D18.2 Deliverable
Notification of Delivery of the Publication Platform for the Results of Digitization and Documentation
Type of Deliverable: Software and Manuals

DOCUMENT IDENTIFIER: PS_WP18_Eurix_D18.2._Publication_platform_v2.3
DATE: November, 16, 2007
ABSTRACT: This is the notification of delivery of the Publication Platforms of the MAD System. This Platform will be able to manage contributions from preservation and restoration areas and will provide the software modules for accessing them with a standard browser. The whole MAD System is made up of two other platforms as discussed in the document D18.1. The two deliverable D18.1 and D18.2 will represent the complete MAD System of the Metadata Access and Delivery Area within the project

AUTHOR, COMPANY: W. Allasia, A. Damiani, M. Porzio, S. Ridolfi, F. Toscano, M. Vigilante - euriX Group
KEYWORDS: Publication, metadata access, storage
RELATED ITEMS: Annex1 – D18.2 Glossary

D18.1 Documentation Platform for the MAD Factory

DOCUMENT HISTORY

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Executive Summary

This deliverable will concern the description of the Publication Platforms of the MAD System. This Platform will be able to manage contributions from preservation and restoration areas and will provide the software modules for accessing them with a standard browser.

The whole MAD System will be made up of two other platforms as discussed in the document D18.1. The two deliverable D18.1 and D18.2 will represent the complete MAD System of the Metadata Access and Delivery Area within the project.

1. Overview

The MAD system will be made up of two main components:

1. Documentation platform
2. Publication platform

Point 2 will be covered in this paper. Point 1 is covered in D18.1.

The Publication Platform is the component of the MAD Platform providing retrieval and browsing functionalities. In detail, it deals with instances of documents in MAD metadata format, making them available on a web representation, and it gives access to the material sources exported from the Core Platform.

The Publication platform has to deal mainly with MPEG7 and MXF formats and with EDOB format for the metadata.

The Publication Platform comprises three different main subcomponents:

- a web application, namely the user interface;
- a relational DBMS that stores information related to the available programmes;
- a text search and indexing engine (Lucene – KIM), comprising a semantic engine for processing natural language queries.

The searching interface of the Publication Platform offers several searching approaches, and the user can choose to apply for a programme or a news item, which can be filtered by programme title, broadcast date, authors, topics, and so on.

The user interface presents a video preview, currently making use of Windows Media Player. This is the only feature written specifically for Internet Explorer.
A schema of the Publication Platform is shown in Figure 1.

![Figure 1: the Publication Platform](image)

## 2 Functionalities

The Publication Platform has to provide a common web interface for importing, searching, querying and browsing metadata and essence documents.

Concerning the import functionality, a software module importing information used by the Publication Platform is provided. As we will describe later, the Publication Platform makes use of the information of a relational database and of the KIM system. By means of this import component, tuples in the database and indexes of KIM can be obtained from the EDOB produced by the Documentation Platform. It could be useful to extend this import module in order to import in the Publication Platform also information provided by another kind of document (rather than an EDOB), for instance containing Dublin Core or P-META metadata.

The main functionalities of the Publication are related to Search & Retrieve.
Search and retrieve functionality allows users to browse programmes and news items, after searching and selecting on data defined into the metadata files. Searching can be processed on programme content too by KIM Platform support.

When an user selects this functionality, a form to acquire searching criteria is presented. The user can choose between executing a programmes selection or a news items selection. Criteria are divided into 4 sections: identification, title, publication, contribution, classification and programme content (KIM section). For every section, user can define data to perform a query on database. Selected programmes or selected news items are showed into a table, where it’s possible to modify list sorting by clicking on columns titles. Once the user selects searched programmes or news item, the application shows the browsing window, where user can navigate through metadata and essence.

The publication platform has to allow functionality at authenticated users. To do this, the platform is supported by Jakarta Tomcat authentication capability. To set up login permissions it has to modify tomcat-users.xml configuration file in Tomcat configuration (cfg) directory.

If a user does not do anything for almost 30 minutes, the session expires and the user is requested to log in again.
PART A: Features of the Publication Platform

3 The MAD Platform

Metadata can be defined as “Data about data”, that is to say those information that describes, or supplements, the main (or central) data. Concerning the broadcast archives scenario, this entails finding which information schemes are needed in order to make archive users able to retrieve audiovisual items with effective levels of accuracy.

The MAD (Metadata Access and Delivery) Platform is the component of the PrestoSpace project having the following objectives:

1. extracting metadata from audiovisual items;
2. offering suitable mechanisms for retrieving and accessing audiovisual contents based on metadata.

3.1 Architecture of the Publication Platform

The Publication platform will provide retrieval and browsing functionalities regarding the essence elaborated within the MAD Platform.

![Figure 2: The Publication Platform - architecture](image)
The platform architecture is based on three main components: a web application to allow user interaction; a database (MySQL) to store data about available programmes and so to make easy searching and selections; the KIM platform (provided by Ontotext) to perform semantic functionality through semantic analysis of speech and full text indexing.

The Publication Platform is delivered as a web archive. Deployment is performed by posting the web archive into the servlet container of the used web server. After completed the deployment phase, it’s possible to set up the platform, launching an ant build file released within the web archive.

3.2 Inputs

The Publication platform will access the data elaborated by the Documentation Platform to fill the KIM text indexing engine and the MySQL database using an export facility. Data exported from the Documentation Platform will be available as static HTML pages to be published in a web browser.

3.3 Outputs

The Publication Platform provides a web interface for searching and retrieving information produced by the Documentation Platform.
4 Web interface

The Publication Platform provides a web interface for searching and retrieving information produced by the Documentation Platform.

The entry point for queries is the form shown in Figure 3

![PrestoSpace Search Interface](image)

*Figure 3: the Search Interface*

Basically, the user can submit a keyword and start the search among programmes or news, searching by contribution, title, publication date, publication service, topic and named entities for semantic queries (i.e. programmes/news which contains Persons, Places, and so on).

The results of the query are then shown in a list (Figure 4) from which the user can select a document in order to browse it.

![PrestoSpace Search Interface](image)

*Figure 4: the list containing the results of a query*

**THE CLIR tool**

Optionally, the user can enable a feature to translate the submitted query from the Italian language to the English language and vice versa. Source language of queries can be different from the target language (characterizing metadata).
Cross-language Information Retrieval (CLIR) is supported in the MAD publication platform by a specific server called CLIR server.

In the left part of the page, there is the video section (upper), and the tree structure showing the segmentation of the programme in news. This segmentation is also shown as a timeline (Figure 6), and it is based upon a video analysis performed during the Documentation.

Each of the segments describes a single highlight and is related to the shots presented in the bottom of the right side of the web page.
The remaining (main) part of the page provides several tabs showing:

- Info (titles, publications, contributions and identifiers): legacy data
- Transcription: the entire text converted from speeches (the user can do a textual search)
- Semantic analysis (using KIM facility – see section 5.1–)
- Content analysis (stripes and camera motion, if extracted during the documentation)
- Related sources (correlated news from external web sites)

**RSS system**

The Platform supplies the feature for exporting the programme in the RSS (Really Simple Syndication) format, and then read it with the aim of a feed reader (Figure 7).

**Figure 7: RSS export feature**
5 Implementation of the Publication Platform

5.1 Physical environment

The web application is developed on JDK 1.4.2, using Java web technologies. It needs a web server with servlet container to run, as Jakarta Tomcat 5.5, but it's possible to use any web server compliant with Java Servlet 2.4 Specifications and JSP 2.0 Specifications. The design takes advantage of the MVC pattern to separate presentation logic and business logic. The Jakarta Struts Framework has been adopted in order to implement the controller layer, which takes into account the task of the business control flow, mapping user request with business operations of the model layer.

In order to perform searching and selections on programmes and news items, the platform is supported by a database, storing information from metadata (e.g. titles, roles, descriptions, publishing dates, services etc.). The connection between the web application and the database management system is provided by the JDBC support. So it's quite easy to change the DBMS.

The KIM Platform (provided by Ontotext) is integrated into the Publication Platform in order to provide semantic analysis capability. To give more details, the KIM Platform consists in a system based on three components: Lucene, Sesame and Gate. Together, they allow searching about semantic content of the programmes, through simple queries formulated as sentences with subject, action and target.

The Publication Platform is delivered as web archive. Deployment is performed by posting the web archive into the servlet container of the used web server. After the deployment phase is completed, it is possible to set up the platform, launching an ant build file released with in the web archive.

5.2 The Kim Platform

The KIM Platform provides a novel Knowledge and Information Management (KIM) infrastructure and services for automatic semantic annotation, indexing, and retrieval of unstructured and semi-structured content.

As a base line, KIM analyzes texts and recognizes references to entities (like persons, organizations, locations, dates). Then it tries to match the reference with a known entity, having a unique URI and description. Alternatively, a new URI and description are automatically generated. Finally, the reference in the document gets annotated with the URI of the entity. This process is called (as well as the result) semantic annotation. This sort of meta-data can be used for indexing, retrieval, visualization and automatic hyper-linking of documents.

For the purposes of semantic annotation, indexing, and retrieval of documents, KIM also uses a seed knowledge base (KB). The knowledge base (KB), in this context, is a body of formal knowledge about entities, representing non-ontological formal knowledge. It consists of instance data – descriptions of entities and their interrelations, i.e. for each entity, the KB contains information about the entity’s type, aliases (incl. a main alias - official or well-known name), attributes, and relations. The KIM KB provides coverage of popular real-world entities of common interest, which are considered well-known and thus not explicitly introduced in the documents. Most important and used entities in the KIM KB are geographic names and
organizations. The entities that represent geographical features are imported from GNS (GEOnet Names Server) and other sources. They are organized so as to represent instances of Location (and its subclasses) having the property subRegionOf as it is applied between Continents, GlobalRegions, Countries, and other subclasses of Location. Some of the subtypes of Location, contained in KIM KB are Country, Province, County, CountryCapital, City, Ocean, Sea, etc. The locations are given together with several of their aliases, including in English and French, as well as with their geographic coordinates (Long/Lat), the designator (DSG) and Unique Feature Index (UFI), according to GNS. All this provides a useful basis for cross-linguistic querying and retrieval. The entities in the KB are derived or collected from various sources like geographical and business intelligence gazetteers.

As a part of the Publication Platform, the KIM engine supplies an indexing of the EDOB’s metadata.

The role of KIM in MAD is to provide a language independent representation for Named Entities as a specific metadata common to the two languages. As an example, consider that the “White House” is translated in other languages (e.g. in Italian the correct translation is “Casa Bianca”). The ontology representation for this entity is via a single id (i.e. an Uniform Resource Identifier “URI”), that is for its nature language independent. This realizes a systematic and consistent approach to multilingual indexing and searching.

5.3 The CLIR Server

As described in Figure 8, the CLIR Server includes several components:

- The NL Parser, to extract Named Entities and other nouns from the query $q$, in the source language $L$;
- Pseudo Context Generator, to generate for each target lexical item $t$ in $q$, the most relevant terms that are topically related to $t$;
- Sense Disambiguator, to disambiguate all common nouns in the source language $L$;

![Figure 8: the CLIR server](image-url)
The CLIR Server communicates with these components and manages the internal workflow. The NL parser, Text Categorization and Kim annotation processes are the same used for the Semantic Analysis.

A distinctive feature of the CLIR server is the adopted technique for Sense Disambiguation and Translation. Translation of all common nouns is required as they are very language specific and must be consistently combined to the language-independent representation of Named Entities. The sense disambiguation algorithm adopted has been presented in [1].

5.4 The MySQL database.

It provides a data set of the EDOBs published and the related METADATA.

![Figure 9: Tables of the MySQL database used by the Publication Platform](image)

The above relational database describes the data used for characterizing the EDOBs, such as role types, topic types, categories, and the programmes and segmentations related to the EDOB itself.
6 Notification of Delivery

The Publication Platform is delivered using a VMWare virtual machine. In this way it's possible to install the Publication Platform simply running this virtual machine with the VMWare Player (that can be used for free).

This virtual machine is a Linux system with all the necessary installed in it (KIM, CLIR, Apache Tomcat, MySQL and so on).

When the virtual machine starts all the services are started up so when the startup of the system is completed you only have to connect to this url http://192.168.11.128:8080/PublicationPlatform using the Internet Explorer of your host pc.

That's all, your Publication Platform is ready to be used.

This kind of delivery was used for the last demos of the Publication Platform done during some public events like IBC or some international conferences.

This is a very simple and successful way to delivery the Publication Platform because nothing should be installed or configured (you have only to download and install VMWare Player).
PART B: Utilization of the Publication Platform

7 How to use the Publication Platform

7.1 How to access the Publication Platform
The Publication Platform is accessible via any browser at the following URL:

http://prestospace.eurix.it/PublicationPlatform

The user has to submit a valid Username and Password:

Figure 10: The Welcome Page of the Publication Platform
After that, it is possible to access the contents of the platform.

Figure 11: The Publication Platform Web Interface

The user can access the documented programme/news or manage the user accounts.

7.2 Platform Administration

By means of the web application, a user can perform the usual administration activities, namely:

- change its own password
- access to the administration of users
- log off the system.

The web page is shown here below.
7.3 Material Publication

Preferences

![Preferences](image)

The user can set the number of results displayed in a page (default: 5), the languages of inputs and outputs if using the CLIR service, and the type of information. In fact, it is possible to choose among technical (only key frames, camera motions and other technical information), journalistic (only the documented editorial parts) or both.

![Profile type](image)

Search&Retrieve

Simple Search

The simplest task it to find a keyword by a full text search. This is equivalent to find a word within the EDOBs submitted by the Archive(s).

![PrestoSpace Search Interface](image)

![Figure 13: The Search Interface](image)
It is possible to search among Programmes or News Items. By clicking on the “Search” button the user starts the search.

Following the preferences, the page displays the results of the query.

**PrestoSpace Search Interface**

![PrestoSpace Search Interface](image)

### Programmes list (30 programmes found)

<table>
<thead>
<tr>
<th>TITLE</th>
<th>SUBTITLE</th>
<th>DATE</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBC 10 O%27clock News</td>
<td>BBC News 22:00 Bulletin</td>
<td>2005-07-06</td>
<td>00:38:50</td>
</tr>
<tr>
<td>BBC 10 O%27clock News</td>
<td>BBC News 22:00 Bulletin</td>
<td>2005-07-06</td>
<td>00:47:43</td>
</tr>
<tr>
<td>BBC News</td>
<td>Ten O clock news</td>
<td>2005-10-05</td>
<td>00:20:13</td>
</tr>
<tr>
<td>BBC News</td>
<td>Newsnight</td>
<td>2005-10-20</td>
<td>00:40:34</td>
</tr>
<tr>
<td>BBC News</td>
<td>Six O clock news</td>
<td>2005-10-05</td>
<td>00:27:9</td>
</tr>
</tbody>
</table>

*Figure 14: Results of the query (programmes)*

Selecting a query of news items, the page displayed looks like this one:

**PrestoSpace Search Interface**

![PrestoSpace Search Interface](image)

### News Items list (61 news found in 30 programmes)

- BBC 10 O%27clock News BBC News 22:00 Bulletin 2005-07-06
- BBC 10 O%27clock News BBC News 22:00 Bulletin 2005-07-08
- BBC News Newsnight 2005-10-20
- BBC News Six O clock news 2005-10-05
- BBC News Ten O clock news 2005-10-05

*Figure 15: Results of the query (news items)*

In the news items displayed list, it is possible to see (by clicking on the icon) a highlight of the news in which the word is found:

Author: Eurix

16/11/2007
Clicking the button on the right of the programme or news chosen will display a pop-up window with the streaming video of the retrieved EDOB.

Clicking on one of the retrieved items will open a new window showing the contents produced by the Documentation Platform (Figure 17).
In the left part of the page, there is the video section (upper), and the tree structure showing the segmentation of the programme in news. This segmentation is also shown as a timeline (Figure 6) and it is based upon a video analysis performed during the Documentation. Each of the segments describes a single highlight (and is related to the shots presented in the bottom of the right side of the web page).

Notice that the segment in which the keyword has been found (plain text or named entity) is highlighted and the related shots and transcription are displayed.

The remaining (main) part of the page provides several tabs showing:

- **Info** (titles, publications, contributions and identifiers) : legacy data
- **Transcription**: the entire text converted from speeches (the user can do a textual search)
- **Semantic analysis** (using KIM facility – see section 5.2–)
- **Content analysis** (stripes and camera motion, if extracted during the documentation)
- **Related sources** (correlated news from external web sites)

### Info tab (legacy data)

This tab shows legacy data: Titles (title, subtitle, title language), Publications data (duration, organisation, channel, date of first publication), Contributions (like production company, news reader, editor-in-chief etc.) and Identifiers related to the source archive (programme number and archive number).

![Figure 18: legacy data – The Info tab](image)

### Transcription Tab
It shows the results of the speech-to-text analysis of the Documentation Platform. Every segment (corresponding to a silence or a change of the news reader) is labelled with the time from the starting point of the programme/news. The actual segment of the EDOB (in which the keyword submitted in the query has been found) is also shown in the timeline section.

As in all the tabs, it is possible to perform a simple plain text searching task using the input form in the upper right part of the page and clicking on the icon.

Semantic Analysis Tab

Within this section the user can browse the named entities (and their categorization) founded by the semantic section of the Documentation Platform.
By clicking on the white rectangles under the categories (see Figure 21), it is possible to highlight the named entities in the transcription tab and then, clicking on them, see a pop-up window (Entity explorer – issued by KIM) with an ontological description of the entity based on the Knowledge Base of the KIM system (Figure 22).

**Figure 21 : named entities**

**Figure 22 : The Entity Explorer**
Content Analysis Tab

Within this section, the user can see the technical information related to the video part of the EDOB. This page shows the stripe images that represent the combination of the central column of each key frame of the shots representing the video and are useful to see changes in the camera motions, zooms, and changes at editorial level (i.e. a different editorial part).

The technical information related to the camera are displayed as coloured rectangles with an area that extends from the starting point ant until the end of the camera motion/zoom.

The displayed information are: camera pan (left – right), camera tilt (up – down) and zoom in and zoom out events.
Related Sources Tab

In this section the user can browse the related news founded by the Documentation Platform and see them on a new window clicking on the link in the upper left part of the panel showing the news itself.

Advanced Search / CLIR

Source language of queries can be different from the target language (characterizing metadata). For this reason, it is possible to use a Cross-language Information Retrieval (CLIR) service.

This service translates the submitted query from a language to another one (from English to Italian and vice versa). By using this tool, it is possible to extend the search to EDOBs with metadata of a language different from the one of the query.

As an example, if the user submit a simple query containing the word ‘guerra’ (the Italian word for ‘war’), it can see only the EDOBs related to audiovisual materials with an Italian origin (like news from a broadcasting Italian company i.e. TG1-RAI, Italian radiotelevision):
Figure 25: results of a query without using the CLIR service – only ‘Italian’ EDOBs founded

Whit the CLIR service enabled, the user can extend the search and can then also find the EDOBs with English metadata:

Figure 26: Results of the query using the CLIR service
The Figure 27 shows a retrieved BBC News with the ‘war’ and ‘warfare’ words founded in the transcription of the speeches.

![Figure 27: Results of using the CLIR service](image)

**Advanced Search**

Clicking on the Advanced Search button the user can submit queries more complicated than a simple full text searching task.

![Figure 28: Advanced Search](image)

The user can use filters searching by Category (only for News items), Contributions, Named entities, Publication Date, Publication Service (only for Programmes) and title.

![Figure 29: Filters of the queries in the Advanced Search](image)
Clicking on the ‘Add’ button the filter is added to the query. It is also possible to make logical operation on the filters of the same type (AND/OR):

**Figure 30 : Filter of the query**

In the following Figure it is selected to search any BBC News that contains the word ‘bush’, published in the January of 2005, containing the Person ‘Bush’ OR the Place New York:

**Figure 31 : Example of an Advanced Search**

Clicking on the Search button, the user can select the entities to be inserted in the query:
Figure 32: Named Entities of the query
PART C: Conclusions

8 Licensing

The software product described in this deliverable is a prototype in an advanced state of implementation. In order to engineer this software, an improvement of the feedback machinery is needed.

9 Bibliography


[D.18.1] The Documentation Platform for the MAD Factory
[D.18.3] The Turnkey System.
# Annex 1 – D18.1 Glossary

<table>
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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>CLIR</td>
<td>Cross Language Information retrieval. It is a system for submitting a query using a language and retrieve results of the corresponding terms in another language, i.e: searching for 'sun' and finding also 'sole' (Italian word for 'sun').</td>
</tr>
<tr>
<td>EDOB</td>
<td>Editorial Object: the xml document describing the AV file and its related metadata.</td>
</tr>
<tr>
<td>MAD</td>
<td>Metadata Access and Delivery</td>
</tr>
<tr>
<td>MPEG-7</td>
<td>MPEG-7 (ISO/IEC 15938, formally named “Multimedia Content Description Interface”) is a standard for describing multimedia content, independent of the encoding of the content, and allows different levels of granularity of the description. MPEG-7 has been designed to support a broad range of applications. MPEG-7 descriptions can be represented either as XML (textual format, TeM) or in a binary format (binary format, BiM).</td>
</tr>
<tr>
<td>Named entity</td>
<td>In the expression named entity, the word named restricts the task to those entities for which one or many rigid designators, as defined by Kripke, stands for the referent. For instance, the automotive company created by Henry Ford in 1903 is referred to as Ford or Ford Motor Company. Rigid designators include proper names as well as certain natural kind terms like biological species and substances.</td>
</tr>
<tr>
<td>RSS</td>
<td>RSS (an acronym for Really Simple Syndication) is a family of web feed formats used to publish frequently updated digital content, such as blogs, news feeds or podcasts. RSS is analogous to a table of contents. An RSS &quot;feed&quot; provides a table of contents for a site's content for a certain period of time; it does not provide the content itself, but links to the content. RSS is useful because it helps aggregate lots of content into an easily accessible place.</td>
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