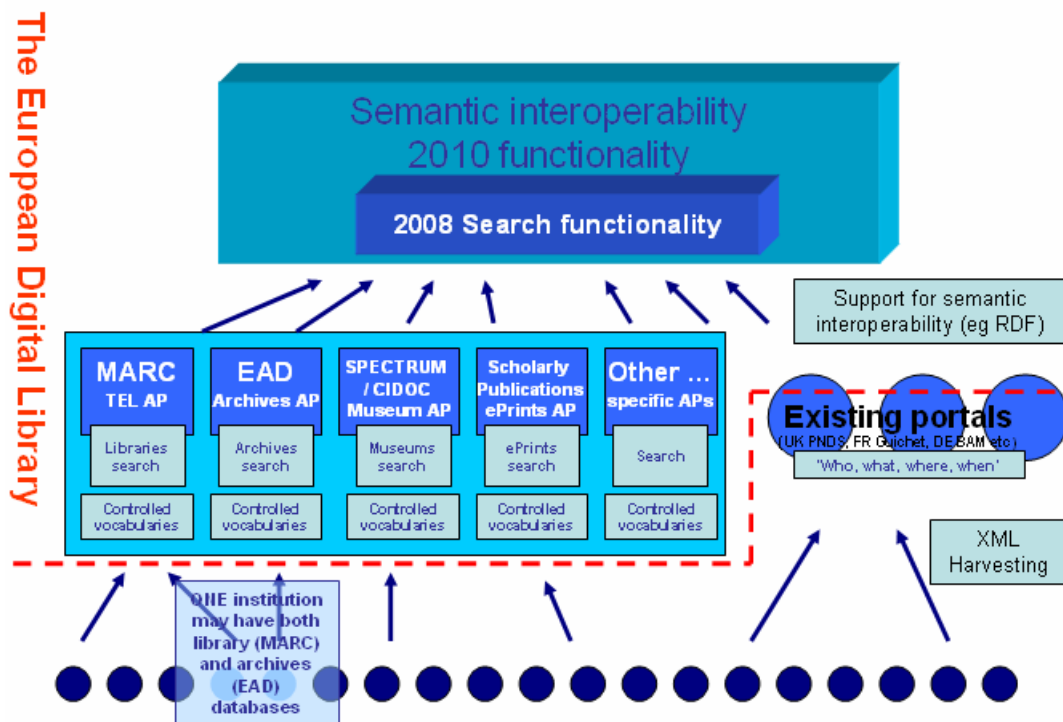
Recommendations on technical, structural (including packaging standards) and administrative metadata (rights information) should be considered separately from descriptive metadata. For 2008 the focus should be on descriptive metadata, however some initial recommendations for these other metadata types can be provided:

- Each domain-specific Dublin Core Application Profile must include provision for rights metadata. A basic controlled vocabulary should be developed for 2008 to express whether objects are “out of copyright” or “public domain” etc. This work could build on the results of the ROMEO project [www.lboro.ac.uk/departments/ls/disresearch/romeo/index.html](http://www.lboro.ac.uk/departments/ls/disresearch/romeo/index.html) (See also: Recommendation 2.6: Licensing Policies)
- Each domain-specific Dublin Core Application Profile must include some provision for technical metadata (at least the file format and the version of this format).
- Packaging standards such as METS, MPEG 21 (DIDL) or XFDU <http://sindbad.gsfc.nasa.gov/xfdu/>, that serve as “wrappers” for complex objects, should be considered as part of Recommendation 2.2: Object Models. However, it is recommended that to ensure interoperability, an expert on packaging standards should be included in the Metadata Working Group.

For file formats it is recommended that:

The Minerva Technical Guidelines (see: [www.minervaeurope.org/publications/technicalguidelines\\_en.htm](http://www.minervaeurope.org/publications/technicalguidelines_en.htm)) are used as a starting point (See Section 5.1: File Formats). These guidelines are going to be updated as part of the Minerva EC project. The work being done on file formats as part of the Planets project ([www.planets-project.eu](http://www.planets-project.eu)) should also be considered. For textual materials, that are not easily OCR-able, it is recommended that they may be provided as images. Provision should also be made to offer a link to the OCR'd text if it becomes available in the future.

In order to support these recommendations, during the Metadata Sub-Group meeting, David Dawson produced a diagram of how the recommendations of the Metadata Sub-group could be implemented within the future European digital library:



A possible implementation of *Metadata Standards* in the European Digital Library

## 5 Metadata Interoperability: the next steps

So far this report has described the models for *metadata interoperability* that have been used by the European National Libraries as part of The European Library; we have explored that particular recommendations in *metadata interoperability* that have arisen from the European Commission's i2010 Digital Libraries Interoperability Expert Group and have looked at the issues that have been raised through liaison with other European Commission funded projects, particularly under the eContentplus programme. The final stage of this report will be to assess these three sources of information regarding *metadata interoperability* and to recommend a series of next steps to move towards *metadata interoperability* between Archives, Audio-Visual Archives, Museums and Libraries.

### 5.1 Achieving consensus on metadata standards

As highlighted in Section 2 of this report, one of the critical success factors in realising *metadata interoperability* in the TEL project was achieving consensus between the partners on which metadata standards should be used for The European Library. A subsequent step was the European Library partners committing themselves to implementing these standards in their local organisations. Albeit with some intense discussions at least in the initial stages, achieving consensus between a particular type of library (i.e. National Libraries, with similar missions and organisational goals) would have been a relatively easy task in comparison to the challenge that lies ahead for achieving *metadata interoperability* for the development of a European digital library. Unlike with The European Library example, the challenge for the



European Digital Library will be achieving consensus on metadata standards between the different cultural heritage communities who will provide their content to the European Digital Library. Museums, Libraries, Archives and Audio-visual archives have a long tradition of cataloguing and describing their objects in line with their own domain-specific standards and practices. It is unrealistic to expect that all the domains should leave their traditions behind and commit to a single metadata schema for making their objects accessible by a European digital library.

The Recommendation made by the i2010 Interoperability Expert group to develop “domain-specific Dublin Core Application Profiles” is a more practical alternative. In this way, consensus is only needed at the domain level (which was also the case for The European Library) so that existing descriptive metadata standards, which are already in use within the domains (e.g. EAD for archives etc.), can be mapped onto a domain-specific Application Profile. This gives the control and the responsibility of the development of the Application Profiles to the specific cultural heritage domains themselves, which is where, the metadata expertise for a specific domain lies. In addition, the possibility of developing a domain-specific search (e.g. Search the content of the museums of Europe) and developing a “professional-level” search, where a search can be initiated in original metadata records, is also available.

However, an alternative model for achieving such consensus is provided by Mary W. Elings and Günter Waibel<sup>1</sup> in a recent article in the peer-reviewed journal on the internet, *First Monday*. In the article Elings and Waibel argue that “applying [ ... ] particular data content standards by material type, and not by community affiliation, could lead to greater data interoperability within the cultural heritage community.” This idea of achieving consensus at the level of material type instead of domain-level is an interesting model. The significant advantage being that focus will be on the content and, therefore, ultimately for the user and less on the domain-affiliation. However, the importance of domain-affiliation should not be underestimated as librarians, archivists and curators are professionals that identify significantly with the domain in which they work.

A second possible challenge to metadata consensus by type could be the complex nature of type metadata. The [DCMI Type Vocabulary](#) would be a possible cross-domain controlled vocabulary for identifying the types of objects that will be offered via the European digital library. However, the DCMI Type Vocabulary has sometimes been criticised for its lack of granularity. The type issue is not a simple one and is still very much an agenda item on The European Library Metadata Working Group agenda. For example, in a recent paper for the Metadata Working Group<sup>2</sup>, Christine Frodl emphasised the complexity in metadata circles with regards to material type saying that “*the ‘type’ discussion and application in general is a difficult matter in almost all national and international metadata working groups. Until now there is no satisfactory solution for dealing with types in a real logical way. Metadata standards like Dublin Core, MARC 21 and ONIX as well as cataloguing rules like Resource*

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<sup>1</sup> Metadata for All: Descriptive Standards and Metadata Sharing across Libraries, Archives and Museums by Mary W. Elings and Günter Waibel, *First Monday*, volume 12, number 3 (March 2007): [http://firstmonday.org/issues/issue12\\_3/elings/index.html](http://firstmonday.org/issues/issue12_3/elings/index.html)

<sup>2</sup> Frodl, C (2007) Element “Type” – Actions from The European Library Metadata Working Group meeting 5.01.07 [Unpublished.]



*Description and Access (RDA) provide rules of fields for type information [...] all these standards are evolving and there is a current need to bundle developments and take into account new publication forms and to find terms for these....”* In the practical experience of the library community through The European Library, where the lack or inconsistency of type information, in order to provide a tool (Reference Manager) for downloading bibliographic citations from The European Library has been a particular challenge. This minor example may be a taster of the challenges that may lie ahead with the Elings and Waibel model. A possible solution is that the organisation of cultural heritage data by type could be assigned to the longer term *metadata interoperability* agenda. Building cross-domain consensus for the European Digital Library could be the focus for the initial stages of achieving *metadata interoperability* for the European digital library through the eContentplus EDLnet project.<sup>1</sup>

### 5.2 Developing a multilingual European Metadata Registry

Once consensus on the choice of Metadata Standards has been achieved there is a need for a central storage point which can be used by the European Cultural Heritage community. This should to be an online, current, and easy to use website, where metadata specialists from the cultural heritage field can go to look at what terms are in use in the European digital library plus information about how they can map, where necessary, their local metadata terms to those that have been agreed by the European digital library Metadata Community. The investigation of software tools for this mapping purpose should also be investigated.

One of the challenges that The European Library has faced has been the development and the ongoing maintenance of the Metadata Registry. Until recently, there was not a dedicated person employed by The European Library Office to coordinate the metadata developments in The European Library. Since 1<sup>st</sup> September 2007 this situation will have changed and it is anticipated that this will bring significant improvements to the development and maintenance of The European Library Metadata Registry. The maintenance overhead of maintaining such a Metadata Registry is still high. As The European Library uses terms from multiple namespaces, awareness of changes in the namespaces that are used need to be monitored and the related terms in The European Library Application Profiles need to be updated as appropriate. Due to the increased complexity in this area, as four domains instead of one will be contributing their content to the future European Digital Library, awareness of a wider number of metadata schemas and standards will be needed along with the maintenance and development of the proposed European Digital Library Application Profiles. However, it is also possible, that the responsibility for these tasks could be distributed to the domains.

As part of the discussions during the i2010 Interoperability Expert Group the issue a European Metadata Registry was discussed. The maintenance overhead was considered to be a significant issue in maintaining an authoritative source of information about the application profiles that are to be used in the European Digital Library. A distributed approach such as the use of “semi-structured Wikis”<sup>2</sup> that are being used by DCMI could be a possibility of reducing the maintenance overhead of such a Metadata Registry.

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<sup>1</sup> More information about the EDLnet project is available on the Thematic Network site at: <http://digitallibrary.eu/edlnet>

<sup>2</sup> Powell, A (23.4.2007) Email to the Metadata Sub-Group of the i2010 Interoperability Expert Group [Unpublished].



For a Metadata Registry that can be truly used by metadata specialists from all the European Member States translations of all the terms, and the supporting guidance information would be a unique selling point for a European Metadata Registry. Due to accuracy needed in the creation and mapping of metadata it is important that metadata specialists have a good understanding of what the metadata terms mean, so that they can ensure that the correct data values are added into the specific metadata elements. Even to a native English speaker, the Dublin Core Metadata Element *Accrual Policy* is not something that is immediately understood. A thorough reading of the guidelines and definition information is needed. Within The European Library, we have the advantage of working with librarians who, although their first language is not English, have an extremely high working knowledge of English. However, as in the future, the European digital library will be working with small museums or archives, where the staff may not be proficient in English in order to understand such terms as 'Accrual Policy.'

The possibility of a future European Metadata Registry being able to provide the terms and guidelines to the terms in all the languages of Europe would be very advantageous. The DCMI is already very aware of this need and maintains a translations webpage<sup>1</sup> where members of the DCMI Community have "taken time to translate DCMI documents" from its website provides central web page hosting all the translations. The Dublin Core Metadata Element Set (DCMES), Version 1.1 for example, has been translated into the following European Languages, [Finnish](#), [French](#), [German](#), [Greek](#), [Italian](#), [Latvian](#), [Norwegian](#), [Polish](#), [Portuguese](#), [Russian](#) and [Swedish](#).

### 5.3 European Metadata Centre of Competence

As well as the need for a central storage place for all the metadata terms that would be permitted to be used in the European digital library (i.e. in a Metadata Registry) there is a need to provide online support materials for the metadata specialists. In the European Library there are two main methods for providing online support for metadata compliancy. The European Library currently provides such support materials via [The European Library Handbook](#) and by providing a "Guidelines" section for each of the terms that are in use in The European Library<sup>2</sup>. In a recent innovative project, funded by the German Research Foundation and led by the Goettingen State and University Library in co-operation with the German National Library, a German-language Competence Centre for Interoperable Metadata (KIM)<sup>3</sup> has been set-up. One of the most interesting aspects of the work that KIM is undertaking is the development of support documentation for German-language metadata specialists. The project includes the development of German-language Metadata e-tutorials (Introduction to Metadata, Metadata and Interoperability), a German-English metadata glossary, a translation of the Dublin Core Metadata Element Set (DCMES) and a Technology Watch Report. The Technology watch report is a free report which will be published twice a

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<sup>1</sup> Dublin Core Metadata Initiative (DCMI) Translations web page:  
<http://www.dublincore.org/resources/translations/> (accessed August 2007)

<sup>2</sup> This useful, but time-consuming work, is still being undertaken by The European Library Metadata Working Group. It is planned for completion by the end of 2007.

<sup>3</sup> For more information about the German-language Competence Centre for Interoperable Metadata (KIM) see: <http://www.kim-forum.org/>



year on news, and national and international development of Standards for the provision of digital information. A survey is also being conducted on the use of Metadata in Germany. The project also works with partners in Switzerland and Austria.

To facilitate the development of the European digital library and other related Cultural Heritage Initiatives, a network of Metadata Centres of Competence, perhaps based on the model of KIM, could be brought together to develop a European-wide Metadata Centre of Competence. Such Centres of Competence could complement the Digitisation and Preservation Centres of Competence that the European Commission proposed in its communication on the i2010 Digital Libraries initiative.<sup>1</sup>

## 6 Conclusion

As stated in the Foreword, the aim of this report has been to provide an assessment of the model in which *metadata interoperability* has been accomplished between the National Libraries in Europe through The European Library. Further we have explored the particular recommendations in *metadata interoperability* that have arisen from the European Commission's i2010 Digital Libraries Interoperability Expert Group and have looked at the issues that have been raised through liaison with other European Commission funded projects, particularly under the eContentplus programme. The final stages of this report were to provide an assessment from these three sources of information regarding *metadata interoperability* and to recommend a series of next steps to move towards *metadata interoperability* between Archives, Audio-Visual Archives, Museums and Libraries.

For the author the three essential strands for *metadata interoperability* within a European digital library would be to:

- **Achieve consensus on metadata standards**
- **Develop a multi-lingual European Metadata Registry**
- **Create a European Metadata Centre of Competence**

Following on from the work on *metadata interoperability* in The European Library, in EDLproject and the European Commission's i2010 Digital Libraries Interoperability Expert Group this work will be taken for as part of Work Package 2 of the EDLnet Thematic Network. Within this project, there will be a dedicated work group (WG2.1) *Standards and Interoperability of Standards (focused on metadata)*. This work group will contain representatives from each of the four domains of museums, archives, audio-visual archives and libraries. Furthermore, another working group within this work package will be devoted to issues of semantic and linguistic interoperability (WG 2.2) and should provide fresh insight to traditional metadata thinking. It is hoped that this report will provide useful input for the future work of both work groups.

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<sup>1</sup> The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: i2010 Digital Libraries: COM (2005) 465 final is available on the European Commission's website at:  
[http://ec.europa.eu/information\\_society/activities/digital\\_libraries/doc/communication/en\\_comm\\_digital\\_libraries.pdf](http://ec.europa.eu/information_society/activities/digital_libraries/doc/communication/en_comm_digital_libraries.pdf)



## **7 Acknowledgements**

I would like to thank Robina Clayphan (Chair of The European Library Metadata Working Group), Stefan Gradmann (Leader of the European Commission's i2010 Digital Libraries Interoperability Expert Group) and Christine Frodl (on behalf of the German-language Competence Centre for Interoperable Metadata (KIM)) for their comments on the draft versions of this document.

Sally Chambers, The Hague, August 2007