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1 Executive Summary and Report Scope

This deliverable is the first starting activity for preparing the work to be performed on the whole WP3. It is available as internal version and as publiched version in PDF:
http://bpnet.eclap.eu/drupal/?q=en-US/home&axoid=urn:axmedis:00000:obj:a345a84f-6fdf-4f84-a412-88094ce363e2&section=docde31

Objectives of WP3

- To set up the ECLAP solution for automated content and metadata management based on existing solutions;
- To set up and ECLAP AXCP ingestion tools and solutions for the several archives, installation in every content partner location for their resource creation and management;
- To define and set up of content and metadata processing and semantification solutions for performing art institutions;
- To define and setup accessibility and multilingual aspects for the ECLAP Social Service Portal and content processing tools;
- To define and set up interoperability interface with Europeana and other solutions such as other social networks and external services.

Thus the deliverable provides description of: Major tools: ECLAP Social Service Portal, ECLAP automated back office, installation parameters/settings, configuration settings, user manual, scripts, and activities, procedures for creating users, groups, procedures for updating taxonomies, etc.; content and metadata, processing and semantification, AXCP Ingestion tool (first version), content format which can be accessed and ingested, model for metadata and content, procedure for content enrichment, annotation, contextualization, ECLAP semantic model, mobile tools, etc. It also include draft version of terms of use and user manual as annex.

This document has been produced in a publishable manner, as a guideline for public access and spreading out. An additional annex with the user manual is also available at the link:
http://bpnet.eclap.eu/drupal/?q=en-US/home&axoid=urn:axmedis:00000:obj:b828710e-b77c-4074-993c-3efddfbfaad7&section=docde31

2 Introduction

WP3 is dedicated to the detailed definition and set up of the technical infrastructure which provides tools and services for automated content and metadata collection, processing and posting on Europeana. The approach is based on a distributed architecture which provides local ingestion tools optionally installed in the factory of the archives in the network. The ECLAP architecture supposes that not all the archive may be entitled to use some local tool for content ingestion and posting on ECLAP. In other cases, the ECLAP processing tools will have to be capable to get into the remote archives to harvest their metadata and descriptors and to really get the files,
Moreover, the ECLAP Social Service Portal and tools will provide access to the catalogue for searching and accessing value-added ECLAP services, integrated as a section for performing arts in Europeana. The workpackage has been organised in the following sub-WPs.

WP3.1: Content/Metadata Ingestion infrastructure (M4-M7)
The task is dedicated to definition of:

- Metadata model. ECLAP metadata profile for Performing Arts Contents will be modeled and defined, based on Europeana recommendations and standards and semantics, focusing on its interoperability based on the usage of metadata standards and specifications. This task includes the review of main standards.
- Metadata acquisition tools, and of nrichment procedure and service, web based;
- IPR models and forms

- setting up AXCP Ingestion tools for digital library management that would be located by many content partner locations. These local tools will provide facilities for digital library organisation, integration with OAI-PMH, support ECLAP metadata model, metadata and content acquisition posting them on ECLAP.
- installations and maintenance, content harvesting, workflow and management, reuse of metadata mapping tools from other project.
- procedures and protocols for material preparation and posting.
- content ingestion models and tools for collecting content from users

As a result of this task, ECLAP will have the tools installed at every content partner location and adapted to ECLAP needs, as well as available guidelines and training facilities for its maintenance and installation, which will be used by new members who wish join ECLAP network.

WP3.2: Content/Metadata Processing and Semantification tools (M7-M36)
The purpose of this task is setting up ECLAP Social Service Portal and related AXMEDIS Content Processing Tool in connection with the AXCP Ingestion tools. The set up of the ECLAP Social Service Portal will be realized customizing the DSI XMF social network which provides support for:

- Access to the content, make queries via PC and Mobile/PDA,
- Create communities and groups for the ECLAP Networking,
- Upload content on ECLAP providing metadata and classifications, similar to UGC models
- Socialize with other ECLAP users
- User registration and networking: single user and groups;
- Search and retrieval of content on the basis of semantic information associated with digital content, i.e., web 2.0 technologies
- Play content: rendering visually content as video, audio, web pages, images, document, etc. With multiple player and languages.
- Voting and ranking content;
- Comments and annotations of Content:
- Search for similar users;
- Search for similar objects (digital resources);
- Digital resource upload for professional and User Generated Content, UGC:

Once the early version of the ECLAP Automated back office will be setup a set of specific tools would be entitled to be used such as those for:

- Content ingestion and integration, database management, processing, formatting, adaptation, transcoding, etc.;
- Metadata mapping and processing; by direct mapping and semantic reasoning
- Connection with other social networks such as YouTube and Flick to propagate queries and get content or for posting content;
- Content and users similarity analysis and clustering, for users and content recommendations; This processing has to be performed off line due to its computational complexity. Results will be immediately usable by the users to identify similar content and users as described above.
- Content aggregation and integration (packing, packaging) for educational and entertainment productions;
- multilingual processing, text processing,
- conversion from XML to RDF, semantic processing,
- harvesting and crawling, etc.,.

These tools will be customized on the basis of activity of:

- Semantic modelling of identified metadata and their mappings procedures
- Definition of content/metadata processing and semantification tools procedures
- Content/metadata processing and production procedures
- Integration of Semantic extractors, processing and production tools into AXCP infrastructure

- Adoption of multilingual automated translation tools, integration into AXCP infrastructure

WP3.3: Accessibility and Multilingual support for ECLAP solution (M7-M36)
Information or objects in ECLAP need to be searchable and presentable independent of the language. Therefore, multilingual interoperability is a key task in the development of the ECLAP infrastructure. This task is particularly concerned with enabling ECLAP users to navigate and find relevant content not described in their native or preferred language.
This is also a requirement from Europeana. Content in Europeana is described and accessible through its metadata descriptions (or surrogate descriptions), but appear in their original language. The objective of this task is to ensure truly multilingual interoperability for all features within ECLAP and with Europeana.
This task will implement solutions to cope with multilingual access issues for users and objects alike within ECLAP. In order to provide multilingual access capabilities for ECLAP, the following services are proposed:

- Multilingual thesauri SKOSification as vocabulary/taxonomy. An automatic service will enable the production of the multilingual vocabulary/taxonomy.
- Multilingual mapping tool for the alignment of controlled vocabulary/taxonomy. This service will be used to automatically align the SKOS.
- Automatic translation tools for GUI and vocabulary/taxonomy. A translation tool will produce the necessary multilingual representations of the Users' queries. Possible translation tools could be Worldlingo or Google Translation tools.
- Coverage of 12/13 major languages for metadata: Danish, Polish, Slovenian, Greek, English, Italian, French, Dutch, Spanish, Hungarian, German, Portuguese, Catalan.

WP3.4: Interoperability with Europeana (M7-M36)
This task is focused on the set up and customization of the integration module with Europeana and other external portal that would be interested in accessing to ECLAP content, or to receive posting of content from ECLAP community, a sort of B2B distribution.
The activities performed in this task are:

- Review of Europeana integration model, including metadata, identification model, semantic modelling, API for direct call, etc.;
- Development of content and metadata integration/mapping with Europeana procedures;
- Development of content modelling and gathering procedures, OAI-PMH;
- Development of Interoperability with OAI PMH, SBN, MAG, Dublin Core, etc.;
- Development of an Interoperability module for multiple identification models and standards: ISBN, ISAN, ISRC, UOID, etc.;
- Development and integration with Europeana, periodically and sporadically according to their readiness;
- Collecting logs and errors regarding content ingestion;

3 ECLAP General Architecture (DSI)

The ECLAP project is centered around the user experience. The ECLAP portal is going to offer access to the objects of the collection. The metadata objects will also be made available to Europeana, through the Europeana. The final integrated service will be easy to use, powerful, and pleasant to the eye, so that “power” users (such as actors, drama lovers, teachers, students, scholars, researchers) won’t suffer from visual strain even after hours of use, and “common” users will be attracted by the entertainment, infotainment and edutainment aspects.

In summary, ECLAP will take several scattered and disjointed performing arts archives and will make them accessible online as a single, unified section of Europeana, independent of content servers and digital libraries.

The ECLAP services will be devoted, in the main, to:

- Collect, enrich, contextualize content and collections, creating a significant mass of theatre content consisting of videos, audio, lyrics, iconographies, and texts available online for full free fruition through semantic indexing and searching, browsing, downloading, and streaming towards different devices.
- Search, share, access and integrate content of several kinds in the field of performing arts, that will eventually lead to the availability online of the whole content of the participating archives, for further reuse, integration and enrichment.
- Simplify the integration of the digital libraries into Europeana: integrating tools for automated content gathering, metadata integration and mapping, transcoding, publishing, download, etc.
- Offer the final user additional services such as (i) access to composite content (added value content), (ii) access to a service to provide user generated content and comments, (iii) access to high quality content on different devices.

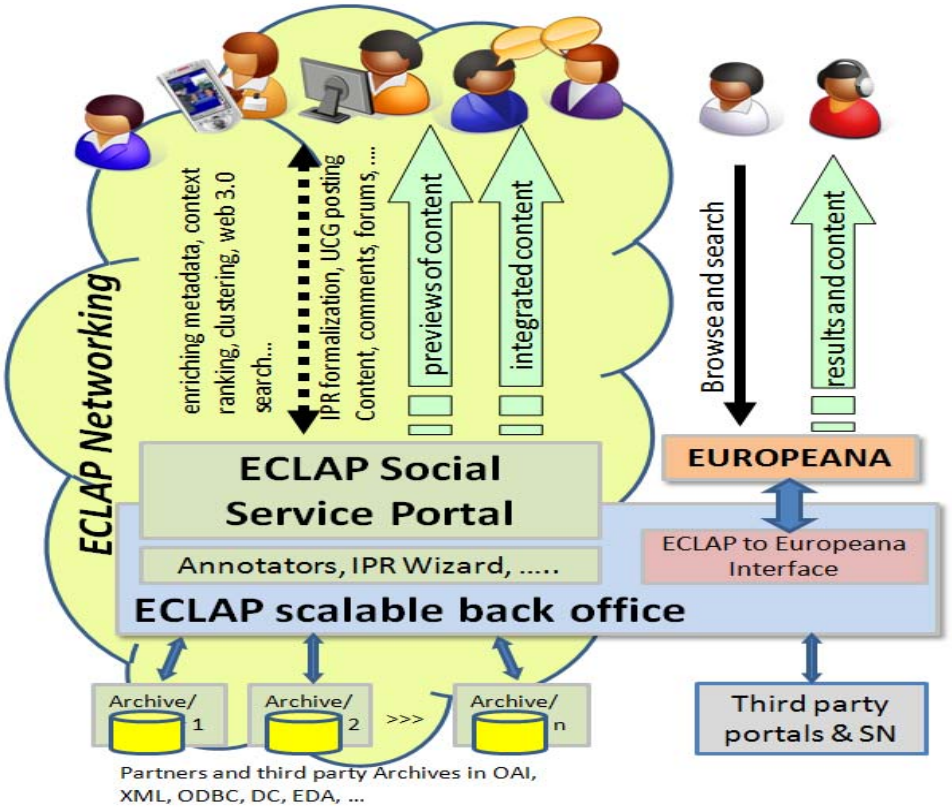


Figure -- ECLAP general overview.

In the above Figure, the major components of the ECLAP solution are depicted, while their description is as follows:

- **ECLAP Social Service Portal:** a social enabled portal that will be the main tool and front end for the networking user to enable enrichment and work on content. It will provide support for users to enrich, annotate, contextualize, search for similar content and users, recommendations, ranking content, IPR Wizard, annotations, etc.
- **ECLAP Scalable BackOffice:** it will be on the back-side of the ECLAP Social Service Portal to manage all the "dirty" activities in an automated manner. It will be established and derived from AXMEDIS AXCP (content processing grid platform) plus additional tools. ECLAP Scalable Back Office will be a scalable solution for: Content ingestion and integration, database management, processing, formatting, adaptation, transcoding, metadata mapping and processing, connection with other social networks to propagate queries and get content or for posting content; Content and users similarity analysis and clustering, for users and content recommendations; Content aggregation and integration for educational and entertainment productions, etc..

- **ECLAP to Europeana interface:** a service to provide selected ECLAP metadata objects accessible for ingestion on EUROPEANA. It is a solution to semantically convert content and metadata (descriptors and classifications) collected in ECLAP for the Europeana OAI PMH interface.
- **Third Party Portals and Social Network** could be connected to exploit ECLAP portal. One of the interesting features of ECLAP solution is the fact that is based on AXMEDIS and DRUPAL. AXMEDIS via AXCP solution provides capabilities for managing back office in a scalable manner and for content distribution content via multichannel: PC, PDA, Mobile, STB, P2P, etc. This means that a set of integrated tools could be usable by any third party to directly distribute the ECLAP content towards these channels. The ECLAP back office could be used to allow the users to create a direct connection with other Social Networks such as YouTube and Flickr. The connection with those social networks can be used to make promotion about ECLAP on social networks.
- **IPR Wizard:** The users providing content via front end portal (similarly to UCG, i.e., online upload facilities) or via traditional physical media such as Hard Disk or Digital Tapes will be entitled to define their IPR licenses for that content. To this end, the IPR Wizard will guide them to set up the associated licensing for each content element. The paths will give them the possibility of using Creative Commons or more detailed models, such as those that can be formalised in some REL (Right Expression Language). The IPR wizard approach will be integrated into the traditional standard content ingestion workflow of Europeana.
- **Content ingestion and upload** for professional and User Generated Content, UGC. A set of AXCP Ingestion Tools for automated content and metadata collection, ingestion and repurposing). The ingestion tools are capable of:
    - harvesting and collecting any kind of content and metadata accessing to a large set of formats and databases. This support will be used for both collecting professional and non-professional content. The users will have the possibility of uploading digital objects in any format providing metadata and classification.
    - transcoding and adaptation.
    - multilingual enrichment of metadata,
    - validation of metadata,
    - IPR definition.
- **Annotation and aggregation** tools will be used to
    - collect annotations information for example for audio, image, video and document formats for integrating them into the ECLAP database and single content elements. Annotations Tools, will be taken from past projects.
    - Enrichment and contextualisation of content; with simple tools the users will be stimulated to perform content enrichment and contextualisation of digital resources.
    - connecting similar content and search for them.
- **Player tools** for:
    - PC and mobiles, and in the case of mobiles they can be also used for collecting and organizing ECLAP content on the mobile device..

The ECLAP architecture (see next Figure) exploits a set of tools for collecting content and metadata, and for their processing, repurposing, publication, and posting on ECLAP in which the content will be prepared, processed with its metadata and semantics for its posting on Europeana.

The main features of ECLAP architecture are:

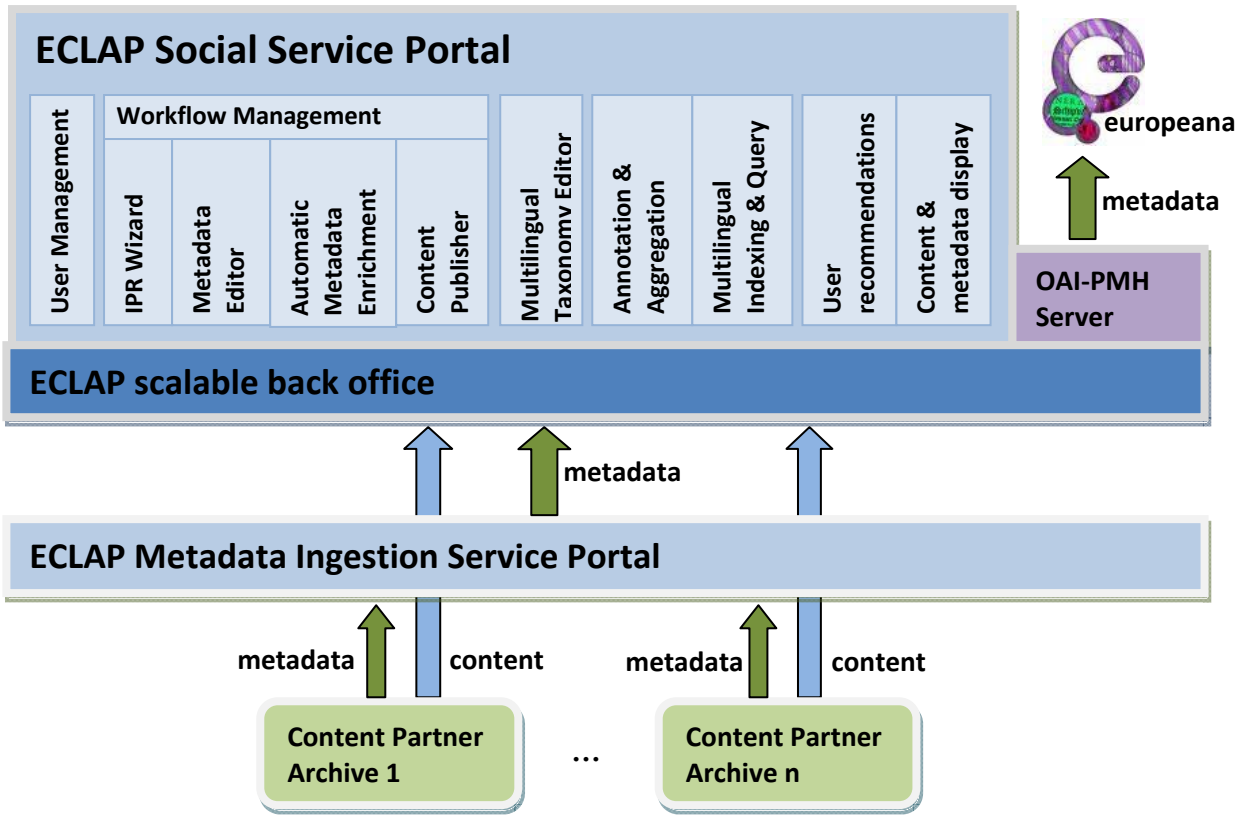
ECLAP Social Service Portal: a socially enabled portal that is the main front end for the networked user to upload, enrich and work on content.

It is going to provide support for:

- **Access to the content**, make queries via PC and Mobile,
- **Create communities** and groups for the ECLAP Networking, discussions on content, on group topics, etc.,
- **Augment content and metadata** with additional information and free tagging,

- Create **aggregated content** for leisure and entertainment, such as compilation, collections, slide shows of images, etc.
- **Ingest and Upload content on ECLAP** providing metadata and classifications;
- **Define IPR issues** on the content, with the support of a guiding **IPR Wizard**,
- **User registration and networking**: single user and groups;
- **Develop social relationships** with other ECLAP users, defining friends and getting and producing recommendations, clustering of content and users,
- **Creation of discussion groups** and for each group a forum of discussion on topics, a list of users, a mailing list, etc.
- **Provide multilingual capabilities** interface, multilingual metadata in several languages such as: Danish, Polish, Slovenian, Greek, English, Italian, French, Dutch, Spanish, Hungarian, German, Portuguese, Catalan;
- **Search and retrieval of content** on the basis of semantic information associated with digital items (e.g., web2.0 technologies), taking and integrating solutions based on metadata, classifications, ontologies, dictionaries, synonymous, etc., Content will include digital resources, web pages of groups, comments on content, forum discussion, etc.
- **Play content:** rendering visually content as video, audio, web pages, images, document, etc. Over multiple players and languages.
- **Voting and ranking content**; Also used for producing recommendations to users to see high quality content when they work on some specific enrichment activity;
- **Comments and annotations of Content**: The users will be entitled to leave comments and annotations on digital objects and content in general, to add semantic and knowledge to the collected content.
- **Search for similar users**; Also used for producing recommendations to users to identify similar Users that may be of help when they work on some specific enrichment activity;
- **Search for similar objects** (digital resources); Also used for producing recommendations to users to see similar objects when they work on some specific enrichment activity;

The ECLAP Social Service Portal will be multilingual, supporting at least 12 different languages of the multiple ECLAP partners. Please note that once a UGC is obtained a set of procedures will be performed in order to semantically analyse and describe the content received.



It is the backside of the ECLAP Social Service Portal where all the dirty activities are managed in ***automated manner.*** It will be set up by using AXMEDIS AXCP (content processing grid platform) plus additional open source tools coming from past projects of ECLAP partners.

The architecture of **ECLAP Scalable Back Office** be realized by using a scalable version of the AXMEDIS AXCP tools. The AXCP may use a range of different databases and mature semantic processing tools. It exposes a number of APIs for external applications that may exploit the back office capability of AXCP can cope with massive parallel and distributed requests. The AXMEDIS AXCP solution can be set up on a set of computers organised in a grid (i.e., on cloud) on which several parallel activities can be **Automatically allocated and performed** such as:

- Content ingestion and integration, database management, etc.;
- Content processing, formatting, adaptation, transcoding, etc.;
- Metadata mapping and processing; by direct mapping and semantic reasoning
- Connection with other social networks such as YouTube and Flick may lead to:
  - propagate queries,
  - get content,
  - post content,
  - export content links (social icons);
- Content and users similarity analysis and clustering, for users and content recommendations;
- Content aggregation and integration (packing, packaging) for educational and entertainment productions;
- multilingual processing, text processing, semantic processing,
- harvesting and crawling.

4 ECLAP Portal user based functionalities (DSI)

This section describes the functionalities related with users and users management.

4.1 ECLAP Portal GUI

The ECLAP GUI will be redesigned to be more attractive for users and more user friendly.

4.1.1 Main page

The following figure reports a draft design for the main page, it will use a drop-down menu to access the various functionalities.

4.1.2 Menu

The main menu items are:

Home, About, Profile, Content, Community, Search, Services, Events, How To

The sub menus for the main menu items are the following:

About

- **ECLAP description** → Multilingual description of ECLAP from DOC, they have to be created as PUBLIC web pages of the General Group, possibly
- **ECLAP News** → link main blog/news, and group blogs: a page exposing
- **ECLAP partners** → page of ECLAP partners
- **Main Contacts** → coordinator page, with main coord links to groups, etc.
- **Terms of use** → page with terms (only if logged in)
- **Privacy and Policies** → link to a page (multilingual.....).

Profile

- **MyProfile** → link to edit change user profile (only for registered)

- **MyActivities**→ page with list your activity (only if logged in)
- **MyContent** → a link to a page with links Uploaded Content (only if logged in)
  - +MyFavourite Content
  - +MyCollections
  - +MySuggested
  - +MyPlaylists
  - +My Channels
- **My Colleagues**→ a link to a page with list colleagues (only if logged in)
  - Content Of colleagues
  - Search users → page/block to search users
  - Invite a colleague → page to perform an invitation (only if logged in)
  - MyPotential colleagues → link to page of ……
- **My Groups** → a link to a page with list of MyGroups (only if logged in)
  - Create a new group → page, form to ask for a new group
- **My Courses** → link to my elearning activity page (only if logged in)
  - It is a list of elearning courses

Content

- **Popular** → activating the list of most popular objects
- **Less popular** → activating the list of less popular objects
- **Last posted** → activating the list of last posted objects
- **Top rated** → activating the list of top rated objects
- **Favourite** → MyFavourite of the logged person (only if logged in)
- **MyContent** (only if logged in)
- **MySuggested content to you** (only if logged in)
- **Content of colleagues** (only if logged in)
- **MyPlaylists** (only if logged in)
- **MyCollections** (only if logged in)
- **Upload** → upload page with help how to…(only if logged in)

Community

- **Groups and Channels** → page with list of groups
- **Request a new group** → page, form to ask for a new group requesting public user to return when registered and logged in.
- **My Activities**→ page with list your activity (only if logged in)
- **My Colleagues** → page with list colleagues (only if logged in)
- **Search users** → page/block to search users (only if logged in)
- **MyPotential colleagues** → link to page of …… (only if logged in)
- **MyGroups** → page with list of Groups at which you are registered (only if logged in)

Search

- **Advanced search** → page of advanced search
- **Search users** → page/block to search users (only if logged in)
- **Browse the portal** → page with map of the portal
- **Groups** → page with list of Groups
- **Courses** → page with list of course/collections

Services

- **Related projects** → a page with related projects
- **Related Links** → a page with related issues
- **Annotations** → a page explaining Playlists, collection and my story player
- **Players** → page with players and tools explained and linked: download tools
- **MyStoryPlayer** → link to mystoryplayer front desk
- **Upload** → upload page with help how to…
- **Wiki** → link to wiki pages

Events

- **Main Blog** → page with main blog
- **Next Events** → page with events list

- **Registration to event** → registration form/page for the events, selection to one of the active events
- **Promotion** → page with flyers, banners, etc.
- **Calendar** → calendar page

How to

- **Help** → activate help in a separate window
- **Upload/ingest** → upload page
- **Get Affiliated** → page to explain how to…
- **FAQ** → a link to a page with a list of FAQ (public pages....)
  - Request a new group → page, form to ask for a new group requesting public user to return when registered and logged in.
  - Create a new play list (explain how … and that the service is only for logged in users….)
  - Create a new collection (explain how … and that the service is only for logged in users….)
- **Report a Bug** → page for bug reporting (only for reporters)

(only if logged in)→ means that a message is shown requesting to login

4.1.3 Content play page

The following is a draft of the page shown when playing a video:

4.2 User management: (DSI)

Users should be able to:

- Register
- Maintain a personal profile with basic information
- Search users using the information in their profile
- Mark other users as their colleagues
- Access at the list of established/marked collegues

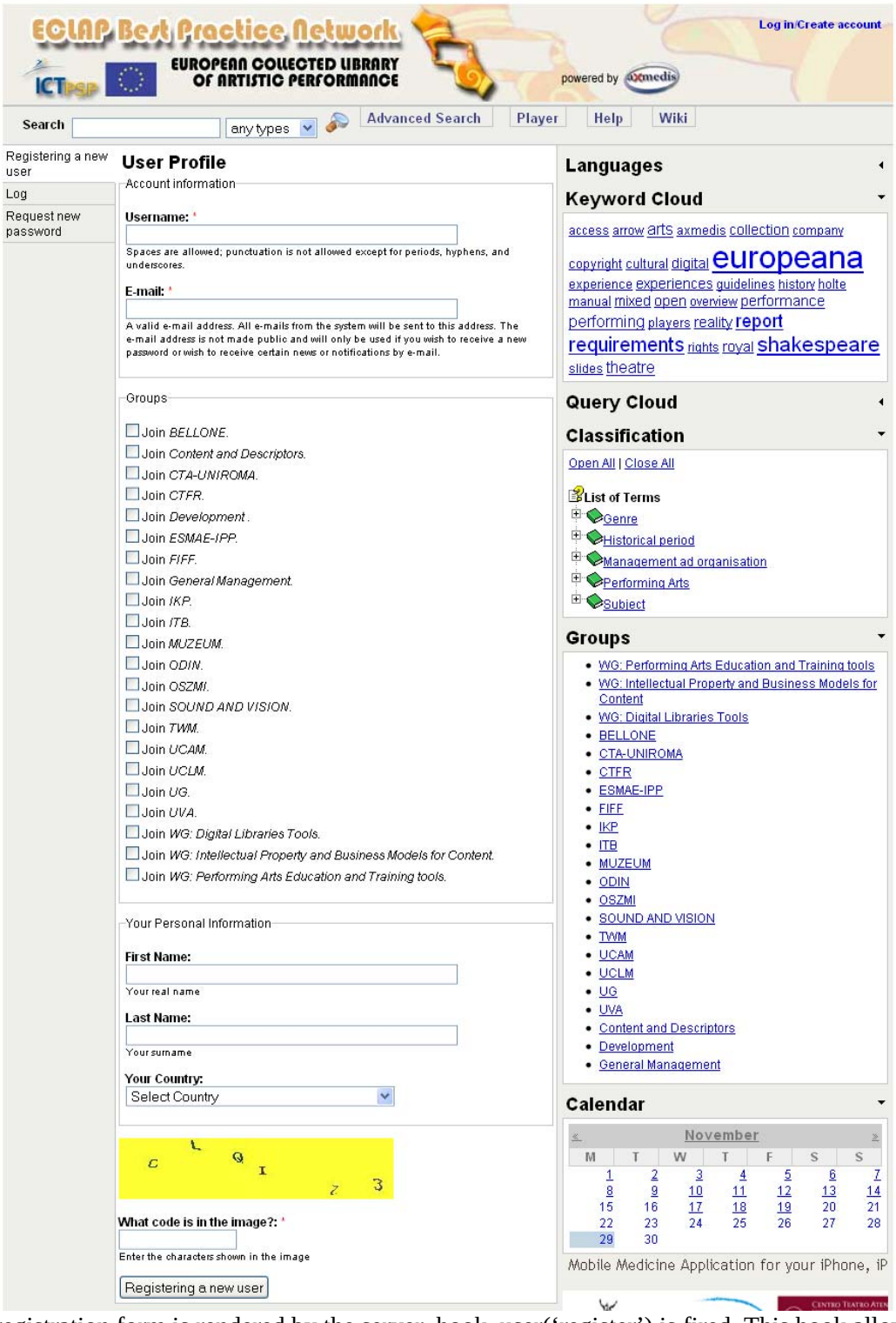
4.2.1 User registration

Registration should allow users to obtain a personal username and a password to log in the portal in order to have access to some restricted functionalities.
To register, users should fill a registration form providing some basic personal information, such as:

- Username that will be used in the portal
- Personal e-mail address
- First name
- Last name
- Nationality
- Groups that the users wants to join

After the user has submitted the form, a confirmation e-mail should be sent to the address provided in the registration form. The e-mail should contain a URL address which allows the user to log in instantly once in the portal and choose his password. The e-mails should contain also a temporary random generated password which can be used as alternative way to log in.
When the user makes his first log in the portal, he is redirected to the profile modification pages in order to let him add some information to his profile.
Once the user has submitted the form a new user should be created on the portal with username and personal information provided in the registration form and a numerical user ID generated by the server.

4.2.1.1 Description and draft user interface



When the registration form is rendered by the server, hook_user('register') is fired. This hook allows modules to add fields to the registration form.
In particular user_user('register') in the user module provides basic registration fields as "Username" and "E-mail address"; user_information_user('register') in the user_information module provides the "First Name", "Last Name" and "Your country" fields; og_user('register') in og module provides group registration choices. The general_info module maintains the ISO 3166_1 and ISO 3166_2 lists in the database to generate the country list from which the user can choose his country.

When the registration form is submitted, the same hook is fired, hook_user, with argument 'insert' instead of 'register'. It allows modules to save the registration form data into custom tables.

4.2.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
general_info	drupal module	
user_information	drupal module	

4.2.1.3 Data model description

The table used from the drupal database are:

- *Users* to store username, password, email, timetsmp of the creation date, ecc
- *General_info*: to store first name, last name, nationality, birthday, and some other general information
- *Countries:* to store the country list and the ISO 3166 code for each country

4.2.1.4 Configuration options

Name	Context (drupal, DB,…)	Notes
xml_config_dir	drupal variable	says where is located the xml file containing the ISO 3166 xml file . It's used to store the countrylist in the database.

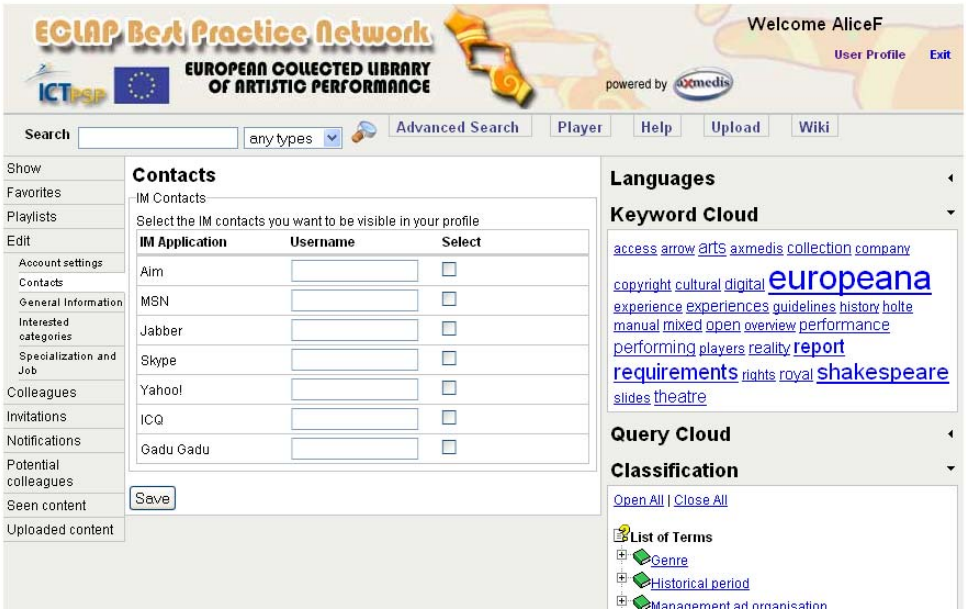
4.2.2 User Profile

The user should be able to provide some personal information apart from those provided during the registration step. These are divided into four categories:

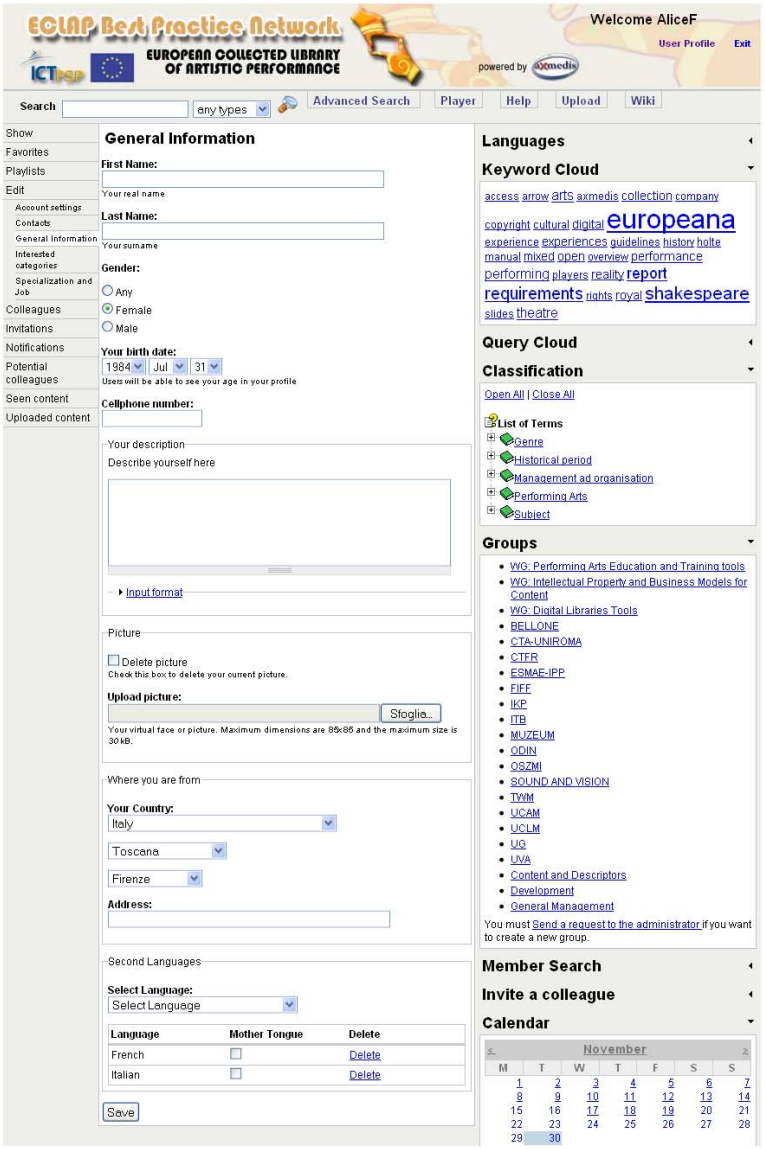
- Contact information: information about other contacts of the user, as IM contacts or social networks usernames.
- General Information: information like birthday, gender, city of belonging, sponken languages
- Interested categories: taxonomy categories in which the user is interested
- Specialization and Job: information about the type of job. In particular the user can choose in a list of types of workplaces, affiliations, and specializations.

4.2.2.1 Description and draft user interface

The user profile modification pages should be located in http://bpnet.eclap.eu?q=user/_ID_/edit, where _ID_ has to be replaced by the user numeric ID.
The following picture shows the user interface for the contact information modification page:

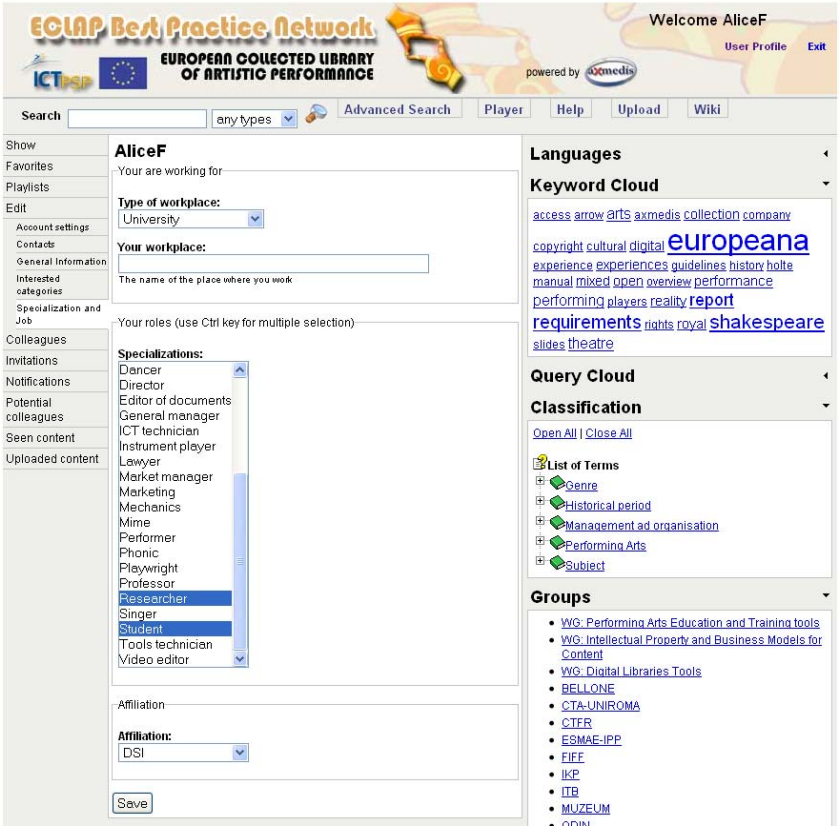


Here the user can choose some contacts by checking the associated checkbox and filling in the username.
The contacts provided will be visible to registered users in the profile page.
The list of contact choices is loaded from a configurable drupal variable.
The following picture shows the general information modification page:



In particular, when a user selects a county from the country list, the function binded to the event $('#edit-country').change in the javascript file general_info.js fires an Ajax call to the URL http://bpnet.eclap.eu/drupal?q=ajax-get-country-subsets/_COUNTRY_, where _COUNTRY_ is the selected country ISO 3166_1 code. This call is handled by the PHP function general_info_get_country_subsets_ajax() in the general_info_module. It returns le list of country subsets in XML format. The Javascript function parses the XML and generates a second select field with the subset list. When the user selects a subset the same process generates another select field to select a more restricted country subset if it exists.
The following picture shows the interest categories modification page

The next picture shows the specialization and job modification page.



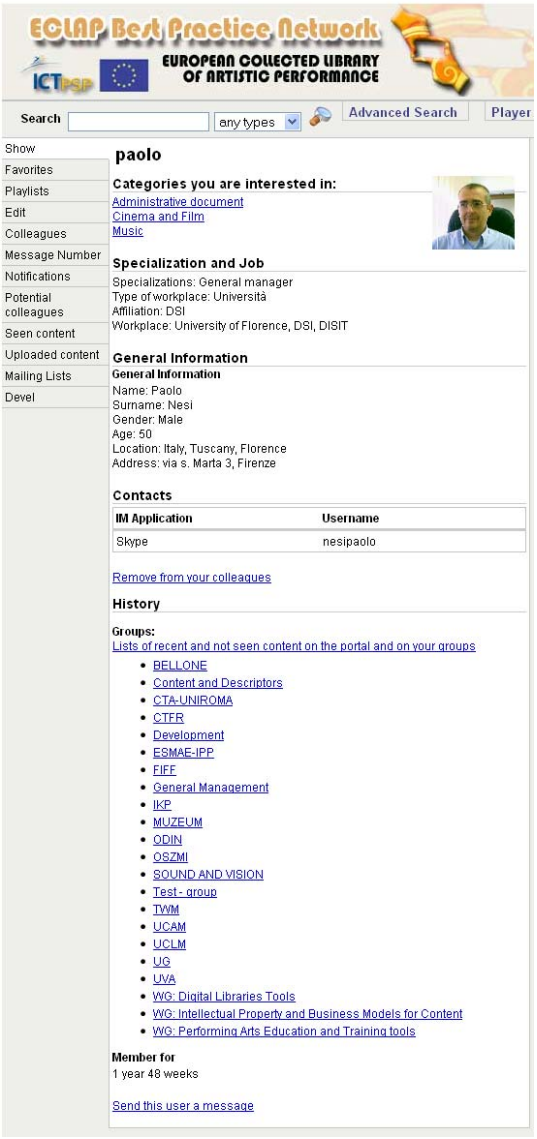
The med _info module shows the list of specialization, types of workplace, and affiliations among which the user can choose. Each of these lists is loaded from a text file: any change in the text files will be reflected in the lists shown to the user.

These pages should be generated by the implementation of the hook_user('form') in contact_info,general_info and med_info modules. This means that the form pages are be generated by these functions:

- general_info_user('form')
- contact_info_user('form')
- med_info_user('form')

This hook allows modules to add or remove fields in the user profile form generated by the user module. The general_info module should maintain a list of languages, countries and countries subsets coded as in standards ISO 639, ISO 3166_1 and ISO 3166_2 respectively.
When the user submits the form, hook_user is fired again with argument 'submit', to allow modules to save user data in their custom database tables.

The user profile page shows some of this information and other "dynamic" information, that is related to the user activity on the portal. The following picture shows how a sample profile page looks. As can be seen from the picture, there are information depending on the user activity, for example the groups joined.
On the left part of the page there are some labels linking to the profile subpages.
When the user clinks on one of these links the subpage is shown without reloading the page with an Ajax call.



In particular, when a user clicks on a link, an Ajax call is issued by AjaxTabsPlayer.changeTab() in ajaxTabsPlayer.js. The URL of the call is retrieved from a global javascript object, Drupal.settings.homepage.tabs. It's an associative array where the keys are the tab url as rendered by the server, and the values are the corresponding Ajax url to call.

4.2.2.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
general_info	drupal module	
contact_info	drupal_module	
med_info	drupal_module	
user_information	drupal module	

4.2.2.3 Data model description

The table used from the drupal database are:

- *Users* to store username, password, email, timestamp of the creation date, ecc
- *General_info*: to store first name, last name, nationality, birthday, and some other general information
- *Countries:* to store the country list and the ISO 3166_1 code for each country
- *Cities*: to store the ISO 3166_2 codes of country subsets
- *Languages*: to store the language list and the relative ISO 639 codes
- *Med_info*: to store information about jobs and education
- *Med_info_taxonomy*: to store information about chosen taxonomy terms of interest

4.2.2.4 Configuration options

Name	**Context (drupal, DB,…)**	**Notes**
job_file	drupal variable	says where is located the text file containing the types of workplaces. It can be changet at http://bpnet.eclap.eu/drupal/?q= admin/user_information/med_info
specialization_file	drupal variable	says where is located the text file containing the specializations. It can be changet at http://bpnet.eclap.eu/drupal/?q= admin/user_information/med_info
affiliation_file	drupal variable	says where is located the text file containing the affiliations. It can be changet at http://bpnet.eclap.eu/drupal/?q= admin/user_information/med_info

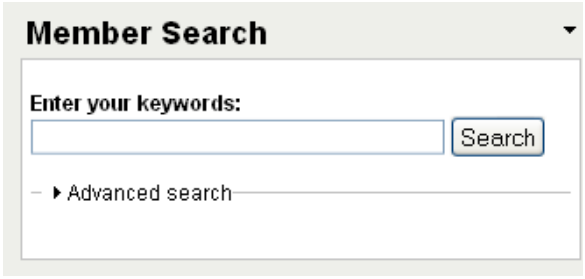
4.2.3 User search

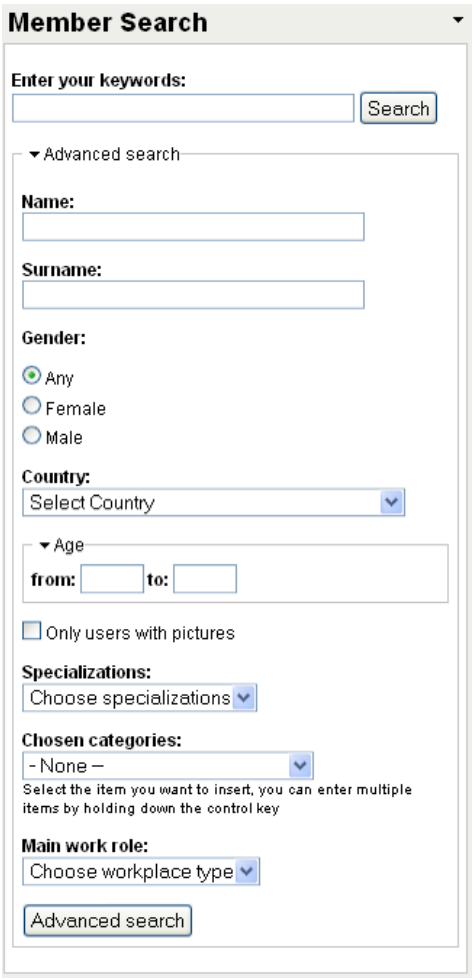
User should be able to search for other users based on their profile information. The portal should provide two types of content search:

- simple search: it should allow users to search other users by simple query string. The string will be matched with the usernames, full names and last names of the users of the site
- advanced search: it should allow users to search other users based on complex profile information, such as age, country, specialization, and so on.

4.2.3.1 Description and draft user interface

The picture shows the search box. Clicking on the “Advanced search” link causes the box to expand and show the advanced search form.





The search users functionality is provided by the users module.
When the user submits the search form an Ajax POST call to http://bpnet.ecplap.eu/drupal?q=search/users/ is fired by the function binded to the Javascript event $("#search-form").submit. This request is handled on the server by the PHP function users_get_keys of the users module. It parses the query string and performs the search by implementing the drupal hook_search.It returns the HTML of the results.

4.2.3.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**

users	drupal module	
search	drupal core module	
user_information	drupal module	

4.2.4 Colleagues

Users should be able to mark other userss as their colleagues. This will allow to chat with them, to view their last objects uploaded in the portal, and so on.
To mark someone as his colleague a user has to request this relationship to him. The other user may respond denying or accepting the request. When the request is accepted the two users are colleagues and the relationship is established.

4.2.4.1 Description and draft user interface

This functionality is provided by the axfriends module, which uses the module user_relationships, a drupal contributed module.
When viewing a user profile or a user list, for example the result list of a user search, the registered user should see a link depending on the relationship status between the user who's viewing the page and the user shown.

For example, if two user are not colleagues and there isn't any pending request, the link "Add to your colleagues" is shown. On the contrary, if two users are already colleagues the link "Remove from your colleagues" is shown.
On clinking the "Add to your colleagues" link an Ajax call is fired at the URL http://bpnet.eclap.eu/drupal/?q=friend/add/_ID_ where _ID_ is the user numeric id. The Ajax call is fired by the AxFriends.addFriend function in axfriends.js Javascript file.
On the server side the request is handled by axfriends_add PHP function of the axfriends module, which issues the request. This also causes the sending an email message to the recipient of the request. The email is generated by the implementation of hook_mail, axfriends_mail.
Once the request is generated and the mail is sent, the PHP function returns 0 or 1 indicating wheter the request has been successful or not.
The AxFriends.changeLink function in the Javascript file changes the link to the one corresponding to the new relationship type.

4.2.4.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
axfiends	drupal module	
user_relationships	drupal contrib module	link to guide and API: http://drupal.org/node/203393

4.2.5 Personal Messages/Notification

User roles access: registered users

Personal Messages: each registered user will be able to send/receive message to/from all the other registered users via PC or e-mail.

Notifications: each registered user can decide if they want to receive notifications on portal events: via e-mail or personal messages on the portal. Each user can decide which notification he/she wants to receive (e.g. when a new page/content is modified/written/commented on, etc.) and read them in a specific portal page. Each message will contain a link or information related to the portal event.

For a more detailed description of notification on group events, see paragraph 4.3.19.

4.2.5.1 Description and draft user interface

The **Personal messages** service will be accessible from the user profile page (Figure 4.2.5.1):

- link 'Your messages': to see all the messages received and sent, to write a new message (see Figure 4.2.5.2);
- link 'Write new message': to directly write a new message to one or more ECLAP registered users (see Figure 4.2.5.3).

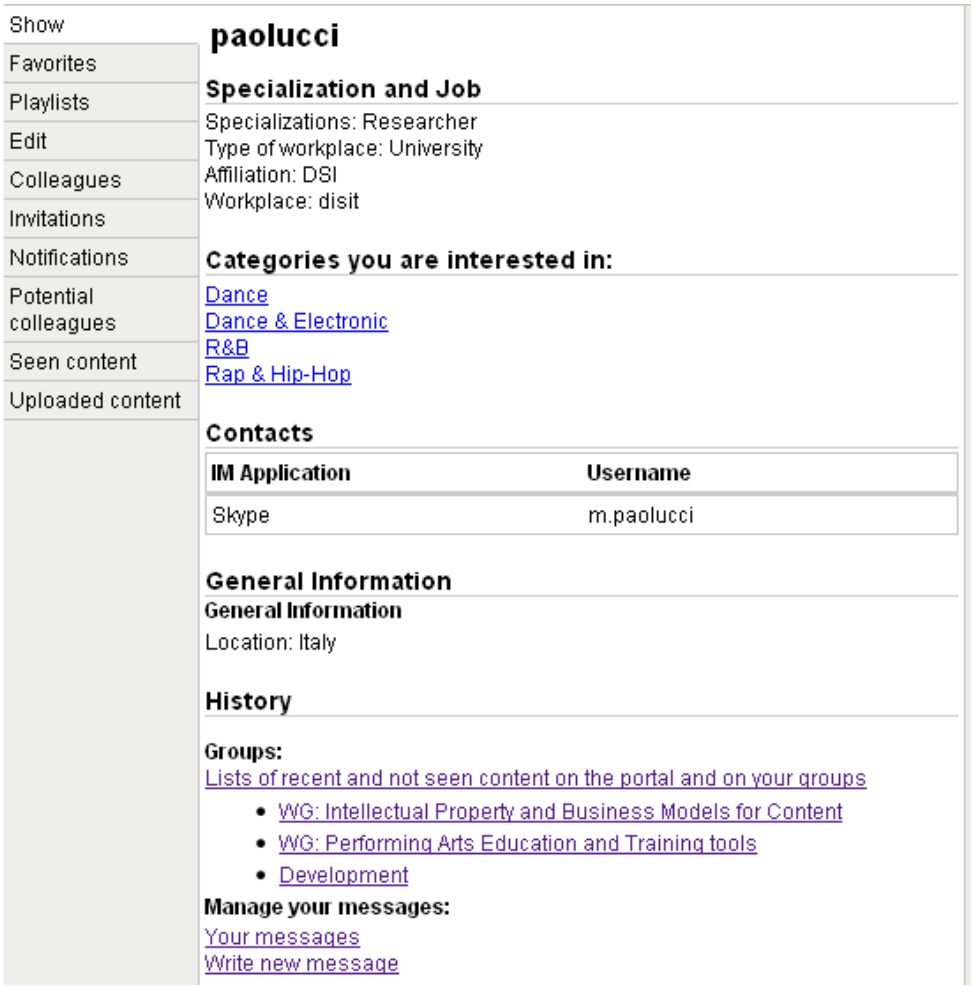


Figure 4.2.5.1

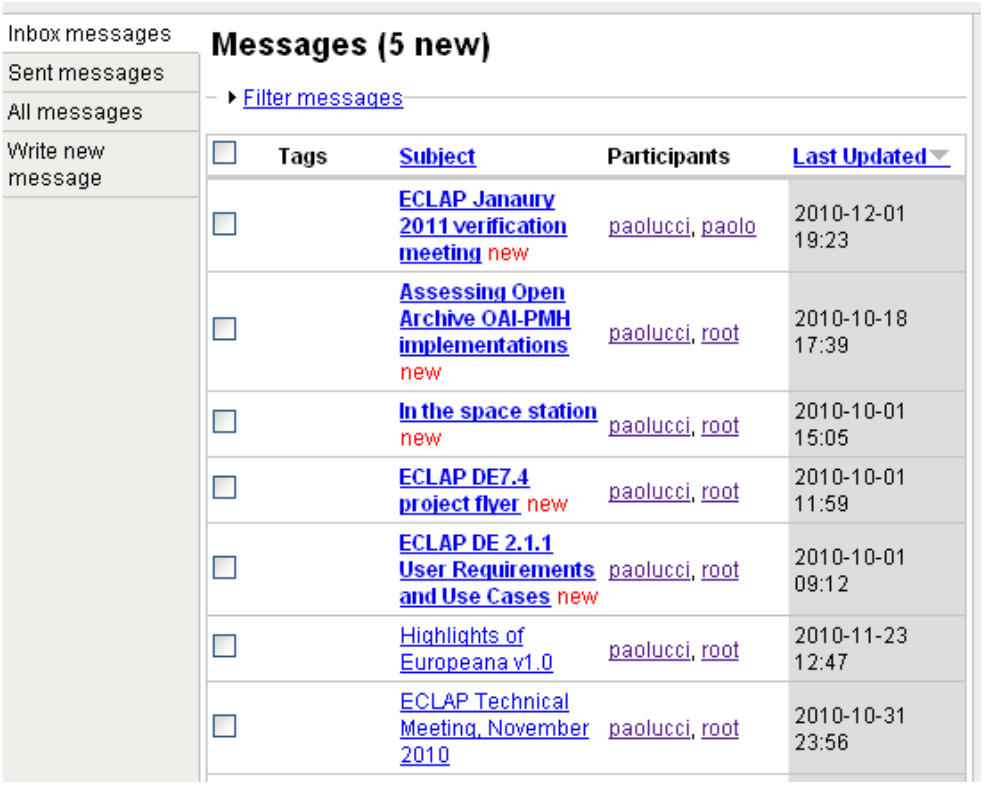


Figure 4.2.5.2

Figure 4.2.5.3

Also the **Notification services** will be accessible from the user profile page (tab "Notification" Figure 4.2.5.4), each user can subscribe to a notification type and the system automatically send him/her notifications.

In order to control notifications, each user can: see all his/her actual subscriptions and cancel some of them (Figure 4.2.5.5), choose the method that the system has to apply to send notifications (e-mail, messages on PC, etc.), decide to which notification types he/she is interested in (Figure 4.2.5.6), temporary disable subscriptions, etc.

The notification types expected are:

- Content type in group, subscribe to specific content within a group:
  - Multimedia content
  - Forum
  - Web pages
  - Etc.
- Content type, subscribe to all content of a given type (Figure 4.2.5.6):
  - Multimedia content
  - Forum
  - Web pages
  - Event
  - Wiki
  - Etc.
- Author, subscribe to all content submitted by a user
- Content type and Author, Subscribe to all content of a given type submitted by a user.

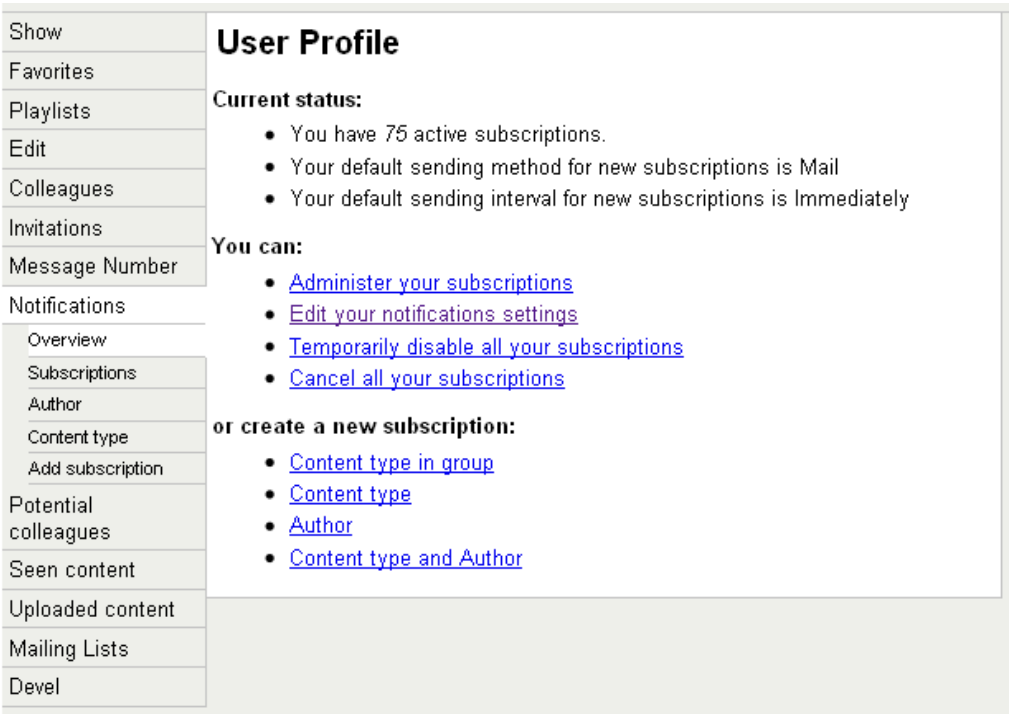


Figure 4.2.5.4

Figure 4.2.5.5

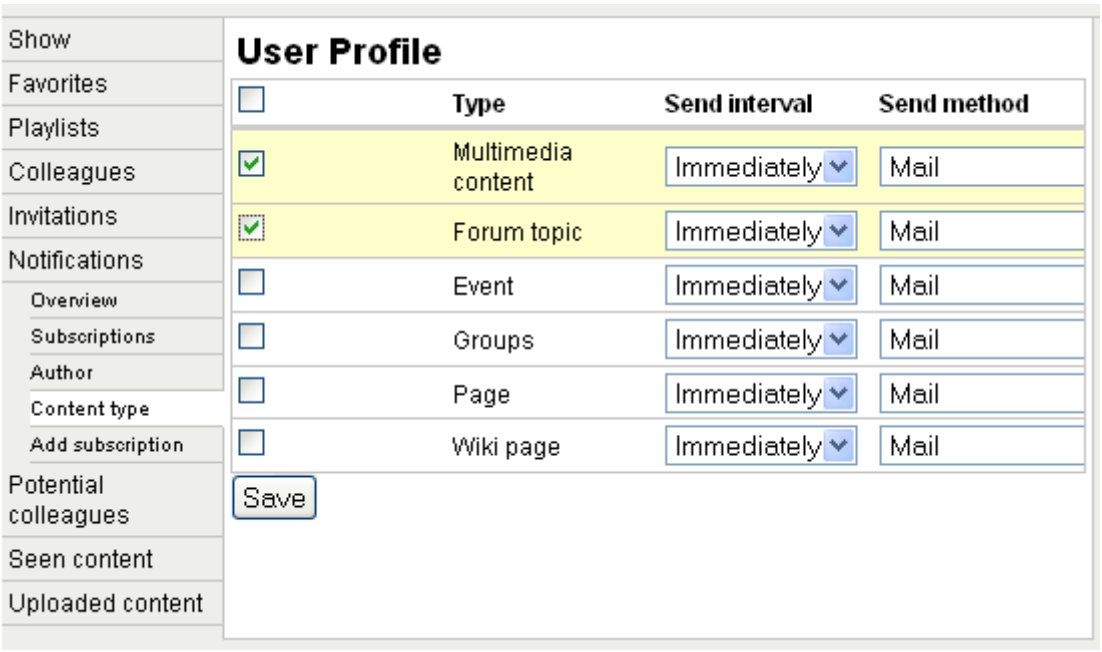


Figure 4.2.5.6

4.2.6 Bug tracking

User roles access: reporter, site administrator

A space to talk about the Portal problems will be provided: some registered users will be promoted to *reporters* and they will be able to report issues to developers. In this way they can: report bugs, make requests on user interface services and style, etc. The site administrator will analyze the issues and distribute the tasks to the appropriate developers.

4.2.6.1 Description and draft user interface

The **Bug tracking** service will be accessible from the user profile page (Figure 4.2.6.1):

- link 'View all issues': to see all the issues sent by the reporters, (see Figure 4.2.6.2). Each issue can be retrieved (and classified, see Figure 4.2.6.4) basing on: Summary (issue title), State, Priority, Category, Component, Answers, people Assigned to the issue.
- Link 'Subscribe to e-mail notification on issues': if the reported will subscribe to all issues, an e-mail will be sent to him/her when a new issue will be published on the portal (see Figure 4.2.6.3).
- Link "Create new issue": to make a new issue (Figure 4.2.6.4). Each issue can be classified basing on the categories described above, moreover a a file can be added to each issue.

In order to clarify the bug tracking classification, we report all the terms for each category:

- State: active, fixed, postponed, closed;
- Priority: critical, normal, minor;
- Category: code, documentation, miscellaneous, user interface;
- Component: aggregated content, content, content player and organizer, index and search, main interface, metadata and semantic model, networking and mailing, project, user;
- people Assigned to the issue: all the reporters and the site administrator.

Note that:

- Summary: is a free text field and contains the issue title;
- Answers: depends on how many answers will be made on an issue.

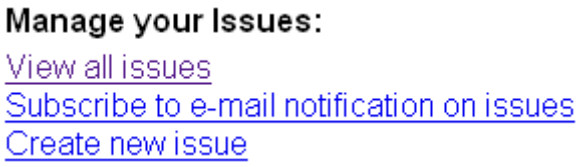


Figure 4.2.6.1

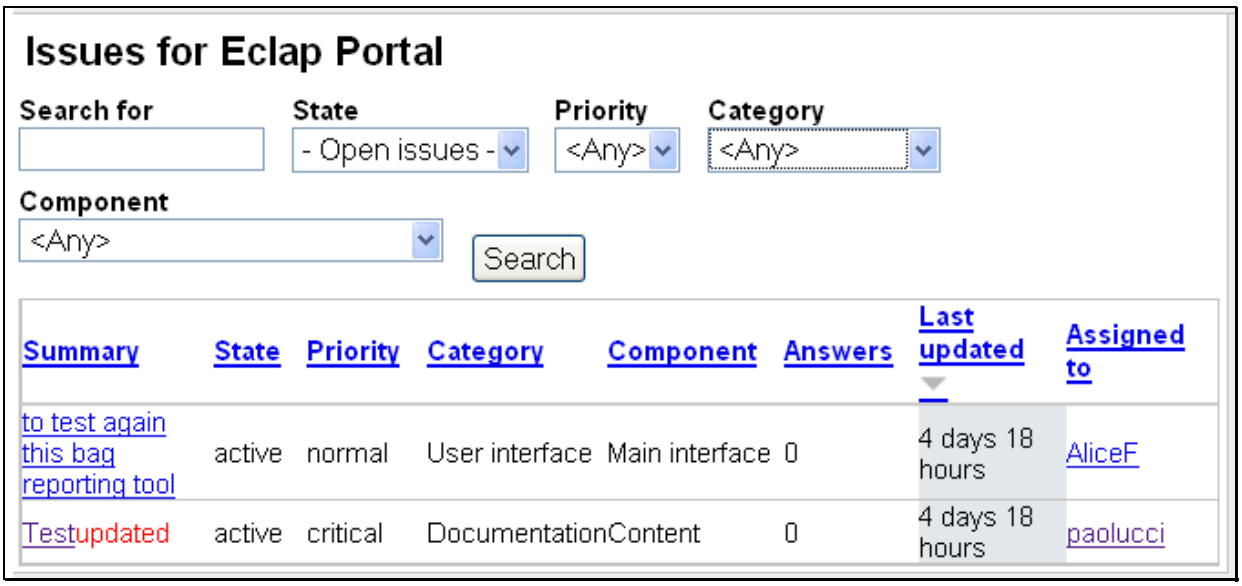


Figure 4.2.6.2

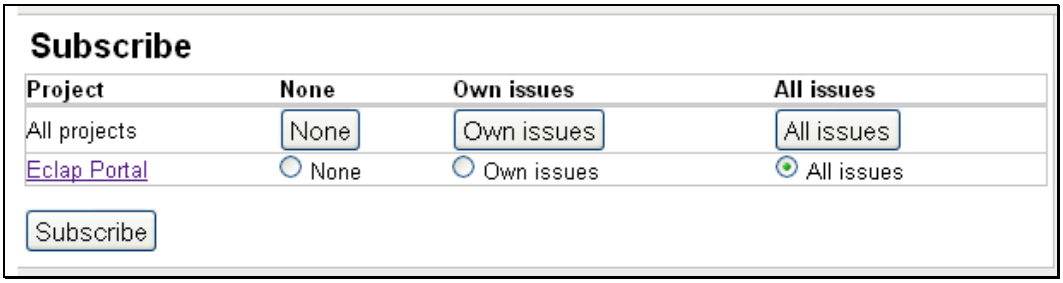


Figure 4.2.6.3

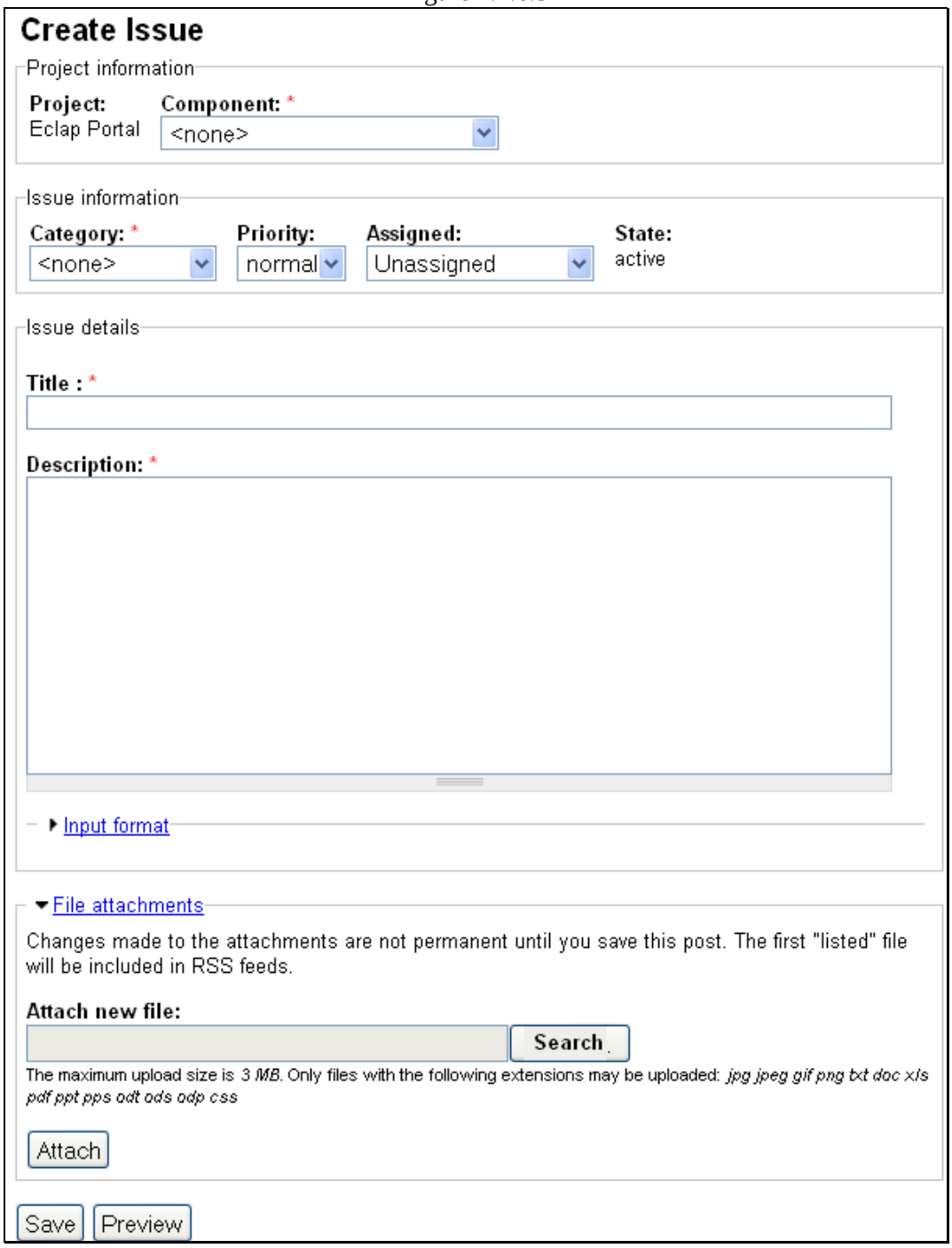


Figure 4.2.6.4

4.2.6.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other	Notes
project_issue	Drupal module	
project	Drupal module	
views	Drupal module	
comment	Drupal module	
comment upload	Drupal module	
upload	Drupal module	(drupal core)

4.2.6.3 Configuration options

These configurations can be made through the drupal user interface (as site administrator):

- you have to create a new user role (*reporter*) and give to it all permissions related to tracking modules
- if you want to modify the classification you have to go to /admin/project:
  - link 'Project issue settings': to change the *component* terms
  - link 'Project issue status options': to change the *status* terms

4.2.7 Blog access

User roles access: registered users

All the ECLAP registered users will be able to access to a set of blogs on which will be made discussions on the activities and the topics of the ECLAP Portal . The main functionalities allowed in the blog are the following:

- See the messages on the blog
- See the preview of the content attached to the blog
- Make new comments
- Suggest the blog to other users

The blog list will be accessible starting from the home page and following the menu: 'Events > Main Blog → page with main blog' (see section **Errore. L'origine riferimento non è stata trovata.**)

4.2.7.1 Description and draft user interface

Here after some screenshots will be used to better describe each functionality allowed in the blogs. Following the menu: 'Events > Main Blog → page with main blog', the registered users will see the list of the ECLAP general blogs. For each blog will be possible to:

- Visualise (see Figure 4.2.7.1):
  - the blog title
  - the messages that are present in the blog
  - the list of each content attached to the blog
- make comments or reply to other comments (see Figure 4.2.7.2)
- Recommend the blog to other users (see Figure 4.2.7.3)

Figure 4.2.7.1

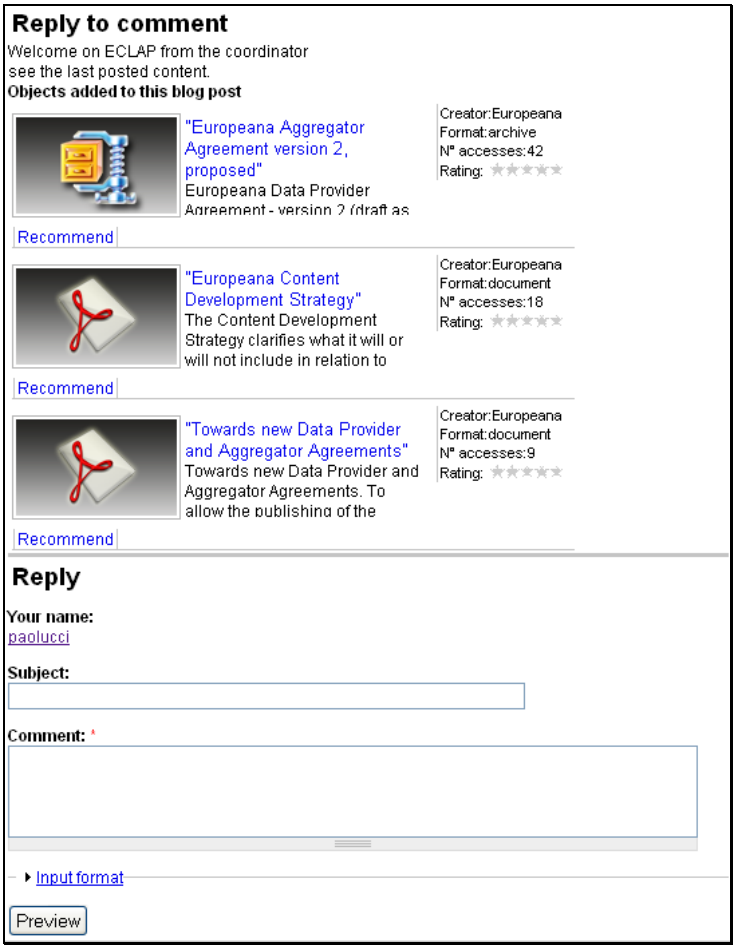


Figure 4.2.7.2

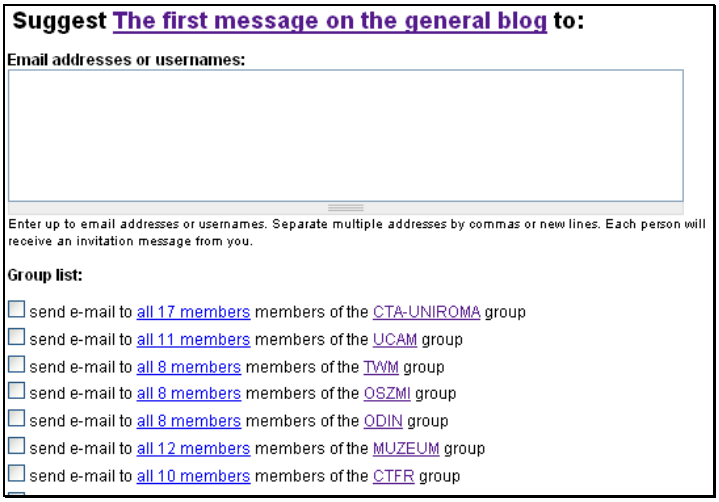


Figure 4.2.7.3

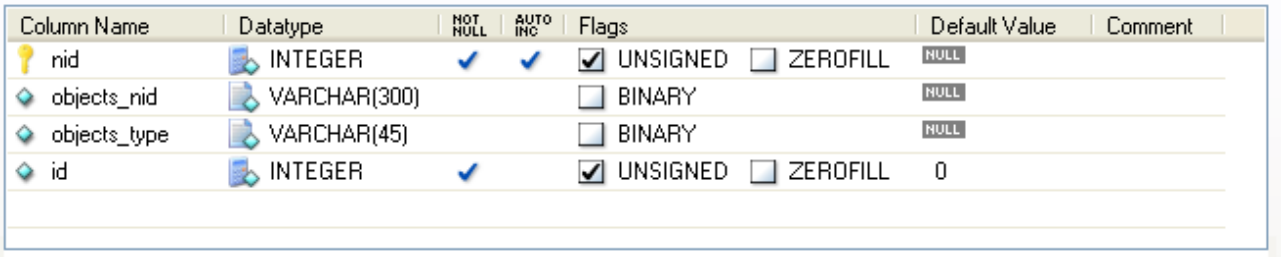
4.2.7.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other	Notes
eclap_blog	Drupal module	Is a customised module
blog	Drupal module	Is a Drupal core module

4.2.7.3 Data model description

Blogs will not be realised using a drupal standard module: we will produce a custom module .A new table will be created: eclap_blogs, that will contain the following fields;

- nid: blog identifier
- object_nid: identifier of the objects connected to the blog
- object_type:
  - ‘site’, to indicate the general site blogs (described in this section)
  - ‘group’, to indicate the blog connected to some groups (see section 4.3.22)
  - ‘user’, to indicate the blog connected only to some registered users
- id: user or group id



4.2.8 Blog creation

User roles access: site administrator

This action is available only for the site administer that will can Create a new blog and add objects to the blog post, and decide the mode of displaying the list of objects.

4.2.8.1 Description and draft user interface

Here after some screenshots will be used to better describe each functionality allowed in the blogs. Following the menu: ‘Events > Main Blog → page with main blog’, the registered users will see the list of the ECLAP general blogs. For each blog will be possible to:

- Make all the actions described in the previous section

- Create a new site blog post (Figure 4.2.8.2.1.1)

At the blog creation the site administer will can add the objects related to the site blog and decide the mode of displaying the list of objects (see Figure 4.2.8.1.2):

- Select object by their title
- Select latest objects (latest 5/10/15)

Figure 4.2.8.1.1

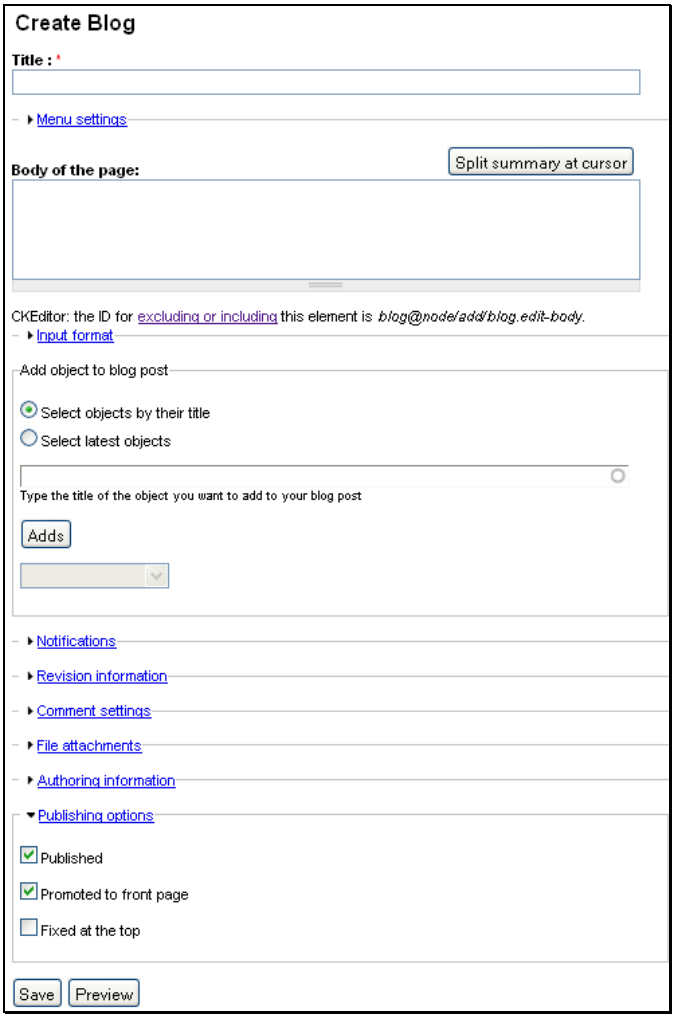


Figure 4.2.8.1.2

4.2.8.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
eclap_blog	Drupal module	Is a customised module
blog	Drupal module	Is a Drupal core module

4.3 Groups and Channels (DSI)

Groups and distribution channels are fundamental in a social network, especially relating task of managing user groups and digital contents, provide in a simple manner what users want, make optimum use of the portal's features to produce and manage contents, increase social relationships and knowledge in the domain area, provide a space for discussions, etc. The main features and services will be described in this section. In the ECLAP BPNET portal (http://bpnet.eclap.eu) many functionalities for the Group management are available. (see BPNET User Manual for more details).

In ECLAP portal many different user roles are present. Each role is connected to different privileges. In order to explain the group services can be useful define the user roles involved in the group and respectively the services provided for them in the portal:

Unregistered user: people visiting the portal. They will:

- See the portal group list (paragraph 4.3.2)

- Access to 'Public Group Home Pages'

Registered user: people registered to the portal but not yet enrolled to groups. The portal will provide to them the same services provided to visitors, moreover they will:

- Request to add a new group

Enrolled to one or more groups: people registered to the portal and enrolled to one or more groups. The portal will provide to them the same services provided to registered user, moreover they will:

- Access to 'private group home page'
- Make use of group forum/ forum topics
- Send a broadcast message to all users enrolled to the same groups
- Invite colleagues/friends to subscribe their groups
- Send specific invitations to users and acquaintances to suggest interesting links
- Directly view the group members list/photo (and easily access to their profile)
- Access to pages/contents related to the group
- Receive notification on group events: via e-mail or personal messages on the portal
- etc.

Group manager: people registered to the portal and managing one or more groups. Note that the ECLAP group will be moderated: each group can have more than one group coordinator that will manage the Group. The portal will provide to them the same services provided to registered user, moreover they will:

- Modify/ maintain group home pages (both private and public)
- Create WEB pages for each group he is coordinator of;
- Cancel a discussion topic in the group's discussion forum he chairs;
- Perform direct registration to the group on behalf of ECLAP BPNET Portal's registered users via their nickname, provided they have already registered to the portal;
- Delete user from the group and/or put them in a black list, block a user from accessing the group;
- Accept or deny group membership requests from portal users;
- Promote/remove a member as group administrator.

Site administrator: who has the role of Portal administrator. Regarding the group functionalities, the portal will provide to him/her the same services provided to group coordinator, moreover he/she will:

- Create new groups;
- Remove all the group coordinators;
- Etc.

Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
og	Drupal module	This drupal module contains other additional sub modules needed to improve the functionalities (located in the sub folder 'modules' and reported here after)
og_views	Drupal module	
og_access	Drupal module	
og_actions	Drupal module	
og_forum	Drupal module	
og_notifications	Drupal module	
og_panels	Drupal module	
og_user_roles	Drupal module	
og_views	Drupal module	

4.3.1 Group User Roles

In ECLAP portal many different user roles are present. Each role is connected to different privileges. Regarding the groups, the following roles, as said in the introduction, are fundamental: vistor, registered user but not group member, group member, group manager, site administrator.
As usual each role has specific permissions and the system provides to them different functionalities and services.
The roles of the people within groups will be defined because in a social network it is natural that there are people with major duties and responsibilities (**group manager, site administrator**): update the information published and made available to the group members, establish basic behavioural rules, have the technical instruments for possibly take correctional actions, maintain the actual group state (both regarding the content uploaded, the discussion topics and the user behaviour). It is equally fundamental the simple users presence (**group member**), they will be able to play basic actions within the group: the system will put them in the position to carry out requests and to receive services that match their expectations. Finally you must promote the group created within the site: this is why it is essential that some basic services will be available even to the simple site **visitors** and both to all **registered users** (people not enrolled in the group).

4.3.1.1 Description and draft user interface

When this functionality will be added to groups, each group member will have a specific role. Each of the functionalities, described in the following paragraphs, will be accessible basing on group user roles.
Services to manage roles will be provided, for example if the site administrator goes to the group user roles administration page he/she can see the member list and their respective roles and change/update them if needed (see paragraph 4.3.17).

4.3.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og_views	Drupal module	
og_user_roles	Drupal module	

4.3.2 Group list

A list of all ECLAP groups is present and accessible in the most part of ECLAP Portal pages, starting from the home page (http://bpnet.eclap.eu/).
This functionality is fundamental in order to show to all visitors the main groups present, the people involved in the project, the topics treated in the ECLAP project.

4.3.2.1 Description and draft user interface

User roles access: all users roles

As visible in the following picture, the list will be visible as a lateral block. When a visitor clicks on each group name, he/she can access to the Public Group Home Page (described in 4.3.4) or Private Group Home Page (only if the user is enrolled in the group, functionality described in 4.3.5).
As usual in Drupal, the group names appears in the block list in alphabetical number, we will add the possibility to choose and change this weight (only for site administrator).

4.3.2.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.2.3 Data model description

In order to give a weight to each group regarding the position in the block list, fundamental for the group visibility into the site, we will add a parameter (‘og_blockweight’) compared to drupal basic module.

In details, it will be added a column ‘og_blockweight’ in table og , as you can see in the following screenshot.

Column Name	Datatype	NOT NULL	AUTO INC	Flags	Default Value	Comment
nid	INTEGER	✓		UNSIGNED ZEROFILL	0	
og_selective	INTEGER	✓		UNSIGNED ZEROFILL	0	
og_description	VARCHAR(255)			BINARY	NULL	
og_theme	VARCHAR(255)			BINARY	NULL	
og_register	TINYINT(4)	✓		UNSIGNED ZEROFILL	0	
og_directory	TINYINT(4)	✓		UNSIGNED ZEROFILL	0	
og_language	VARCHAR(12)	✓		BINARY		
og_private	TINYINT(4)	✓		UNSIGNED ZEROFILL	0	
og_blockweight	INTEGER	✓		UNSIGNED ZEROFILL	0	

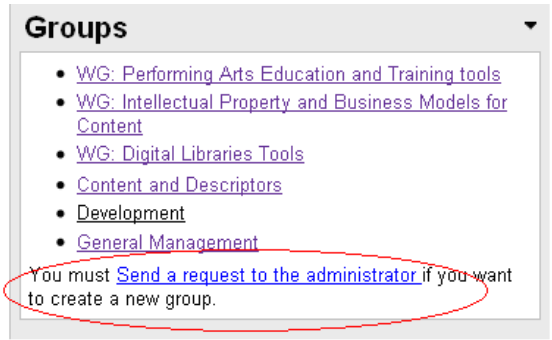
4.3.3 Request to add a new group

User roles access: all registered users (group manager, site administrator, group member, etc.)

All users can view the group list (see 4.3.2) and their home pages (Public 4.3.4 or Private 4.3.5) containing information related to the topic treated into the group. If the topics addressed are not sufficient to cover the theme of user interest, it will be possible to request to add a new group: each user will be able to ask it to ECLAP administrator. In the future, a specific form can be set up to facilitate the production of a request to create a new group.

4.3.3.1 Description and draft user interface

Below the block containing the groups list, a link will be visible by clicking that link users can send an e-mail to the site administrator indicating the reasons for requesting a new group (see the following figure). Such requests will be examined by the ECLAP Management Committee.



4.3.3.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.4 Access to Public Group Home Pages

User roles access: visitors, not group members

As said in 4.3.2, when a visitor clicks on the name of one of the groups contained in the group list, he/she can access to a *Group Public Home Page*. In this page will be possible to read some basic information written by the group coordinator or by site administrator and related to the group, such as the topics covered,

the group coordinator name or e-mail, content types available for group members, etc. As default, ECLAP Portal offers the guideline to make a request for registering to the portal and then subscribing to the group.

This page is different from the Private Home Page (see 4.3.5) accessible only for group members. The presence of these two different pages (Public and Private) is not provided by Drupal basic modules: we will add this functionality in order to provide a better service fo ECLAP Users.
So, the *Public Home Page* is useful to promote the ECLAP group while the other one, the *Private Home Page*, will contain information only for users members (each member is enrolled in the group only with the group manager permission).

4.3.4.1 Description and draft user interface

Here after, an example of the Public Home Page. The system provides basic services, then each group manager or site administrator can change the home page look and feel and add more information (see 4.3.6).
If the user is interested in enrolling in the group, he/she has to follow the guidelines that will be reported in the Public Group Home Page (see section 'To access to this group' in Figure 4.3.4.1). Particularly:

- Register to the ECLAP Portal (see section 4.2.1)

Make the group subscription: the system will automatically send an e-mail to each group coordinator and to the site administrator. When the responsible for the group will authorize the subscription, the user will be a group member (Figure 4.3.4.2).

Figure 4.3.4.1

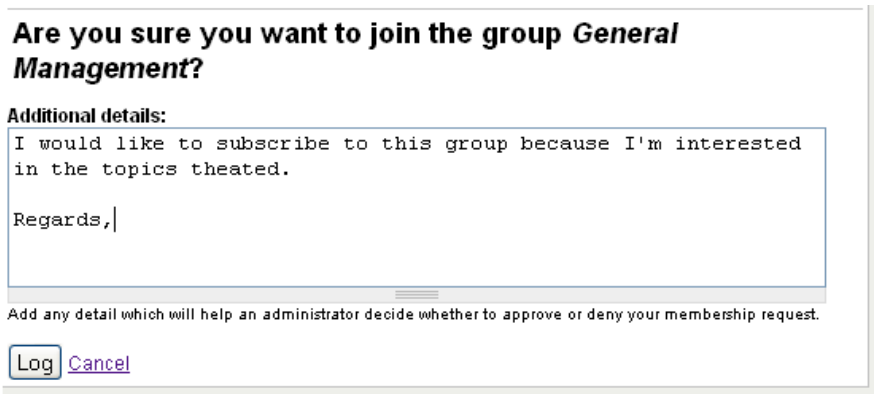


Figure 4.3.4.2

4.3.4.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	
page_manager	Drupal module	
panels	Drupal module	
og_panels	Drupal module	
ctools	Drupal module	

4.3.5 Access to Private Group Home Page

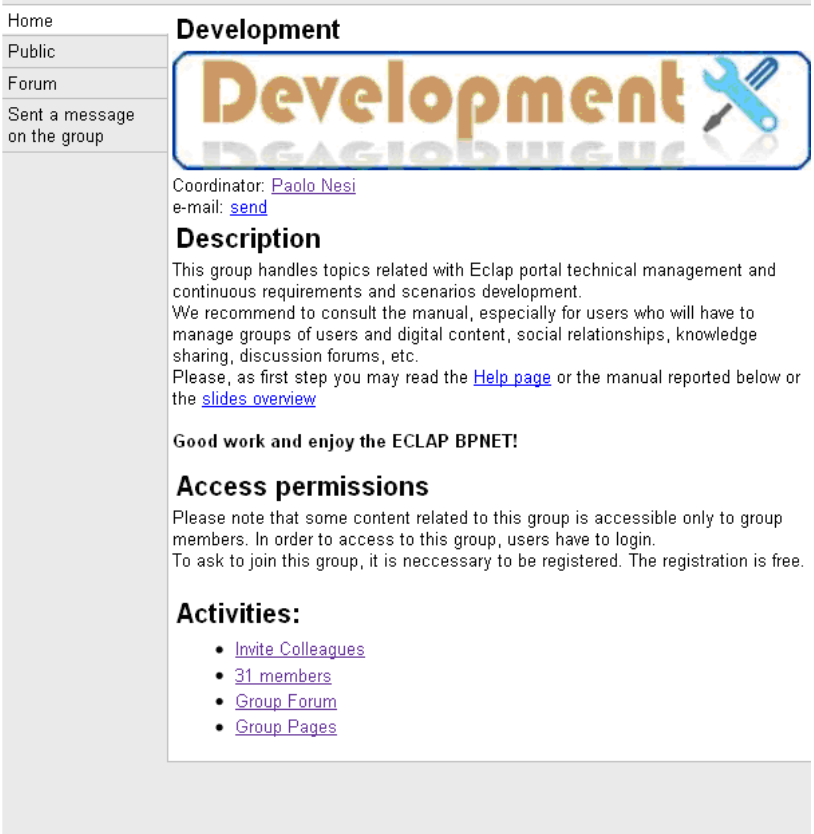
User roles access: group members, group manager, site administrator.

As said in 4.3.4, when a group member, group manager or site administrator clicks on the name of one of the groups contained in the lateral block group list, he/she can access to a *Group Private Home Page*. In this page it will be possible to read some basic information written by the group coordinator or by site administrator and related to the group, such as the topics covered, the group coordinator name or e-mail, content types available for group members, etc. As default, ECLAP Portal offers the guideline to make a request for registering to the portal and then subscribing to the group.

This page is different from the Public Home Page (see 4.3.4) accessible only for group members. The presence of these two different pages (Public and Private) is not provided by Drupal basic modules: we will add this functionality in order to provide a better service fo ECLAP Users.
So, the *Public Home Page* is useful to promote the ECLAP Group while the other one, the *Private Home Page* will contain information only for users members (each member is enrolled in the group only with the group manager permission).

4.3.5.1 Description and draft user interface

Here after, an example of the Private Group Home Page. The system provides basic services, then each group manager or site administrator can change the home page look and feel and add more information (see 4.3.6). These basic services are accessible through visible links in this Private Home Page: each of them will be added basing on user role into the group and will be described in the following paragraphs.



4.3.5.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	drupal module	
page_manager	drupal module	
panels	drupal module	
og_panels	drupal module	
ctools	drupal module	

4.3.6 Modify/maintain group home pages

User roles access: group manager, site administrator

As just said, each group manager or site administrator is in charge of maintain and update the group home Pages: he/she can acces both the Private and Public editing so he/she can update the pages and provide users with updated information.

4.3.6.1 Description and draft user interface

Here after, an example of the home pages editing: three possibilities will be provided:

- **Group** editing: each group manager/site administrator can modify a lot of aspects related to his/her group by clicking on group home page lateral ‘edit’ tab. In order to update the group information written on the home pages the first thing that he/she can do is modify/edit the ‘Group description’ and the group “Body” (see Figure 4.3.5.1). This information regards the group in general and can be added to both Private and Public Home Pages.
- **Private Home Page** editing (see Figure 4.3.5.2): in this editing page, it is possible to edit only the content visible in the Private home page, so the group manager can:
    - Add the general ‘Group description’ (described in the previous point)

- Add the general group “Body” (described in the previous point)
- Edit and add other Private free text, html, link, and more information using the editor (in Figure 4.3.5.2 : under ‘Please insert the HTML code for the Private Home Page’)

- **Public Home Page** editing (no figure, you can refer to Figure 4.3.5.2) : in this editing page, it is possible to edit only the content visible in the Public home page, so the group manager can:
  - Add the general ‘Group description’ (described in the previous point)
  - Add the general group “Body” (described in the previous point)
  - Edit and add other Public free text, html, link, and more information using the editor (when you follow the right links you will find ‘Please insert the HTML code for the Public Home Page’)

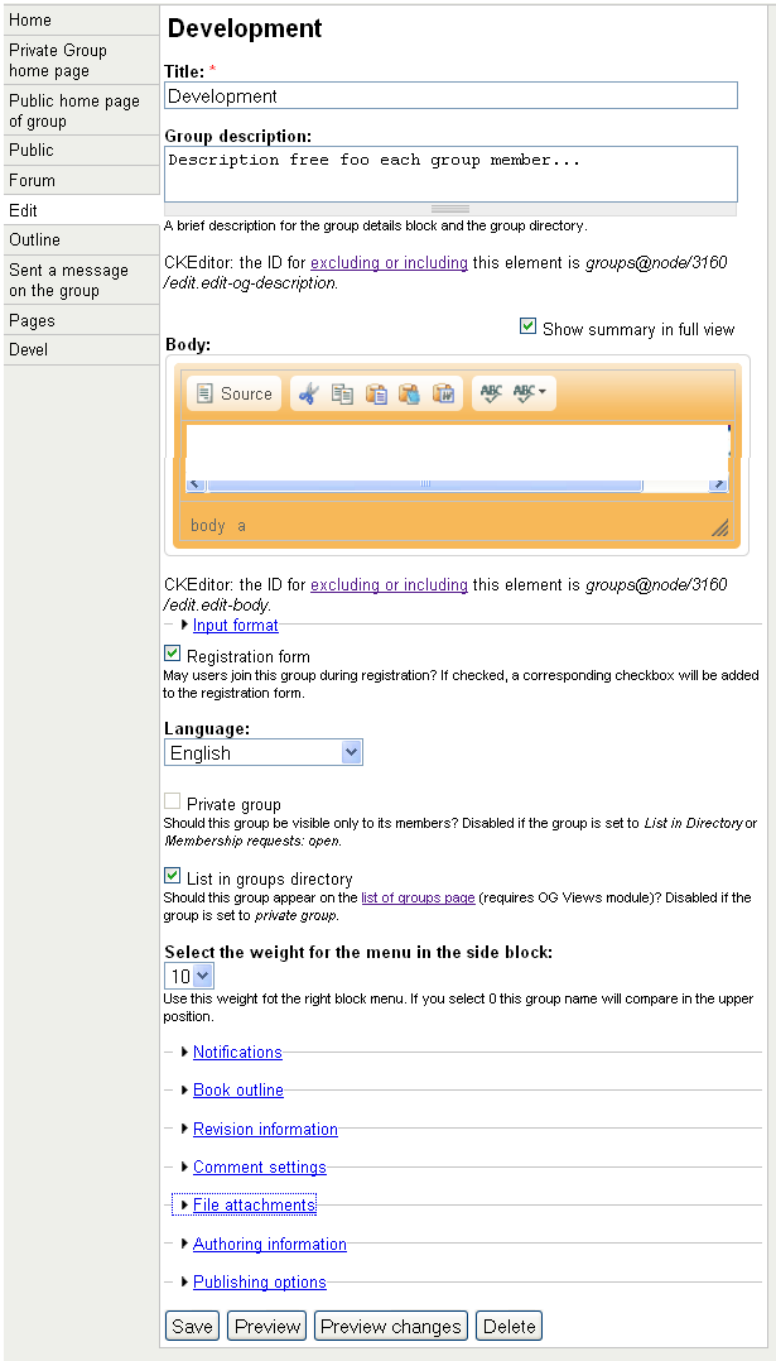


Figure 4.3.5.1

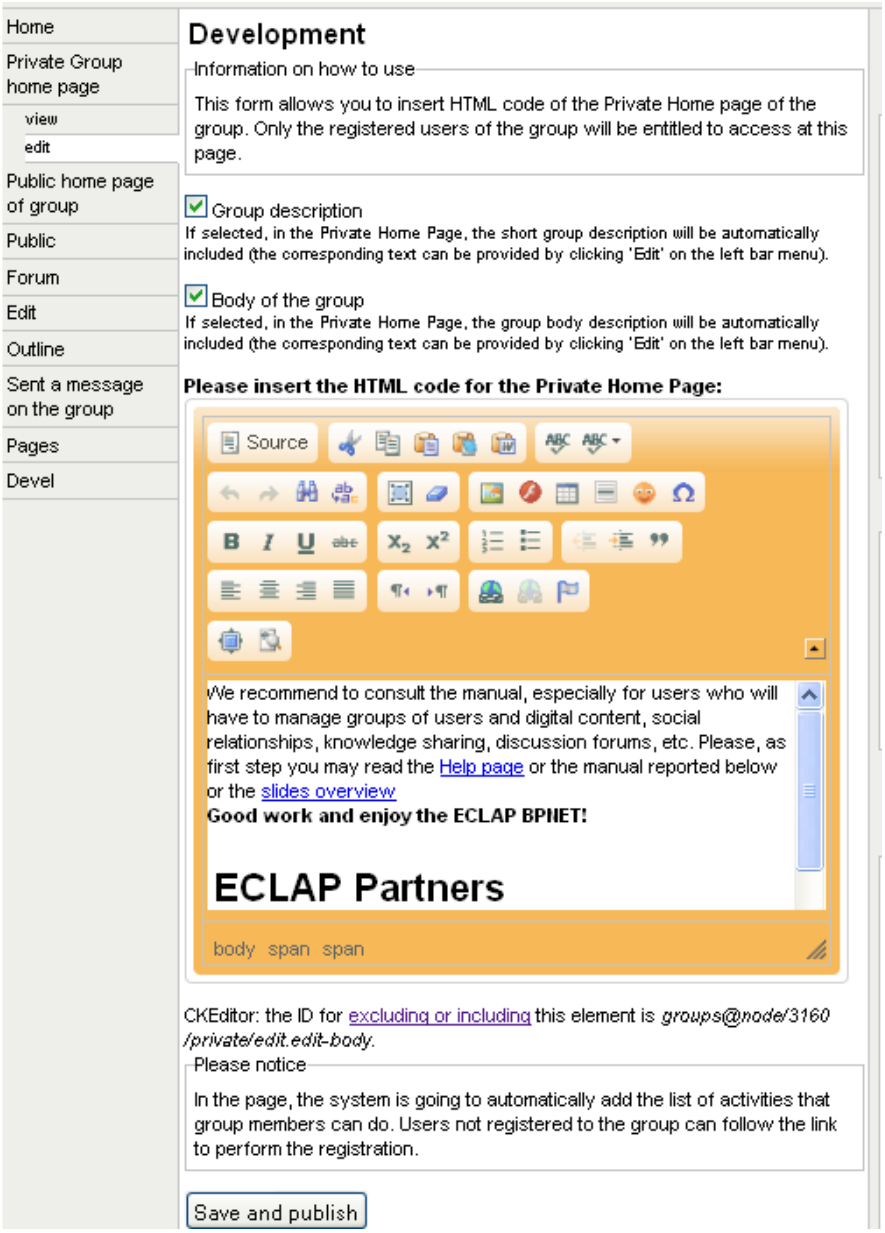


Figure 4.3.5.2

4.3.6.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
og	Drupal module	
page_manager	Drupal module	
panels	Drupal module	
og_panels	Drupal module	
ctools	Drupal module	
ckeditor	Drupal module	

Third-party software	**Version**	**Notes**
CKEditor (http://ckeditor.com)	Version: 3.4.2, released	License: http://ckeditor.com/license

	on 4 November 2010	Demo: http://ckeditor.com/demo

4.3.7 Invite colleagues/friends to the group

User roles access: group members, group manager, site administrator.

Each group member can invite other users to the group in order to promote it. This functionality has the same purpose of the Public Home Page (4.3.4): promote the group.

4.3.7.1 Description and draft user interface

When a member is interested in inviting other users to the group, he/she can click on the "Invite Collegues" link (Figure 4.3.6.1.1), then a "Send Invitation" page (Figure 4.3.7.2) will be visible. In this page the user can:

- Insert one or more e-mail addresses
- Write a personal message
- Send e-mail (the system will do it automatically) by clicking on "Send invitation" button

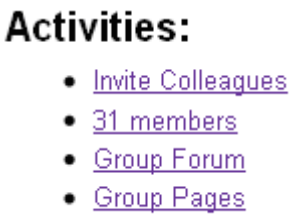


Figure 4.3.7.1.1

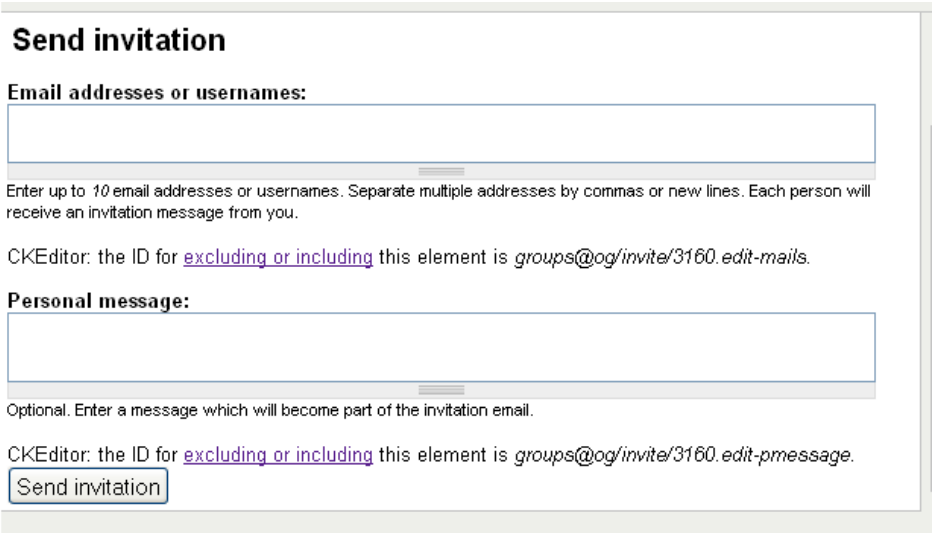


Figure 4.3.7.1

4.3.7.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.8 Group Member list

User roles access: group members, group manager, site administrator.

This functionality is particularly relevant in order to communicate with all peole having the same interests (topic treated in the group, common friends or collegues, etc.), in the ECLAP Portal a great part of the services will be created in this direction.

4.3.8.1 Description and draft user interface

When a member is interested in seeing all the group members, he/she can click on the "n° members" link (Figure 4.3.8.1), then a "Faces" page (Figure 4.3.8.2) will be visible. In this page the user can view:

- Member list
- Member image (if the users have added it to their profile)
- Member roles in the group (site administrator, group administrator, simple member)
- Links to Users Profile (see 4.2.2)

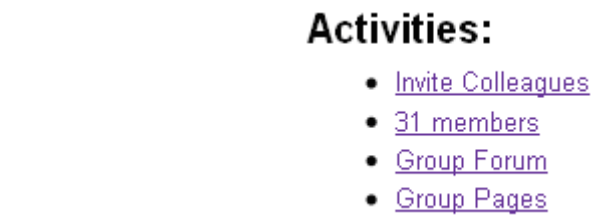


Figure 4.3.8.1

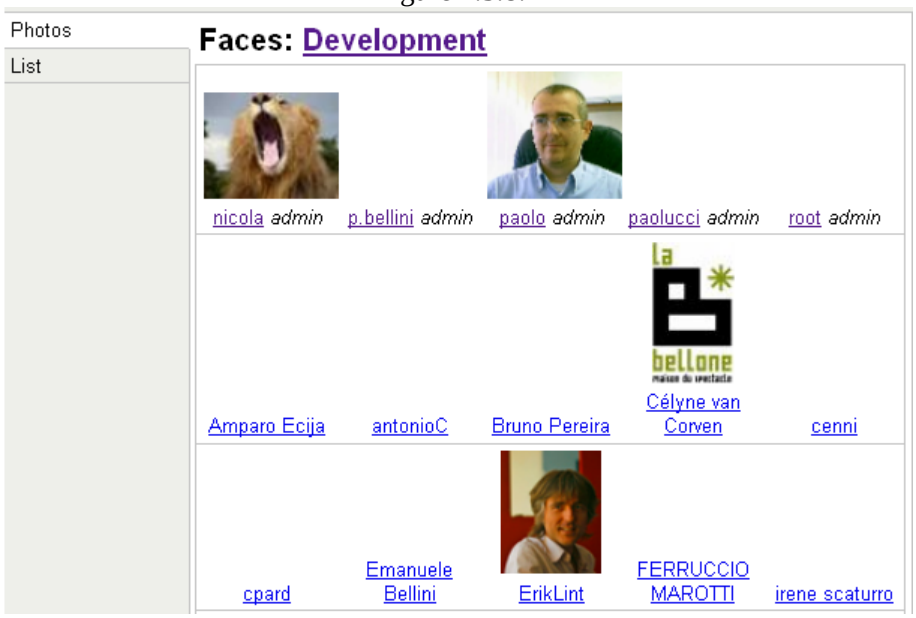


Figure 4.3.8.2

4.3.8.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.9 Group Member list on User Profile page/ tab visible at ECLAP home page

User roles access: group members, group manager, site administrator.

Each registered user has his/her personal profile page in the ECLAP site, containing the public information he/she has provided in the ECLAP portal. This page is accessible to all ECLAP registered users (a more detailed User Profile description is in 4.2.2).

In the User Profile page is also present a list of the groups in which the user is enrolled in, moreover a link to the list of recent and not seen contents that are related to the groups of which the user is member.
Also in the home page there is a tab pointing to a page containing the list of the groups of which the user is member.

4.3.9.1 Description and draft user interface

If the user wants to look of which groups he/she is member, has two possibilities:

- Access his/her profile page (Figure 4.3.9.1). As additional service is possible to see the lists of recent and not seen contents that are related to the groups of which the user is member (link "Lists of recent and not seen content on the portal and on your groups" in Figure 4.3.9.1 and Figure 4.3.9.2)
- Access to ECLAP home page and follow the tab "My groups". As additional service the ECLAP registered user can invite other users to his/her groups (Figure 4.3.9.3, clicking on "Invite colleagues to the group", the same functionality described in 4.3.7 is provided).

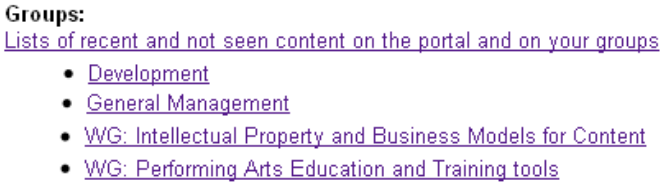


Figure 4.3.9.1

Figure 4.3.9.2

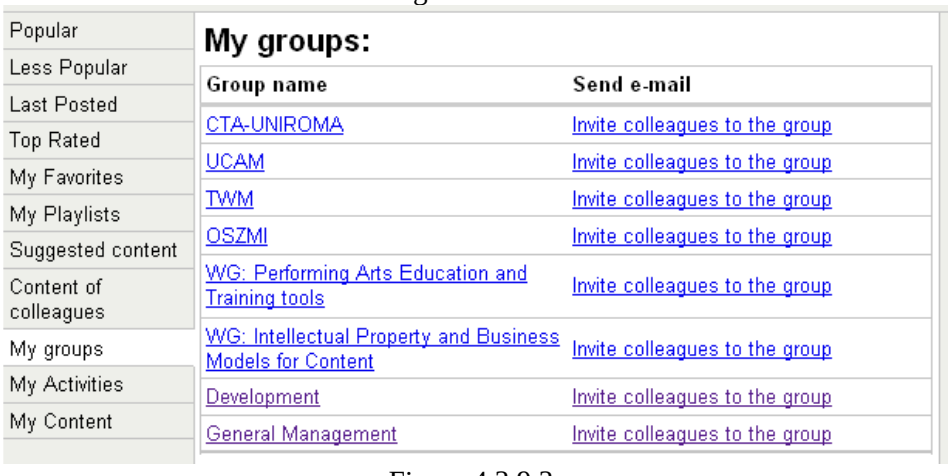


Figure 4.3.9.3

4.3.9.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.10 Group forum

User roles access: group members, group manager, site administrator.

Group forums are fundamental in order to create discussions about the main group topics, to communicate group rules, understand what are the most active users in the group and what are their opinions, share ideas on how to improve the Group's activities or exchange opinion on what contents, rules, topics are considered more relevant for the group members, etc.

4.3.10.1 Description and draft user interface

When a member is interested in seeing all the group members, he/she can click on the "Group Forum" link (Figure 4.3.10.1), then he/she can acces to the Froum Topic page in which the following services are provided (Figure 4.3.10.2):

- Topic list
- New topic creation: if needee each user can add a new topic

Clicking on one topic name, the user can acces to that topic, read all discussion and reply to them (Figure 4.3.9.1.3).

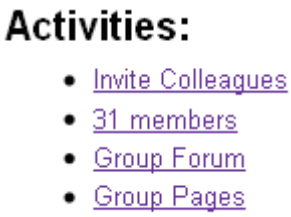


Figure 4.3.10.1

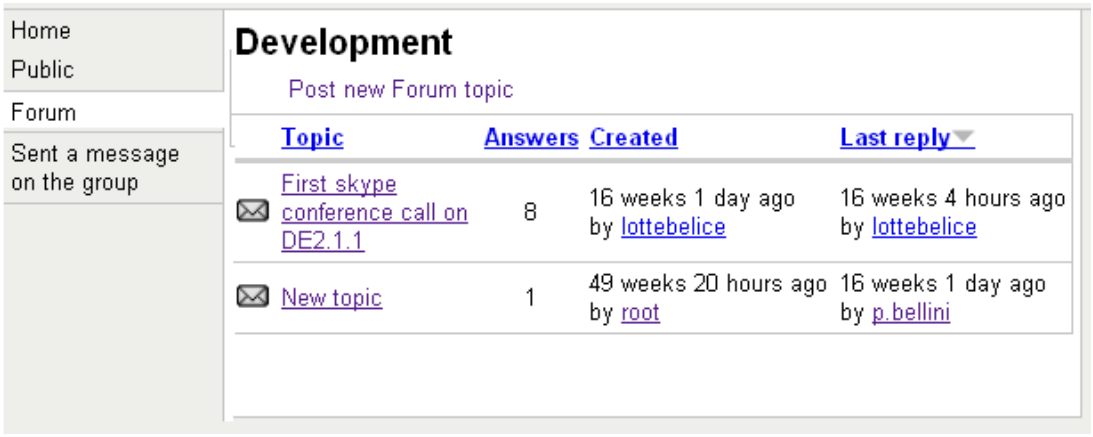


Figure 4.3.10.2

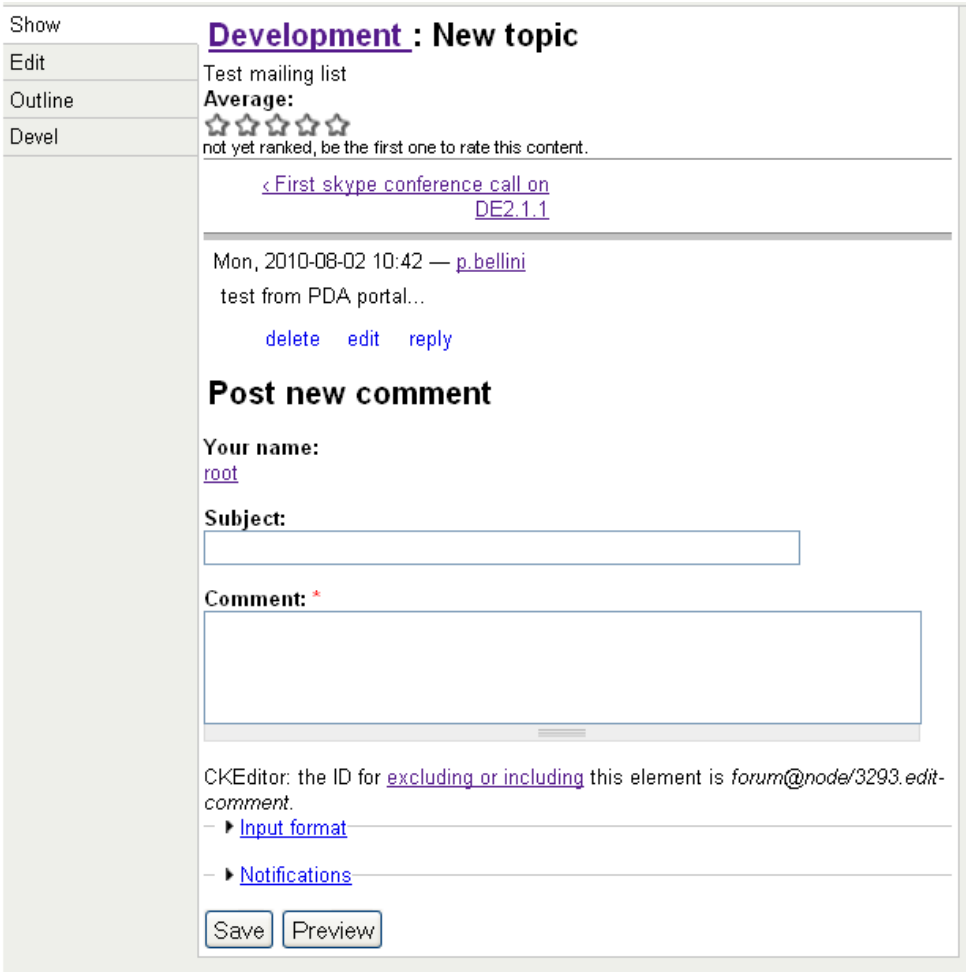


Figure 4.3.10.3

4.3.10.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	
axmedis	Drupal module	

4.3.11 Access to Group Web Pages/content

User roles access: group members, group manager, site administrator.

ECLAP groups will be created to both exchange ideas and also to access to common contents such as web pages but also and especially multimedia contents such as documents, video, audio, images, etc.

4.3.11.1 Description and draft user interface

When a user clicks on “Group Pages” or “Group objects” in the Group Activities panel (Figure 4.3.11.1) he/she can access to a list like the one in Figure 4.3.11.2. All the object in the list are accessible only by the group members.

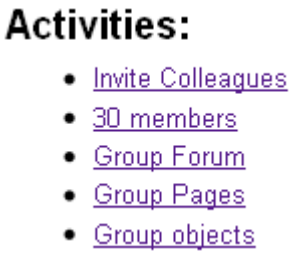


Figure 4.3.11.1

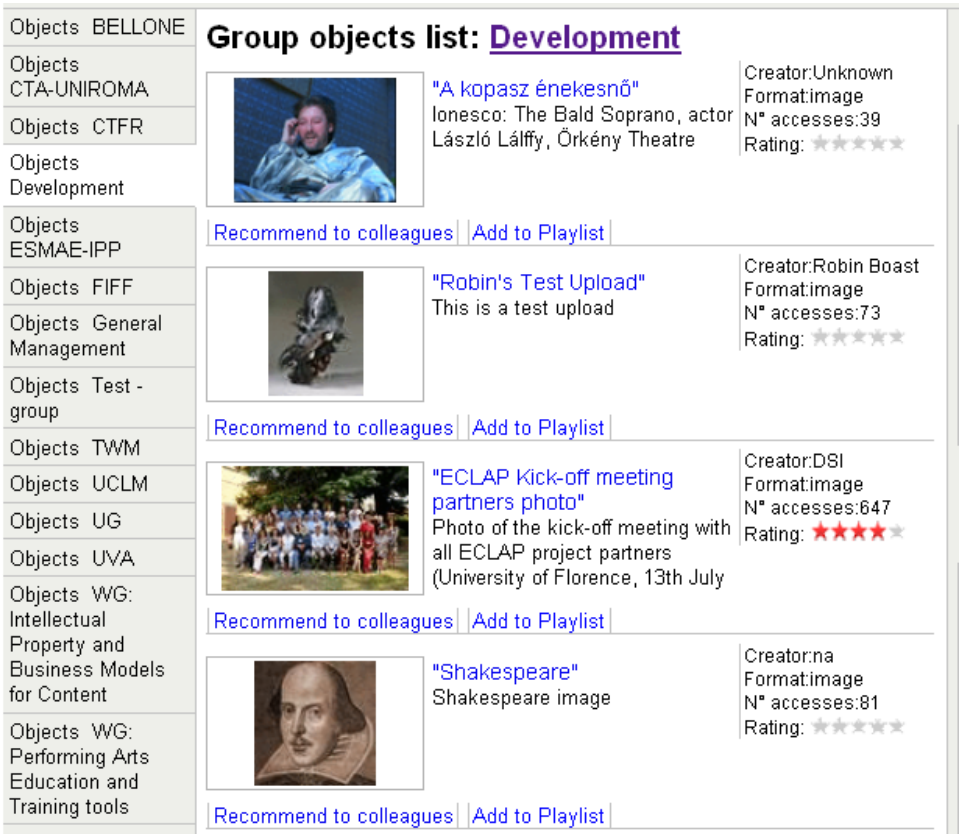


Figure 4.3.11.2

4.3.11.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.12 Create Group Web Pages/content

User roles access: group manager, site administrator.

Not all information can be put in the home page, for this reason the group manager can decide to add other multi language pages, containing external links (not in ECLAP Portal); these pages can also collect (as links) contents managed in the ECLAP portal and related to the same topic, etc

4.3.12.1 Description and draft user interface

When the group manager clicks on “Create an additional web Page of group” (Figure 4.3.12.1), an editing page (Figure 4.3.12.2) will be accessible: the user can create a new page and connect it to the group.

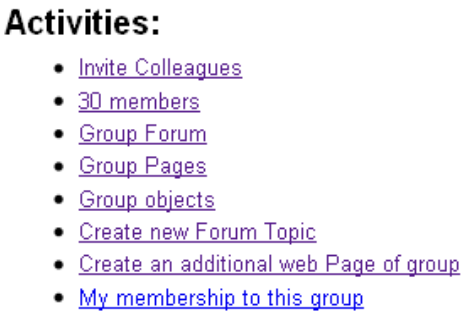


Figure 4.3.12.1

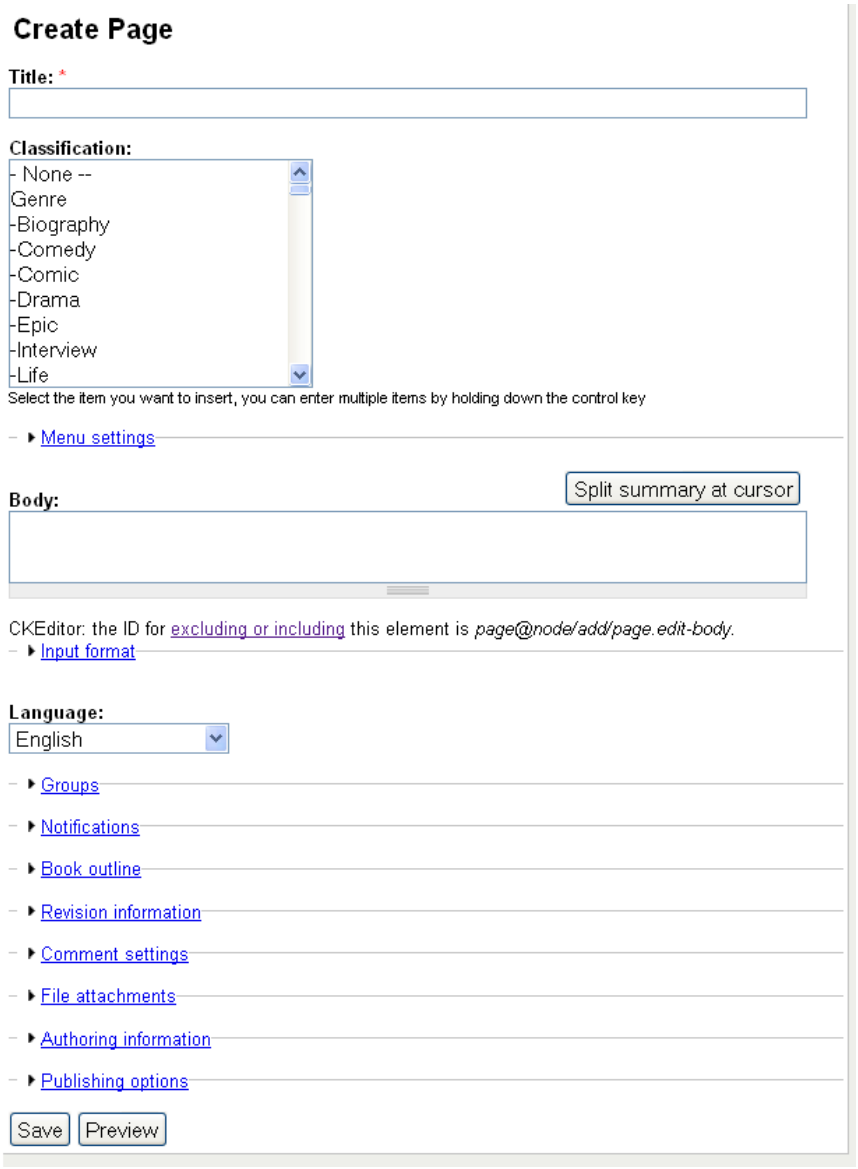


Figure 4.3.12.2

4.3.12.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.13 Broadcast messages

User roles access: group member, group manager, site administrator.

This functionality is useful to send a message to all group members: an e-mail will be sent to them. The user does not have to collect all member names, e-mail or nicknames in ECLAP Portal: the system will automatically do it for him/her.

4.3.13.1 Description and draft user interface

If a member is interested in sending a broadcast message, he/she can click on lateral tab "Send a message on the group" visible in the home page (Figure 4.3.13.1). In this case the member has:

- To indicate the e-mail subject
- To write his/her personal message
- Click the 'Send message' button when finished

And an e-mail will be sent to all group members.

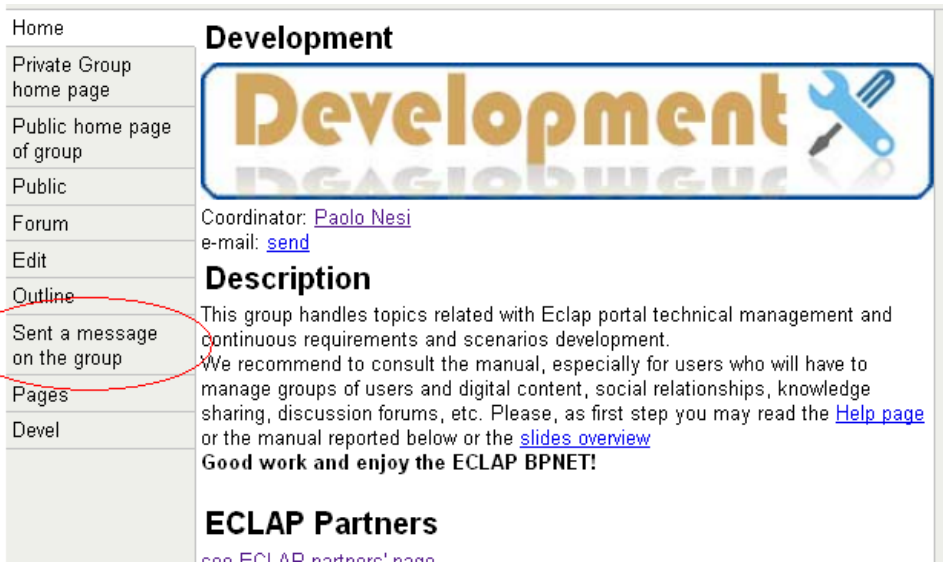


Figure 4.3.13.1

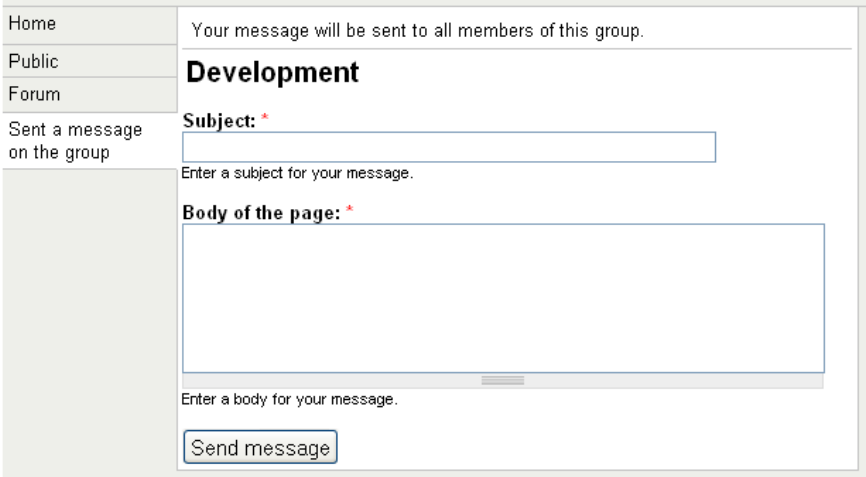


Figure 4.3.13.2

4.3.13.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.14 Accept/Deny group membership requests from portal

User roles access: group manager, site administrator.

As written in 4.3.4, users will have to request to the group managers for their subscription to the group, according to the main features of the moderated groups.

4.3.14.1 Description and draft user interface

When a new user request his/her subscription to the group, the system will automatically send an e-mail to both the site administrator and to all group managers.
The e-mail (Figure 4.3.14.1) body will contain a link to directly approve the request or the link to the group users administration page (needed if the manager wants to check the user identity and perhaps deny the request).
Morever, the administrator can go to the group home page (Figure 4.3.14.2) and follow the link “n° members (1)” > “List” tab and “approve” or “deny” the user request (Figure 4.3.14.3).

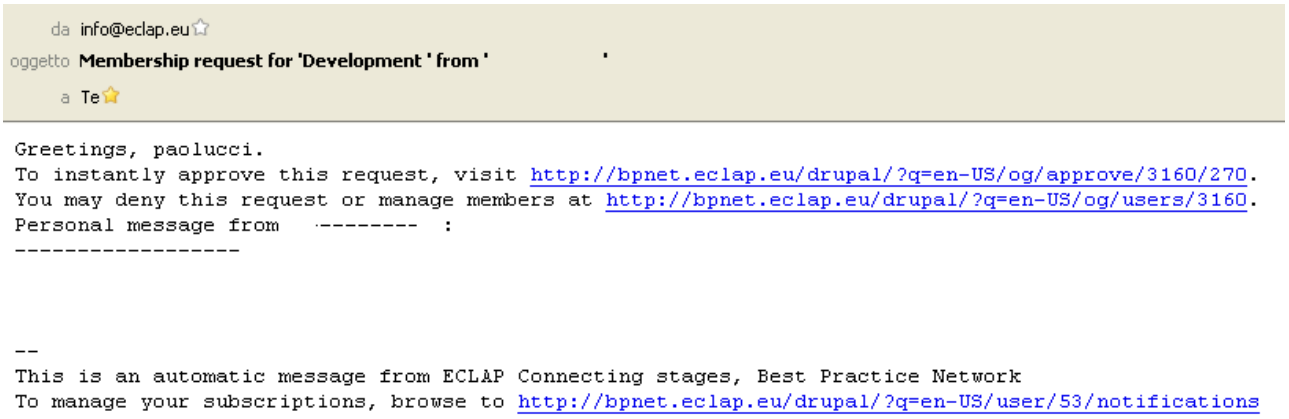


Figure 4.3.14.1

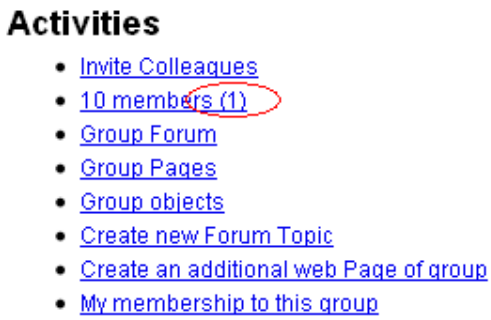


Figure 4.3.14.2

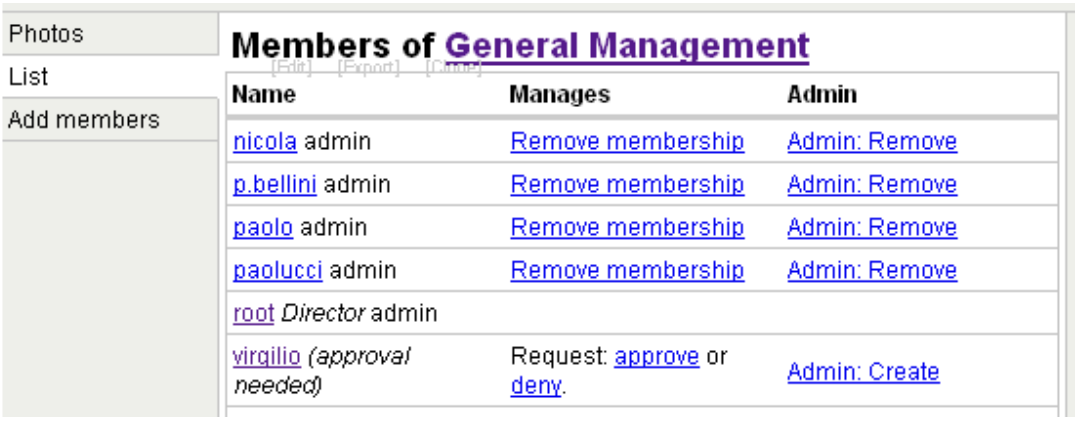


Figure 4.3.14.3

4.3.14.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.15 Register new users

User roles access: group manager, site administrator.

As usual in the moderated groups, users request to the group manager their subscription to the group, the group manager receives an e-mail or a notification, then he/she can decide if enrol the users or not in the group. This is the standard modality also in ECLAP Portal (see section 4.3.14).
However, in some cases, can be useful for the group managers to use a direct registration of the group members. In this case, the site administrator and each group manager can perform direct registration to the group on behalf of ECLAP BPNET Portal's registered users via their nickname, provided they have already registered to the portal.

4.3.15.1 Description and draft user interface

When a group manager wants to register new users, he/she has to click on "n° members" link (Figure 4.3.15.1), accessible in the group home page, then has to click the "Add members" tab and fill in the list of users he wants to add to the group (Figure 4.3.15.2).

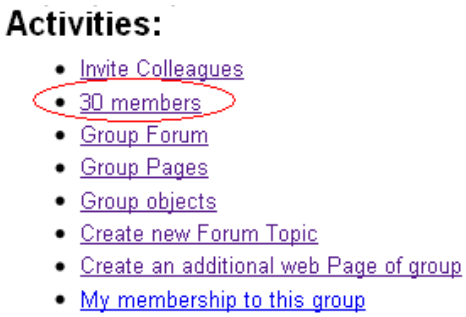


Figure 4.3.14.1

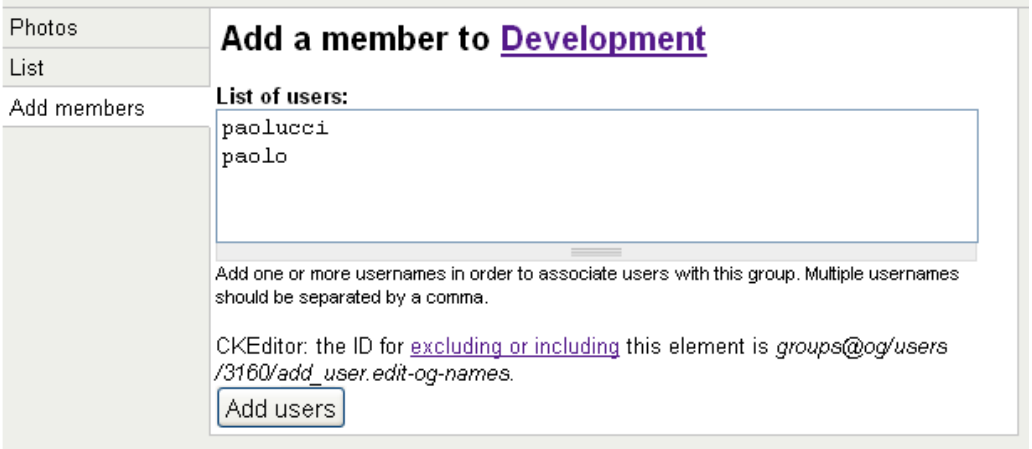


Figure 4.3.15.2

4.3.15.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
og	Drupal module	

4.3.16 Delete users from a group

User roles access: group manager, site administrator.

If one user's behaviour is inappropriate in relation to the rules of the Group, the group manager can remove this user from the group (not from the ECLAP Portal).

4.3.16.1 Description and draft user interface

When a group manager wants to remove a user from the group, he/she has to click on the “n° members” link (Figure 4.3.16.1), accessible in the group home page, then can click in the “List” tab and select “Remove membership” (Figure 4.3.16.2).

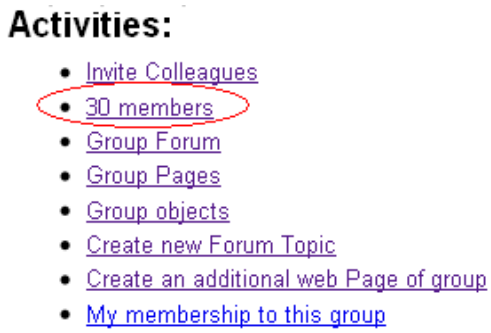


Figure 4.3.16.1

Figure 4.3.16.2

4.3.16.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.17 Promote or remove a member as a group manager

User roles access: group manager, site administrator.

More than one group manager will be accepted in ECLAP groups: each of them can check the colleague's behaviours and eventually remove the manager not capable of group maintenance, similarly each manager can promote one member to group manager (if he/she has the competence to assume this role).

4.3.17.1 Description and draft user interface

When a group manager wants to remove a user from the group, he/she has to click on the "n° members" link (Figure 4.3.17.1), accessible in the group home page, then can click in the "List" tab and select "Remove membership" (Figure 4.3.17.2).

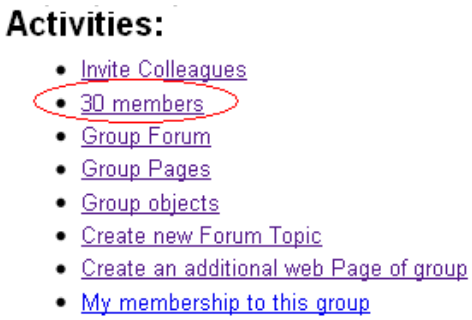


Figure 4.3.17.1

Figure 4.3.17.2

4.3.17.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.18 Accept/Deny group membership requests from portal

User roles access: group manager, site administrator.

More than one group manager will be accepted in ECLAP groups: each of them can check the colleague's behaviours and eventually remove the manager not capable of group maintenance, similarly each manager can promote one member to group manager.

4.3.18.1 Description and draft user interface

When a group manager wants to remove a user from the role of group manager, he/she has to click in the "n° members" (Figure 4.3.18.1), accessible in the group home page, then can click in the "List" tab and select "Admin: Remove" (Figure 4.3.18.2). Similarly if the group manager wants to proote a simple member to a group manager has to select "Admin: Create" (Figure 4.3.18.2).

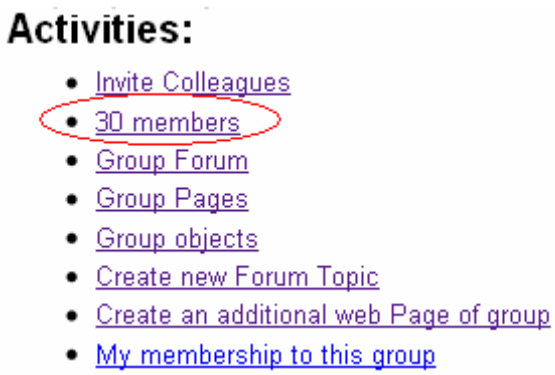


Figure 4.3.18.1

Figure 4.3.18.2

4.3.18.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
og	Drupal module	

4.3.19 Group Notification

User roles access: group member, group manager, site administrator (Note that: general notifications are accessible for all registered users).

Each group member can decide to receive notifications on group events: via e-mail or messages on PC on the portal. Each user can decide which notification he/she wants to receive (e.g. when a new group page/content is modified/written/commented out, etc.) and read them in a specific portal page. Each message will contain a link or information related to the group event.

4.3.19.1 Description and draft user interface

The Notification services will be accessible from the user profile page (tab "Notification" Figure 4.3.19.1), each user can subscribe to a notification type and the system automatically send him/her notifications.

In order to control notifications, each user can: see all his/her actual subscriptions and cancel some of them (Figure 4.3.19.2), choose the method that the system has to apply to send notifications (e-mail, messages on PC, etc.), decide to which notification types he/she is interested in (Figure 4.3.19.3), temporary disable subscriptions, etc.

The notification types expected (we put all of them in the list, even if not strictly related to the groups, in that cases are accessible for all registered users) are:

- Content type in group, subscribe to specific content within a group:
  - Multimedia content
  - Forum
  - Web pages
  - Etc.
- Content type, subscribe to all content of a given type:
  - Multimedia content
  - Forum
  - Web pages
  - Event
  - Wiki
  - Etc.
- Author, subscribe to all content submitted by a user

- Content type and Author, Subscribe to all content of a given type submitted by a user.

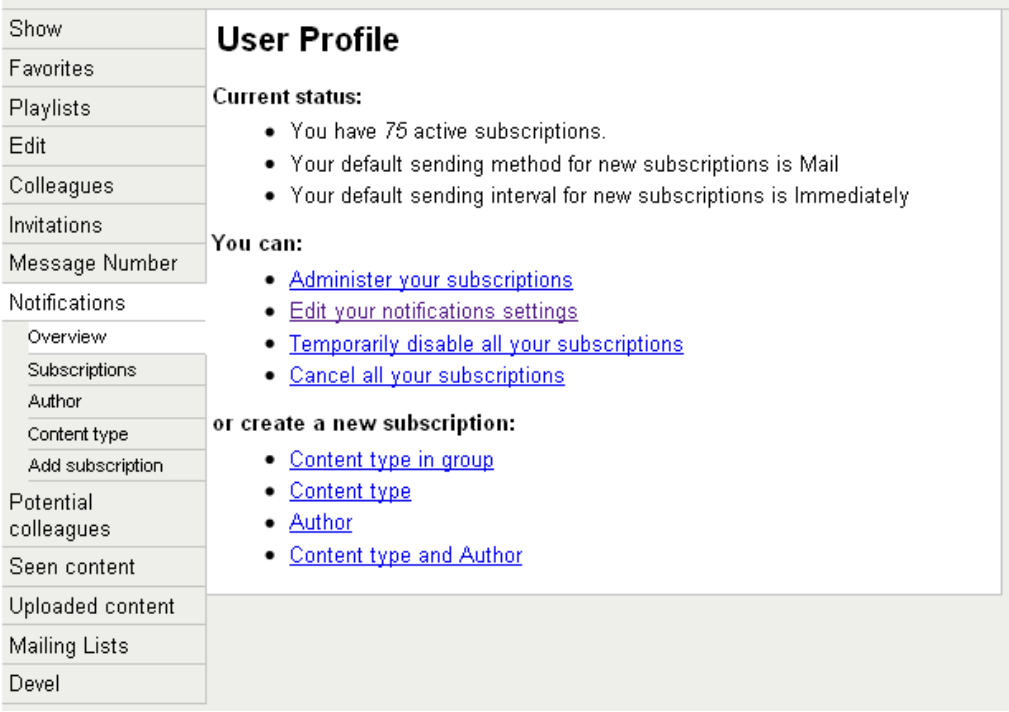


Figure 4.3.19.1

Figure 4.3.19.2

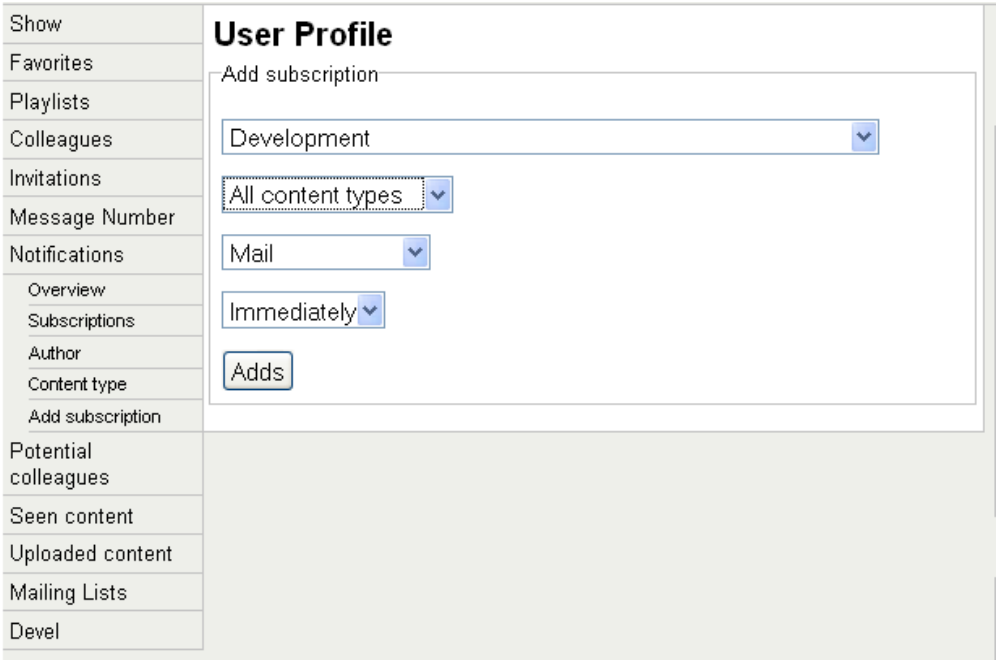


Figure 4.3.19.3

4.3.19.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.20 Suggest interesting links

User roles access: group member, group manager, site administrator.

This functionality is useful in order to send specific suggestions to users or group of users.

4.3.20.1 Description and draft user interface

This functionality is not accessible in the group home page but is present in all objects previews, for example it is possible to see the link “Recommend to colleagues” under each object preview in the site home page (http://bpnet.eclap.eu/drupal). If the user click the link (Figure 4.3.20.1), a Suggest page will be visible (Figure 4.3.20.2), in this case the user has to:

- write e-mail addresses or ECLAP user name of the user to which he/sh want to suggest the ECLAP content (as a link)
- choose one or more groups (only the groups to which the user is enrolled in will be visible)
- add a personal message
- clilck on the “Send Invitation” button

The system will automatically send a preformatted e-mail containing the content URL, a general message and all the data inserted by the user.

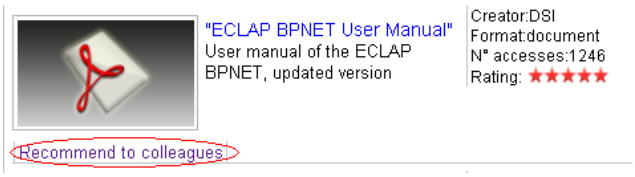


Figure 4.3.20.1

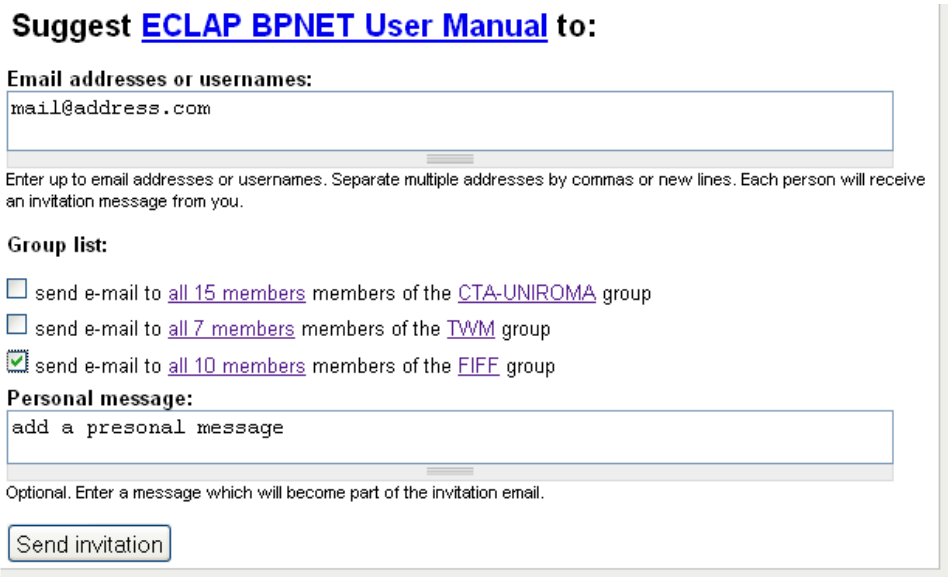


Figure 4.3.20.2

4.3.20.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	

4.3.21 Create Groups

User roles access: site administrator.

Only the site administrator can create new groups in order to better control the site structure, to avoid the creation of too many similar groups, and to verify the real requests to create new groups made by users (e.g. checking all the topics already present in the site), etc.
The site administrator can manage group settings, add new services to the home pages, create new groups, remove all the group coordinators, etc.

4.3.21.1 Description and draft user interface

When a site administrator wants to create a new group, he/she has to use the navigation block (‘root’, Figure 4.3.21.1) “Create content” > “Groups”, then a new creation page will appear (Figure 4.3.21.2): the administrator has to fill in the field with the appropriate information and save the new group.
Note that the main settings in order to create the moderated groups for the ECLAP project are:

- language: English
- registration form: active
- Membership requests: Moderated
- membership requests must be approved
- Default role for new members: default
- list in groups directory: active
- One Forum topic creation

An important additional step to complete the group creation, is the setting of the Public and Private Home Pages (this point is particularly important because these pages are not native in Drupal modules but will be added for the ECLAP project).

Particularly the two home pages have to be manually created (Figure 4.3.21.3, in future this step will be automatised). In Drupal the group home pages have a distinct structure respect to the other Multilanguage web page: are composed of specific objects (called *mini panels* in Drupal). Each object has its functionality (e.g. online user list, group taxonomy list, group actions, text free space, etc.). For the final purpose of ECLAP group we will choose the most relevant or the functionalities that can be useful to solve different problems all togheter (see Figure 4.3.21.4 and chapter 4.3.6.1):

- Description (will contain the text edited by group managers in "Group editing" > "Group description")
- Mission (will contain the text edited by group mangers in "Group editing" > "Body")
- Custom (will contain the text edited by group mangers in "Private Home Page editing" > "Please insert the HTML code for the Private/Public Home Page")
- Group details (will contain all basic actions for group members, "Actions" visible in the Private Home Page, see 4.3.5)

All these *mini panels* structures are not visible to group managers or to simple group members: they will only access to the functionalities contained in them.

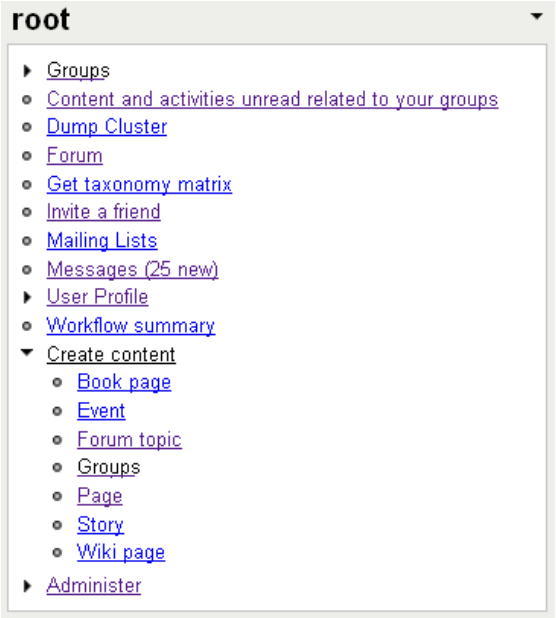


Figure 4.3.21.1

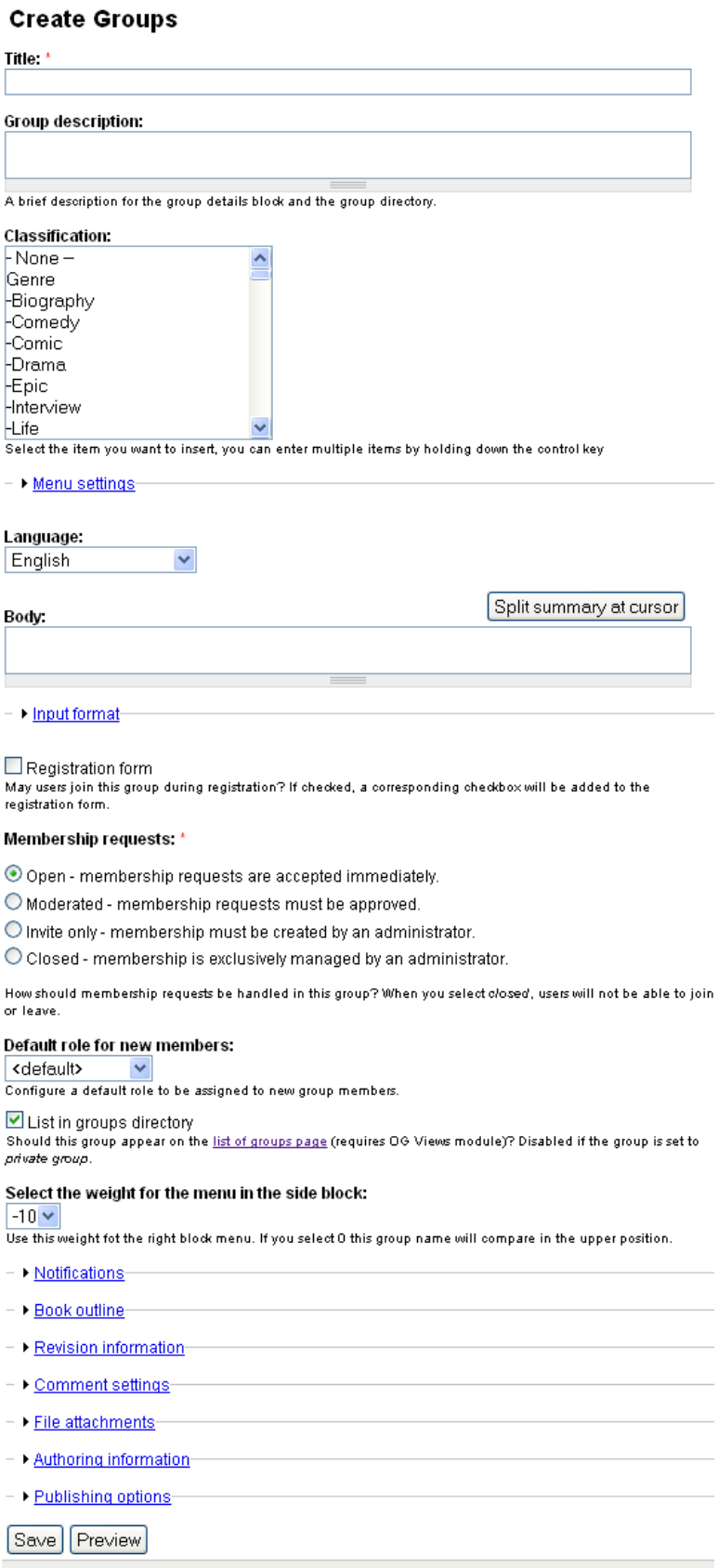


Figure 4.3.21.2

Figure 4.3.21.3

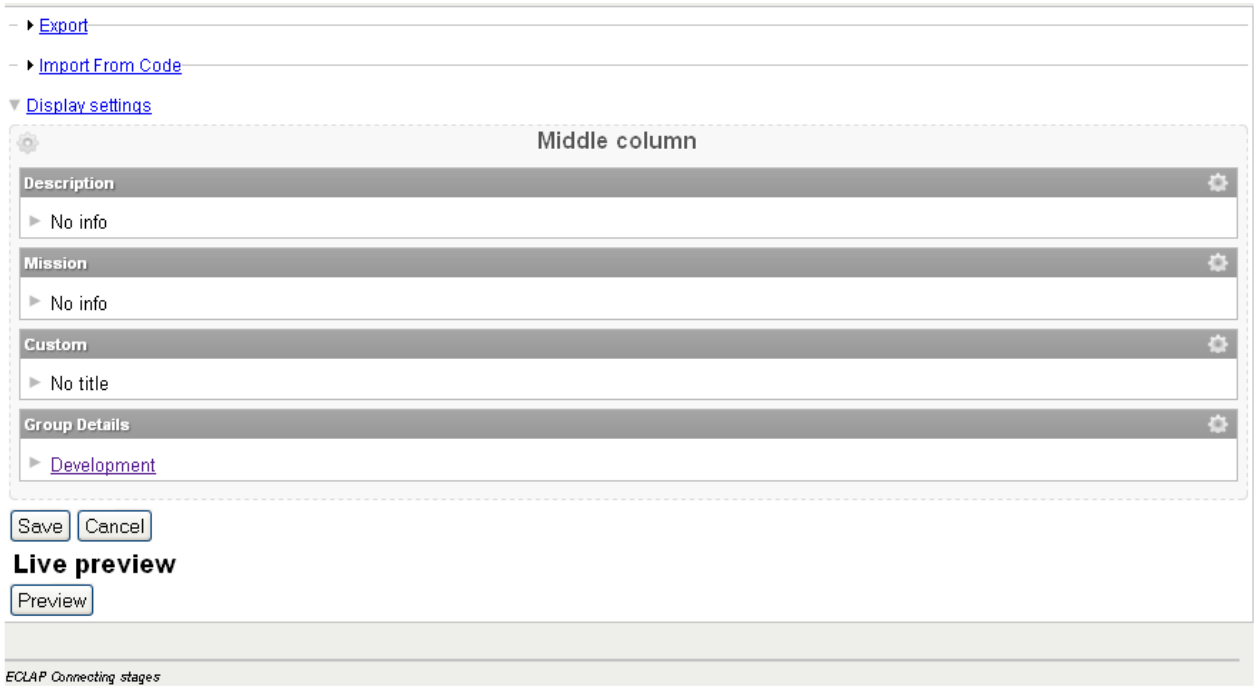


Figure 4.3.21.4

4.3.21.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	
panels	Drupal module	
og_panels	Drupal module	
page_manager	Drupal module	

4.3.22 Group blog

User roles access: group members, group manager, site administrator.

In addition to using the forum, a different modality in order to create/manage discussions in the groups is the group blogs. Two possible actions can be provided:

- Group blog access: this action is available for all the user subscribed to the group
- Group blog creation: this action is available only to for the site administrator and the group manager

4.3.22.1 Description and draft user interface

Here after we put some screentshots related to the main group blog actions. Starting from the group home page a lateral tab ('Blog') will be visible. Some actions will be accessible for all the user registered to the group while other action will be available only for the site administer or for the group manager:

- Blog access (Figure 4.3.22.1): each registered user can
  - See the comments of the blog and reply to them
  - Add a new comment
  - Recommend the blog post
- Blog creation (Figure 4.3.22.2 and Figure 4.3.22.3): each group manager and the site administrator can create a new group blog post:

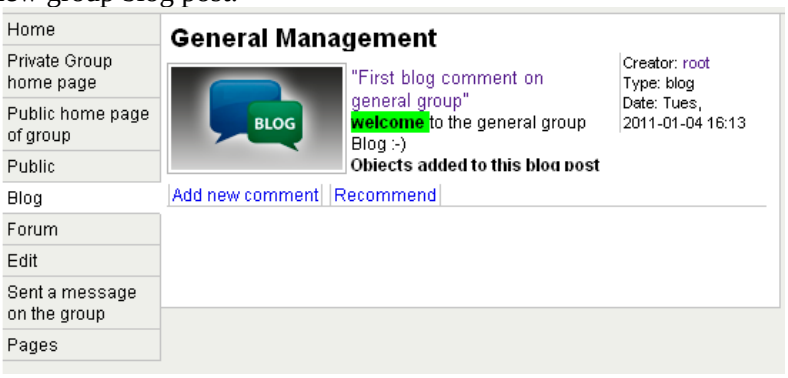


Figure 4.3.22.1

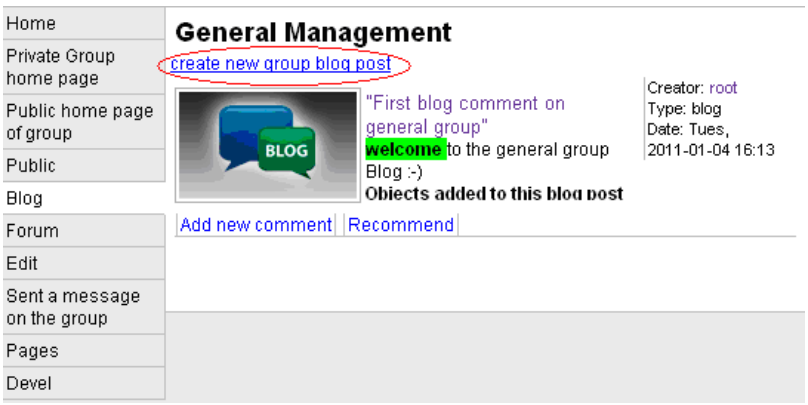


Figure 4.3.22.2

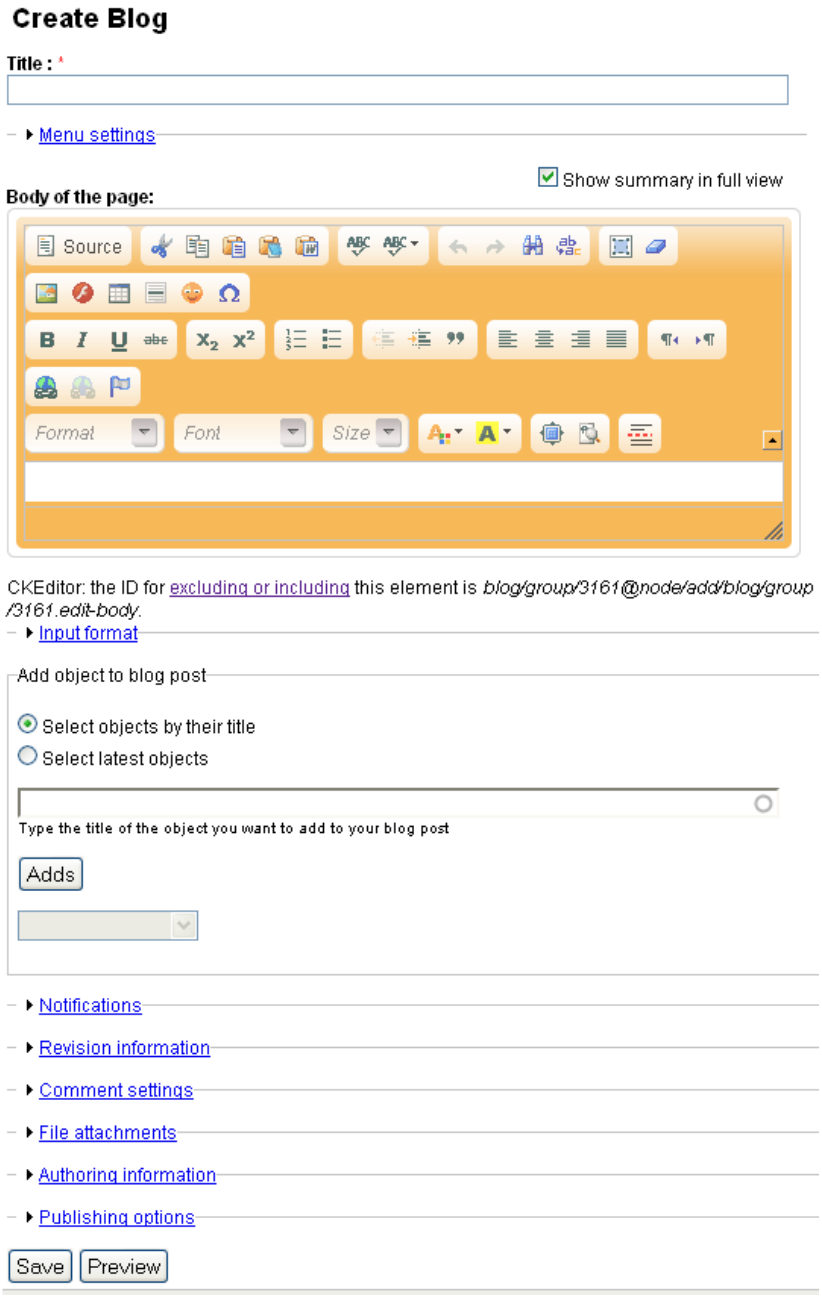


Figure 4.3.22.3

4.3.22.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
og	Drupal module	
eclap_blog	Drupal module	Custom module

4.4 User Monitoring (DSI)

In ECLAP Portal, like what happens in the most diffused Best Practice Networks, each registered user has a personal space in the site and the system provides him/her a lot of services. Some of these services directly involve single users (content download, access to web pages , content searching and consequently query made on the portal, annotations on content, content ranking, etc.): action made by users on the portal.

However in ECLAP Portal a great part of the services provided to users will be oriented to aggregate users, foster communication among users (list of collegues/friends,), exchange opinions (messaging, forums, chat, events, wiki, blog, displaying online users, etc.) and contents (notifications, groups, list of contents visualised from colleagues, etc.), etc.

A monitoring system will be realised to allow the site administrator to register all users actions so providing data and to analyse the Portal services' state. This analysis is fundamental in order to improve the features already available on the site, to create and provide to the users of the Portal new functionalities, that will be based on their preferences, establish a list of the most active users on the Portal, etc .

Three functionalities will be realised and accurately described in the following paragraphs:

- Statistics: to collect data on actions made individually on the Portal by each user (see 4.4.1)
- Social Network Analysis: to collect data on actions involving groups of users based on Social Network Analysis (SNA, see 4.4.2)
- Using monitoring systems models derived from other platforms (e.g. in e-learning activities, see 4.4.3 and the User Manual).

4.4.1 Statistics

User access: site administrator.

The first step to realise a statistical analysis is data collection, the main users' actions on Portal that will be monitored are the following:

- Number of access to
  - Profile Page
  - Posted and/or preferred content
  - Comments
  - Groups
  - etc.
- Activities on content:
  - Number of posted/downloaded content
  - Number of posted comments, on content, on area, on forum, etc.
  - Number of votes per content, per area, etc.
  - Number of accesses to the Portal
  - Etc.
- Platform used to access to the ECLAP Portal
- Content searched into the site
  - Query made to access or download content
  - Etc.
- Geographical position / language
  - Content/user language
  - User country, region, city, etc.
  - IP number
  - Etc.
- Etc.

Most significant statistics will be performed exploiting data collection on users' actions:

- Object Stability: it will measure how many times a content object has been downloaded in a period of time
- Mean number of downloads per day in the stability period
- User Fidelity: it will assess which are the most active users in the ECLAP Portal
- More accurate measures would lead to go into the distribution of users actions over a time period

- Compare users activities in a period of time: as in Figure 4.4.1.1 in which all user's activities are registered and used to establish the Most active users
- Compare the Platforms and the devices used, Figure 4.4.1.2
- Establish the most content type downloaded from the Platform, Figure 4.4.1.3
- Compare (in percentage) the content published and the content that will be downloaded from the site, Figure (d)
- Etc.

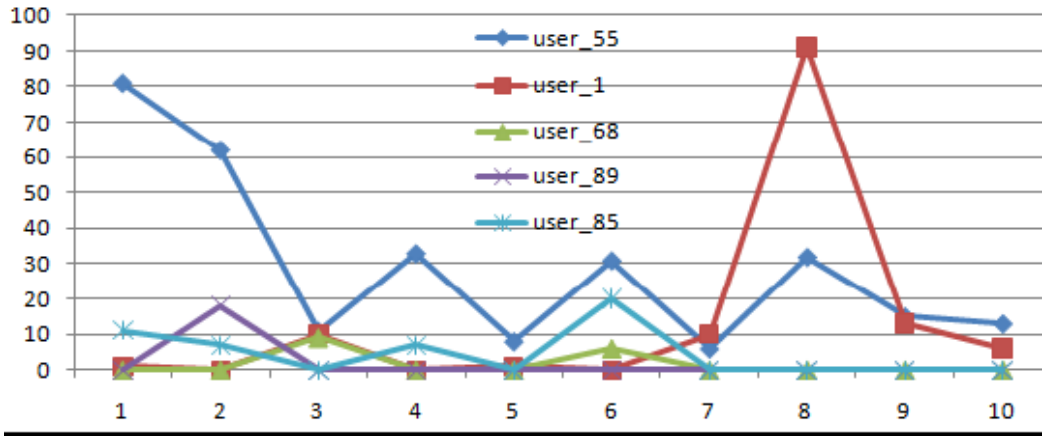


Figure 4.4.1.1

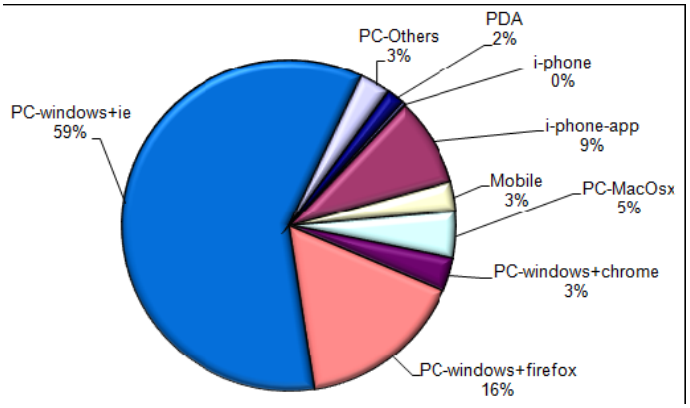


Figure 4.4.1.2

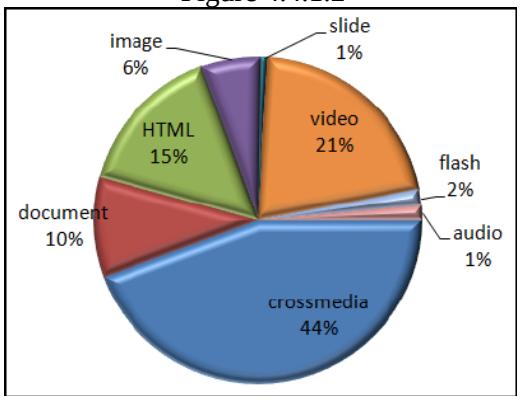


Figure 4.4.1.3

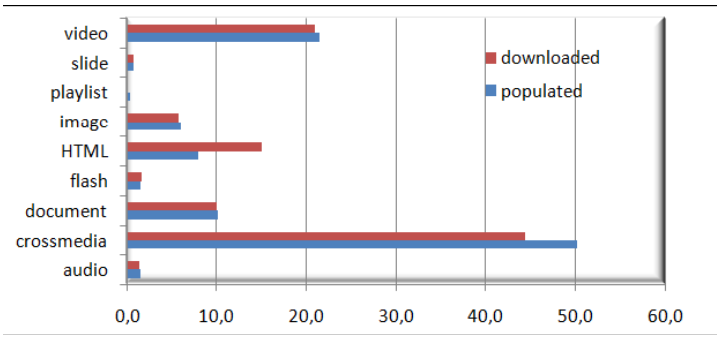


Figure 4.4.1.4

4.4.1.1 Description and draft user interface

When the site administrator wants to collect information related to user actions on ECLAP Portal, he/she has to fill in the form to request the statistic. Obviously, the field contained in the forms will be created basing on data collected, for example:

- User name
- Content/Platform type
- Web page visited (site section)
- Country/region/city
- Date
- Etc.

The two following forms will be accessible as lateral blocks:

- Statistics on Downloads (Figure 4.4.1.1.1)
- Statistics on Queries (Figure 4.4.1.1.13)

If the site manager is interested in **Statistics on Downloads,** he/she has to fill in the appropriate form and click on the "Send request" button. For example in Figure 1, it is possible to 'translate' the request in a human readable way:
"Please show me all statistics on downloaded content from ECLAP Portal from 3 September 2010 to 3 December 2010 and all tables available (Stability, Fidelity, download) - adding user data".
Note that no restrictions based on user names, content types, web pages visited or site section, content language, user contry are present so data related to all content types, etc. will be shown.

Figure 4.4.1.1.1

After this request, a 'Dowload Statistics' page will be automatically elaborated (Figure 4.4.1.1.2) and the site administrator will have the following services:

- Display of the following tables:
  - User fidelity (Figure 4.4.1.1.3)
  - Content stability (Figure 4.4.1.1.4)
  - Content download (Figure 4.4.1.1.5)
- Display of histograms and pie charts basing on:
  - 'Type' (view_pc, http_pc,view_pda, http_pda, etc.), Figure 4.4.1.1.6
  - 'Portal' (e.g PC, mobile, etc.)
  - 'Platform' (e.g. Windows+FF, Windows+ie, Linux, i-phone,MacOsx, etc.), Figure 4.4.1.1.7
  - 'Section': will contains the web pages (in a text format) from which a content will be downloaded (e.g. home page, lastPosted, MostDownloaded, SimilarObjects, mail, taxonomy, playlist, etc.), Figure 4.4.1.1.8
  - 'Locale': content language, Figure 4.4.1.1.9 ,
  - User 'Country','Region','City'

- Content/user unique identification numbers (ids)
- ‘Content stability’ (graphics related to ‘Stability table’), Figure 4.4.1.1.10
- ‘User Fidelity’ (graphics related to ‘Fidelity table’), Figure 4.4.1.1.11
- Date
- Etc.

- Saving of the requested ‘statistics’ on ECLAP Server (Figure 4.4.1.1.12), with the possibility of accessing to the archive when necessary.

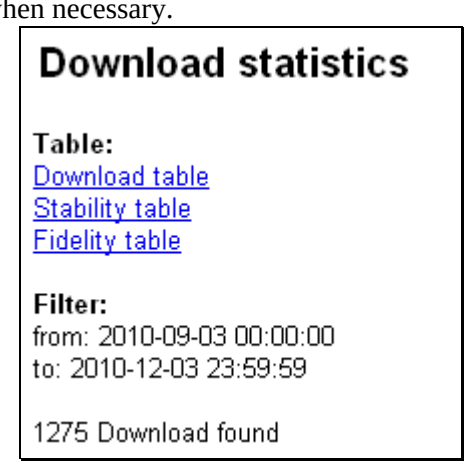


Figure 4.4.1.1.2

Most active users table (User Fidelity Table)

UID	Download	Date of first download	Date of last download	Fidelity	Mean number of download per day
229	14	2010-07-17 18:12:34	2010-12-02 18:25:41	138	0.1014
218	52	2010-07-19 10:14:22	2010-12-03 15:06:25	137	0.3796

Figure 4.4.1.1.3

In the user Fidelity Table (Figure 4.4.1.1.3): data related to the most active users in the selected (Figure 4.4.1.1.1) period of time are present. For or each user (one row per user) are registered and visible the following data:

- User identifier number (and a link to his/her profile)
- number of downloads made by the user
- date of first download
- Fidelity
- Mean of number of download per day

Content Stability Table

Content ID	Download	Date of first download	Date of last download	Stability	Mean number of download per day
urn:axmedis:074-993c-3efddfbfaad7	253	2010-07-26 20:11:34	2010-12-03 13:45:23	130	1.9462
urn:axmedis:53a-b471-a9b42249bafa	78	2010-08-03 13:03:17	2010-12-02 16:23:37	121	0.6446

Figure 4.4.1.1.4

In the Content Stability Table (Figure 4.4.1.1.4): data related to the stability of the downloaded contents in the selected (Figure 4.4.1.1.1) period of time are present. For each content (one row per content) are registered and visible the following data:

- Content identifier number (and a link to the content)
- number of total downloads
- date of first download

- Stability
- Mean of download of download per day

Download table

Id	AXUID	UID	Platform	Ip address	Type	Timestamp	Portal	Section	Locale	Country	Region	City
62136	urn:axmedis:00000:obj:7e659b5d-0c5f-49ad-b656-2427e2e1a7dc	0	windows+firefox	193.0.75.132	VIEW	2010-11-16 17:26:15	PC	taxonomy	pl	Poland	Mazowieckie	Warsaw
62133	urn:axmedis:00000:obj:348ee46d-ef2b-11d3-b135-3dc621bf2d88	0	windows+firefox	193.0.75.132	VIEW	2010-11-16 17:21:28	PC	mostDownloaded	en	Poland	Mazowieckie	Warsaw

Figure 4.4.1.1.5

In the Download Table (Figure 4.4.1.1.5): data related to the most downloaded contents in the selected (Figure 4.4.1.1.1) period of time are present. For each content (one row per content) are registered and visible the following data:

- Content identifier number (and a link to the content)
- Identifier number of the user who has downloaded the content
- Platform used
- IP address
- Download type
- Date (timestamp)
- Portal type
- Section
- Locale
- Country/Region/City

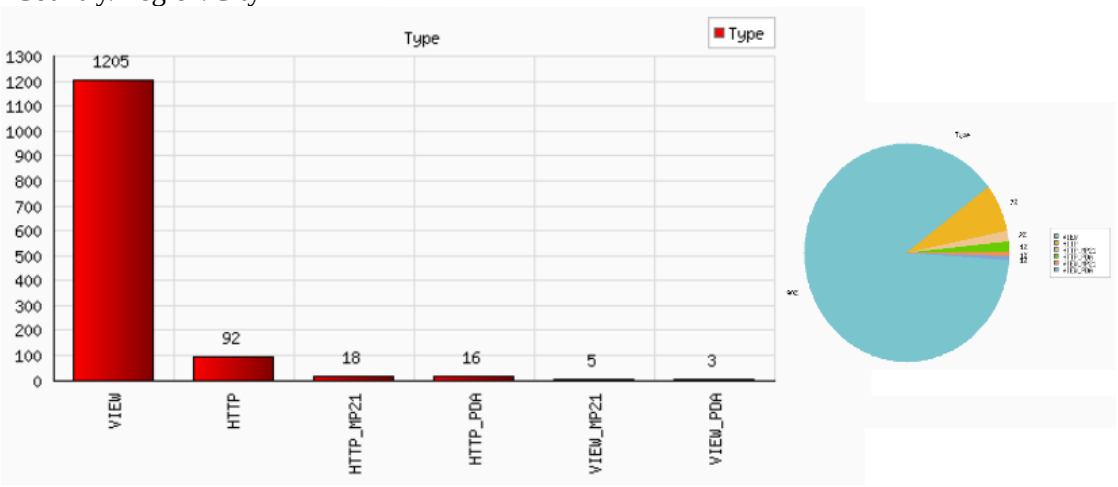


Figure 4.4.1.1.6

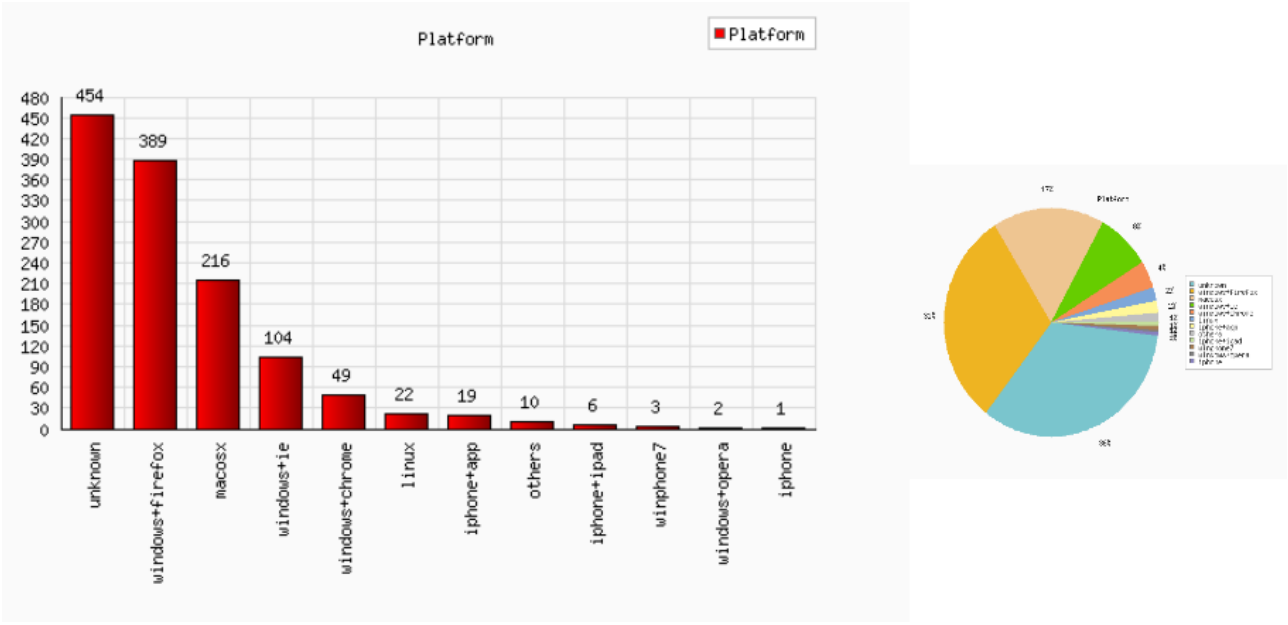


Figure 4.4.1.1.7

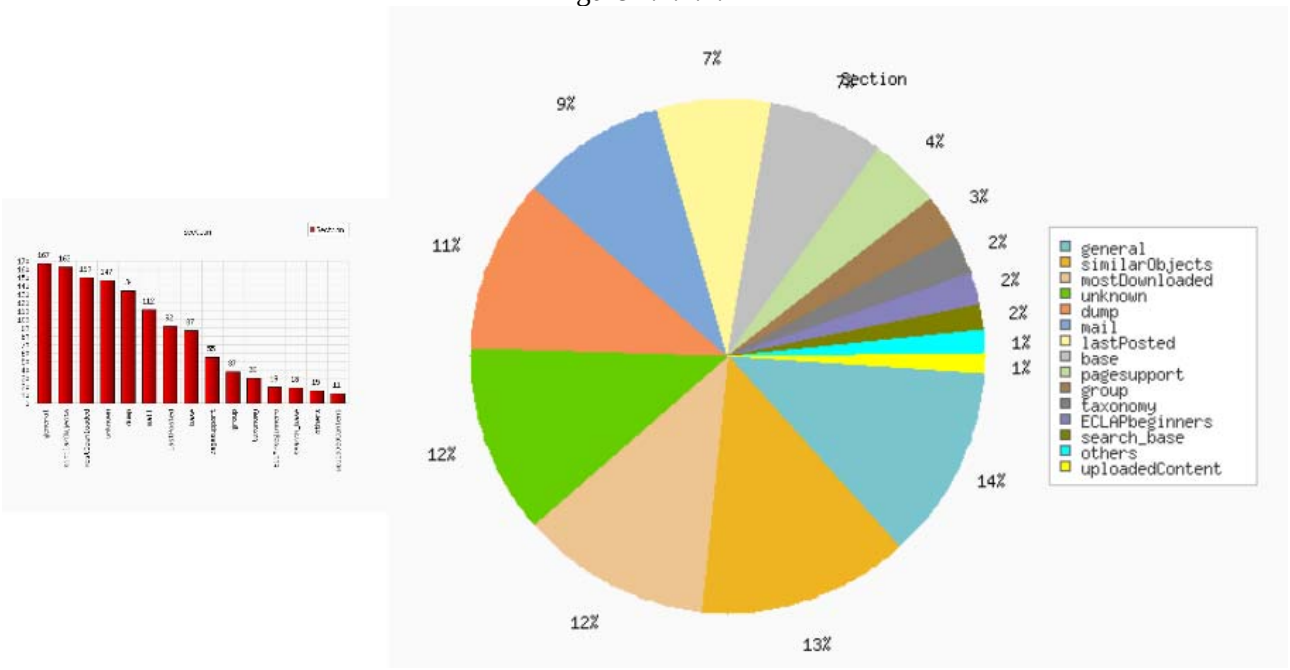


Figure 4.4.1.1.8

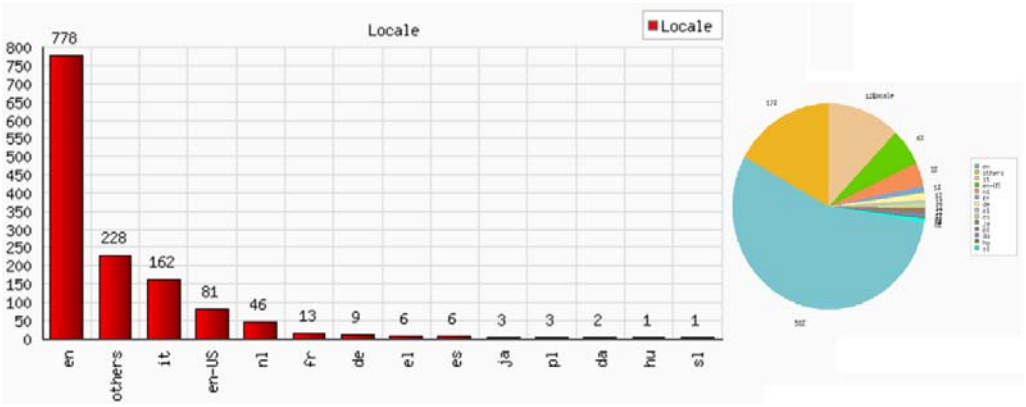


Figure 4.4.1.1.9

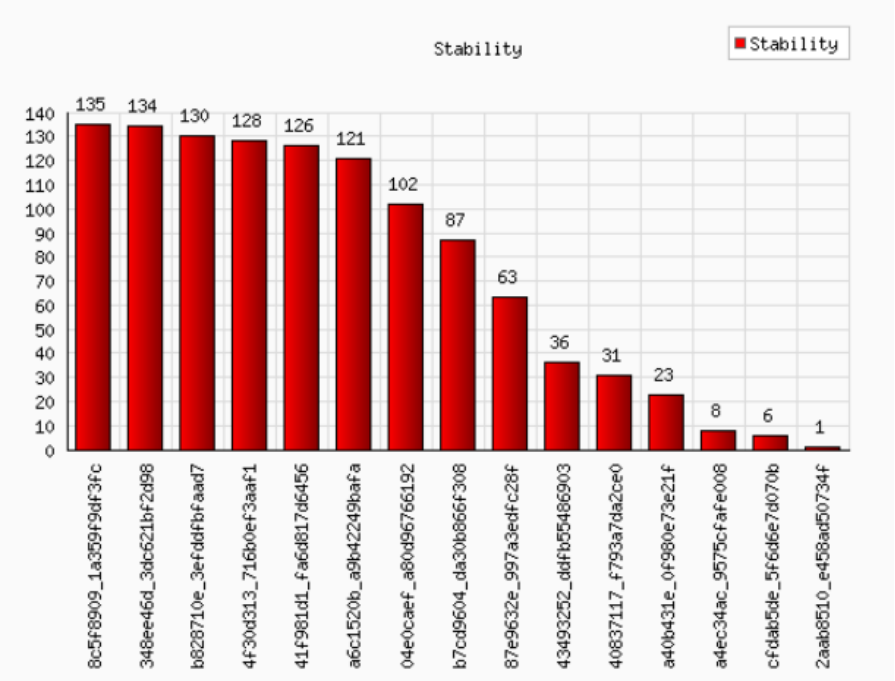


Figure 4.4.1.1.10

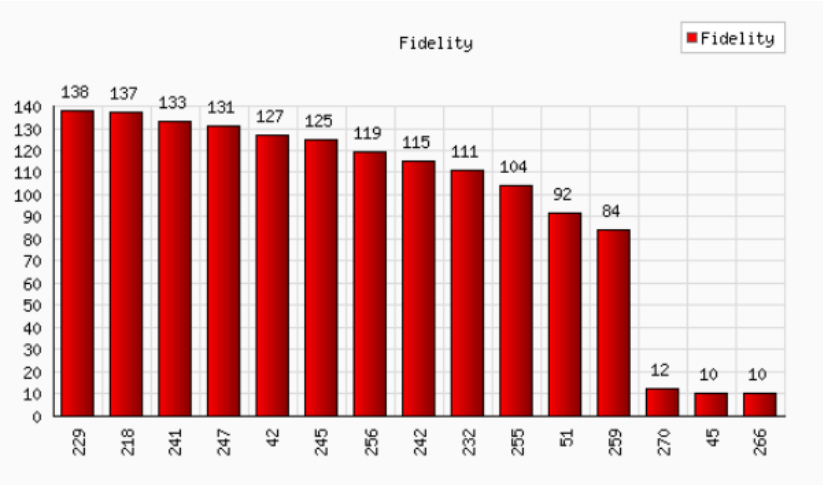


Figure 4.4.1.1.11

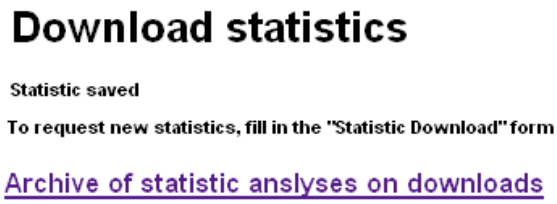


Figure 4.4.1.1.12

If the site manager is interested in **Statistics on Queries,** he/she has to fill in the appropriate form and click on the “Send request” button. For example in Figure 4.4.1.1.13, it is possible to ‘translate’ the request in a human readable way:
“Please show me all statistics on the queries made on ECLAP Portal regarding the content from 3 September 2010 to 3 December 2010 and all tables available (query) - adding user data”.
Note that no restrictions based on user names, content types, web pages visited or site section, content language, user country are present so data related to all content types, etc. will be shown.

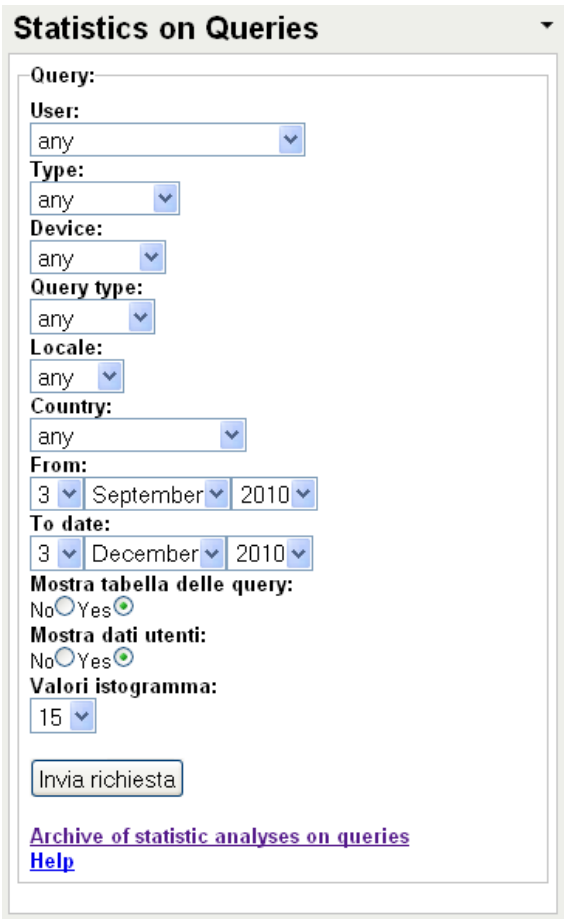


Figure 4.4.1.1.13

After this request, a ‘Query Statistics’ page will be automatically elaborated (Figure 4.4.1.1.14) and the site administrator will have the following services:

- Display of the query table (Figure 4.4.1.1.15)
- Display of histograms and pie charts basing on:
  - Distribution of Content Access per content Type (document, video, image, pdf, slide, excel file, archive, etc.) Figure 4.4.1.1.16
  - ‘Device‘ (PC, pda, etc.)
  - 'Querytype' : a string containing the queries made by users to search content
  - ‘Locale’: content language
  - User ‘Country’,‘Region’,‘City’
  - User identifier (Figure 4.4.1.1.17)
  - ‘Content stability’ (graphics related to ‘Stability table’)
  - Date
  - Etc.
- Saving of the requested ‘statistics’ on ECLAP Server (Figure 4.4.1.1.12), with the possibility of accessing to the archive when necessary.

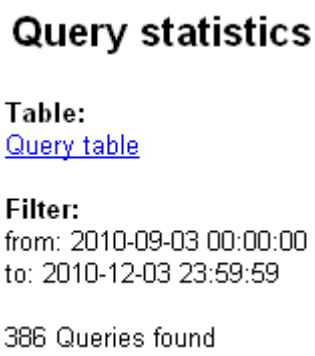


Figure 4.4.1.1.14

Query table

Id	Uid	Querytype	Ip	Type	Timestamp	Device	Locale	Country	Region	City	Query
5349	0	simple	86.30.224.63	any type	2010-09-04 10:49:25	any device	en	United Kingdom	Glasgow City	Glasgow	eclap
5350	1	simple	87.18.128.196	any type	2010-09-04 18:59:49	any device	en	Italy	Toscana	San Miniato	action
5352	1	simple	87.18.128.196	any type	2010-09-04 19:16:42	any device	en	Italy	Toscana	San Miniato	help

Figure 4.4.1.1.15

In the Query Table (Figure 4.4.1.1.15): data related to the most downloaded contents in the selected (Figure 4.4.1.1.1) period of time will be present. For each content (one row per content) are registered and visible the following data:

- Identifier number of the user who has made the query on content
- Query type (method used for searching: simple or textual, metadata, video ,image, etc.)
- IP address
- Platform/Device used
- Date (timestamp)
- Locale
- Country/Region/City
- Query made (a string)

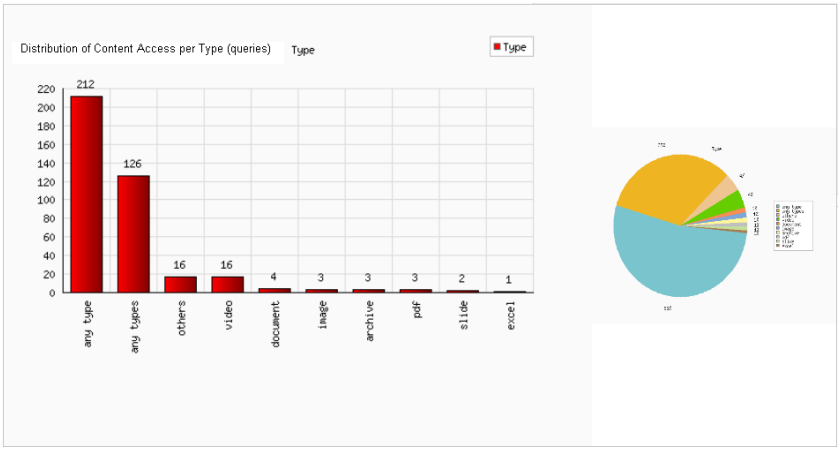


Figure 4.4.1.1.16

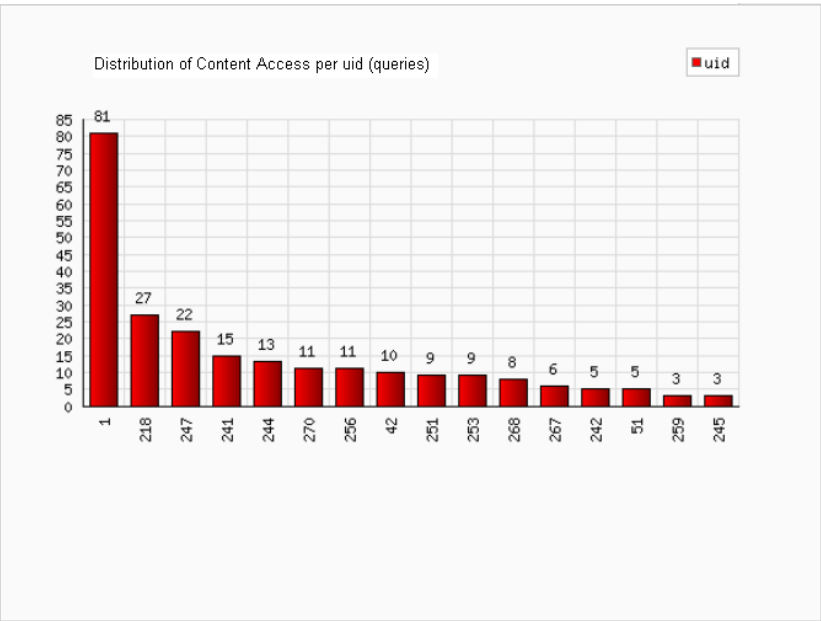


Figure 4.4.1.1.17

4.4.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
axmedis	Drupal module	
datatstat	Drupal module	custom module

Third-party software	Version	Notes
Dynamic Drive DHTML code library (http://www.dynamicdrive.com): Expando image script (expando.js) (http://www.dynamicdrive.com/dynamicindex4/expandoimage.htm)		

- o

4.4.2 Social network Analysis

User access: site administrator.

Once having registered data related to all Portal activities (some of them described in 4.4.1), content, users, etc. we can proceed with the monitoring activity basing on Social Network Analysis (SNA). This phase is particularly relevant in order to make provisions for the best services that could be provided to users, to establish what users are more relevant (referring to graph theory), discover how to improve the aggregation activities, to create and provide to the users of the Portal new functionalities, that will be based on their preferences, etc.

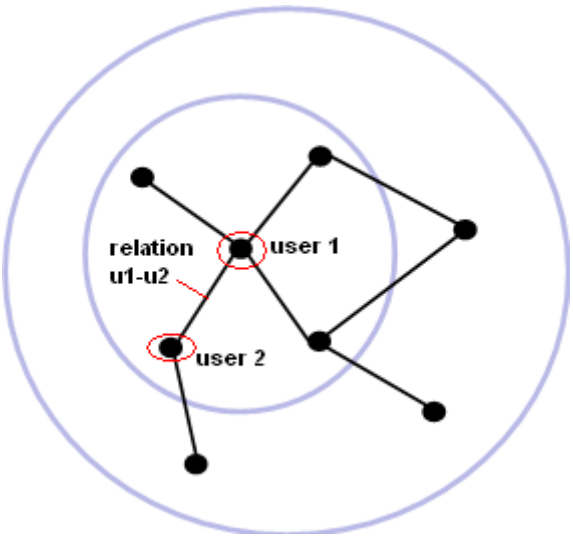


Figure 4.4.2.1

The SNA is mainly focused on evaluating the status of the network of relationships that may give an idea of the evolution of the SN and of the healthy aspects. In order to do this models and metrics to establish the following features will be elaborated:

- connections among users basing on graph theory (the users the node on the graph and the relations among them are the edges, Figure 4.4.2.1):
  - Number of direct connections among users,
  - Distances (number of nodes-users) among users, groups, cliques, etc.
  - Which are the most important users
  - Which are the critical conditions
  - Which are the major drivers of growing
  - Which are the most interested aspects in a given period
  - Which are the most active people
  - Etc.
- Determine user preferences basing on their activities:
  - downloaded content
  - query made to search content
  - Annotations on content
  - Etc.

We predict the metrics that will be used are:

- User Eccentricity: is defined as the max distance of a certain node with respect to all other nodes of the network
- User Beetweennes: Gives info about the control degree of a node (user) about the information flowing among other nodes (users).
- Number of connections: number of friend for each user (direct connections)
- Etc.

4.4.2.1 Description and draft user interface

When the site administrator wants to see the results obtained through Social Network Analysis on the Portal, he/she can select (probably from a lateral block, Figure 4.4.2.1.1) one of the following choices:

- Analysis of user Eccentricity
- Analysis of user Betweenness
- Analysis of user' Connections

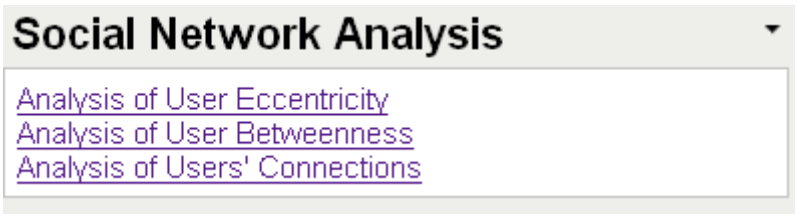


Figure 4.4.2.1.1

For example if the site administrator will select the Betweenness link,he/she will access to a user graph view (Figure 4.4.2.1.2), in which for each node representing a user will be visible: User name, e-mail, link to ECLAP Usen Profile, calculus of betweenness, friends, cliques, etc.

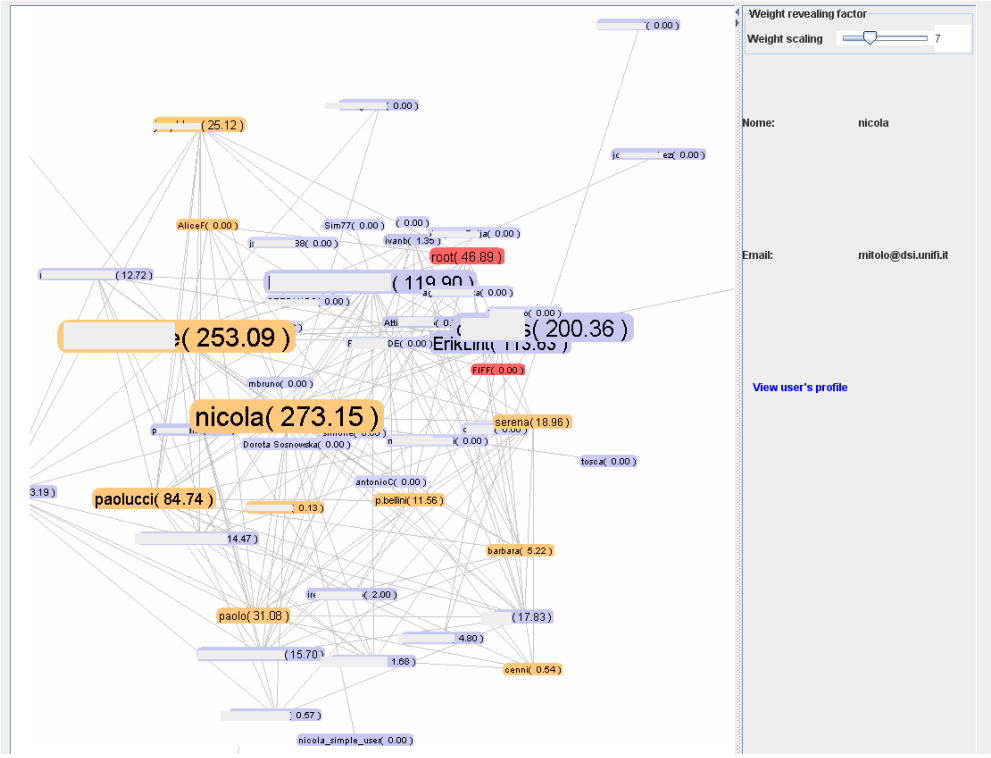


Figure 4.4.2.1.2

4.4.2.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
graphstats	Drupal module	custom module

Third-party software	Version	Notes
Prefuse visualization toolkit	2007.10.20	Java library to visualize graph stats
Java2D graphics library		
MySQL connector API	3.1.12	Java API to connect to MySQL

4.4.2.3 Data model description

The Graphstats module should integrate Prefuse in Drupal, to allow displaying of data. Prefuse is an extensible software framework for helping software developers create interactive information visualization applications using the Java programming language. The administrator should refresh the data displayed by

the module by running a batch file that create a set of xml schemas containing user through a Java application. These xml files should be loaded by the Prefuse Applet.
The Java application should make some queries in the database to retrieve the user data (betweenness, number of connections, eccentricity) for each user and write the output in xml.

4.4.2.4 Communication protocol description

JDBC Java API should be used to query a MySQL database.

4.4.3 e-learning activities

User access: site administrator, teachers (moodle side).

In order to monitor information related to the e-learning activities, the exploitation of the potentialities of Moodle will be useful. This also because Moodle will be the LCMS used to create and organise the courses and all the learning activities.

4.4.3.1 Description and draft user interface

The following description is referred to the Moodle side.

The teacher can visualize a page reporting an overall view of the grades obtained by each student during the assessment activity. The page can be view by selecting the *Grades* link in the **Administrator** block on the left column. The following actions will be monitored:

- Student list for each course with a numeric evaluation referred to each questionnaire and a total evaluation referred to the whole course;
- medium evaluation of activities performed by all enrolled students;
- student activities evaluation on: questionnaires, forums, assignments, etc.(Figure 4.4.3.1.1) and values can be expressed in numeric form, as text in the form of words or phrases, or in a scale or rating system
- etc.

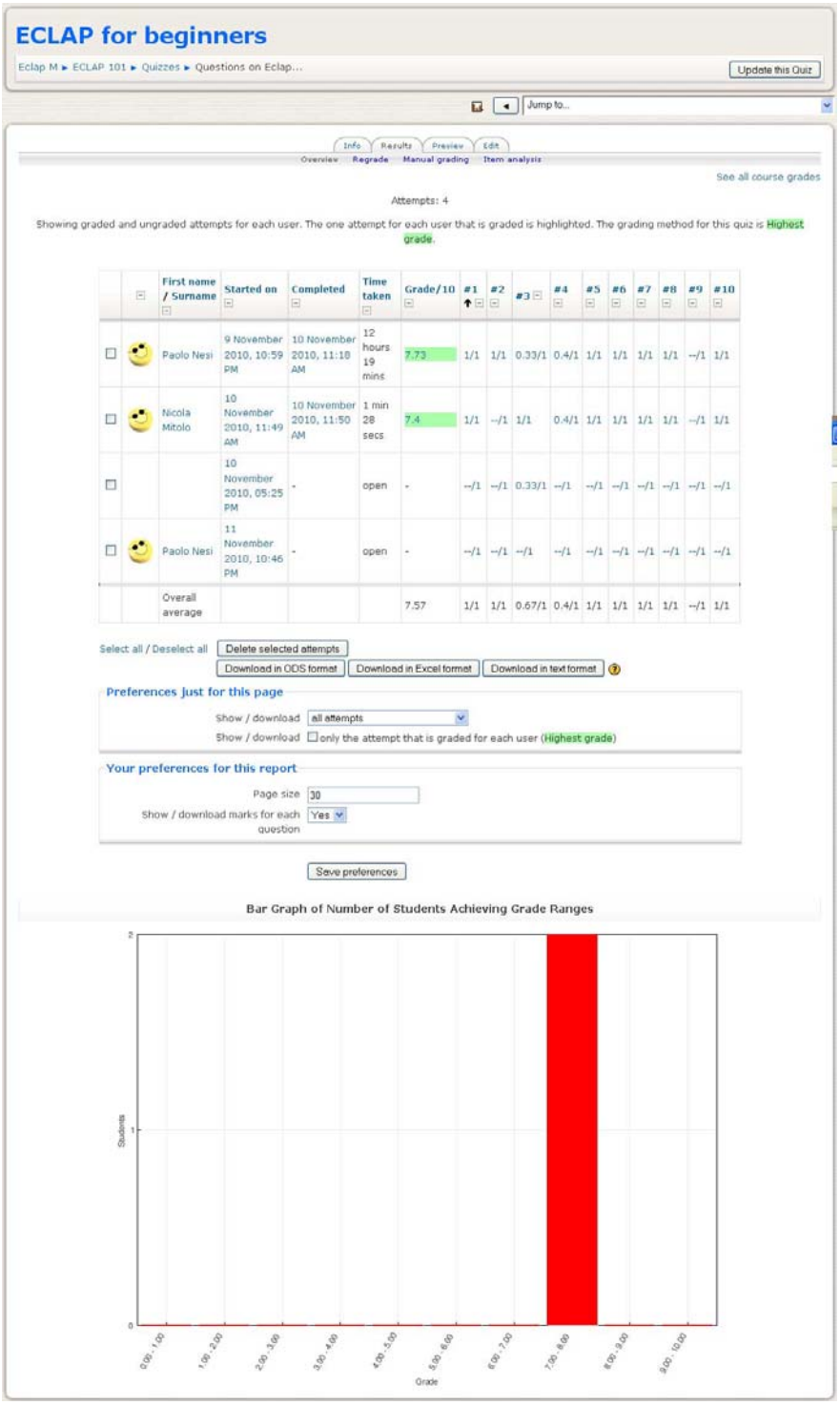


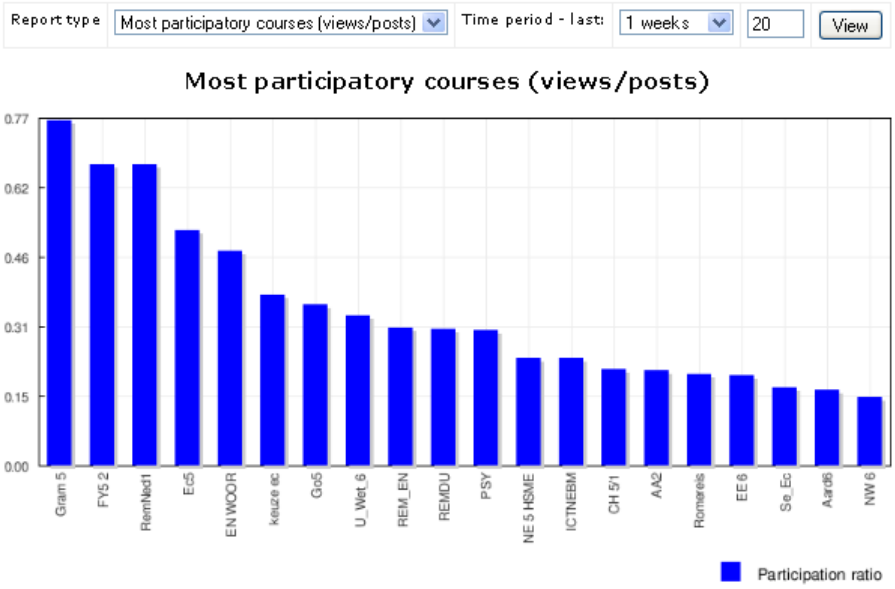
Figure 4.4.3.1.1

It will also be possible to manage data on the activities carried out by students and teachers on Moodle side by consulting all log: the page related to reports management is accessible by selecting the link *Reports* in the Administration block in the left column. The reports page allows teachers and administrator to recover information about all activities performed by users into a course. Particularly relevant are the following aspects:

- *Course logs:* show activity within the course
- *Live logs from the past hour*, it shows all the activity in the last hour
- *Activity report*, it shows all activity in the course, sorted by topic

- *Participation report*, provides any easy way to monitor students' participation
- *Statistics*, (if enabled) Moodle gathers statistics about each course and for the whole site, and produce graphs displaying them
- Etc.

The following image is related to course overview reports and show information like the most active courses or the most participatory courses over a certain time period. Results are displayed in a bar chart and in a table.



For a more detailed description, it is possible to see the User Manual or Detailed information on Grades are available in official Moodle documentation: http://docs.moodle.org/en/Grades .

4.4.3.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
moodle	Drupal module	

Third-party software	**Version**	**Notes**
Moodle	1.9.x	

4.5 Exploiting User behaviour (DSI)

The portal should store information about user behaviour and process it in order to create new information about objects and users of the portal. For example data about which objects the user watches or about which other users he marks as his colleagues should be used to obtain:

- Recommendations: the portal should generate some recommendations of similar users (U→U), content that the user may like (U→C), content similar to other content (C→C)
- Dynamic profiling: the user profile should contain some categories which vary with user activity on site and which describe the user in the contest of the content distribution community.

Moreover analysing the terms used in portal queries a Query keyword cloud can be generated to provide some general information on the behaviours of users using the portal.

4.5.1 Dynamic Profile

The activity of the user on site is used to create some information about him, other than the information that can be added through the profile modification pages. For example, when an user views an object some information about the object being viewed are stored in the database. This information is used to calculate some similarities between users and between user and content.
The dynamic profile information categories are:

- Friends: The friends added by a user are considered part of his profile and are used to compute distances with other users
- Favourites: objects added as favourite are used to compute distances with other users
- Dynamic preferred taxonomy categories: a list of preferred taxonomy categories is computed based on the types of objects being viewed by the user.

4.5.1.1 Description and draft user interface

When an user views an object the drupal hook_nodeapi is fired. In particular the hook implementation med_info_nodeapi of the module med_info is called. This function stores on the database for each taxonomy category the percentage of times the user has viewed an object of that category among all objects viewed.
It stores the same percentages also for formats and devices types.

The module that handle user favorites is the favorites module. Usng the drupal hook hook_links it adds a link "Add to favorites" to every object that isn't in user favorites, and adds a "remove from favorites" for the objects that are in user favourites. When the user clicks on the link an Ajax call to the URL http://bpnet.eclap.eu/drupal/?q=favorite/toggle . On the server side this is handled by the PHP function favorites_toggle_favorites of the favorites module. It changes the status of the object for the user (favourite/non-favourite). Returns 1 if the object has been added to user foriter, 0 if it has been removed.

The user can see his list of Favorites clicking on the corresponding tab in the homepage.

4.5.1.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
med_info	drupal module	
axfriends	drupal module	
favorites	drupal module	

4.5.1.3 Data model description

The database tables used to store this information are:

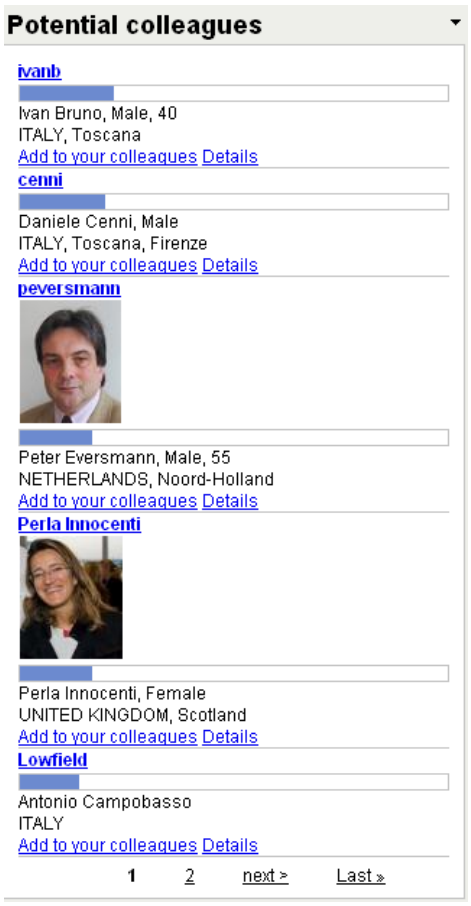
- *Med_info_activity*: stores information about formats, device types and taxonomy categories of objects viewed by the user
- *User_favorites:*stores information about object chosen as favorites by users.

4.5.2 User →User Recommendations

The portal should present each registered user a list of "similar users". The similarity between two users is based on profile information - age, nationality, spoken languages, chosen taxonomy category – and on information retrieved from user activity on site – favourite objects, chosen colleagues, seen objects.

4.5.2.1 Description and draft user interface

The U→U recommendations are handled by the potentialFriends drupal module and by two AXCP rules: checkNeighbourly and CalculateAllNeighbourly. The drupal module generates the interface shown to the user while the AXCP rules are responsible of calculating the distances between users.
Th generated list is shown by the potentialFriends module as a subpage in the user profile and as a block in the home page, as shown in the picture.



The blue bar indicates the level of similarity between the users. The list is generated by the PHP function potentialFriends_show_list in the potentialFriends module. It retrieves the list of users from the database.
Clicking on the "Details" link issues an Ajax call to the URL http://bpnet.eclap.eu/drupal/?q=potentialFriends_details/_ID1_/_ID2 , where _ID1_ indicates the numeric ID of the user viewing the page and _ID2_ is the ID of the user being viewed. The Ajax call is fired by PotentialFriends.showDetails in potentialFriends.js. On the server side the PHP function that handles the request is potentialFriends_print_details. It retrieves from the database information about user

The AXCP rule checkNeighbourly is activacted periodically by the scheduler every 24 hours. It selects the users which potential friends list is too old. It divides the selected list of users in fragments of 10 users and calls calculateAllNeighbourly for each fragment.
calculateAllNeighbourly is responsible of calculating the distances for each of the 10 users it receives. The calculateAllNeighbourly retrieves information about the user from the database to calculate the distances. It reads also some csv files where relationships between some information found in user categories are stored. For example the formats.csv maintains the similarity values between each possible object format, the languages.csv maintains the similarity between any couple of possible languages, and so on.

4.5.2.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
checkNeighbourly	AXCP rule	
calculateAllNeighbourly	AXCP rule	
potentialFriends	drupal module	

4.5.2.3 Data model description

The database table used fr this functionality are:

- *potential_friends:* to store distances information:
- *potential_friends_timestamp*: to store the timestamp of the last potential friends calculation.

4.5.2.4 Configuration options

logFilePath	checkNeighbourly internal parameter	says where the log file s located
parameterFile	checkNeighbourly internal parameter	says where is located the XML file which contains the parameters for the calculateAllNeighbourly
logFilePath	calculateAllNeighbourly	says where is located the log file
csvPath	calculateAllNeighbourly internal parameter	says where are located the csv files

4.5.3 Content → Content Recommendations

The portal should show a list of "similar content" for each object. The list should be based on the objects information, that is format, assigned taxonomy category, tile, description, subject, and so on.

4.5.3.1 Description and draft user interface

This functionality is provided by two AXCP rules – DivideAndCallClusteringRules, AddResourceToClosestCluster and ClusterObjects – which are responsible of the distances calculation, and by a Drupal module – related_objects module – which is responsible of generating the user interface.
A third AXCP rule, ClusteringCleaner is used to reset the clustering database.

To generate content to content recommendations, objects are divided in clusters, and objects belonging to the same cluster of the object viewed by the user are suggested.
Due to the great amount of data the clustering is done hierarchically. At first the objects are divided in "chunks", groups sufficiently small of objects. Then every chunk is clustered and into every cluster a centroid is selected. A centroid is an object which as the minimum mean distance from all the other objects in the cluster. To the next level centroids are considered objects, so they are divided in chunk, each chunk is clustered and in each cluster a centroid is selected. This process is repeated recursively until there is exactly one chunk left at the last level. The last chunk is clustered and the clusters generated are those considered for the objects. An object belongs to a cluster if there exists path composed by centroids in the tree generated by the process from the leaf (the object) to the cluster created in the last level.

The DivideAndCallClustering rule is periodic: every time it starts it checks the clustering status. The ClusterObjects rule is called by DivideAndCallClusteringRule. It receives a "chunk" of elements and it divides them in clusters of similar objects. In particular the DivideAndCallClusteringRule:

- Checks if there are errors in ClusterObjects rules called previously. If there are it calls the corresponding rules again.
- Counts how many not clustered objects there are and calls some ClusterObjects rules to assign them to clusters. The objects left to be clustered are divided in chunks. It calls as many ClusterObjects rules as the number of chunks left, limited by a maximum of 10 rules that can be executed together.
- Eventually, if there are no more objects, it checks if there are other levels. If there are it raises the level of operation.

The ClusterObjects rule:

- Selects the objects to be clustered
- Generates the data file for clustering
- Calls the AxmedisClustererDef.jar file. It uses the rhird party software Rapidminer to generate the clusters based on a custom distance.

- Writes on the database the results and his status.

The AddResourceToClosestCluster rule is called whenever an object is added to the portal or by the DivideAndCallClustering rule if the clustering pyramid is complete but there are some object at level zero not assigned to clusters and not sufficient to create another chunk. This rule calls AddResourceToClosestCluster.jar which assigns the object to the cluster with the more similar centroid. These objects are "marked" so that when they reach the number necessary to form a chunk, the DicideAndCallClusterin rule can assign them to a chunk and call the corresponding ClusterObjects rule. The pyramid is then refreshed starting from level 1.

The related_objects drupal module shows the list of objects belonging to the same cluster of the one viewed by the user. In particular, when viewing an object the function RelatedObjects.createRecoomendedTab in related_objects.js is called. This issues an Ajax call to http://bpnet.eclap.eu/drupal/?q=ajax/recommended. The HTTP request is handled on the server side by the PHP function related_objects_recommended_content, which loads the list of objects from the database and returns the rendered HTML list.

4.5.3.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
related_objects	drupal module	
DivideAndCallClusteringRule	AXCP rule	
ClusterObjects	AXCP rule	
AddResourceToClosestCluster.jar		
AxmedisClustererDef.jar	Java Executable	

Third-party software	**Version**	**Notes**
RapidMiner	4.6	

4.5.3.3 Data model description

The *clustering* database is used to store information about object clustering.
It is composed of the following tables:

- *Chunkstate*: is used to store information about chunks and the corresponding ClusterObjects rules called, shuch as start time and end time, number of objects in this chunk, level, and so on
- *Clusterinfo*: is used to store info about clusters, such as chunk of belonging, level of belonging, centroid
- *Clusterrelationship*: is used to store information about relationship between clusters through levels. Inparticular the field *cluster_a* contains the name of a cluster at level i, then the field cluster_b contains the name of the cluster at level i+1 to which was assigned the centroid of *cluster_a*.
- *Objectchunkassignment*: stores information about chunk assignment, that is for each object the chunk of belonging if the object has been assigned. Objects in this table may be real objects or centroid in levels superior than 0.
- *Objectclusterassignment*: there is one row for each object (just real objects) and each object the level zero cluster and the current level cluster in the computation process are memorized. When the computation of the hierarchical clustering is ended the *currentLevelCluster* fied contains the cluster of assignment of the object.
- *Statenfo*: stores information about clustering levels as the numer of chunks and so on.

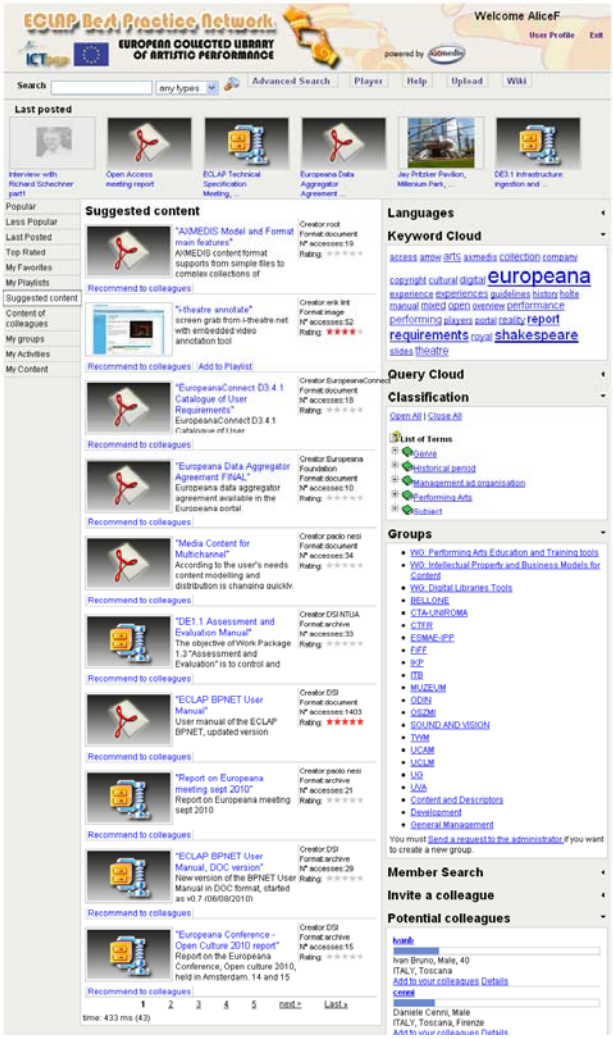
4.5.3.4 Configuration options

Name	**Context (drupal, DB,…)**	**Notes**
inputFileDir	DivideAndCallClustering rule internal parameter	says were files containing object info should be located
outputFileDir	DivideAndCallClustering	says were log files for the

	rule internal parameter	ClusterObjects rules should be located
parameterFile	DivideAndCallClustering rule internal parameter	says were is located the parameter file necessary to call the ClusterObjects rule
logFile	DivideAndCallClustering rule internal parameter	says were should be located the log file
rulesLimit	DivideAndCallClustering rule internal parameter	number of clusterObjects rules that can be executed together
numClusters	DivideAndCallClustering rule internal parameter	Number of clusters at each level and at the end of the process
meanClusterDim	DivideAndCallClustering rule internal parameter	the mean cluster dimension. It's used to determinate the chunksize
rulesTimeout	DivideAndCallClustering rule internal parameter	time after which the ClusterObjects rules that have been called but hanven't completed the excution are considered in an error state and must be restarted.
jarFile	ClusterObjects internal parameter	states where is located the AxmediClusterer.jar file
processFile	ClusterObjects internal parameter	path of the process file needed by Rapidminer to cluster the objects. The process file specifies some parametrs like the algorithm used
taxonomyFile	ClusterObjects internal parameter	file path of the taxonomy.csv file, containing the similarities between each taxonomy term
rapidMinerHome	ClusterObjects internal parameter	path of the local Rapidminer install

4.5.4 Content → User Recommendations

Content to Users recommendations should be generated using profile information, such as chosen taxonomy categories, and from dynamic profile information, as preferred taxonomy categories based on history view. The list of "suggested content" as a tab in the homepage, as shown in the picture below.



4.5.4.1 Description and draft user interface

To suggest content to the user a comparison between some profile information and the centroids of the clusters created for the Content → Content recommendations. This comparison is based on the taxonomy categories of the content and on the chosen taxonomy categories of the user and on the computed taxonomy categories based on the user history view.
This functionality is provided by two AXCP rules – checkUserRecommendations and UserRecommendations – which are responsible of the back-end distances calculation, and by a drupal `module – user_recommendations - which is responsible of generating the user interface.

The checkUserRecommendations rule is periodic and calls the UserRecoomendations rule, passing it a listof 10 users. The UserRecommendation calculates, for each user, the distance whit each centroid of the computed clusters. The cluster with the centroid more “similar” to the user is chosen to recommend objects to the user.

The “suggested content” list in the home page is generated by the user_recommendation_recommended_content PHP function in user_recommendation module. This function selects randomly objects from the cluster closer to the user and returns the rendered HTML list.

4.5.4.2 Dependencies

Internal component	**Type (drupal module, AXCP rule,**	**Notes**

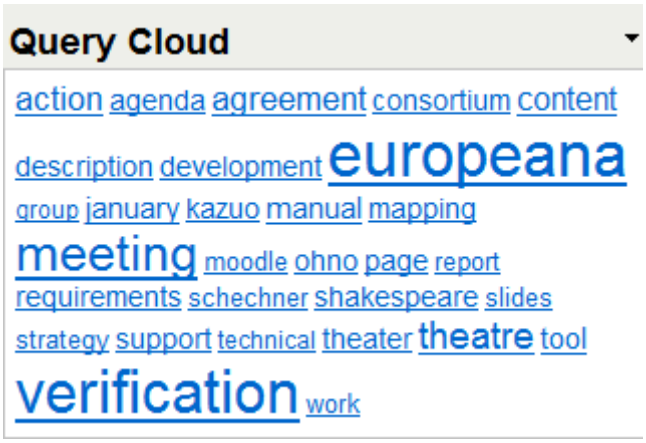
	Java Servlet, Other)	
checkUserRecommendation	AXCP rule	
UserRecommendation	AXCP rule	
user_recommendations	drupal module	

4.5.4.3 Data model description

On the database information about this functionality are stored in the *user_recommendations* table of the drupal database. This table stores relationships between users and clusters of objects.

4.5.5 Query Cloud

A Query Cloud block should be present on the left side of the portal, containing the queries performed most often. A java command line application should be implemented, for querying the database and collecting the queries list. This list should be written to a text file, and then read by a Drupal module that implements the Query Cloud block. Each query should be presented with a different font size (high size means a very popular query). A blacklist text file should be read by the Query Cloud Drupal module, to allow stopwords and bad words removal. The query cloud generation should be scheduled through a javascript rule execution that runs the java service.



4.5.5.1 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
Query cloud module	Drupal module	Custom drupal module that reads the query list text file and renders the Query Cloud Drupal block on the portal
Query Cloud Generator	Java command line application	A query list java generator, runned from command line or javascript rule, that generates the list of most performed queries

5 ECLAP Semantic Model (DSI)

This section describes the general metadata model used in the portal.
In the abstract metadata model as shown in the figure 5.1.1 we have *Content* representing all the type of content that can be managed on the ECLAP portal, it is specialized in a *WebPage*, a *Forum* and an *Object*, each *Content* has associated a set of *Comments* and a set of *TaxonomyTerms.* Each *Group* is associated with

a set of *Content* (can be *WebPages*, *Forum* or *Objects*) moreover each Group is associated to a set of *TaxonomyTerms*. An *Object* is further specialized in a *Collection* and a *CollectableObject* and a Collection is associated with a set of *CollectableObjects.* An *Object* is associated with a set of *Metadata* elements that can be *DublinCoreMetadata*, *TechnicalMetadata* or *PerformingArtsMetadata.* A *CollectableObject* is specialized in an *AVObject* (Audio Visual Object) , a *Document*, a *Playlist*, an *Animation*, an *Archive*, a *Tool.* A *Playlist* is associated to a set of *AVObjects.* The *AVObjects* are specialized in *Image*, *Video* and *Audio.* A set of *Annotations* can be associated to an *AVObject* while an *Annotation* can be associated to one or two *AVObjects.* In this way an *Annotation* may annotate an *AVObject* with another *AVObject*.

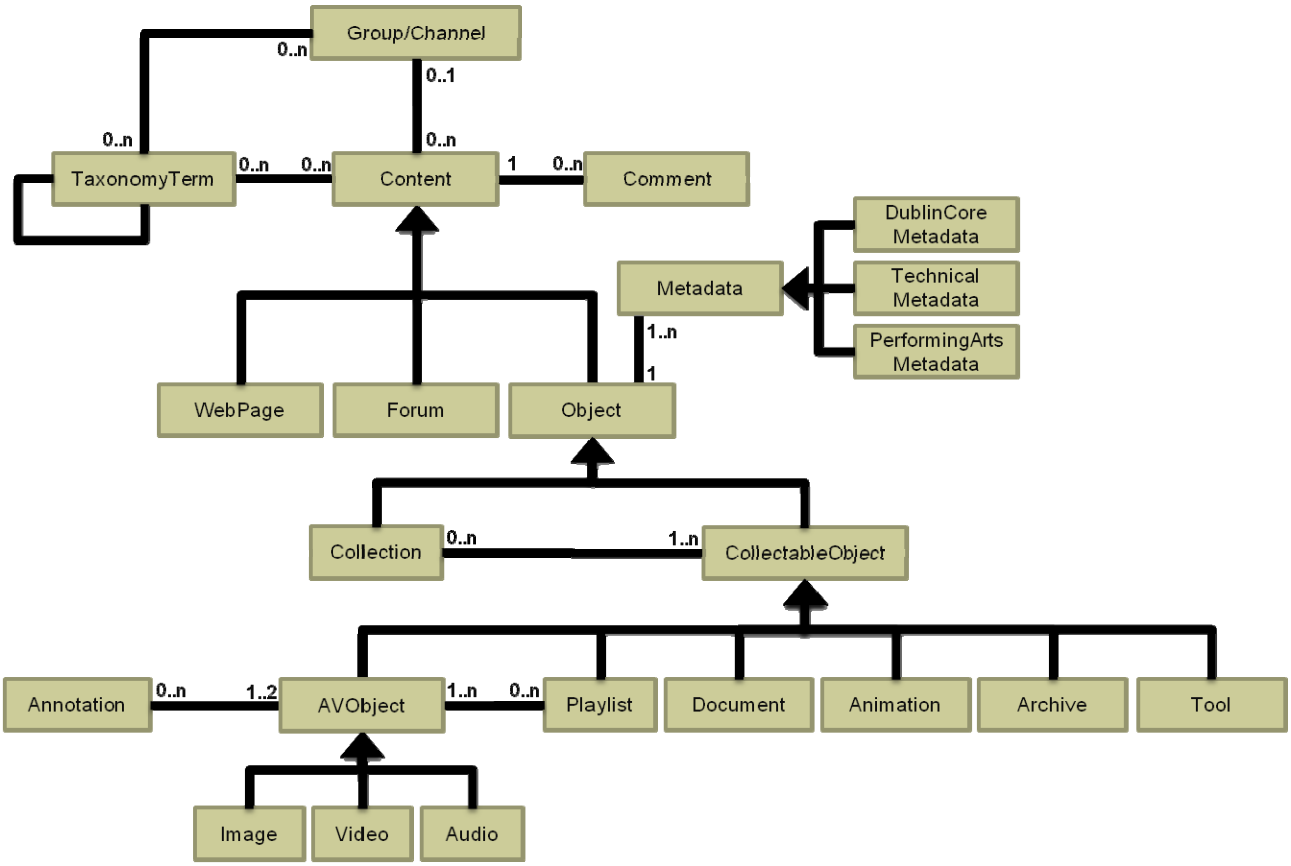


Figure 5.1.1

Regarding the connection with users see Figure 5.1.2, we have *RegisteredUsers* that are registered to a set of *Group/Channel* and one or more of them can be manager of a *Group*, they provide a set of *Content* and are associated with a set of preferred *TaxonomyTerms*. A *RegisteredUser* can be the colleague of another *RegisteredUser*. Each *RegisterdUser* can perform some *Action* that may modify a *Content* in some way. The Actions can be specialized in *ToRate*, *ToComment*, *ToTag*, *ToSocialShare*, *ToRecommend*, *ToValidate*, *ToPublish*, *ToView*…

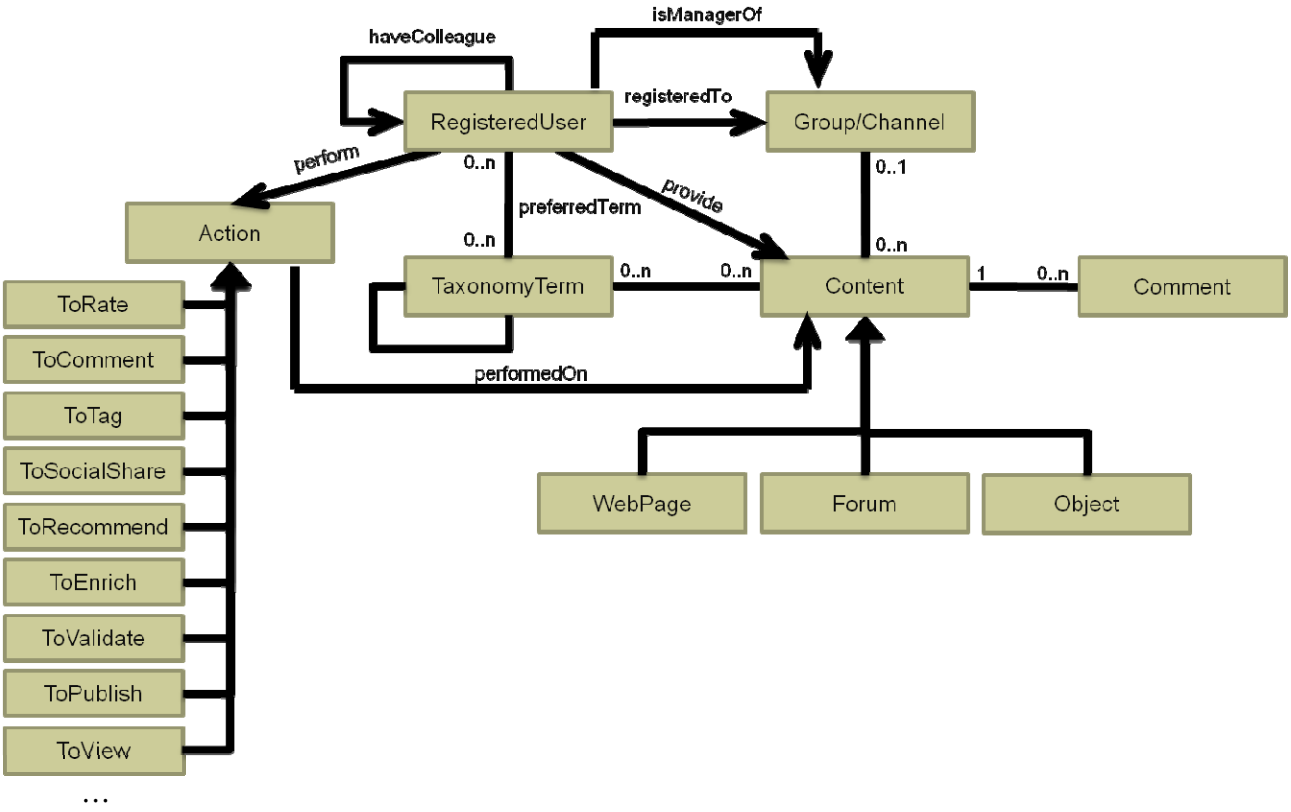


Figure 5.1.2

5.1 Dublin Core Metadata

Each *Object* is associated with many Dublin Core metadata fields, each fields can be repeated many times and can be written in different languages, the fields supported will be:

1. Title
2. Subject
3. Coverage
4. Creator
5. Contributor
6. Publisher
7. Format
8. Type
9. Date
10. Language
11. Identifier
12. Source
13. Rights
14. Description
15. Relation

And from the dcterms namespace will be:

1. Alternative
2. Conforms To
3. Created
4. Extent
5. Has Format
6. Has Part

7. Has Version
8. Is Format Of
9. Is Part Of
10. Is Referenced By
11. Is Replaced By
12. Is Required By
13. Issued
14. Is Version Of
15. Medium
16. Provenance
17. References
18. Replaces
19. Requires
20. Spatial
21. Table of Contents
22. Temporal

Of all these fields only the title is mandatory.

5.2 Technical Metadata

Each Object is also associated with some Technical metadata fields, some of them are derived automatically from the digital object or from other contextual information.

Field name	Cardinality	Derived	Description
ECLAPFormat	1	Y	derived from the content file format
ECLAPType	1	Y	derived from content file format
Duration	0..1	Y	derived from content if audio or video
UploadDate	1	Y	automatically generated
Partner	0..1	Y	generated from ingestion information or from user affliliation
Group	0..n	Y/N	Groups to which the Object is associated with, one group may be derived from partner
User	1	Y	The upload user
WorkflowType	1	N	The type of workflow used for the Object, it may be preset during ingestion
AXOID	1	Y	Internal identifier, automatically generated
TaxonomyTerm	0..n	N	TaxonomyTerms to which the object is associated
IPRContactUrl	0..1	N	Url where to ask information on IPR (see section **Errore. L'origine riferimento non è stata trovata.**)
EuRights	0..1	N	Europeana rights url (see section **Errore. L'origine riferimento non è stata trovata.**)
Permission	0..n	N	The permissions available on the object (see section **Errore. L'origine riferimento non è stata trovata.**)
AggregationID	0..1	N	ID used for possible automatic aggregation

ECLAP Format & Type values are:

Format	Type
audio	audio
video	video
document	• document • html • pdf

	• slide • excel
archive	archive
image	image
crossmedia	• audio • crossmedia • document • flash • html • image • pdf • slide • smil • video
tool	tool
playlist	playlist

see table in section **Errore. L'origine riferimento non è stata trovata.** for the association of content file format with ECLAP Format & Type.

5.3 Performing Arts Metadata

Each Object may be also associated with some performing arts metadata fields, in the performing arts many people are involved in the creation and execution of a performance each with a different role (director, stage designer, choreographer, dancer, etc.) it is important to not loose this role information. The person name might be mapped to a Dublin Core *contributor* field but in this way we loose the information on his/her role. For this reason we can have the *Professional* field with a role as attribute. The role can be one of:

- Acrobat
- Actor
- Adaptator
- Architect
- Assistant director
- Casting
- Choreographer
- Clown
- Composer
- Costume designer
- Critic
- Dancer
- Director
- Dramaturge
- Hairdresser
- Light designer
- Make-up artist
- Marketing manager
- Mask designer
- Mime
- Musician
- Patron
- Performer
- Playwright
- Producer
- Puppet designer

- Scenographer
- Seamster
- Set builder
- Set designer
- Singer
- Sound designer
- Stage manager
- Technician
- Theatre manager
- Theoretician
- Translator
- Other

Other fields are:

- Location of performance, country/city where the performance was held
- Venue of performance, theatre or building where the performance was held
- Date of first performance
- Date of recording
- Historical period*
- Content Type*
- Performing Art Type*
- Artistic movements and acting styles*
- Performing Art Group
- Keywords
- Cast
- Summary
- Objects
- …

The historical period, performing art type, artistic movent and acting style and also the content type can assume predefined values, for this reason this values can be organized in a taxonomy.

5.4 Aggregations

As shown in the general model, Playlists and Collections are a way to aggregate ECLAP Objects. Playlists can aggregate only Image, Audio and Video content (see **Errore. L'origine riferimento non è stata trovata.**) while Collections aggregate any kind of Objects (see **Errore. L'origine riferimento non è stata trovata.**). Playlists and Collections are Objects and for this have their own metadata set and in particular have a workflow type, this allows to provide to europeana also aggregated content.

5.5 Annotations and tagging

Annotations are used to annotate audio visual content (image, audio or video).
An annotation:

- refers to the whole content or to only a temporal fragment of it
- may associate a text description
- may refer to a second audio visual content as a whole or for only a temporal fragment, the content may be the same but can refer to a different time fragment.

The taxonomy, folksonomy and annotations provide semantic information on an object. Other semantic information may be derived indirectly from user comments and from user votes.

5.6 User Profile

The User profile contains information on the user that he/she wants to share with the other ECLAP users.
The information stored in the user profile is the following:

- e-mail

- password
- Name
- Surname
- Gender (Male/Female/Any)
- Birth date
- Cell phone number
- Description
- A personal picture
- Country, Region, City
- Address
- Spoken languages
- A set of taxonomy terms he/she is interested in
- Type of workplace
- Workplace
- Specializations
- Affiliation
- Contacts info
- The groups he/she is registered to
- The favorite objects
- The objects he/she has viewed
- The objects he/she has voted
- The users that are colleagues

A registered user can have many roles:

- trusted user
- group member
- group manager
- site administrator
- bug reporter
- metadata enricher
- metadata validator
- content publisher
- ipr responsible

5.6.1 Relationships among users

Two kinds of relationships among users are present, one direct as being colleagues the other is indirect as being registered to the same group.

6 Content and metadata ingestion and management (NTUA, DSI)

In this section and subsections it is described how the metadata & content in the content partners archives will be transferred to the ECLAP Social portal and how they will be adapted to be accessible to users on the portal as well as via europeana.

Content partners can provide content & metadata using a manual web upload, providing a content file together with the metadata entered via a web form, but in many cases they have a great number of content items to be provided and the manual approach can be used only in few cases. For this reason a

The basic workflow for massive content and metadata ingestion will be made of the following steps:

1. content partners will provide metadata using the ECLAP Metadata Ingestion Service (EMIS) portal, metadata should be provided as XML, it will be directly uploaded as a file or harvested them via a OAI-PMH access (DSI: other possibilities??)
2. each content partners will map their own metadata XML structure to the ECLAP metadata XML format , this will be done using the EMIS portal to define a XSLT that will be used in the mapping phase;
3. in case of a OAI-PMH access the EMIS will crawl the content partners archives and it acquires the original metadata;
4. when the original metadata is acquired it is mapped to the ECLAP metadata format and stored and it will be available to the ECLAP Social Service Portal (ESSP) via OAI-PMH access;
5. the ESSP regularly crawls the EMIS to acquire metadata represented using the ECLAP metadata format and in the original metadata format
6. for each metadata record acquired the ESSP will download the content files associated with it, ESP will use the content urls defined in the ECLAP metadata (content may be also acquired using Hard Disks, DVDs in case content size is too high for a rapid download)
7. each piece of content acquired will be formatted, adapted and a complete media content will be produced in the ESP portal with the associated metadata;
8. each produced content will be available only internally in the ESSP portal for:
   - metadata enrichment
   - metadata translation
   - IPR definition
   - …

   these activities will be orchestrated using an internal workflow management tool integrated in the portal
9. when the content and the associated metadata will be ready they will be available (on the basis of the IPR defined) for access to the final users
10. metadata will be published on europeana and europeana users will reach the ESSP portal to see the content

In the following sections each point will be described in more details

6.1 Metadata ingestion (NTUA)

This section reports the description of the tool to be used by content partners to upload & map metadata from their archives.

In the Cultural Content Metadata Space, the largest technological challenge is to ensure syntactic and semantic interoperability across the different types of metadata that exist in the Cultural Heritage sector. The technical standards enabling interoperability form an important dimension of this work. In order to achieve semantic interoperability we need a common automatic interpretation of the meaning of the exchanged information, i.e. the ability to automatically process the information in a machine-understandable manner. The first step of achieving a certain level of common understanding is a representation language that

exchanges the formal semantics of the information. Then, systems that understand these semantics can process the information and provide web services like searching, retrieval etc.
The following figure illustrates the proposed workflow for ingesting metadata in DC-DI.

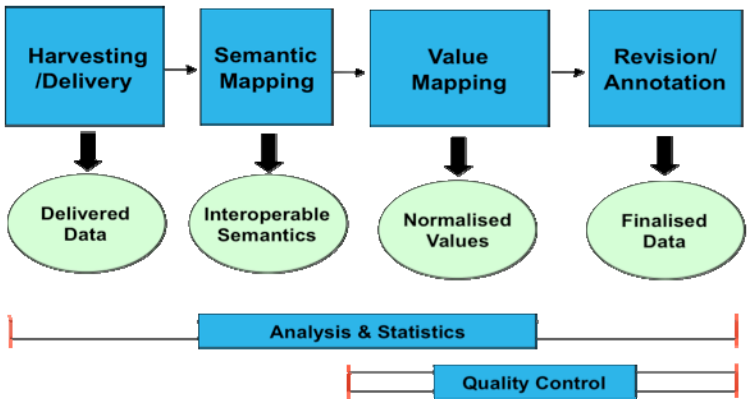


Figure. 6.1.1 Ingestion workflow

The workflow consists of four phases. Each phase is responsible for specific services all needed to ensure the quality of the ingestion process.
Harvesting/delivery is responsible for collecting the metadata It will be an interface for different methods of data delivery including, OAI-PMH, HTTP upload/download FTP upload/download
Semantic Mapping will provide the service for assigning semantics to the harvested metadata. It will assist to manually map Providers fields to a reference rich schema. Providers that have metadata in supported known formats might be able to omit this step (use stored transformations from selected schemas to the reference schema based on existing crosswalks).
Value Mapping will take existing attribute values and produce different/edited values. In particular:

- It will enable providers to resolve data issues, e.g. map own terminology list to selected terminology lists
- It will then automatically normalize data e.g. dates, geographical locations, nationality/language, name writing convention to selected vocabulary standards.

Revision/Annotation will enable the addition of data that is not in the original metadata (e.g empty fields, fields that take values from controlled vocabularies).
Analysis & Statistics service will provide detailed analysis and statistics of metadata contributed by a provider. (i.e. number of items imported, total values per field etc).
Quality Control will automatically check and report on Content Provider's data (i.e. missing values, malformed data). Error reports and warnings will be produced to facilitate editing the semantic mappings, value mappings and/or edit items until the Provider's data successfully passes the Quality control checks.

6.1.1 Mapping Procedure

For the needs of the ECLAP service, an import is not required to include the schema used. This simplifies the actual work for the user and at the same time the set of schema components that have to be mapped is reduced to only those that are used, thus reducing redundancy. The Schema Generator module produces the required simplified version of the schema that corresponds to a specific import by the user. When a user triggers the invocation of the mapping tool for a specific import, this module is also invoked. The next step in the workflow is to parse the data for a specific import and generate a tree like structure using HTML elements that represents the schema used. This tree like structure is then transmitted to the mapping Interface in order to create an interactive tree that represents a snapshot of the XML schema that the user is going to use as input for the mapping process.
The Mapping Interface is responsible for creating and presenting an intuitive and visual appealing environment for the user to define mappings, without sacrificing any of the functionality needed to properly achieve the task of schema mapping.
In order to offer a more user friendly environment to perform the task of schema mapping, the tool can be configured to provide to the user groups of high level elements that constitute separate semantic entities. These top level sets of elements are presented on the right side of the mapping Interface as can be seen in

Figure 6.1.2. On the left side of the mapping tool User Interface a tree structure is always present that represents the schema produced by the Schema Generation module for a specific import. The user is able to interact with this tree, expand or collapse the elements of the tree and retrieve brief statistics for each element and its values. An example of the info provided for each element can be found in Figure 6.1.3.

6.1.1.1 Description and draft user interface

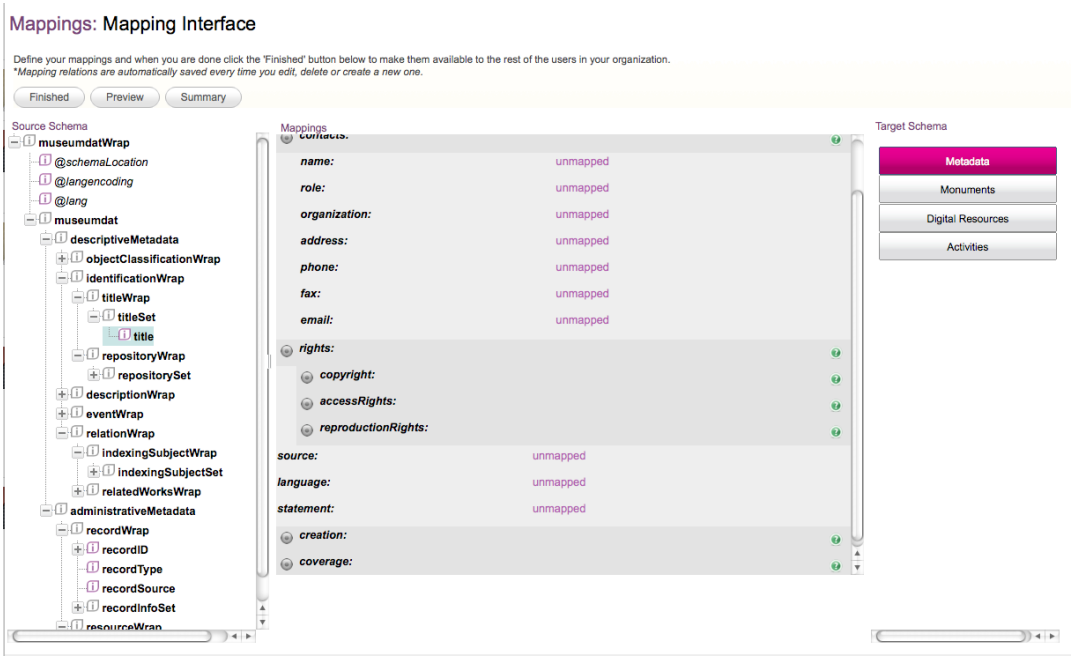


Figure 6.1.2 Screenshot of the mapping tool.

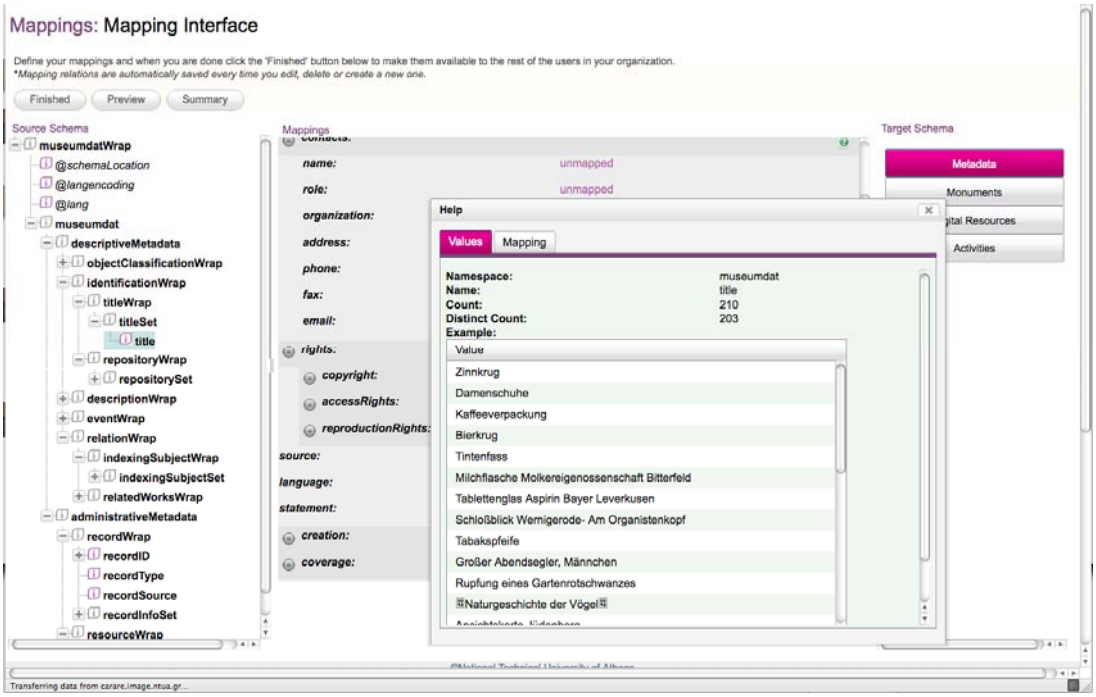


Figure 6.1.3. Statistics for an input element

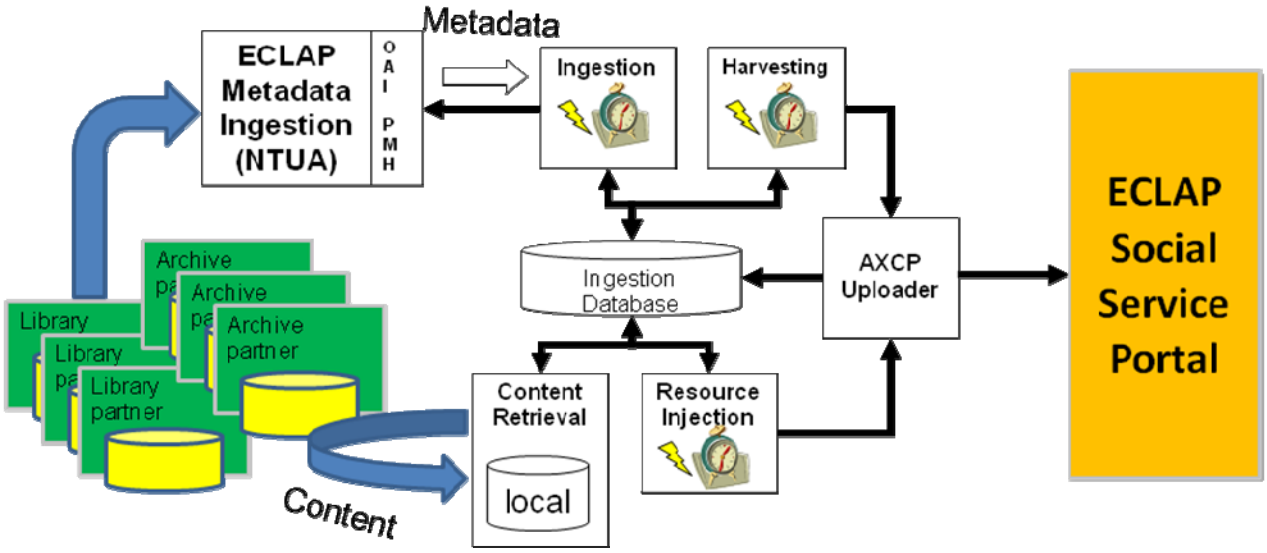
When a user wants to create or edit a mapping, he initially has to select one of the top level element groups that are presented on the right side of the mapping interface. Clicking the corresponding button, the set of the

sub-elements that are part of that group are presented to him in the middle part of the screen. This part of the user interface has a tree structure of embedded boxes that represents the internal structure of the complex element. The user is able to interact with this structure by clicking to collapse and expand it, similar to what he is able to do the with the tree representation of the input schema. Every embedded box represents an element and the user is able to request and view any information about it that is part of the XML schema.

When a user wants to perform an actual mapping between the input and the target schema, he has to drag and drop any element he wishes from the tree structure on the left part of the user interface to one of the boxes in the middle. When a successful mapping occurs, the user gets notified for the event and he is able to view the mappings in the middle part of the screen. Using the delete button the user is able to delete and correct any mappings he has made so far and repeat the procedure.
The user interface of the mapping tool is completely schema aware regarding the target schema. That means that many operations might be restricted based on constraints that appear in the target XML schema. For example, if an element can be repeated the user is able by using a button that appears on the visual representation of that element to add another one and make a new mapping.

6.2 Content & metadata ingestion (DSI)

Content and Metadata Ingestion will be the process that will allow importing metadata and content coming from ECLAP partners and Digital Archives. The process will allow ingesting both massively and singularly metadata and digital resources.
It could be happen that some digital resource since too big to get via Internet has to be provided by using physical device, so that we will have the need to start producing ECLAP content just with metadata and then when the digital resource will be available injecting it off-line in the corresponding ECLAP content..
This section describes how the ECLAP portal will work with ECLAP Metadata Ingestion service by NTUA.
The picture below describes the processes that will be involved in content ingestion:



The activities will be divided as following:

- Content and Metadata Retrieval: retrieving the metadata from the EMIS service
  - **Ingestion** will be a periodic process that will monitor and get metadata of new content or a new version of metadata for just retrieved contents.
  - **Harvesting** will be a periodic process that will monitor for new retrieved metadata and will call the content production and posting on ECLAP portal by the AXCPUploder process.
- **Content Retrieval**: retrieving and organize contents coming from the partners via internet or via physical devices

- **Resource Injection**: it will be a periodic process that will monitor for digital contents availability and will call the content production to update the existing ECLAP contents just created only with metadata in order to inject/fill with the digital resource by the AXCPUploder process.

All processes will share and update a Database of metadata (Ingestion Database) where all metadata and other information will be stored and used to manage the whole life cycle of contents ingestion.
All processes will be AXCP rule running on AXMEDIS AXCP grid as better described in the following sections.

6.2.1 Ingestion Database

The Ingestion Database will be used to store, trace and orchestrate all ingestion and production activities. Such database will be organized to refer:

- XML files containing structured metadata according to the ECLAP Schema or storing the whole XML as a TEXT
- URL/Location of digital Resource
- XSLT file of rules to map the original XML of metadata according to the ECLAP schema
- XML file of original metadata
- Flag status of production
- Timestamps: production and acquisition
- AXOID related to the generated content both Empty Object and full object
- contentID identifier of the of original content
- Library/Source the name of library/provider of content

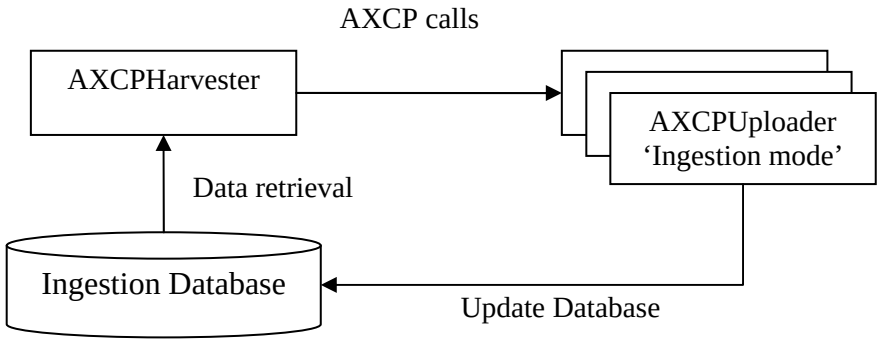
6.2.2 Content and Metadata Retrieval (Ingestion)

This process will be performed by an AXCP Rule called AXCPOAI-PMH that periodically will

- Monitor and get metadata of new contents or a new version of metadata for just retrieved contents from EMIS.
- OAI_PMH access by NTUA service to get and store new or updated metadata. The response to this call will expect to get:
    - XSLT file of rules to map the original XML of metadata according to the ECLAP schema
    - XML file of original metadata
    - XML file related to the metadata mapped into the ECLAP Schema
    - The remote URL of the digital content
- Download the content if the URL of digital resource is available
- Organizing all collected information in the ingestion database

6.2.3 Content Generation From Metadata (Harvesting)

This process will be performed by an AXCP Rule called *AXCPHarvester* that periodically will query the ingested metadata database to search for new content. The generation process will start by organizing the metadata collected by the database and structured according to the ECLAP Schema. A list of contents/references to metadata will be generated. For each item, the AXCP rule will invoke asynchronously the *UploadAXCP* Rule (for more details please see the section of Web Upload) for content production by providing the URL of content file and the structured metadata file associated with content. The *UploadAXCP* Rule will be invoked in *'Ingestion'* mode.. The result of content generation will be an AXMEDIS mp21 object that will contain all metadata and the digital content. If any file URL will be not available, the AXMEDIS mp21 object will contain only metadata and for this reason this kind of "content" will be called "*Empty object*".



The UploadAXCP rule will take in charge the Ingestion Database update by setting:

- flag indicating that the content has been produced
- flag indicating that the digital resource is missing
- Setting date and time of production
- AXOID of the produce AXMEDIS mp21 object

6.2.4 Content Retrieval

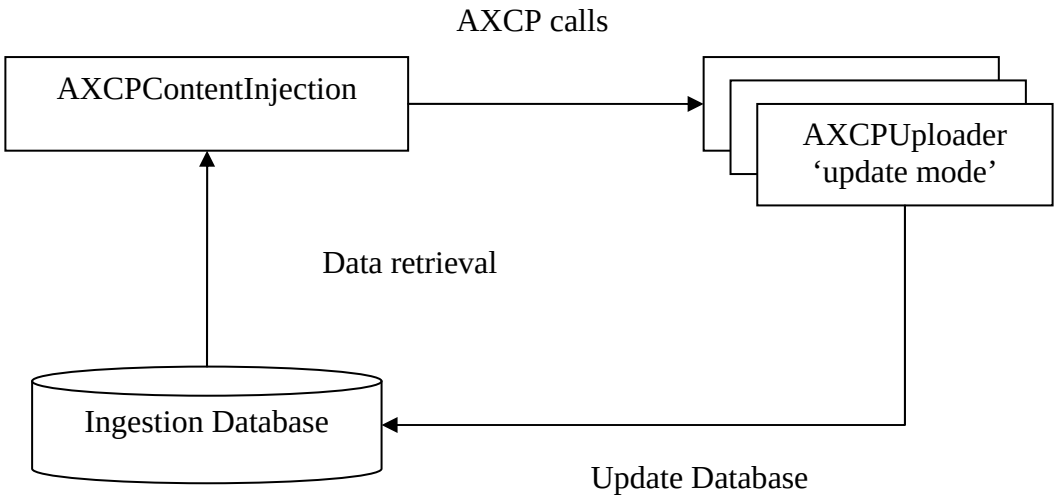
During ingestion some metadata could be available before of the associated digital contents and the resource could be retrieved by means physical devices like hard disk or via authorized or free remote access on the web:

- **Direct access** to database via
  - ODBC, WS, REST, etc.
- **Files** + Excel file (or database) or XML
  - Via HD with db and content
  - Via FTP, HTTP, SFTP, etc.
- **Metadata mapping** is needed

In this case many Empty objects wait for digital content injection in order to complete their production.
The content retrieval from the network will be performed by an AXCP Rule called *AXCPRetrieval*. This rule will download the digital content via authorized or free remote access (via HTTP,FTP or from physical devices) and will build a list of pair <contentID>;<fileUrl> where contentID will be the identifier of the metadata set associated with AXMEDIS id (AXOID) Empty Object. The rule will update the Ingestion Database by setting the content location (an URL or File System location).

6.2.5 Resource Injection

This process will be performed periodically by an AXCP Rule called *AXCPContentInjection*. This rule will query the ingested metadata database to search the fileUrl related to Empty Object by analysing the status flag. For each "Empty object" the AXCP rule will invoke asynchronously the *UploadAXCP* Rule (for more details please see the section of Web Upload) for content production by providing the file url information. The *UploadAXCP* Rule will be invoked in 'Update' mode.



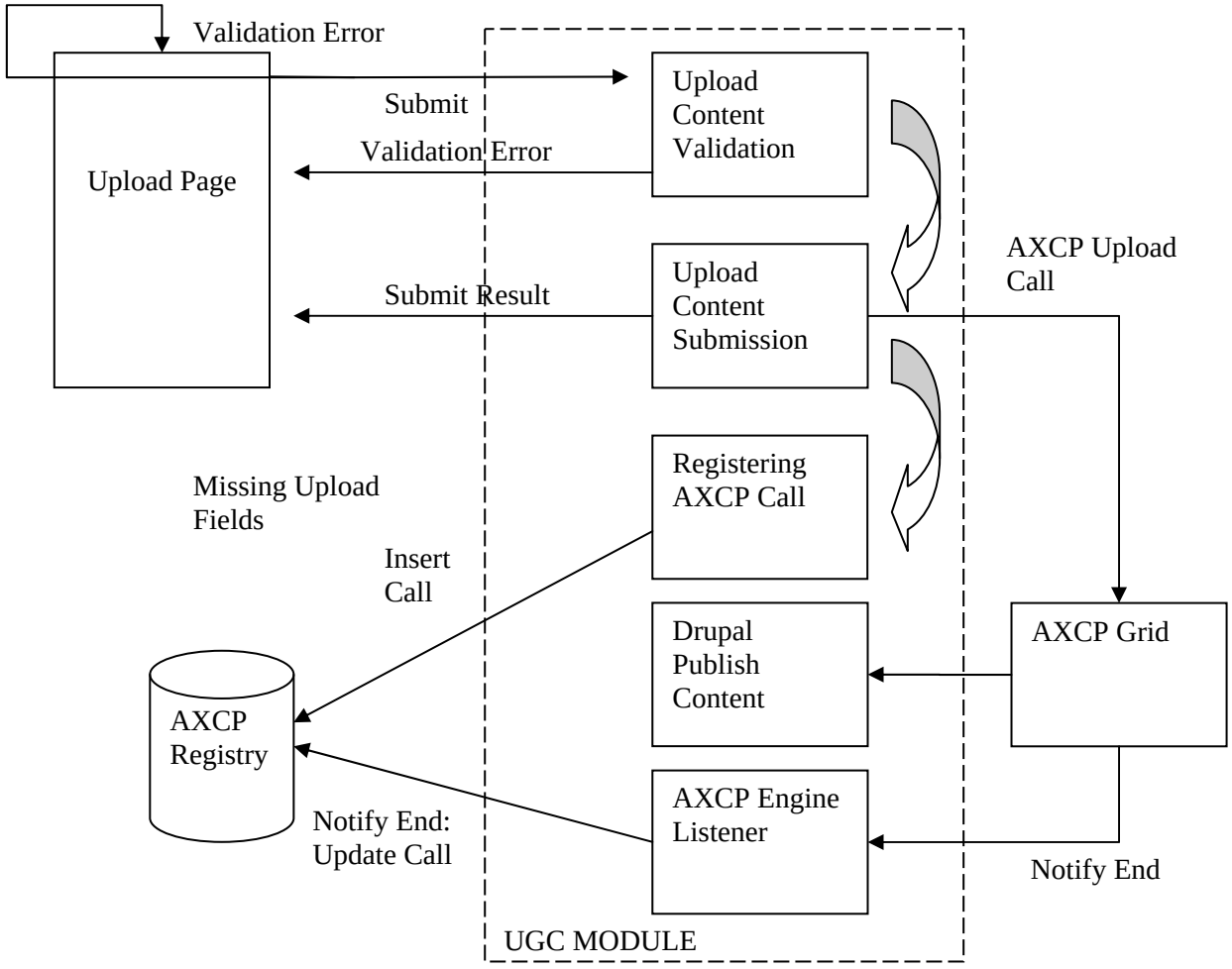
6.3 Content & metadata web upload (DSI)

The ECLAP users will upload contents on the portal through the Upload web page. The upload web page will be developed as part of a more complex module that will be called UGC (User Generated Content). This module will provide all functionalities to build and manage the Upload page and the administration issues for customizing and configuring the upload page and the interaction with the AXCP AXMEDIS grid used as back-office platform for content production.

The Upload page will show a form where users will input metadata and digital content information.
The form will be divided into sections to cope with;

- **DCMI metadata**: it will consist of a minimal set of Dublin Core fields necessary for indexing and retrieval. Some of those metadata will be mark as required.
- **Taxonomy**: it will consist of a multiple classification terms selector, Such terms allow to classify contents and will be used in indexing and retrieval.
- **Groups** : it will consist of a multiple ECLAP Groups selector. A content will be associated to one or more Groups and this will be used in indexing and retrieval.
- **Resource**: it will allow to select a file from user HD device or a valid URL of digital resource.
- **Workflow**: it will allow to assign a workflow type associated with the life-cycle of content. This will be used by the ECLAP workflow rules to orchestrate enrichment, validation and publication

The upload page (client-side) will perform an on-fly validation check of required metadata, while the validation of upload content will be executed on the server-side. If all will go good, the user will receive a successful report message otherwise an error report.
On server-side, when a file transfer or URL validation will be validated successfully, all fields coming from the Upload form will be organized to build a background call to the AXCP back-office. The call will put in execution the Upload Content AXCP Rule in the AXMEDIS AXCP Grid. Each AXCP request will be logged in a specific AXCP registry table. This table will be useful to control the status of content upload and production or to re-ask the content production in case of failure.

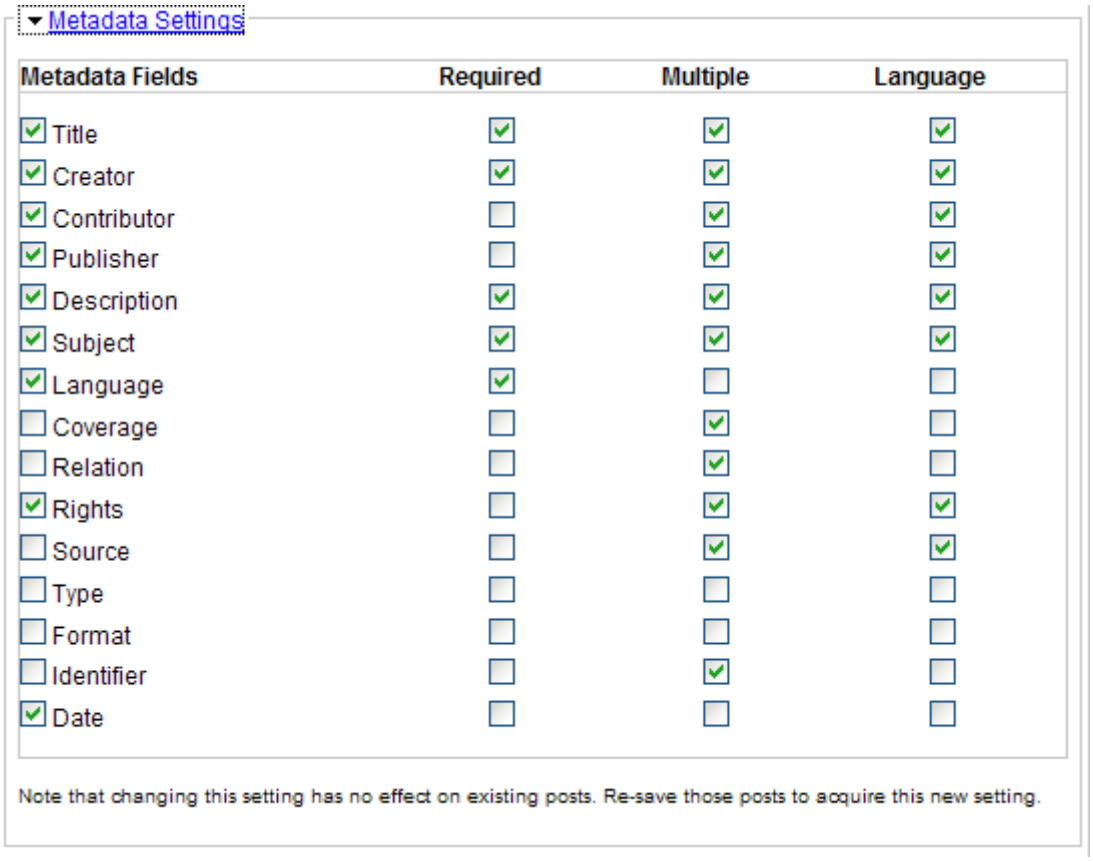


6.3.1 Configuring the Form Submit User Content

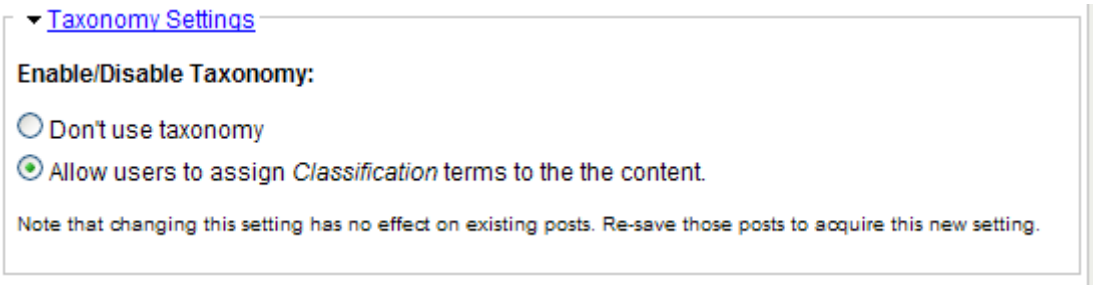
The Administration panel will be accessible only by root/administrator. It will allow to configure and customizing the content and metadata upload form. It will be divided in the sections reported in the following:

Metadata Settings

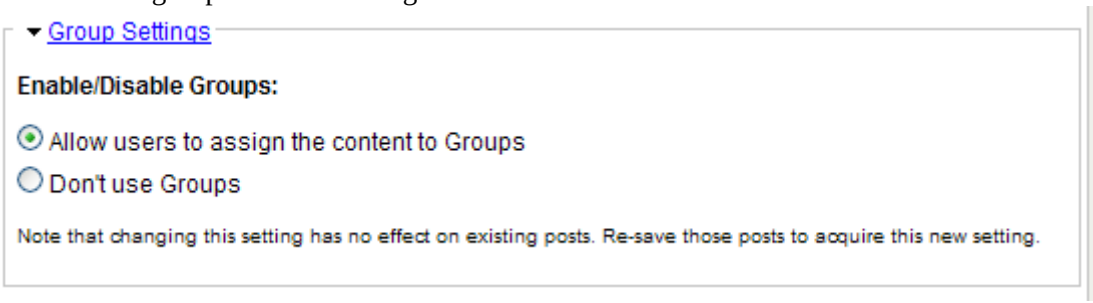
It will provide a panel (see the picture below) where the administrator selects the metadata fields to be displayed in the Upload form. Metadata fields will be a complete set of Dublin Core metadata according to the ECLAP requirements for content description. Such fields will be marked as ‘Required’, ‘Multiple’ and ’Language’. When *required* is checked, a field will be controlled by the script in the upload page to validate it (if it is not empty). When *multiple* is checked, more fields can be added in the form to cope with multiple instances of metadata When *language* is checked, the user will have to specify the language of the metadata.



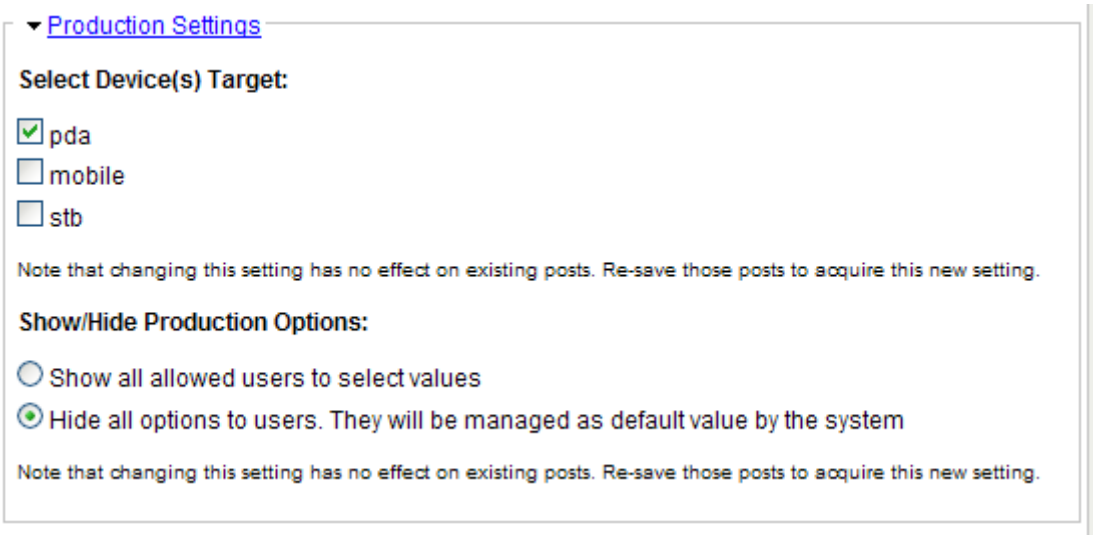
Taxonomy Settings
It will provide a panel (see the picture below) where the administrator selects if a taxonomy has to be associated or not with the content. The taxonomy will be the current enabled taxonomy on the portal.



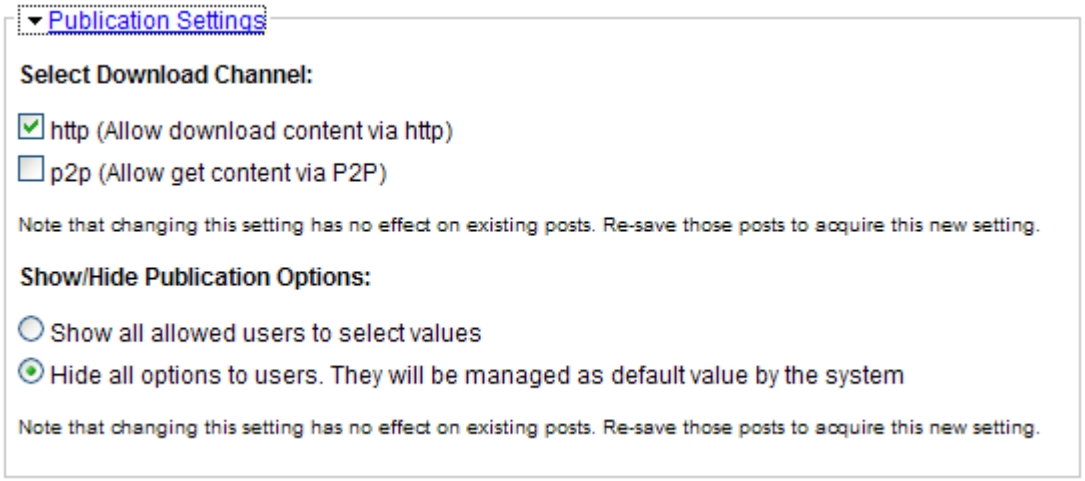
Groups settings
It will provide a panel (see the picture below) where the administrator selects if a user will be enabled to assign own content to groups where he is registered.



Production settings
It will provide a panel (see the picture below) where the administrator selects further devices to manage in content production (i.e. smart phone, pda, mobile, set of box). More, the selection can be made visible to users in order to let them the choice of possible devices or hidden to define the default behaviour of the system.



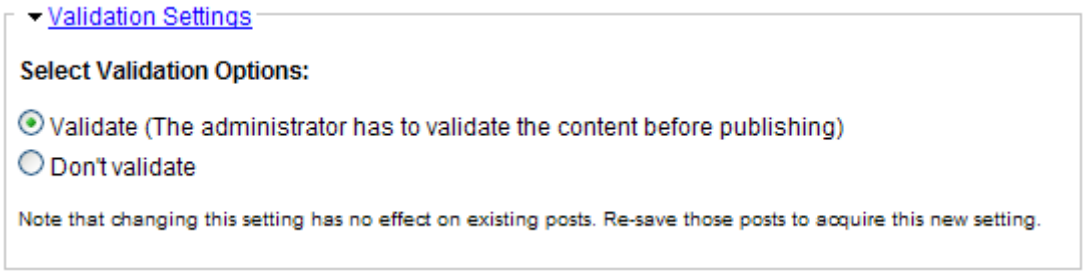
Publication settings
It will provide a panel (see the picture below) where the administrator selects distribution channel (i.e. http or/and p2p). More, the selection can be made visible to users in order to let them the choice of distribution channel or hidden to define the default behaviour of the system.



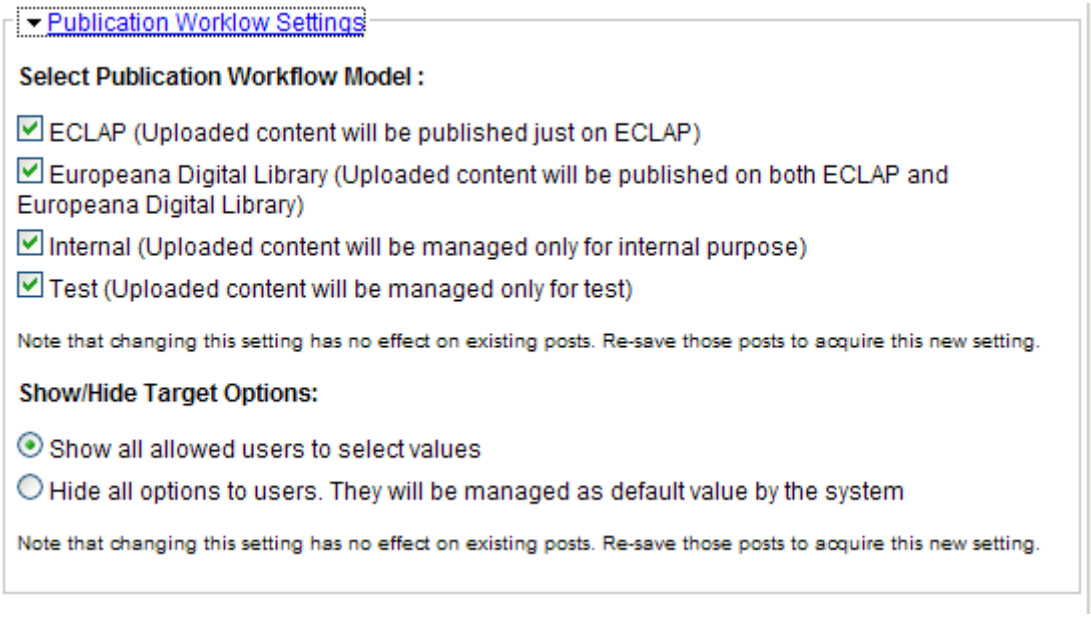
Validation settings
It will provide a panel (see the picture below) where the administrator define if the content upload will be validate or not. The Upload/Publication procedure will be as follows:

- direct/without any moderating device: when this modality will be on, all the files uploaded via the upload form will be published without any further control.
  This direct modality will be available only for some privileged users (i.e a group coordinator)
- with moderating device/controlled, which means validation will be needed: when this modality will be on, all the files uploaded via the upload form will be gathered in a database called Administration and they will be published no sooner than the content manager will have given his assent. This modality will be set by default for all new registered users.

The direct/moderate mode will be possible by defining a drupal permission that will be called ‘trusted user’. The administrator could be assign this privilege to users will request to be trusted uploader.

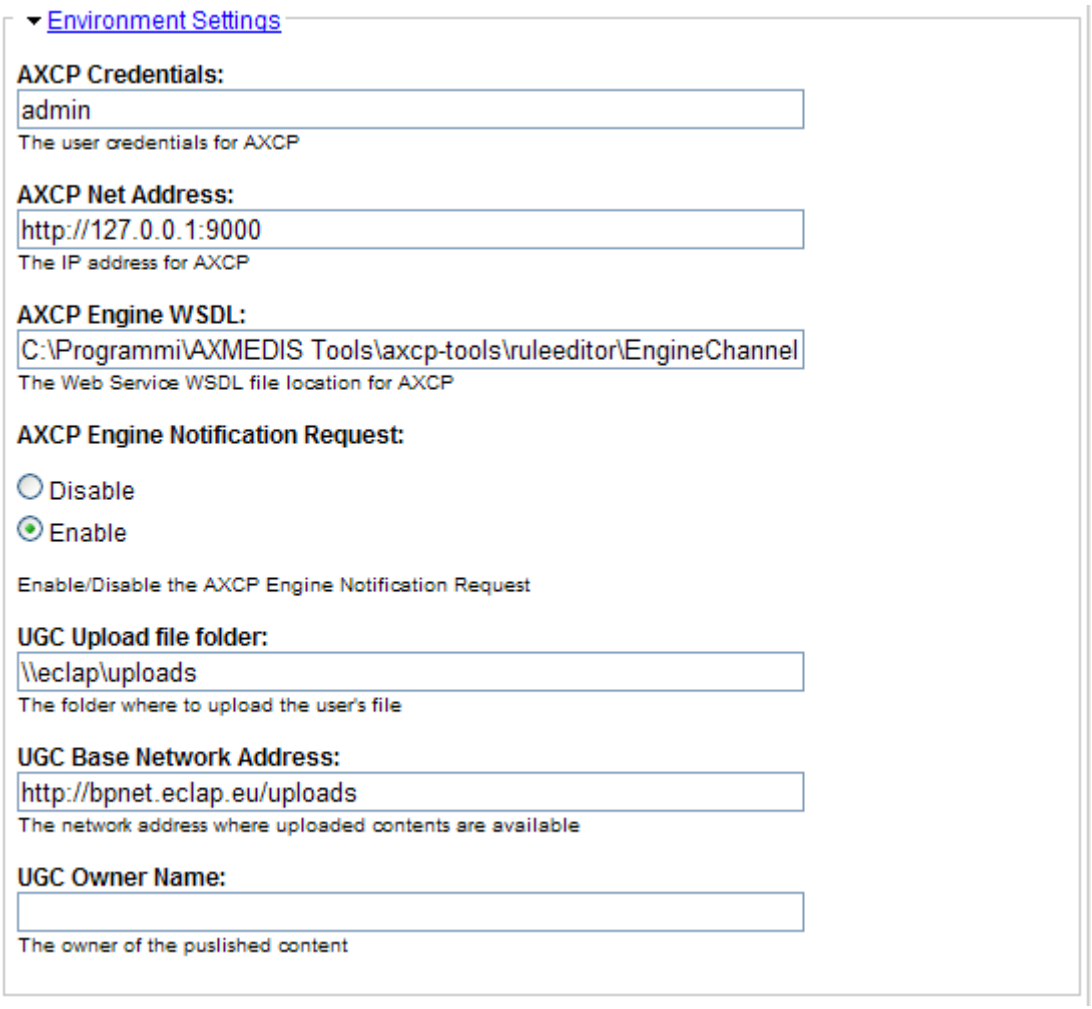


Publication Workflow Settings
It will provide a panel (see the picture below) where the administrator selects workflows type for content publication. More, the selection can be made visible to users in order to let them the choice of workflow type or hidden to define the default behaviour of the system.



6.3.2 Configuring the User Content for the inclusion

The Administration panel will be accessible only by root/administrator. It will allow to configure the production environment and the interaction with the AXCP AXMEDIS Grid back-office.



6.3.2.1 Configuration options

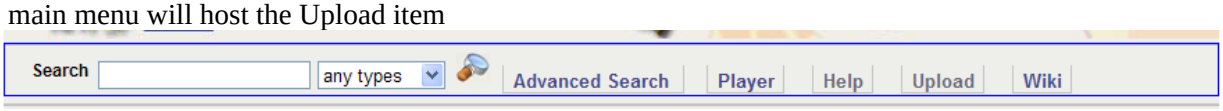
Name	Context (drupal, DB,…)	Notes
AXCP Credentials	Drupal/AXCP	Credentials for invoking AXCP rule
AXCP Net Address	Druapl/AXCP	The url of the AXCP Scheduler
AXCP Engine WSDL	Drupal/AXCP	The location of wsdl file for creating a WSDL Client in php
AXCP Notification Request	Drupal/AXCP	Enable/Disable the request of a notification coming from AXCP (Success or failure)
UGC Upload file folder	Drupal/AXCP	The location where UGC module store the uploaded content
UGC Base Network Address	Drupal/AXCP	The base URL to be used in conjunction with the upload folder to build the url for getting data by the AXCP in content production
UGC Owner Name	Drupal/AXCP	The default value for the owner of content

6.3.3 Upload

The upload page will be accessible at the drupal path ‘ugc/upload’ and by clicking on upload button on top menu of front-end. Only authenticated users will be able to access to this functionality.

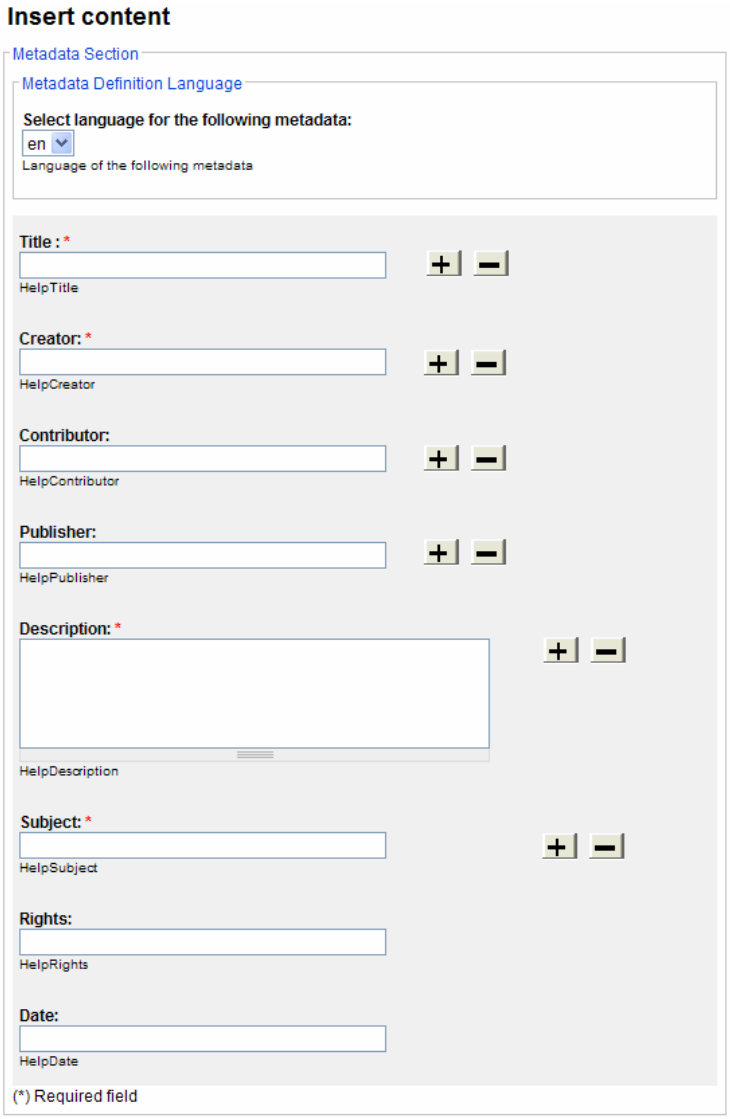
6.3.3.1 Description and draft user interface

The main menu will host the Upload item



The upload page will show a form divided into sections:

- **Metadata Section**: it will consist of a minimal set of Dublin Core fields necessary for indexing and retrieval. Some of those metadata will be mark as required according to the metadata settings. Metadata marked as multiple will have a couple of button like + and – that will allow to add more fields (i.e another title, more authors, etc..) To cope with multilingual metadata, the user shall associate the metadata definition language with the metadata set.



- **Resource Section**: two mutually exclusive modalities will be available. The former will allow to select a local file or a multiple selection of files from user’s computer (File on your disk), the latter

to edit a valid URL of a remote digital resource (File URL). If the resource has a language, the language selector will allow to perform the choice.

The system will allow to edit the File URL field with the address of the resource that can be uploaded via FTP or HTTP protocol. If the resource to be uploaded is freely accessible without any username and password, the syntax to be used is in the form ftp://ftp.yourdomain.com/filename or http://www.yourdomain.com/filename

If username and password are necessary to access the resource, the syntax to be used will be:

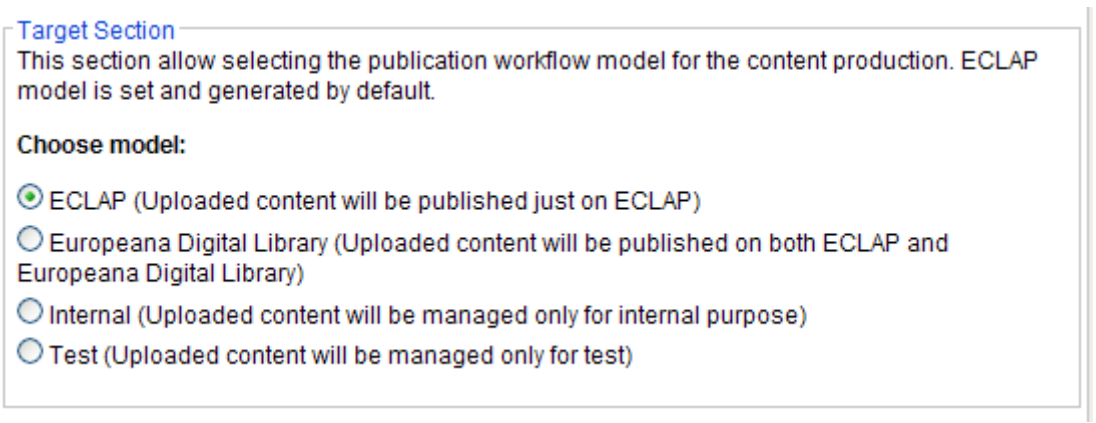
ftp://username:password@ftp.yourdomain.com/filename

or

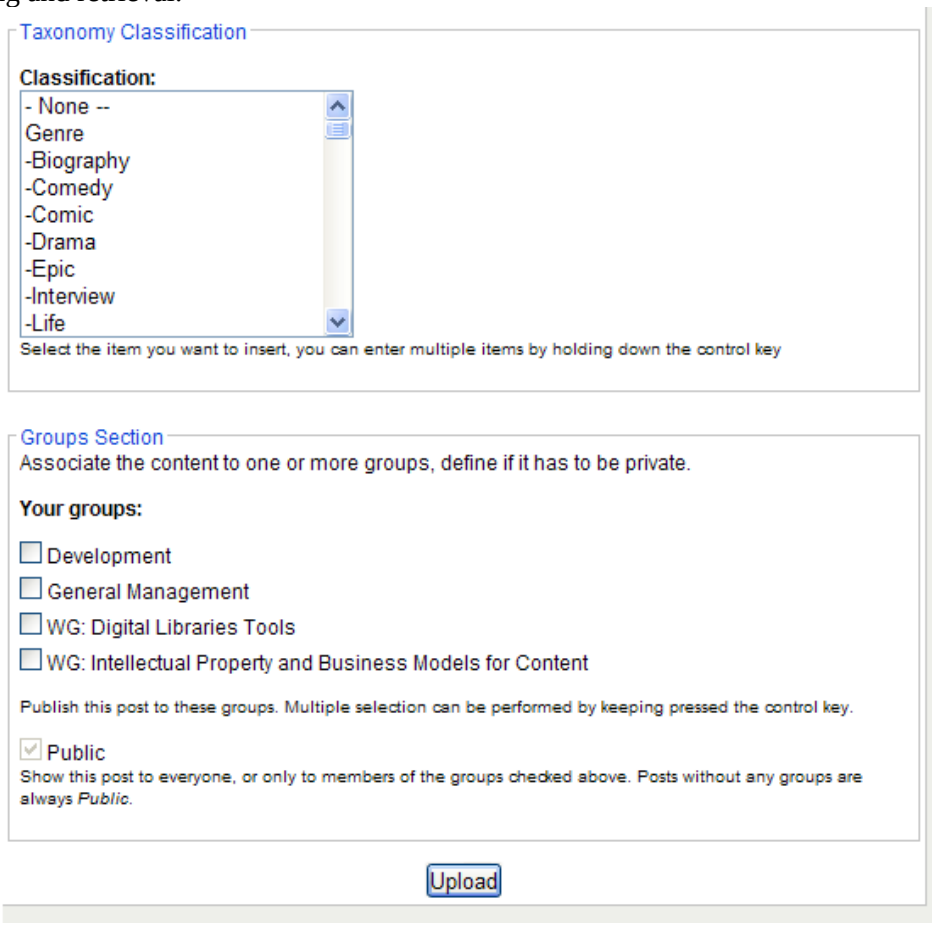
http://username:password@www.yourdomain.com/filename

Alternative:
In event of mulitple upload from disk, a text control could be added to each file in order to write a auxiliary title derived from the main title or a new text. This allow marking the resource as belonging to a set of files such as sorted list (i.e. collection).

- **Target Section**: it will allow to assign a workflow type associated with the life-cycle of content as defined in the workflow section. This will be used by the ECLAP workflow rules to orchestrate enrichment, validation and publication



- **Taxonomy Classification**: it will consist of a multiple choice classification terms selector, Such terms allow to classify contents and will be used in indexing and retrieval.
- **Groups Section** : it will consist of a multiple ECLAP Groups selector. A content will be associated to one or more Groups and/or could be public (visible to all uses). This information will be used in indexing and retrieval.



6.3.3.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
UGC	Drupal module	Main Drupal Module for managing content upload
UploaderAXCP	AXCP Rule	Backoffice process on AXCP Grid for content production
UploaderAXCP4Devices	AXCP Rule	Backoffice process on AXCP Grid for content production on PDA devices
extractResource	AXCP Rule	Backoffice process on AXCP Grid for content production for IPHONE, IPAD and mobile
produceMDHDVideo	AXCPRule	Backoffice process on AXCP Grid for content production for MD/HD Video

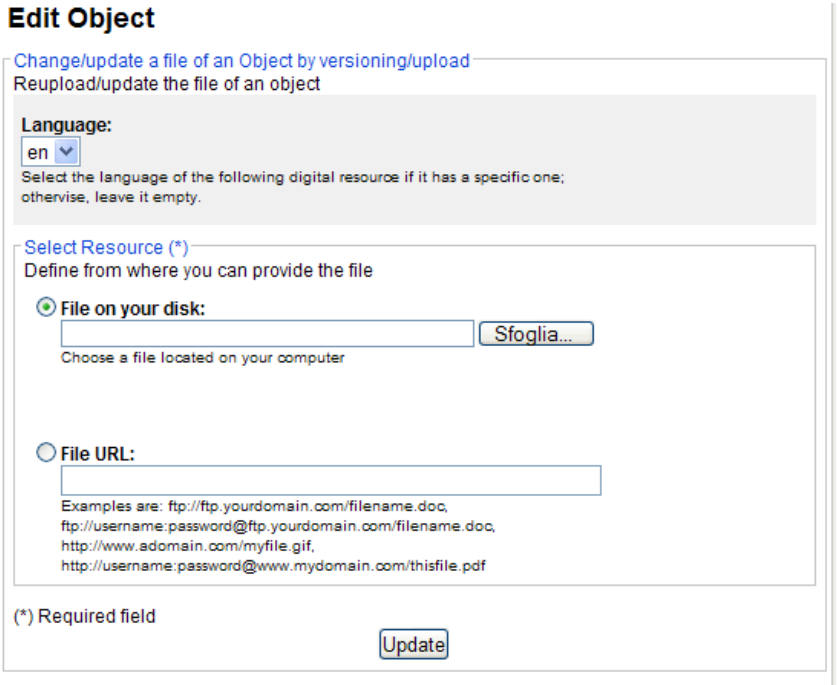
Third-party software	Version	Notes
Imagick	6.6.6-3 q8	Image Processing library
FFMPEG	SVN-R 13712	Video/Audio processing tool
MENCODER		Video/Audio processing tool
MP4Box		MP4 production tool
K-LITE CODECK Pack	6.6.0	Set of audio/video codec
FLVMDI		Tool for metadata injection in FLV video file

6.3.3.3 Configuration options

The upload form will be configurable by means of the administration panel that will be specifically developed for this purpose. This panel has been described in the "Configuring the Form Submit User Content" section.

6.3.4 Update Content

The update content page will be a page where the content owner or the administrator will be able to change the digital resource by replacing the existing one. The page will be accessible via the Edit Object link. The form will be derived by the Resource Section of the Web Upload page, this will allow to provide files on user's disk or URLs. The form submission will be redirect by the server to the upload service that will work in update mode and will invoke content production process on AXCP Grid (update mode) without changing existing metadata.
The user could change the prebuilt icon by uploading a new image to be used as icon. The system will provide to scale and assign the icon with the object. For this issue an upload section will be provided in the Edit Object page.



6.3.5 Upload Form Validation

The upload form validation will be performed by a javascript on user client. It will check all required fields, and missing fields will be highlighted in order to facilitate the user to complete the form. The upload will start only if the client-side validation will be passed.
Required fields will have the attribute 'required' in the 'class' html element.

6.3.5.1 Description and draft user interface

No specific user interface

6.3.5.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Checkuploadfields.js	javascript	Script for validating required fields

6.3.6 Upload Content Validation

The upload content validation will be performed on server by a php drupal-based function. According to Drupal programming guide, the validation is made before to perform the submission of the form-data. When the content will be upload by choosing 'File on your disk' mode the Upload Content Validation will check the uploaded content against file size and mime-type, in event of extra-size or wrong type a message will be return back to the user. In the 'File URL' mode the URL provided by the user will be checked syntactically and verified if it is not a broken link. In event of error a message will be displayed to the user.
When the validation is passed, the submission of form will continue.

6.3.6.1 Description and draft user interface

No specific user interface

6.3.6.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
UGC (ugc_upload_form_validate)	Drupal module	

6.3.7 Upload Content Submission

The upload content submission will be performed on server by a php drupal-based function. According to Drupal programming guide, the submission will be performed after the validation. The data provided by the Upload Form will be collected and organized to create:

Url for metadata file: all Dublin Core fields are stored as XML file and it will be accessible by AXCP through a specific URL created buy using the filename of the digital content.
Url for content: the URL(s) to get the content(s) and a set of additional information organized as following:

{'url':'".$fileUrl."','filename':'".$file."','mime':'".$type."','mode':'".$source."','localFolder':'".$folder."'}

Where:

- $fileUrl: it is url where getting the content;
- $file: it is the filename:
- $type: it is the mime type of content
- $source: it defines if the source is File or Url
- $folder: it is the folder associated with content in the upload folder on the server.

taxonomy data (classification): the list of indexes related to taxonomy terms chosen by the user. List of ids separated by semicolon ';'
groups data (privileges): the list of indexes related to groups chosen by the user. List of ids separated by semicolon;
user data (owner): user id and affiliation ➔ <userId>;<Affiliation>
validation data (validate): if user is a trusted user the value is true, false otherwise
distribution data (noHttp, noP2p): http or p2p will be set up according to the selected channels in the configuration panel

devices data (devices): what other devices will be considered in the production
workflow data (wfType): the type of workflow associated with the content
op data (op): the kind of operation, UPLOAD will be set as default.
protection data (protectObject): used if DRM will be used. Default: false;
All parameters will be used to create the AXCP Call and inserted in the AXCP Registry table.

By using the SOAP PHP extension and the AXCP Engine WSDL file for invoking the AXCP Engine, a soap client will be allocated and the AXCP Call will be performed. Contextually to the call, all parameters will be stored into the AXCP Registry Table by setting the call as 'pending'. If the call will go, the user will get back a success message about content production in progress, otherwise a service temporary down error.

6.3.7.1 Multiple resources upload

In event of N files/resources, N calls will be sent to the AXCP Engine in order to produce N different contents sharing the same set of metadata. This means that the set of metadata will be replicated in each generated content.

6.3.7.2 Description and draft user interface

No specific user interface

6.3.7.3 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
SOAP client	PHP extension	Needed to build a SOAP client from a WSDL file.
UGC (ugc_upload_form_submit)	Drupal module	
UploaderAXCP	AXCP Rule	AXCP Rule for content production

6.3.8 Registering AXCP Upload Call

The AXCP registry table will be used to store all AXCP calls for content production. This Table will be used as a log of calls and will allow to resend/resume contents production.

6.3.8.1 Data model description

The AXCP registry table will be a MySql table hosted by the AXCP database and will be organized as following:

Axrqid : An identifier of AXCP Call request
Time: the time of call
ruleId: the AXCP Rule ID of content production rule
type: AXCP (Constant value)
status: status of call. Possible values will be: 'pending', 'failure', 'completed'
endpointUrl: the url of the AXCP notification listener where AXCP Grid will send the notification of production process
caller: the caller identifier (php process, axcp rule)
schedule: the time to start the production. If empty, the production will start on GRID as soon as possible
params: a XML string of AXCP Rule signature
user: user who made the upload
mail: mail of user who made the upload
source: name of upload content file
title: title of content provided in the upload form
retVal: the content id will be stored when notified by the AXCP Grid at the end of production

A row id and contented will complete the set of registry table columns. ContentId will be reserved.

The following MySQL create statement shows the table details and columns format.

```
CREATE TABLE `axcp`.`registry` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `axrqid` varchar(128) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `time` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP,
  `ruleId` varchar(128) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `type` varchar(45) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `status` varchar(45) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `retVal` text CHARACTER SET latin1,
  `endpointUrl` varchar(255) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `caller` varchar(45) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `schedule` text,
  `params` text NOT NULL,
  `user` varchar(255) NOT NULL DEFAULT "",
  `mail` varchar(255) CHARACTER SET latin1 NOT NULL DEFAULT "",
  `source` text,
  `title` text,
  `contentId` varchar(255) CHARACTER SET latin1 NOT NULL DEFAULT "",
  PRIMARY KEY (`id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

6.3.8.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
UGC (ugc_insert_axcp_req)	Drupal module	

6.3.9 AXCP Engine listener

The AXCP Engine listener will be the service where AXCP Grid will notify the result of content production. The listener will update the corresponding row in the registry table according to the result and will send a mail to the user and to the administrator in order to notify the content production.
In event of failure, a mail will be sent only to the administrator and the status of the relative call will be put at the failure value and the description of fail will be written in the retVal field. In event of success, a mail will be sent both to the user and the administrator, the status of the relative AXCP Call will be put at the Complete value and the content id (AXOID related to the mp21 AXMEDIS format) will be written in the retVal field.

Mail in event of success

- 'ugc_success_subject': Upload confirmation at @site;
- 'ugc_success_body': Dear @username,\n\nI'm very glad to inform you that the content \"@title\" (@content) was uploaded successfully!\n\nRegards\n\n@signature;

Mail in event of failure:

- ‘ugc_error_subject': Upload failed at @site
- 'ugc_error_body': Dear @username,\n\nI'm sorry to have to inform you that the content \"@title\" (@content) was not uploaded.\n\nThe system has received the following error: \"@retVal\".\n\nRegards\n\n@signature

@variable_name are placeholders that will be replaced with the proper values.

6.3.9.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
UGC (ugc_axcp)	Drupal module	
SOAP client	PHP extension	Needed to build a SOAP server from a WSDL file.

6.3.10 Drupal publish content

The drupal publish content will be the service that the AXCP content production rule will call to publish the content on the portal. This service will be the interface to the node save drupal function that allow to generate a new content in the DRUPAL data model.

6.3.10.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
UGC (ugc_publish_content)	Drupal module	

6.3.11 UploadAXCP Rule

The UploadAXCP rule will be the main process in the AXMEDIS AXCP GRID involved in content production and adaptation. The result of the process will be a mp21 AXMEDIS object. This object will be the PC version and will be consider the *father/main-object* of other derived objects. The UploadAXCP Rule will work in three modality: INGESTION, UPLOAD and UPDATE mode.

- The INGESTION mode will be used when content will be ingested via the OAI_PMH server for the first time together with metadata. In this mode, metadata will be structured according the ECLAP schema.
- The UPLOAD mode will be used when content will be upload from the portal for the first time together with metadata coming form the upload form
- The UPDATE mode will be used when the content has to be modified by providing a new version of digital content that will replace the previous.

If the digital resource will be available, the rule will perform an automatic format and type analysis about it and will work according the **Format and Type** table. When needed, the digital content will be adapted/transcoding according to the **Conversion Features** table.

Format and Type table

Format	Type
Audio	Audio
Video	video
Document	• document • html • pdf • slide • excel
Archive	Archive
Image	image
Crossmedia	• audio • crossmedia • document • flash

	• html • image • pdf • slide • smil • video
Tool	Tool
Playlist	Playlist

Conversion Features table

Resource	Coding parameters	Output Format
Video	Size (512)x288 Video codec h263 Video bitrate 320kb Audio codec mp3 Audio bitrate 64kb	FLV
Audio	As original	Mp3
Image	As original	PNG

Other formats will be embedded without further processing.

6.3.11.1 Data model description

The AXCP rule parameters are defined according to AXCP RULE schema. Such parameters are described in XML. In the following, an example of instance for the XML signature used by the content production rule is reported:

```
<AXCP_Rule>
    <Arguments>
      <Parameter Description="" Name="fileUrl" ParamType="In" Type="String">http://sn3/uploads/stenosi tracheale neoplastica_08-07-09_19-47-30/stenosi tracheale neoplastica.flv</Parameter>
      <Parameter Description="" Name="validate" ParamType="In" Type="Boolean">true</Parameter>
      <Parameter Description="" Name="owner" ParamType="In" Type="String">53;DSI</Parameter>
      <Parameter Description="" Name="metadataUrl" ParamType="In" Type="String">http://sn3/uploads/stenosi tracheale neoplastica_08-07-09_19-47-30/stenosi tracheale neoplastica.xml</Parameter>
      <Parameter Description="" Name="protectObject" ParamType="In" Type="Boolean">false</Parameter>
      <Parameter Description="" Name="noHttp" ParamType="In" Type="Boolean">false</Parameter>
      <Parameter Description="" Name="noP2p" ParamType="In" Type="Boolean">true</Parameter>
      <Parameter Description="" Name="drupalId" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="classification" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="privilegies" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="devices" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="reqId" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="device" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="op" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="axoidRef" ParamType="In" Type="String"></Parameter>
      <Parameter Description="" Name="wfType" ParamType="In" Type="String"></Parameter>
    </Arguments>
        …..
</AXCP Rule>
```

Argument	Description

fileUrl	the URL(s) to get the content(s) and a set of additional information organized as following: {'url':'".$fileUrl."','filename':'".$file."','mime':'".$type."','mode':'".$source."','localFolder':'".$folder."'}
validate	Indicates if content has to be controlled by administrator and then stored into Administration database
owner	User and affiliation according to the forma ➔userId;Affiliation
metadataUrl	the URL to get the metadata XML file
protectedObject	Used for DRM purpose
noHttp	Enable/disable download via http
noP2p	Enable/disable download via p2p
durpalId	Not used
classification	the list of indexes related to taxonomy terms chosen by the user
privilegies	the list of indexes related to groups terms chosen by the user
devices	List of derived object (i.e. PDA, MOBILE…)
reqId	Request id and caller identifier (i.e. php for portal, ingestion for the ingester)
device	Current device. The content will be generated by adapting to current device
op	It will be set to 'UPLOAD' when content is uploaded for the first time. It will set to 'UPDATE' when content will be modified
axoidRef	Empty or axoid related to the main object or to the content to be updated
wfType	Type of workflow associated with the content

6.3.11.2 Configuration options

The configuration options will be loaded from the axdbv4.properties table and merged with the axcp.properties table. This last table will be used by all AXCP rule involved in content production and back-office activity. It will be a table with a list of pair <name,value> related to all configurations parameters, such as DB access, Web Url, etc….

6.3.11.3 Upload mode

The main activity of process when used in UPLOAD mode will be in the order:

1. **Content retrieval**: the fileUrl parameter will be analyzed to get the URL of content. The content will be downloaded and stored in the AXCP Grid Node
2. **Metadata retrieval**: the metadataUrl parameter will be analyzed to get the URL of the metadata file and then it will be downloaded and stored in the AXCP Grid Node.
3. **Content adaptation**: an automatic format detection will be performed to defining *format* and *type* and then select the proper content adaptation and transcoding process according to the Format and Type and Conversion Features tables
4. **Metadata organization**: the metadata file will be parsed to extract metadata set and to generate the Dublin Core section associated with the content when stored as AXMEDIS mp21object.
5. **Extra metadata generation**: the user information (id and affiliation), taxonomy and groups choices will be organized as xml generic metadata and stored in the mp21 object according to the AXMEDIS model.
6. **Icon generation**: an animated gif or a single gif image will be generated in event of video or image content. This image will be used as icon associated with the content in ECLAP portal.
7. **Save content on Database**: the mp21 AXMEDIS object will be stored in the AXMEDIS Database. If the validate parameter will be set to false, the AXMEDIS database will correspond to the Publishing *axdbv4* database, otherwise the content will be stored in the Administrative *axdbv4f* database. Contextually, the corresponding *rootobjectinfo* table will be update by adding a new row related to new content. The UploadAXCP Rule will set the following fields of the *rootobjectinfo* table leaving the other parameters with the default value.
   - **rootObjectAxoid**: the Axoid of the mp21 object

- **nohttp**: disable/enable http download (default 0)
- **nop2p**: disable/enable p2p download (default 0)
- **published**: the publication status (default 0 not published)
- **sourcefile**: the location of raw resource
- **sourceUrl**: the original location of the content
- **defLanguage**: the language used for metadata in the upload form
- **format**: the format of new digital content
- **type**: the type of the new digital content

8. **Workflow Tables Update**: the *workflow_info* and the *workflow_metadata* tables will be updated in order to store the status of metadata and workflow information as described in the workflow section. The UploadAXCP Rule will set the following fields of the *workflow_info* table leaving the other parameters with the default value:
   - **Axoid**: the id of AXMEDIS mp21 object
   - **md_number**: the number of inserted metadata
   - **md_original_num**: the number of inserted metadata
   - **type**: the workflow type associated with the content

   The UploadAXCP Rule will set the following fields of the *workflow_metadata* table leaving the other parameters with the default value. It will insert a row for each metadata:
   - **Axoid**: the id of AXMEDIS mp21 object
   - **Id**: the id metadata
   - **Dbtable**: the database table where the metadata value is stored
   - **proposerUID**: the id of user who made the upload and provided metadata
   - **status**: 0 means PROPOSED (just uploaded and written for the first time)
   - **production**: 2 means UPLOADED (provided since the beginning via upload form, web page)
9. **Derived Content Production**: an AXCP Rule (*UploadAXCP4Device*) will be invoked in order to generate mp21 AXMEDIS object to cope with different devices (i.e. pda, mobile, etc…) and will pass the AXOID of the just created mp21 object. The AXOID will be sent in the *axoidRef* parameter together with the input parameters of the rule.
10. **Drupal publication**: If the validate parameter will be set to false, the UGC publishing service will be invoked in order to publish the content on Dupal/ECLAP portal.
11. **Indexing request**: If the validate parameter will be set to false, the indexing service will be invoked to index metadata and content in the Publish Index Database.
12. **Extract Resource**: If the validate parameter will be set to false, an AXCP rule (*Extract Reosurce*) for generating different resolution and formats raw files will be invoked
13. **Metadata Translation**: If the validate parameter will be set to false, an AXCP rule (*Metadata Translation*) for automatic metadata translation will be invoked.

6.3.11.4 Ingestion mode

The rule will work as in Upload mode except for content retrieval and metadata organization steps. The former step will be done if the url of digital resource is available the latter will work with an instance of metadata coming from ingestion and represented according to the ECLAP Schema. If the digital content is available it will be retrieved, processed and adapted as in the Upload mode otherwise no content processing will be done and an Empty Object will be produced. At the end of production the rule will update the Ingestion Database

6.3.11.5 Update mode

The main activity of process when used in UPDATE mode will be in the order:

1. **Content retrieval**: the fileUrl parameter will be analyzed to get the URL of content. The content will be downloaded and stored in the AXCP Grid Node
2. **Content adaptation**: an automatic format detection will be performed to defining *format* and *type* and then select the proper content adaptation and transcoding process according to the Format and Type and Conversion Features tables

3. **Mp21 Current version retrieval**: the mp21 AXMEDIS object of the current version will get from the database by means the AXOID received in the *axoidRef* parameter.
4. **Icon generation**: an animated gif or a single gif image will be generated in event of video or image content. This image will be used as icon associated with the content in ECLAP portal.
5. **Save content on Database**: the modified mp21 AXMEDIS object will be re-stored in the AXMEDIS Database. The AXMEDIS database will correspond to the Publishing *axdbv4* database. Contextually, the corresponding *rootobjectinfo* table will be update by updating rows related to current content. The UploadAXCP Rule will update the following fields of the *rootobjectinfo* table leaving the other parameters with the default/existing value.
   - **sourcefile**: the location of raw resource
   - **sourceUrl**: the original location of the content
   - **format**: the format of new digital content
   - **type**: the type of the new digital content
6. **Derived Content Production**: an AXCP Rule (*UploadAXCP4Device*) will be invoked in order to update the mp21 AXMEDIS object already generated for different devices (i.e. pda, mobile, etc…) and will pass the AXOID of the just created mp21 object and the file.
7. **Indexing request**: The indexing service will be invoked to index the updated content in the Publish Index Database.
8. **Extract Resource**: an AXCP rule (*Extract Reosurce*) for generating different resolution and raw files will be invoked for the new content.

If the request will come from the ECLAP Metadata Ingestion Service (the reqId will contain this information) at the end of update/production the rule will update the Ingestion Database

6.3.12 UploadAXCP4Device Rule

The UploadAXCP4Device rule will be the process in the AXMEDIS AXCP GRID involved in content production and adaptation for generating content for different devices such pda, mobile, stb.
The UploadAXCP4Device Rule will work in two modality: UPLOAD and UPDATE mode.
The UPLOAD mode will be used when content will be upload for the first time together with metadata. The UPDATE mode will be used when the content has to modified by providing a new version that will replace the previous.

Input type: Video, Image, Audio and PDF files.

Format and Types

Format	Type
Crossmedia	• Video • Image • Audio
Document	Pdf

Generated Formats
Video: resolution 240x180, video codec mpeg4, video bitrate 128kb, audio codec aac, audio bitrate 32kb output format mp4
Image: jpeg embedded in SMIL format
Audio: mp3 embedded in SMIL a file
Document: only pdf

6.3.12.1 Data model description

The UploadAXCP4Device will have the same definition of the UploadAXCP rule. So, refer to UploadAXCP for details.

The result of the process will be a mp21 AXMEDIS object that will be stored in the same location of the main object. The filename of the device version will be generated by using the *axoidRef* argument related to the AXOID of main object and the device type according this rule:

<filename>=<axoidRef>_<device type>.mp21

6.3.12.2 Configuration options

The configuration options will be loaded from the axdbv4.properties table and merged with the axcp.properties table. This last table will be used by all AXCP rule involved in content production and back-office activity. It will be a table with a list of pair <name,value> related to all configurations parameters, such as DB access, Web Url, etc….

6.3.12.3 Upload mode

The main activity of process when used in UPLOAD mode will be in the order:

1. **Content retrieval**: the fileUrl parameter will be analyzed to get the URL of content. The content will be downloaded and stored in the AXCP Grid Node
2. **Metadata retrieval**: the metadataUrl parameter will be analyzed to get the URL of the metadata file and then it will be downloaded and stored in the AXCP Grid Node
3. **Content adaptation**: an automatic format detection will be performed to defining format and type and then select the proper content adaptation and transcoding process (i.e Mp4 for pda, SMIL for mobile).
4. **Metadata organization**: the metadata file will be parsed to extract metadata set, generate the Dublin Core section and additional metadata associated with the content when stored as AXMEDIS mp21 object.
5. **Extrametadata generation**: the user information, taxonomy and groups choices will be organized as xml generic metadata and stored in the mp21 object according to the AXMEDIS model.
6. **Save content on db**: the mp21 AXMEDIS object will be stored in the AXMEDIS Database together with the main AMXEDIS Object. If the validate parameter will be set to false, the AXMEDIS database will correspond to the Publishing *axdbv4* database, otherwise the content will be stored in the Administrative *axdbv4f* database. The rule will update the *rootobjectinfo* table by setting the *device* (pda, mobile, stb) column to 1 for the parent mp21 object by means the *axoidref* argument

6.3.12.4 Update mode

The main activity of process when used in UPDATE mode will be in the order:

1. **Content retrieval**: the fileUrl parameter will be analized to get the URL of content. The content will be downloaded and stored in the AXCP Grid Node
2. **Mp21 Current version retrieval**: the mp21 AXMEDIS object of the current version will get from the database by means the AXOID received in the *axoidRef* parameter. If the device version is not available, the main AXMEDIS mp21 (the PC version of object) will be load. A new mp21 object will be generated by copying the metadata of the pc version.
3. **Content adaptation**: an automatic format detection will be performed to defining format and type and then select the proper content adaptation and transcoding process (i.e Mp4 for pda, SMIL for mobile).
4. **Save/update content on db**: the mp21 AXMEDIS object will be stored in the AXMEDIS Database together with the main AMXEDIS Object. The AXMEDIS database will correspond to the Publishing *axdbv4* database.

6.3.13 Extract Resource AXCP Rule

The Extract Resource AXCP Rule will be invoked to generate different resolution and formats raw files. Such files will be generated from the orginal uploaded digital resource and they will be accessible by different devices not supporting mp21 format (PDA, Iphone, Ipad, SmartPhone).

In event of video, the rule will generate the iphone video version and will invoke the MD/HD video production AXCP Rule to generate Medium and High resolution video.

The rule will accept as parameters:
listAxoid: a list of AXOID related to contents to be processed. The list is formatted using semicolon as delimeter for each AXOID,
params: It is a free parameter used to provide the database where axoids are stored.

At the end of process, the rule will update the *rootobjectinfo* table by setting technical data as reported below:

filesecco= extension of file
pcview= 1 or 0. When 1 is set, the content can be played by a pc,
resolution= L or H depending by the original resouce,
dx=width of video/image
dy=height of video/image
duration=duration of the fluid resource such as video, audio,
iphone=1 or 0 if the resource has been generated for Iphone i.e. video

In event of video resource the Iphone/Ipod version will be generated according to the following features:

Video size: 640x(360)
Video codec mpeg4
Video bitrate: 512kb
Video fps: 25
Audio codec: aac 96kb
Output format container: mp4

If the resource has original size and/or frame rate too low, it will be converted mantaining them.

6.3.13.1 Data model description

The AXCP rule parameters are defined according to AXCP RULE schema. Such parameters are described in XML. In the following, an example of instance for the XML signature used by the extract resource rule is reported:

```
<AXCP_Rule>
    <Arguments>
      <Parameter Description="" Name="listAXOID" ParamType="In"
Type="String">urn:axmedis:00000:obj:3a49afe2-c9da-4267-9b40-f07573b204cd</Parameter>
      <Parameter Description="" Name="Params" ParamType="In"
Type="String">database=publishing</Parameter>
    </Arguments>
        …
</AXCP_Rule>
```

6.3.14 MD/HD video production AXCP Rule

The MD/HD video production AXCP Rule will be invoked to generate the Medium Definition and the High Definition versions of a video.
The MD and HD video are generated using the uploaded video file, and the MD/HD version is generated only if the height of the original video it is greater or equal to 480 for MD and 720 for HD.
For MD the video parameters are:

Video size: (852)x480
Video codec: h264
Video bitrate: 800kb
Audio codec: aac 96kb
Output format container: flv

For HD the video parameters are:

Video size: (1280)x720
Video codec: h264
Video bitrate: 2Mb
Audio codec: aac 96kb
Output format container: flv

The video width it is adapted to mantain the same aspect ratio as the source video on the basis of the video height.

6.3.14.1 Data model description

The AXCP rule parameters are defined according to AXCP RULE schema. Such parameters are described in XML. In the following, an example of instance for the XML signature used by the produceMDHDVideo rule is reported:

```
<AXCP_Rule>
    <Arguments>
      <Parameter Description="" Name="listAXOID" ParamType="In"
Type="String">urn:axmedis:00000:obj:3a49afe2-c9da-4267-9b40-f07573b204cd</Parameter>
      <Parameter Description="" Name="Params" ParamType="In"
Type="String">database=publishing</Parameter>
    </Arguments>
        …
</AXCP_Rule>
```

6.4 Workflow management tool (DSI)

This section describes how the workflow management tool integrated in the ECLAP portal will work.

During production we have to take care about the original content that does not have to be published in any case. That content does not have to be accessible via internet, neither indexed by robots.

In ECLAP, the workflow has tocope with:

- Ingestion via rule or upload
- Creation of draft objects
- Production of multilingual metadata
- Production of semantic metadata, technical information, taxonomy, etc.
- Production of the other format and resources at different resolutions
- Send an email to those that have to revise and accept
- Pass in the phase of metadata validation and enrichment
- Triggering actions
- Taking decision
- Managing different workflow-types
- Controlling tools (unlock-lock access)
    - Internal tools (ECLAP service and Web Page) will be used as workflow-driven tools
    - **External tools** like AXCP grid (back-office) will be used to perform automatic enrichment on metadata, for instance performing translation activities, taking decisions or statistical analysis, changing workflow status, publication.
- Publication of content in all several formats may be full (at it was uploaded, bay be transcoded), regular (as now), lowres or trunked (means lowres trunked)
    - Proceed to make public the content according to rules
    - Proceed to post them on EDL

6.4.1 User Roles/capabilities

In addition to existing roles:

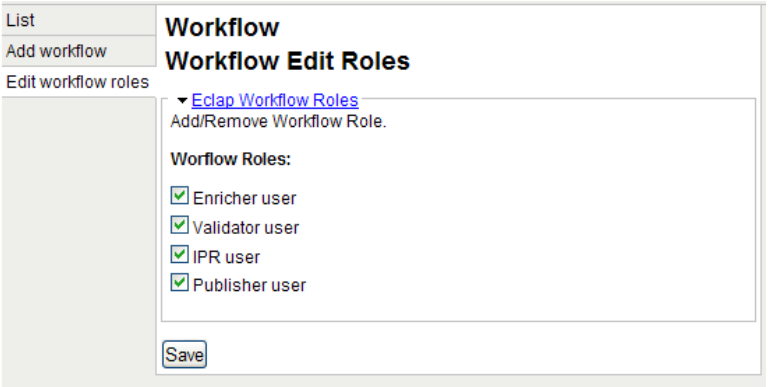
- anonymous user,
- authenticated user
- trusted user (to automatically publishing in AXDBV4 skipping the moderation of the administrator:
- admin: the drupal ROOT, only on DRUPAL
- group manager

The ECLAP Workflow will add a new set of roles and will define a specific permission.

- **WF IPR user:** responsible for the definition and validation of IPR issues for its corresponding partner
    - An user can be IPR for a specific partner
    - for example IPRRESP-CTA, IPRRESP -UVA are combinations of the IPR role and affiliation, so that we are going to have 20 different IPR roles
- **WF ENRICHER User:** user enabled to make enrichment on metadata, changes on metadata, all the changes are logged
    - An user can be ENRICHER only for a certain number of languages
    - for example ENRICHER-IT, ENRICHER-EN are a combinations of the ENRICHER role and enabled languages, so that we are going to have 13 different ENRICHER roles
- **WF VALIDATOR user:** user enabled to validate the metadata, all the metadata have to be singularly validated to push the object on the approval phase
    - An user can be VALIDATOR only for a certain number of languages

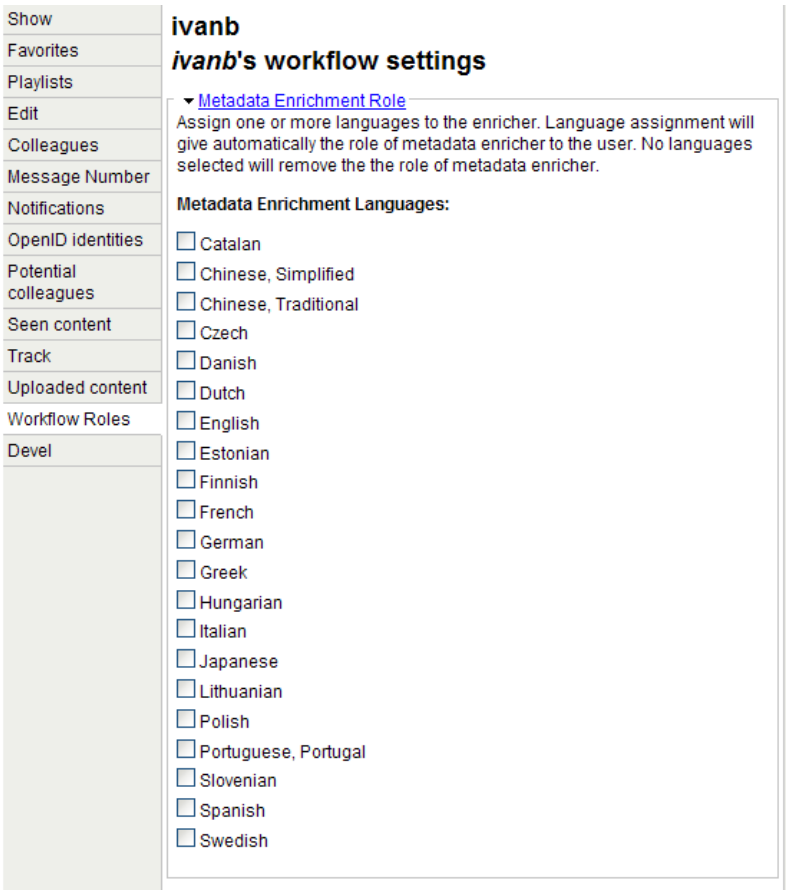
  - for example VALIDATOR-IT, VALIDATOR-EN are a combinations of the VALIDATOR role and enabled languages, so that we are going to have 13 different VALIDATOR roles
- **WF PUBLISHER user:** may take final decision to publishing on ECLAP.EU and on Europeana
  - An user can be PUBLISHER for a specific partner
  - for example PUBLISHER-CTA, PUBLISHER-UVA UVA are combinations of the PUBLISHER role and affiliation, so that we are going to have 20 different IPR roles

All these roles will be associated with the **eclap workflow** permission. The management and activation of these roles will be possible by accessing to the workflow administration panel and selecting the **Edit workflow roles** tab. A panel with this new roles will be displayed and the administrator will activate them by checking the corresponding checkbox and then saving. It is sufficient to select one role to activate automatically the workflow permission.

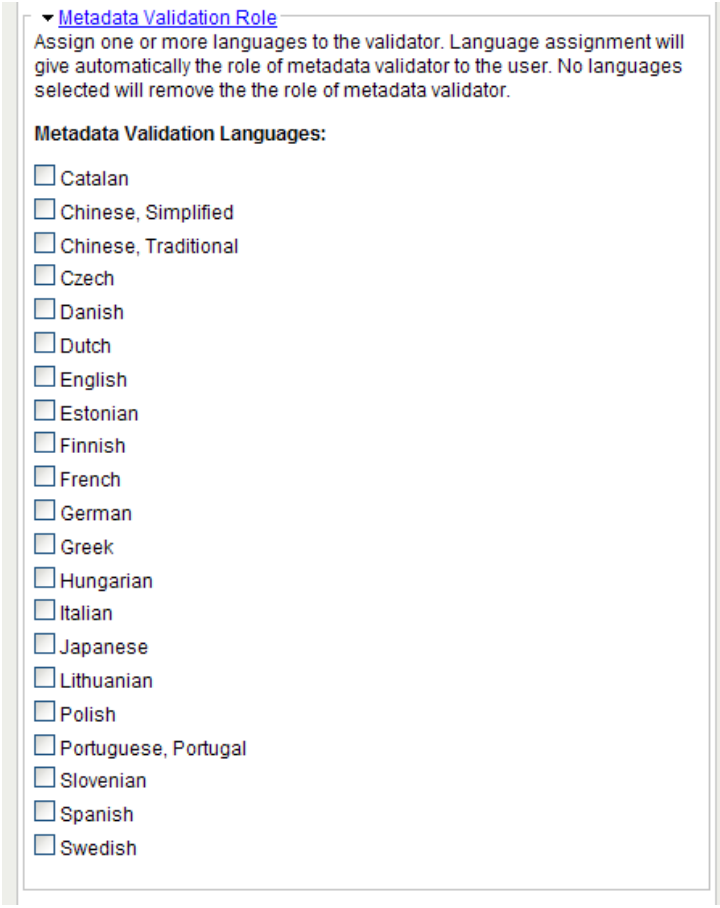


Regarding the activation of roles for user, the administrator will access to the **Workflow Roles** tab in the User Profile page. The tab will display sections related to roles as reported in the following pictures:

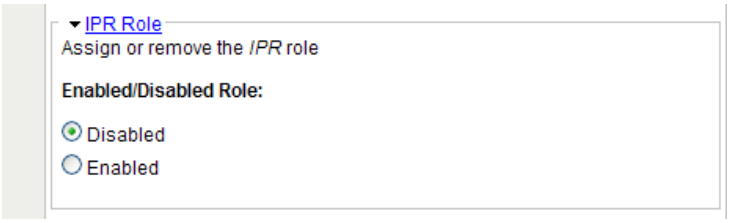
Metadata Enrichment Role
This section will allow to assign the WF Enricher role and select the enrichment languages. A language will be sufficient to assign automatically the role, whereas if any language will be not selected the role will be removed.



Metadata Validation Role
This section will allow to assign the WF Validator role and select the enrichment languages. A language will be sufficient to assign automatically the role, whereas if any language will be not selected the role will be removed.



IPR Role
This section will allow to assign the WF IPR role. The role will be associated with the affiliation declared by user in own profile.

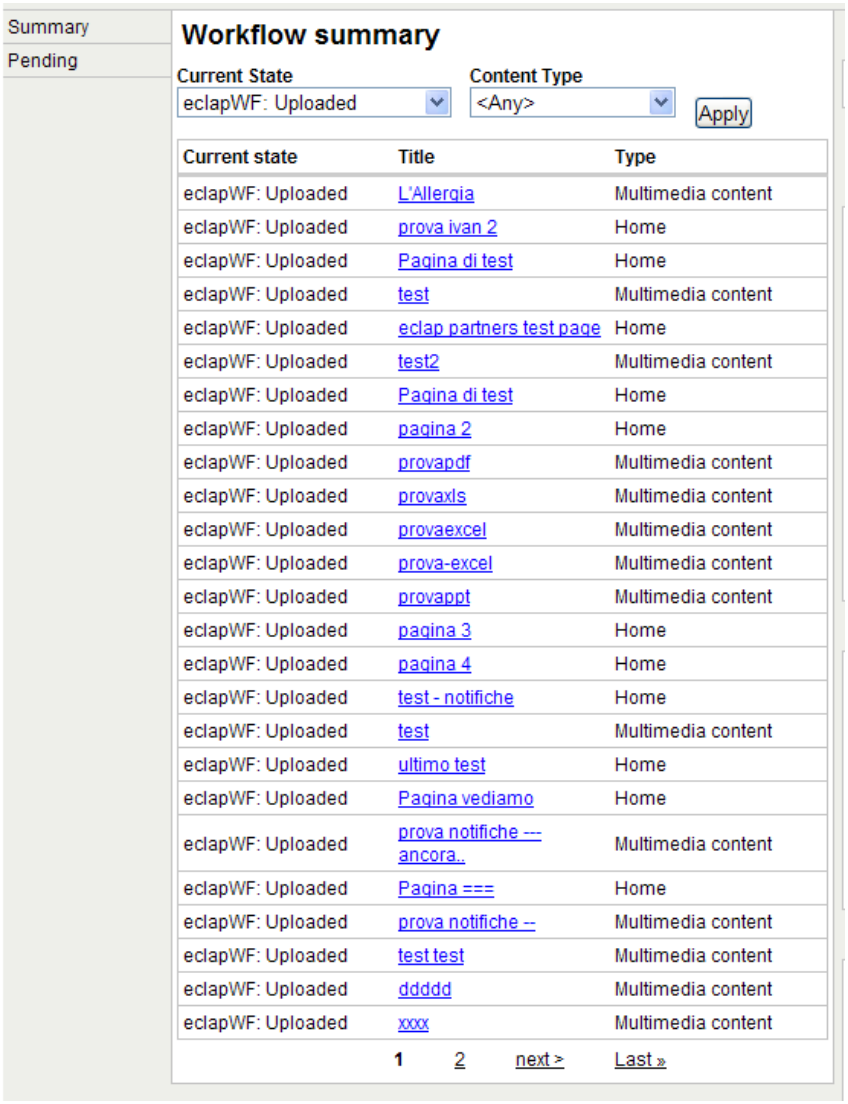


Publisher Role
This section will allow to assign the WF PUBLISHER role. The role will be associated with the affiliation declared by user in own profile

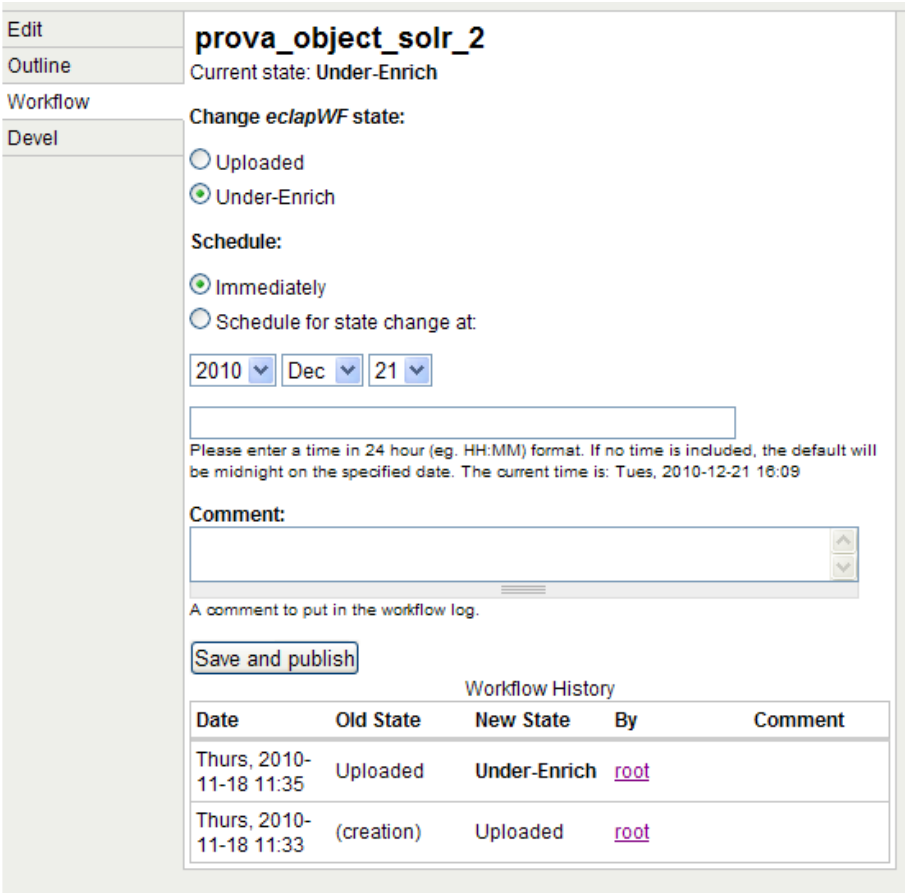
6.4.2 ECLAP workflow administration tools

The native drupal workflow module provides several administration panel to manage workflow. Hereby, these panels will described.

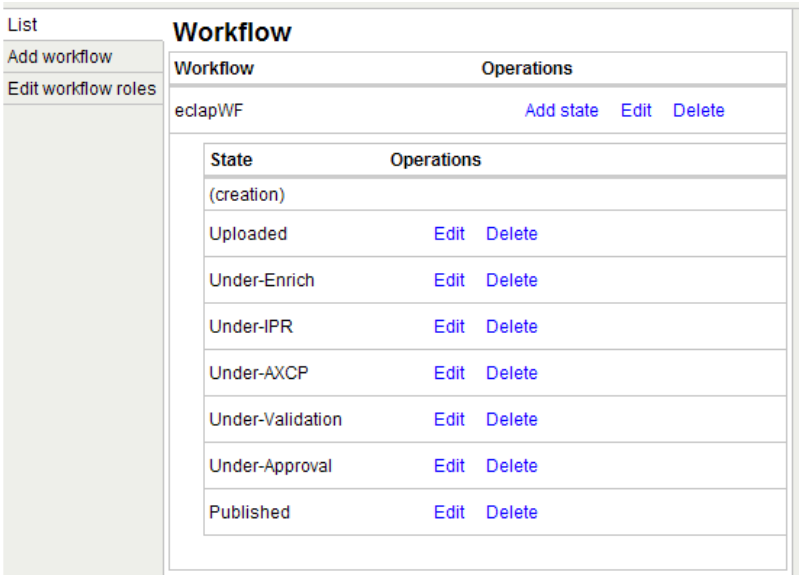
The **workflow summary** allows the administration to check the workflow status of contents and manually perform transition in order to resume/correct/progress the workflow status.



A Workflow panel is associated with the content in order to report the current status, possible workflow transition and the history of transitions (status name, user and comment, time and date). Such panel is available only for the administrator.



The administrator has a workflow editor to define and modify the workflow status and transitions:



6.4.3 Drupal Rule module

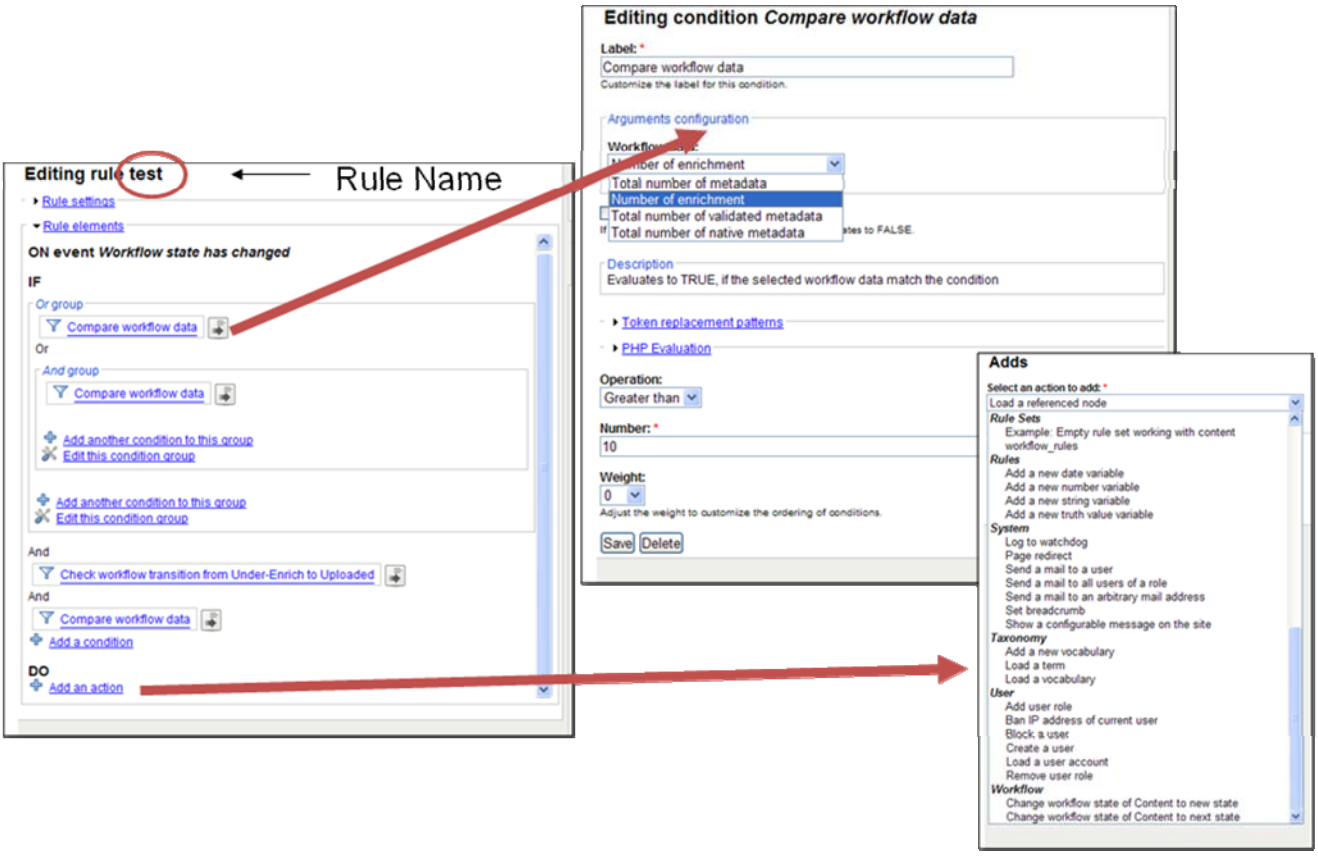
The Drupal Rule module in conjunction with the workflow module will allow defining and associating trigger rules/actions with transition: i.e. send a notification mail when transition passes from A to B status. This functionality will allow to orchestrate all ECLAP activities/tools on metadata enrichment and validation, licensing and content publication. The native Drupal rule system allow writing rule in terms of

single condition, multiple or grouped conditions and actions to perform. A Drupal rule implements the "if then" statement of programming languages. Some Drupal modules provides ready to use actions and conditions to test, however specific actions and conditions will be added to the ECLAP workflow module in order to extend the workflow management rule-based.
Example of condition test could be:

- Testing number of validated metadata against a pre-defined value (i.e. a validation threshold)
- Testing number of enriched metadata against a pre-defined value (i.e. a enrichment threshold)
- Testing subset of metadata number by language
- Testing workflow data against a value
- Comparing workflow data

Possible action to perform:

- Notification of activities to workflow users selecting them on the basis of the assigned workflow role
- Invoking AXCP rule for metadata analysis



6.4.4 ECLAP workflow web service

A service hosted on web portal will be developed to allow external tools like AXCP grid interacting with workflow to change, read, restore the workflow status of an object and perform activities to the content. A specific URL and a set of parameters will be used such as:

- **op**: the workflow operation, possible values could be
  - *Get* to read the current status
  - *Set* to write/ask for a transition
- **objid**: the identifier of the content
- **id**: the identifier of the tool making the request
- **transition**: the requested status for a transition

In this way, Drupal URLs can be created to:

1. ask for (get) the current workflow status for the object 2345 made by the tool n (id):

   http://portalsite/drupal/?q=eclapworkflow/wfservice&op=get&objid=2345&id=n

   The response of the service will be the status of the object when the tool n has the eclap workflow permission, otherwise a FALSE value

2. ask for (set) a status transition on the object 2345 requested by the tool n:

   http://portalsite/drupal/?q=eclapworkflow/wfservice&op=set&objid=2345&id=n&transition=status

   The response of the service will be a TRUE value indicating the right execution of transition, otherwise FALSE.

6.4.5 ECLAP workflow-driven tools

The ECLAP workflow will drive internal (accessible from ECLAP) and external tools (AXCP Grid) involved in metadata enrichment and validation, content publication and licensing. Internal tools will be accessible by users who have the ECLAP workflow permission or a workflow role. In particular, each tool will be associated with a specific workflow role:

- Metadata Editor (Enrichment mode): only users with WF Enricher role will work fully with this tool in order to add/edit metadata
- Metadata Editor (Validation mode): only users with WF Validator role will work fully with this tool in order to validate/invalidate metadata
- IPR Wizard: only users with WF IPR role will work fully with this tool
- Approving for Publication tool: only users with WF Publisher role will work fully with this tool

External tool like AXCP grid will be used to perform automatic enrichment on metadata, for instance performing translation activities, taking decisions or statistical analysis. Then, AXCP rules will be defined and used in conjunction with the workflow web service in order to interact with the ECLAP workflow like an ECLAP workflow tool.

By using the workflow roles and the functionalities derived from the workflow module of Drupal will be possible to generate lock-unlock mechanism that will avoid the opening of the same tools (Metadata editor, IPR Wizard) at the same time from two different persons.
This will allow:

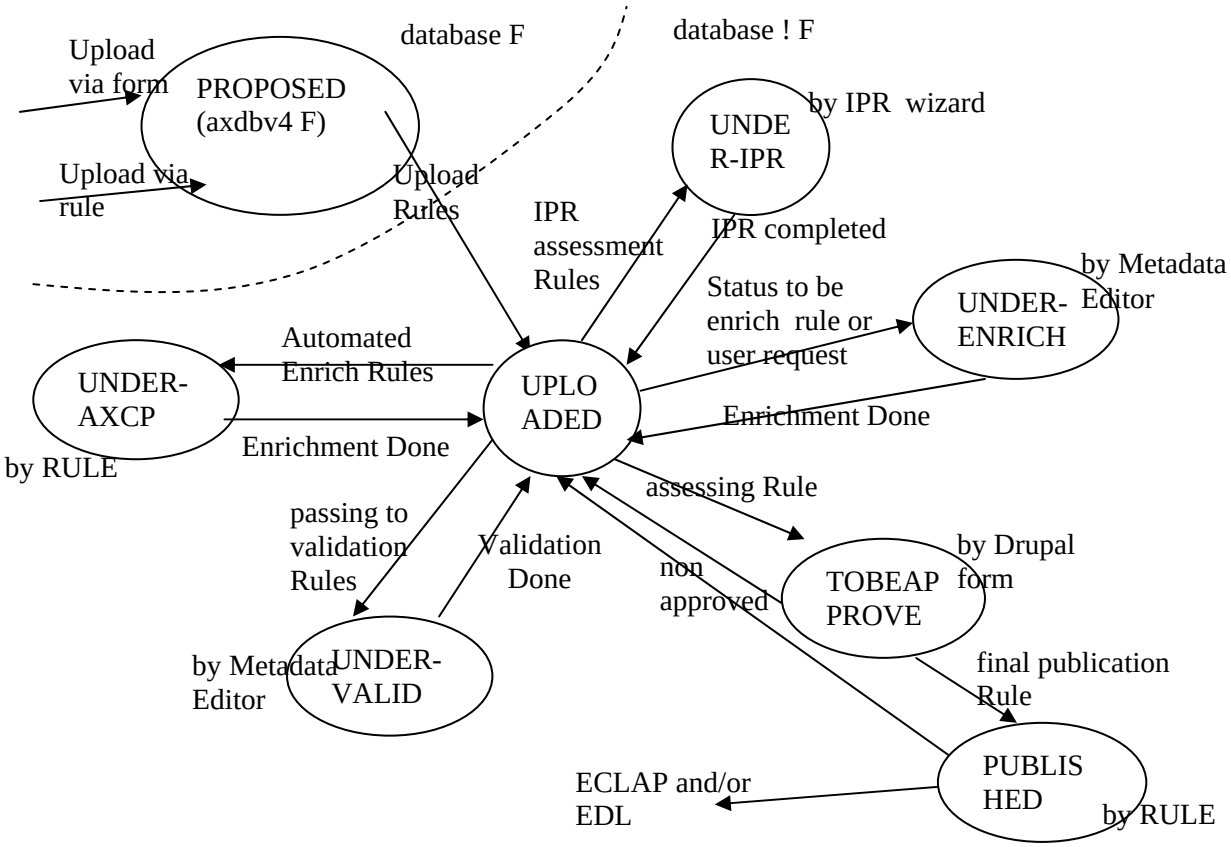
- tracing all activities
- tracing the metadata status
- taking decision (i.e. an object has a good number of metadata where good could be a predefined percentage of required metadata)
- triggering actions

All these activities will be possible by defining a specific workflow status diagram and database tables where all actions on metadata, object status, user/tool involved will be registered. More details about this will be described in the following sections.

6.4.6 ECLAP workflow model

The ECLAP workflow will be coded into the system by using DRUPAL workflow module and it will take into account of the status variables including **workflowtype**:

The general workflow will be coded as in the following graph:



- Un-trusted User Upload → PROPOSED
  - Admin verifies content (Moderated Upload)
- Ingestion or once accepted by Admin → UPLOADED
- From UPLOADED the status can pass to →
  - UNDER-IPR definition by human (using a tool)
  - UNDER-AXCP by computer (back-office)
  - UNDER-ENRICHMENT by human (using a tool)
  - UNDER-VALIDATION by human (using a tool)
- To return at UPLOADED when an activity will be completed
  - Workflow status could change continuously among UNDER-xxx status
- If (*ApprovalCondition* is true) then TOBEAPPROVED
  - *ApprovalCondition*: testing if the content matches conditions on metadata, validation status, IPR
  - Validated fields cannot be changed any more, they can be retouched only if the Administrator put the object back to the workflow status of UPLOADED
- Once Approved by PUBLISHER → PUBLISHED
  - Content will be published according the workflow-type

Please note that Rules are only used to assess the status and stimulated notification and work, not for the general changing of the status that is performed into PHP/JSP tools mainly.

6.4.6.1 Coding Workflow STATUS and transitions

According to the diagram the STATUS and transition will be:

- PROPOSED:
  - the object has been proposed and loaded on the AXMEDIS axdbv4F database

  - this status is reached via an Ingestion or Upload form defining/ingesting some metadata, file, groups and taxonomy, etc. The publication flag of drupal form is IMPOSED by default at PRIVATE if no explicit request is provided. Content without group is public for default.
  - The status PROPOSED is set by the AXCP rule doing the upload on the database.
  - There are some users that can have the right to directly skip this phase and pass directly to the AXDBV4 (publishing) database
- UPLOADED:
  - the database F (as now) is periodically analysed (by HUMAN as now) to see if there are new objects on the AXDBV4F in the status of PROPOSED to pass in UPLOADED.
  - objects that pass this phase go on the status of UPLOAD passing them on the AXMEDIS non F database e published on the DRUPAL database without making them PUBLIC, they are private of the groups. The following values are set with meaning described in the following.
    - MDENRICHED=0;
    - MDVALIDATED=0;
    - MDNUMBER = number of native metadata
    - MDORIGINAL = number of native metadata
    - ECLAP-Published=false;
    - EDL-Published= false;
    - IPR-ECLAP=false;
    - IPR-EDL = false;
    - IPR fields cleaned
    - The object status is set to PROPOSED
- UNDER-IPR:
  - Assigned to be on IPR
  - A periodic rule/query has to identify the **last recently updated objects** that are in the status of UPLOADED and do not have the IPR solved; other constraints can be imposed on the number of validated MD, etc...
  - the IPR definition/validation is requested via a notification/mail sent to the IPR responsible of the partner that is the OWNER of the object, the PUBLISHER
  - completing the process may set to true either:
    - IPR-ECLAP solved: true/false
    - IPR-EDL solved: true/false
- UNDER-AXCP:
  - a periodic AXCP rule analyses the objects that are in the status of UPLOADED and MDENRICHED=0 and takes a decision about passing them to AXCP for automated enrichment. If an object has to be sent to AXCP for automated processing it has to be forced to have ENRICHED=0.
  - The automated enrichment is focussed on
    - producing automated translations of metadata
    - Metadata update (content versioning)
    - other issues to be determined
  - the rule imposes variable MDENRICHED to M where M is the number of fields that have been changed.
- UNDER-ENRICHMENT:
  - a periodic AXCP rule or a Drupal internal rule analyses objects that are in the status of UPLOADED (and may have MDENRICHED>0) and takes a decision about passing them for manual enrichment.. The passing is performed by sending a notification to some user with WF ENRICHER role
  - The manual enrichment is focussed on producing manual translations of metadata, MD for MD, singularly as described in the following regarding the above augmented table DCMI
  - the tool for the manual enrichment (Metadata Editor) also increases MDENRICHED on the basis of the number of MD enriched/changed by the user in the section for that object.
  - The MPEG-21 object is not rebuilt.

- UNDER-VALIDATION:
  - a periodic AXCP rule or a Drupal internal rule analyses the objects that are in the status of UPLOADED (and may have MDENRICHED >ALFA) and takes a decision about passing them into validation step. The passing is performed by sending a notification to user withWF VALIDATOR role
  - The validation is focussed on accepting as valid metadata, metadata by metadata, singularly
  - the tool for the manual validation (Metadata Editor) increases MDVALIDATED on the basis of the number of validated metadata by setting the MDENRICHED=K, where K is the number of non validated MD.
  - The MPEG-21 object is not rebuilt.
- TOBEAPPROVED:
  - a periodic AXCP rule or a Drupal internal rule analyses objects that are in the status of UPLOADED (and may have MDVALIDATED >BETA and provide IPR solved in some measure)
  - the rule takes a decision about passing them from the validation to the user with WF PUBLISHER role. The request of publication is performed by sending a notification.
  - The objects are thus passed in the TOBEAPPROVED workflow status
    - The object status is updated to VALIDATE
  - if the object is not accepted by the PUBLISHER,
    - the workflow status has to return back to the UPLOADED value
    - The object status is still set to PROPOSED
    - MDENRICHED=M, according to the number of MD filled and not validated
    - MDVALIDATED =K, according to the number of MD validated
- PUBLISHED:
  - A Final Publication rule/tool analyses the APPROVED objects and:
    - Set to public the DRUPAL private flag
    - rebuild the object on the basis of the last version of the Metadata and information
    - generate the Mobile version.
    - make them in the status of PUBLISHED for some of the portals
      - ECLAP-Published=true and EDL-Published=true;
        - make it accessible on EDL front end for the EDL OAI-PMH probe.
      - ECLAP-Published= true and EDL-Published= false;
      - other values are not possible.
  - An ADMINISTRATIVE user may make enrichment/edit on a PUBLISHED object
    - the MD are changed/updated periodically
  - An ADMINISTRATIVE user may remove from the status of PUBLISHED some object, forcing it to
    - STATUS = UPLOADED
    - MDENRICHED=M, according to the number of MD filled and not validated
    - MDVALIDATED =K, according to the number of MD validated
    - Drupal flag to PRIVATE
    - ECLAP-Published=false;
    - EDL-Published= false; removing also from EDL front end.
  - Any user with WF ENRICHER role may update some objects when PUBLISHED (only not yet validated fields). The system does not ask them to do it. If an user modifies an object changing/adding metadata, the variables are updated to
    - MDENRICHED=M, according to the number of MD filled and not validated
    - MDVALIDATED =K, according to the number of MD validated
    - Validated fields cannot be changed any more, they can be retouched only if the Administrator put the object back to the workflow status of UPLOADED and object status is set to PROPOSED.

To have the status UNDER-XX permits to avoid the changes of MD during the enrichment and validation. So that when a given rule takes a decision to change status to a given object it has to do it before making any other changes in the object.

Example of workflow
Simple Content workflow for Full Object

1. Content is ingested via Web Upload or Ingestion with a few MD/info
2. Multilingual MD are automatically produces
3. One or more experts are involved enrichment and/or their validation
4. IPR has to be defined, the responsible is involved to access and defined them on the IPR wizard
5. Once the quality if reached (MD+Sem.info+IPR) the content is made public on ECLAP SSP and/or on Europeana according to their formats and shapes
    - On ECLAP the content may be made public earlier

For Empty Object, off-line injection of content or via Edit object → Update Resource has to be done before publish

6.4.6.2 Data model description

As stated before, the workflow module of Drupal will be use to define and manage the workflow model. Since, metadata terms are stored in different tables (DCMI, rootobjectinfo, optional fields, etc.,) will be enriched/changed/edited modified, all changes and additional information regarding the life cycle of objects have to be traced. For these reason two **MetadataWorkflow** tables will be used: *workflow_metadata* and *workflow_info*. These tables will be synchronized to wokflow model and updated by the wokflow-driven tools and AXCP Grid.

Please note that combining AXOID+ dbtable+ID will be possible to get the effective metadata name and value and language if defined for that value, etc. This means that this three values will be use to link the changes with the effective instance of metadata.

Workflow_metadata Table
The workflow_metadata table will be used to manage the workflow life-cycle of each content and will be defined as following:

- **mid**: an auto incremental id
- **AXOID**: the id of AXMEDIS mp21 object
- **Dbtable**: database.table name (in effect several databases will be available like: axdbv4.dcmi, axdbv4.optionalfield (tax and groups), rootobjectinfo, etc...
- **ID**: id reference to the above mentioned line in the dbtable
- **Status**: this is the status of the single metadata to be not confused with the status of the whole object:
    - PROPOSED (just uploaded and written for the first time), value = 0
    - VALIDATED (when it has been validated by an human by using the Metadata Editor) value=1
- **RespUID**:
    - Responsible Drupal UserID (who has validated/who has to validate),
- **ValidationDate**:
    - Date of validation
- **ProposerUID**:
    - Proposed Drupal UserID (who has proposed, uploaded, generated by translation which tool has been used via the AXCP we are going to use more than one tool)
- **ProposedDate**:
    - Date of proposal (last date of changed value)
- **Production**: The state of production coded as follow:
    - GENERATED (0): produced by AXCP
    - MANUAL (1): provided, via Metadata Editor
    - UPLOADED (2): provided since the beginning via upload form, web page

- PROVIDED (3): provided via some database such as XML, XLS, or crawling, batch ingestion or other files. even OAI-PMH

mid	axoid	dbtable	id	status	respUID	validationDate	proposerUID	proposedDate	production
18	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21365	0	0	0000-00-00 00:...	52	2010-09-17 16:...	2
17	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21364	0	0	0000-00-00 00:...	52	2010-09-17 16:...	2
16	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21363	0	0	0000-00-00 00:...	52	2010-09-23 11:...	1
15	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21362	0	0	0000-00-00 00:...	1	2010-09-22 16:...	1
14	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21361	0	0	0000-00-00 00:...	52	2010-09-17 16:...	2
13	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21360	0	0	0000-00-00 00:...	52	2010-09-17 16:...	2
12	urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	dcmi	21359	0	0	0000-00-00 00:...	1	2010-10-01 18:...	1

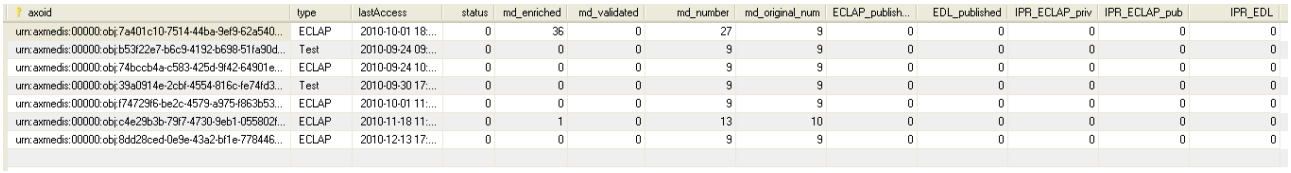
```
CREATE TABLE  `axdbv4`.`workflow_metadata` (
  `mid` bigint(20) unsigned NOT NULL AUTO_INCREMENT,
  `axoid` varchar(60) NOT NULL,
  `dbtable` varchar(60) NOT NULL,
  `id` bigint(20) unsigned NOT NULL,
  `status` int(10) unsigned NOT NULL DEFAULT '0',
  `respUID` int(10) unsigned NOT NULL DEFAULT '0',
  `validationDate` timestamp NOT NULL DEFAULT '0000-00-00 00:00:00',
  `proposerUID` int(10) unsigned NOT NULL DEFAULT '0',
  `proposedDate` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP,
  `production` int(10) unsigned NOT NULL DEFAULT '0',
  PRIMARY KEY (`mid`)
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

Workflow_info Table

The workflow_info table will be used as track changes for metadata and will be defined as following:

- AXOID: aligned with RootObjectInfo:
- type: it is the chosen Workflow type
  - ECLAP (only),
  - Europeana (publication on ECLAP and Europeana Digital Library),
  - Test (just for test),
  - Internal (internal of the project)
- last access: it is a Timestamp data that mark last changes on this object, to set up rule based on **Last Recently Updated** changes
- STATUS; The current wf status of object
- MDENRICHED: integer, default 0
  - 1: if passed under AXCP once, we can increment on the basis of the number of passages
- MDVALIDATED: integer, default 0
  - N means to have N validated fields (counting only DC and other fields useful for Europeana)
- MDNUMBER: it is the Number of Metadata
  - a number counting the total number of metadata field set/available for this content into DCMI and Optional Fields only, excluding number of groups. It is updated every time changes will be done
- MDORIGINAL: it is the native number of metadata associated with the object by the upload or ingestion process.
- EDL-Published: true/false
  - if the object has been posted on the EDL front end server to make it accessible for OAI-PMH probe of EDL
- ECLAP-Published: true/false
  - if the object has been published on the ECLAP front end server to make it accessible
- IPR-ECLAP-PRIV solved: true/false

  - Per la pubblicazione su ECLAP possiamo chiedere cose piu'blande ma certamente con vari tipi di formati, etc. PRIV singifica che rimane private dei gruppi di ECLAp cioe'accessibile per gli utenti registrati su ECLAP solo.
- IPR-ECLAP-PUB solved: true/false
  - When true, object will be public on ECLAP portal for all user.
- IPR-EDL solved: true/false
  - When true, object will be public on Europeana Digital Library



axoid	type	lastAccess	status	md_enriched	md_validated	md_number	md_original_num	ECLAP_publish...	EDL_published	IPR_ECLAP_priv	IPR_ECLAP_pub	IPR_EDL
urn:axmedis:00000:obj:7a401c10-7514-44ba-9ef9-62a540...	ECLAP	2010-10-01 18:...	0	36	0	27	9	0	0	0	0	0
urn:axmedis:00000:obj:b53f22e7-b6c9-4192-b698-51fa90d...	Test	2010-09-24 09:...	0	0	0	9	9	0	0	0	0	0
urn:axmedis:00000:obj:74bccb4a-c583-425d-9f42-64901e...	ECLAP	2010-09-24 10:...	0	0	0	9	9	0	0	0	0	0
urn:axmedis:00000:obj:39a0914e-2cbf-4554-816c-fe74fd3...	Test	2010-09-30 17:...	0	0	0	9	9	0	0	0	0	0
urn:axmedis:00000:obj:f7472f6-be2c-4579-a975-f863b53...	ECLAP	2010-10-01 11:...	0	0	0	9	9	0	0	0	0	0
urn:axmedis:00000:obj:c4e29b3b-79f7-4730-9eb1-055802f...	ECLAP	2010-11-18 11:...	0	1	0	13	10	0	0	0	0	0
urn:axmedis:00000:obj:8dd28ced-0e9e-43a2-bf1e-778446...	ECLAP	2010-12-13 17:...	0	0	0	9	9	0	0	0	0	0

```
CREATE TABLE  `axdbv4`.`workflow_info` (
  `axoid` varchar(255) NOT NULL,
  `type` varchar(45) NOT NULL,
  `lastAccess` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP,
  `status` int(10) unsigned NOT NULL DEFAULT '0',
  `md_enriched` int(10) unsigned NOT NULL DEFAULT '0',
  `md_validated` int(10) unsigned NOT NULL DEFAULT '0',
  `md_number` int(10) unsigned NOT NULL DEFAULT '0',
  `md_original_num` int(10) unsigned NOT NULL DEFAULT '0',
  `ECLAP_published` tinyint(1) NOT NULL DEFAULT '0',
  `EDL_published` tinyint(1) NOT NULL DEFAULT '0',
  `IPR_ECLAP_priv` tinyint(1) NOT NULL DEFAULT '0',
  `IPR_ECLAP_pub` tinyint(1) NOT NULL DEFAULT '0',
  `IPR_EDL` tinyint(1) NOT NULL DEFAULT '0',
  PRIMARY KEY (`axoid`)
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

6.4.6.3 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
EclapWorkflow	Drupal module	It extends the native drupal workflow module
Worklow	Drupal module	Native workflow of Drupal
Rules	Drupal module	Native Rule module of Drupal, used to create triggering rule

Third-party software	**Version**	**Notes**

6.5 Metadata Editing, Metadata Editor (DSI)

Metadata editor will be the tool for enriching and validating metadata. Since enrichment and validation activities will be governed by ECLAP Workwlow, the Metadata Editor will be a workflow-drive tool.
It will allow:

- Opening workflow session by executing:
  - WF Under Enrich transition in event of enrichment activity
  - WF Under Validation transition in event of validation activity
- Closing workflow session and executing the WF Upload transition
- Modifying the metadata values (proposed during the content upload)
- Filling metadata in other languages
- Adding more fields and values
- Validating metadata, it will be consider acceptable
- Invalidating metadata if it will be consider not acceptable
- Comparing metadata in different languages
- Manual translation of metadata in other languages
- Easy recognition of made changes by means of text highlighting
- Undo changes
- Trace each action by recording them in the workflow tables:
  - Workflow_info table
  - Workflow_metadata table
- Viewing current workflow status of content, metadata counters (i.e. number of current metadata, number of validated metadata, number of native metadata)
- Viewing the name of user who made last change on metadata
- Applying all made changes by saving changed metadata into databases
- Updating index archive in event of changes
- Checking for made changes before leaving session
- Accessing in read-only mode if user has not the permission to edit (eclap workflow permission missing or content already in use by another WF user)
- Browsing the assigned objects by workflow

Metadata editor will be activated by the user:

- clicking on a direct link according to requests received via notification
- spontaneously by using |Edit Object| and then |Edit Metadata|
- when needed for validation by using |Edit Object| and then |Validate Metadata|

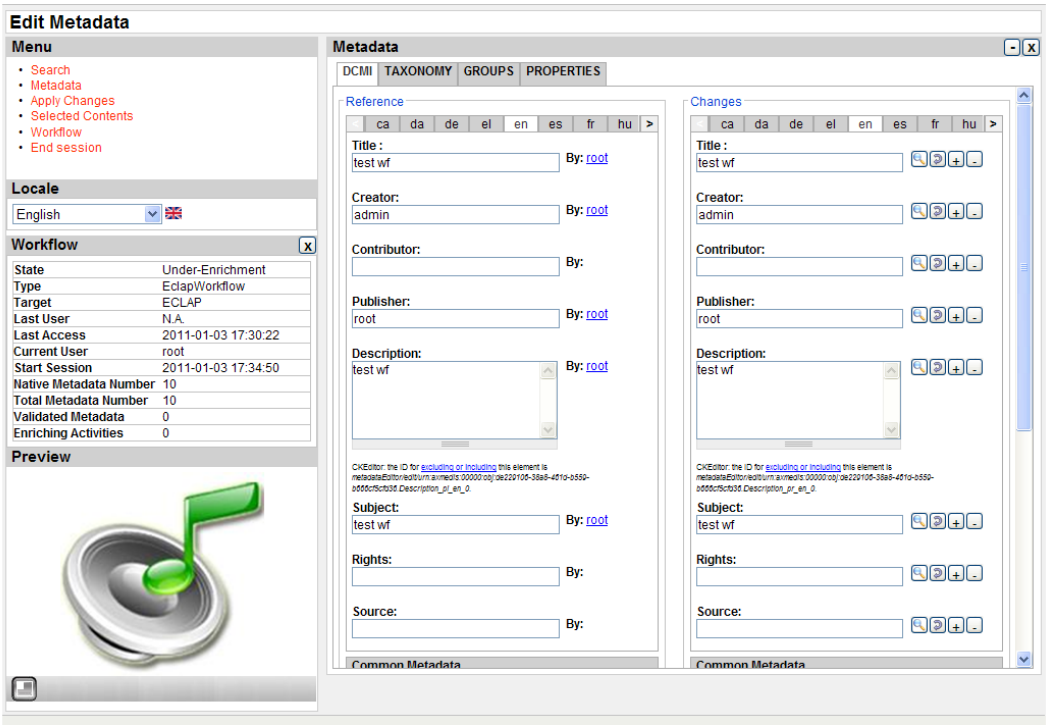
Only users with ECLAP workflow permission will be able to work fully with the editor. However, according to the user role, the editor will work in Enrichment mode for the WF Enricher role and in Validation mode for WF Validation role. Users without a workflow role could access anyway to the editor only in read-only mode.

6.5.1 Metadata Editor Web Page

The metadata editor web page will be structured as a 2 columns page.
The right column will display a set of blocks for:

- **Menu**: this block will provide the access to main functionalities:
  - **Search** (available only for the administrator) will open/close a panel in the middle area with a search form for content searching
  - **Metadata** will open/close a panel in the middle area with all metadata divided into tabs
  - **Apply changes** will send to the server all made changes on metadata both update and modifications.
  - **Selected contents** will open/close the block with all contents assigned by the workflow
  - **Workflow** will open/close the block of workflow properties and info
  - **End Session** will send to server the end of activity to close the workflow session
- **Locale**: this block will display a language selector (default language will be the language selected by the user in the main page) to change the language of the page
- **Workflow**: this block will display workflow information.
- **Preview**: this block will embed the content player
- **Selected Contents**: this block will display the list of content assigned by workflow

The following picture show the layout of metadata editor page:



6.5.2 Metadata Panel

The panel will show the metadata edit area and will be organized in tabs to organize metadata set. Possible metadata set will be:

- **DCMI**: Dublin core set
- **Taxonomy**: classification terms
- **Groups**: List of Groups associated with content and/or Public flag
- **Properties**: Technical set of metadata accessible obly by administrator.

Each tab will show the list of metadata and iconized controls. To help the user each control will have a tip with the name of action.

6.5.2.1 DCMI Metadata Panel

The DCMI panel will be divided into two sub-area: Reference and Changes.
The Reference fields set will show the current metadata values in read-only mode and for each of them the username who made the last change/edit (By). The Changes field set will show a copy of reference set where the user can edit/adding values. In both case each metadata will be displayed in a text box with a label reporting the metadata field name. In the changes set each metadata will have also a set of iconized buttons that will allow to perform:

- **View**: It will open a popup dialog displaying a better readable string of metadata
- **Undo**: Reset the value to the fist time displayed string
- **Add more**: it will add a new text box with own button.
- **Remove**: it will remove the text box/metadata value
- **Validate/Invalidate**: it will validate/invalidate the metadata

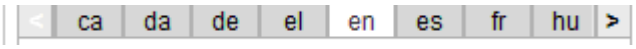
The add and remove buttons will be displayed with multiple metadata.
The validate/invalidate button will be displayed/enable only for administrator and user with WF Validator role.

During the enrichment every time a user made a change or edit a new metadata the text box/selector background color will be red

During validation, the text box/selector background color of validated metadata will be green, otherwise white.

Every time a user invalidate a validated metadata the text box/selector background color will be red (as a metadata change)

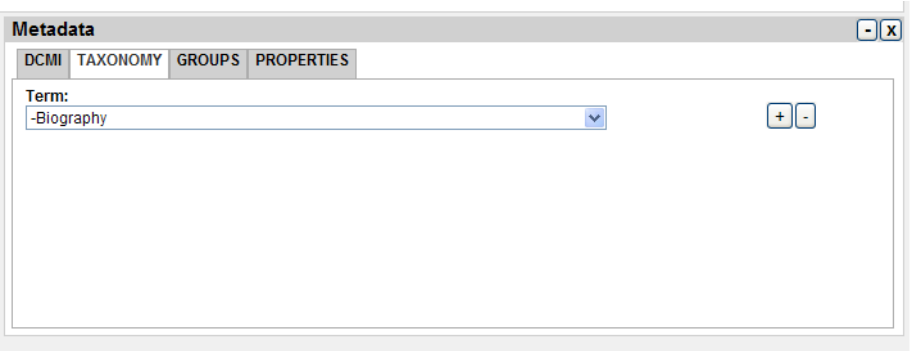
A language tabs will allow browsing on available languages in both views and this will allow to compare a language with an another or to help the user in translating the metadata.



More buttons/controls could be added to enhance the GUI usability (i.e. clear text).

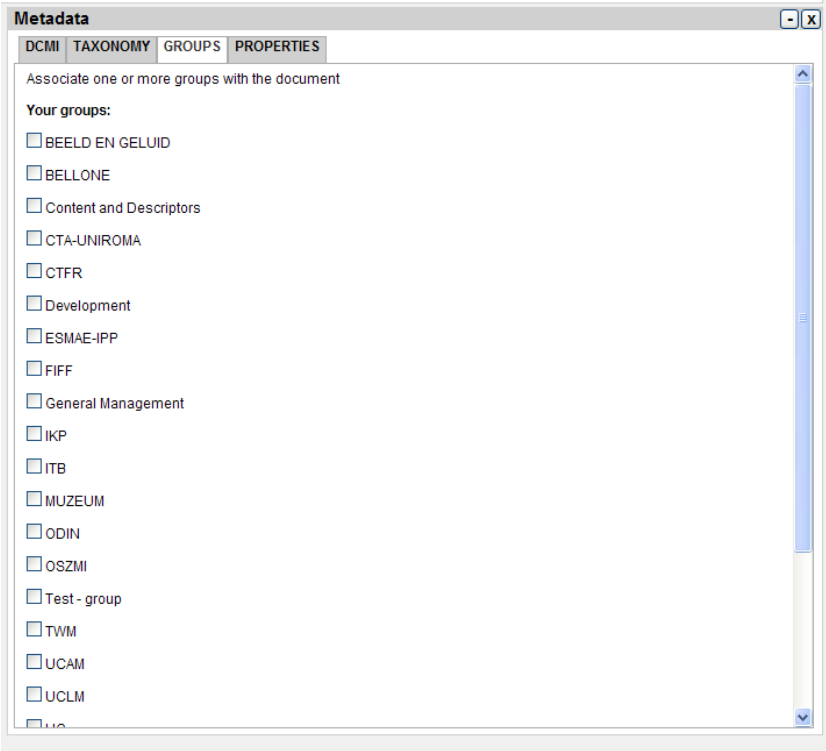
6.5.2.2 Taxonomy Metadata Panel

The Taxonomy panel will allow to add/remove classification terms by means a text selector (single selection) and add/remove buttons. Every time an existing value will be changed by selecting a different one, the text selector will be red highlighted to mark that it has been changed/removed.



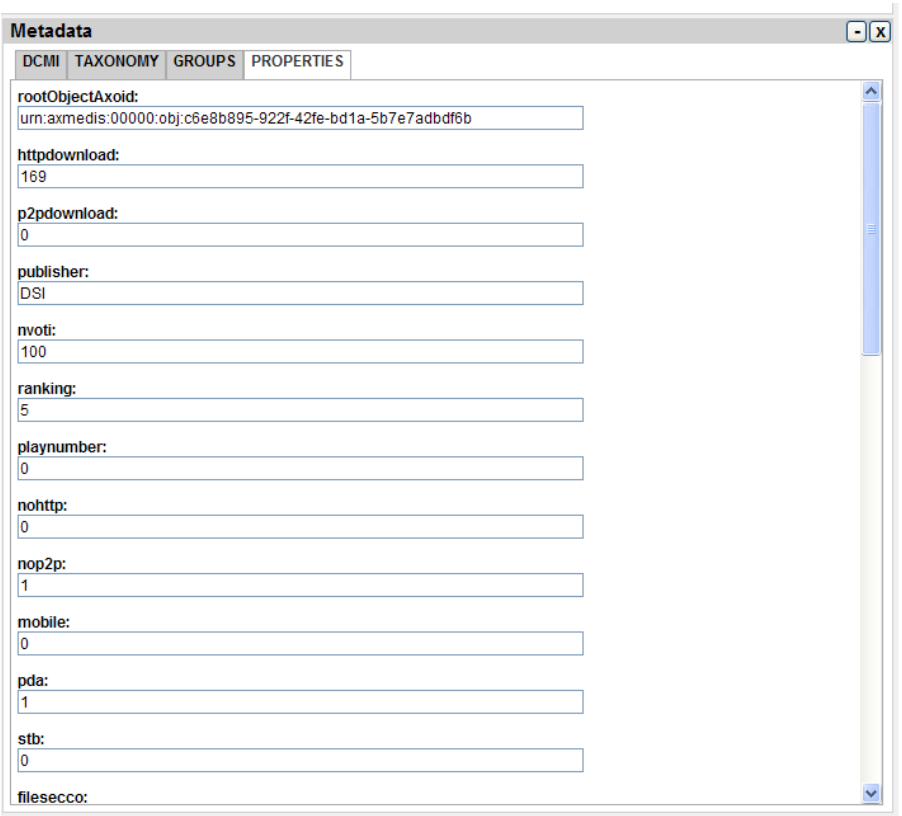
6.5.2.3 Groups Metadata Panel

The Groups panel will display the list of available groups. The selection/deselection will be possible by enabling/disabling checkboxes. When a checked checkbox is disabled, it will be red highlighted to mark that it has been changed/removed.



6.5.2.4 Properties Metadata Panel

The Properties panel will display the technical metadata. This panel will be available only for the administrator.



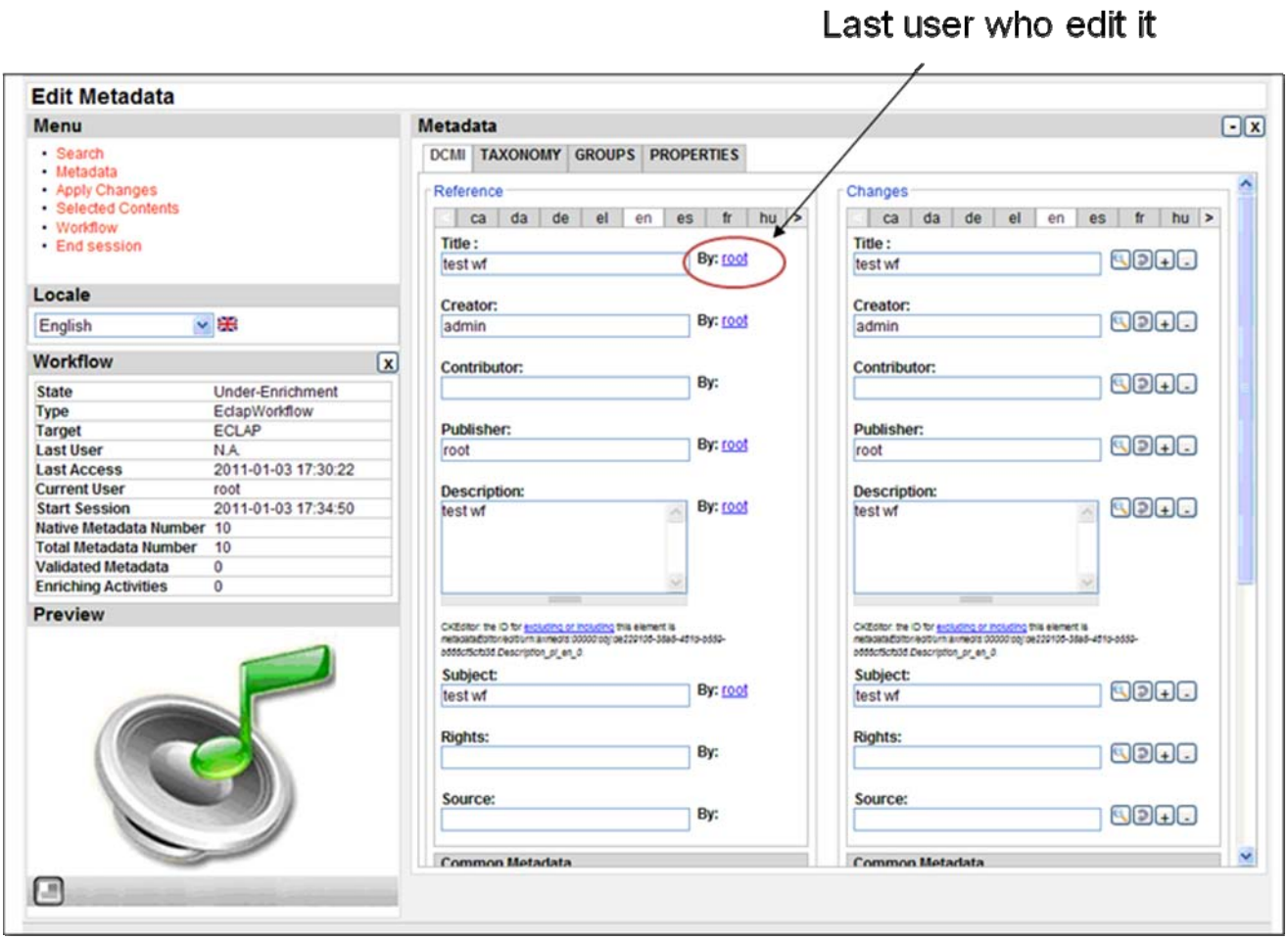
6.5.3 Workflow Block

This block will display a workflow report showing:

- **State**: the current state of content according the workflow status
- **Type**: the workflow model under usage (EclapWorkflow)
- **Target**: the workflow target of content (Eclap, Europeana & Eclap, Test, Internal)
- **Last access**: date and time of last editing
- **Last user**: who made the last editing session
- **Current user**: name of user who is currently editing the object
- **Start Session**: date and time of current editing session
- **Native Metadata Number**: the number of native metadata
- **Total Metadata Number**: the current number of metadata
- **Validated Metadata**: the current number of validated metadata
- **Enriching Activities**: how many time the content has been modified

6.5.4 Metadata Editor Enrichment mode

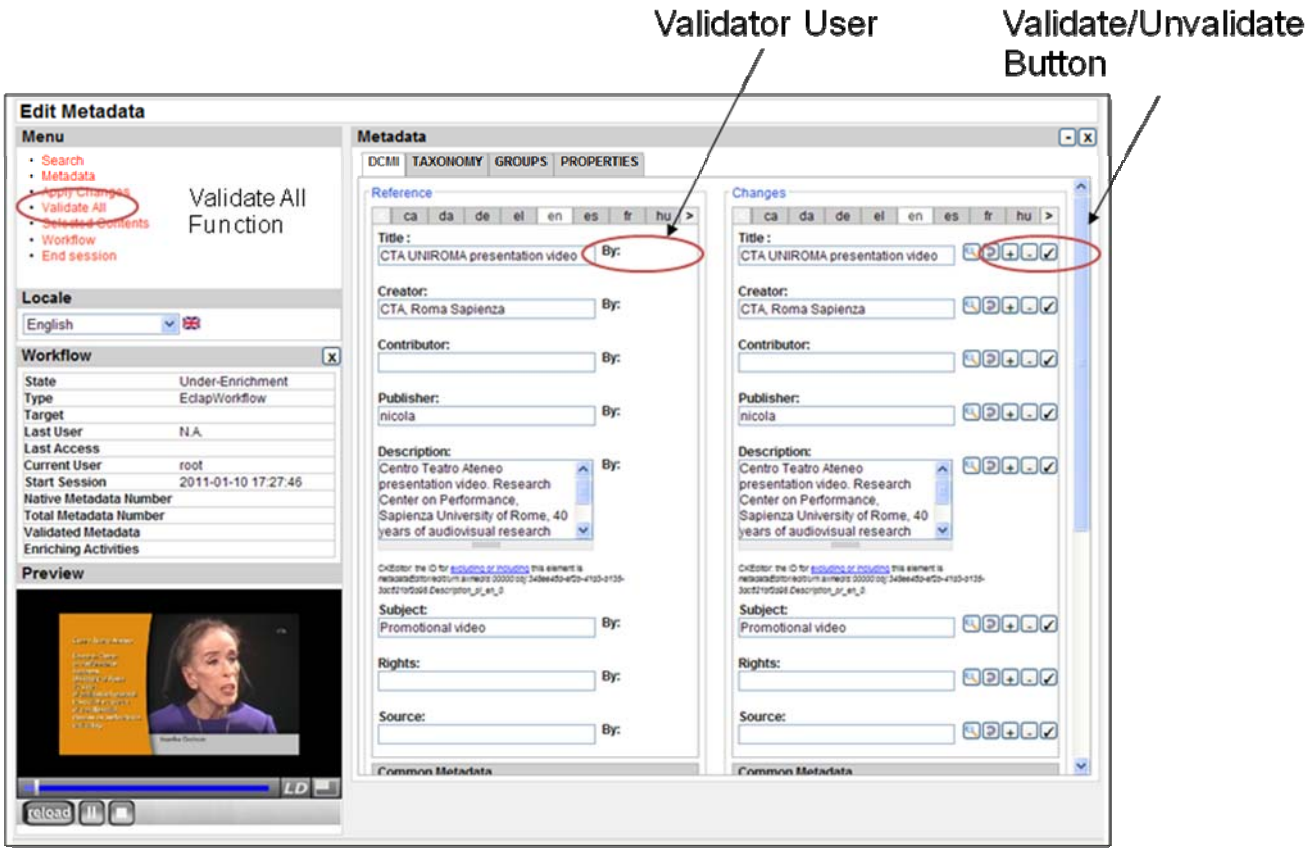
The editor will work in Enrichment mode for the WF Enricher role. The editor could be used to edit/enrich metadata. Before starting a workflow transition will be invoked according to the workflow model (transition Uploaded → Under-Enrich). If the transition will be done with success, this means no other user is working on the content, the workflow tables will be updated with the user id and start session date and time, otherwise the content was locked by other user and the editor will be opened in read-only mode just for browsing metadata. When user will be authorized by the workflow he will have full access to editing capabilities and metadata will be displayed according to his language capabilities. The workflow box will display the current information.



6.5.5 Metadata Editor Validation mode

The editor will work in Validation mode for the WF Validation role. The editor could be used to edit/enrich/validate/invalidate metadata. Before starting a workflow transition will be invoked according to the workflow model (transition Uploaded → Under-Validation). If the transition will be done with success, this means no other user is working on the content, the workflow tables will be updated with the user id and start session date and time, otherwise the content was locked by other user and the editor will be opened in read-only mode just for browsing metadata. When user will be authorized by the workflow he will have full access to editing capabilities and metadata will be displayed according to his language capabilities. The workflow box will display the current information.

The validator could Validate/unvalidate single metadata or Validate/unvalidate all metadata.



6.5.5.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Metadataeditor	Drupal Module	Main Module
Metadataeditor.js	javascript	Client–side functions

Third-party software	Version	Notes
JQuery		

6.5.6 Validate All

The validate all function will allow the user to validate not jet validated metadata. This function will work o client-side and it be a javascript function (*validateAllMetadata*). The function will find all not validated metadata and for each of them the corresponding validate button will be triggered and a copy will be store into a hidden form with all metadata information that the Apply Changes function will send to the server.

6.5.6.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Metadataeditor	Drupal Module	Main Module
Metadataeditor.js	javascript	Client–side functions

Third-party software	Version	Notes
JQuery		

6.5.7 Apply Changes

The apply changes function will allow the user to fix own metadata changes. On client-side it will be javascript-ajax call (*updateMetadata*) that will send to the server the list changes (new, validate, invalidated, updated and delete metadata) and in event of success it will ask for refreshing all panels with the applied changes. The list of changes will contain all information according to the data model.

The corresponding service on server is the *updateDb* function. This function will update all set of metadata on databases, the content/node on Drupal and all workflow tables.

6.5.7.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Metadataeditor	Drupal Module	Main Module
Metadataeditor.js	javascript	Client–side functions

Third-party software	Version	Notes
JQuery		

6.5.7.2 Data model description

The data model adopted to manage metadata changes and validation will be the following:
$data['term'] → Name of metadata
$data['op'] → made change (values: new, delete, update, validated, invalidated)
$data['value'] → metadata value
$data['id']→ Original database id if already exists, empty otherwise
$data['lang'] → metadata language
$data['axoid'] → content id
$data['dbtable'] → database table where metadata will be inserted/updated/removed
$data['status']→ 0 (Proposed), 1 (validated) (according to workflow)
$data['production'] → type of production according to workflow:

- GENERATED (0): produced by AXCP
- MANUAL (1): provided, via Metadata Editor
- UPLOADED (2): provided since the beginning via upload form, web page
- PROVIDED (3): provided via some database such as XML, XLS, or crawling, batch ingestion or other files. even OAI-PMH

$data['proposerUID'] → id of user who made changes

6.5.8 End session

The End Session function will allow the user to end metadata editing/validating session. On client-side it will check if there are changes to apply. In event of positive check a dialog will be display to ask for apply changes before exit or to continue loosing all changes. Otherwise, a call to the EndSession service will be sent.

On server side, the End Session function will invoke a workflow transition according to workflow model and will update the workflow tables with the end session time and date.

6.5.9 Leaving Metadata Editor

Since Metadata Editor is a web application, the user has to make some operations before leaving the page:

- Users have to apply all made changes before closing
- End Session has to be clicked to close and return back to Edit object page
    - If changes are pending a popup dialog will be show to remind to apply the made changes before exit or to leave them
- If users try to change page/exit a popup dialog reminds to apply the made changes or to leave them
- If users close the browse or exit without End Session an object will stay in a pending UNDER-xxx status, only the administrator or the user coming back on the content can complete the back-transition

6.5.9.1 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Metadataeditor	Drupal Module	Main Module
Metadataeditor.js	javascript	Client–side functions

Third-party software	Version	Notes

6.6 Automatic metadata translation (DSI)

The automatic metadata translation will be used to cope with the multi-language version of metadata. The translation will be performed by the AXMEDIS AXCP Grid and will be implemented as an AXCP rule. The translation will be made by using the following Google translation service API:

http://ajax.googleapis.com/ajax/services/language/translate?v=1.0&langpair=fromLan|toLan"&q="+phrase

where:

fromLan: original language
toLan: target language

During the translation could be happen that the content is already under a workflow activity. The translation of metadata can be done if the workflow status can be put to the UNDER-AXCP value in order to get the lock on the content and perform changes on metadata. In event of failure when taking the lock the translation is delayed by resubmitting a call scheduler after a time interval. If the lock acquisition can not be performed after a number of retry the process will be aborted and a notification mail will be sent to the administrator.

The list of languages to use for translating metadata will be defined as configuration parameter in the configuration options.

6.6.1 Automatic translation

The main activity of the rule will be in the order:

1. **Workflow lock request**: a workflow request will be done to ask for a status transition from the UPLOADED to the UNDER-AXCP status (according to workflow diagram).
    a. If the transition will be not performed and the retryCount is less than a threshold, the retryCount will be incremented and the Automatic translation will be resubmitted to the AXMEDIS Grid by scheduling it to a new time schedule and passing the new retryCiubt value. The current activity will be stopped.
    b. If the retryCount is greater than the threshold, the current activity will be stopped and the automatic translation will be aborted definitively. A notification mail will be sent to the administrator.

2. **Metadata retrieval**: the metadata set stored in the database (DCMI table in the publishing AXMEDIS database).
3. **Original Language detection**: the original language used during the upload or content generation. It is stored in the rootObejctInfo table of publishing AXMEDIS database
4. **Metadata translation**: each metadata will be translated for each default languages by accessing to the Google translation service. If a metadata is already available in the language under translation, it will be skipped.
5. **New Metadata insertion**: translated metadata will be inserted in the publishing DCMI AXMEDIS database
6. **Workflow Tables Update**: the *workflow_info* and the *workflow_metadata* tables will be updated in order to store the new translated metadata and workflow information as described in the workflow section. The AXCP Rule will update the following fields of the *workflow_info* table leaving the other parameters with the default value:
   - **md_number**: the number of inserted metadata

   The AXCP Rule will set the following fields of the *workflow_metadata* table leaving the other parameters with the default value. It will insert a row for each new translated metadata:
   - **Axoid**: the id of AXMEDIS mp21 object
   - **Id**: the id metadata
   - **Dbtable**: the database table where the metadata value is stored
   - **proposerUID**: the id of user who made the upload and provided metadata
   - **status**: 0 means PROPOSED (just uploaded and written for the first time)
   - **production**: 0 means GENERATED (produced by the AXCP Rule)

7. **Axmedis RootObjectInfo table update**: The rule will be update the rootObejctInfo table in the publishing AXMEDIS database by setting the value to true/1 of the *modified* flag field
8. **Workflow unlock request**: a workflow request will be done to ask for a status transition from the UNDER-AXCP to the UPLOADED status (according to workflow diagram).
9. **Indexing request**: The indexing service will be invoked to index/update metadata in the Publish Index Database.
10. **Automatic translation resubmit**: The resubmission will be done in enevt of workflow transition failure or connection failure with Google.

6.6.1.1 Data model description

The AXCP rule parameters are defined according to AXCP RULE schema. Such parameters are described in XML. In the following, an example of instance for the XML signature used by the content production rule is reported:

```
<AXCP_Rule>
    <Arguments>
      <Parameter Description="" Name="axoid" ParamType="In"
Type="String">urn:axmedis:obj:00……</Parameter>
      <Parameter Description="" Name="database" ParamType="In"
Type="string">Publishing</Parameter>
      <Parameter Description="" Name="retryCount" ParamType="In" Type="numer">3</Parameter>

    </Arguments>
        …..
</AXCP Rule>
```

Argument	Description
axoid	axoid related to the main object or to the content to be updated

database	The database where metadata are stored (publishing or administrative database)
retryCount	The number of current attempt

6.6.1.2 Configuration options

The configuration options will be loaded from the axdbv4.properties table and merged with the axcp.properties table. This last table will be used by all AXCP rule involved in content production and back-office activity. It will be a table with a list of pair <name,value> related to all configurations parameters, such as DB access, Web Url, etc….

6.6.1.3 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
MetadataTranslation	AXCP Rule	

Third-party software	**Version**	**Notes**
Google translator web api call		

6.6.1.4 Communication protocol description

The communication protocol between the AXCP rule and the Google Translation web api will be done via http connection

6.7 Metadata translation validation (DSI)

Metadata translation validation will be done by the validator users as defined in the workflow. Each validator will validate the metadata of a specific language using the metadata editor (see 6.5.5).

6.8 Content publication (DSI)

Before publishing content, it will have to be approved by the publisher. A publisher is an user who has the WF Publisher role as described in the workflow section. When content is ready to be approved the publisher will be informed by a notification and will be able to decide to publish or not the content. Publication of content will be done on the basis of the target workflow associated with it. So, if the workflow type was set to ECLAP the content will be accessible only in ECLAP. When type is ECLAP plus Europena, the content will be accessible on ECLAP and will be published on Europeana Digital Library. According to the workflow model before a content is published it has to be approved. The publication will invoke a workflow transition from UPLOADED to the TOBEAPPROVED status. In this way, the object will be locked and it cannot be modifed anymore by enrichers and validators. The publisher will decide to publish or not. When the content will be published definitively the own workflow status become PUBLISHED otherwise if rejected the status will be put to the UPLOADED. To enable europeana to get the content metadata (via OAI-PMH) an AXCP rule (see 12.3) will be invoked.

7 IPR issues and IPR Wizard (DSI)

Performing arts content has a high cultural and economical value. Content that ECLAP partner institutions are going to provide embodies many precious materials. This material is captured on film, video, audio, images, books, posters, etc..

Some content may be submitted by users of the platform: for instance those students who use their content during their studies, they will can upload that content on ECLAP (obviously in a controlled manner). It has to be stressed again that this material has so far been 'locked off' from the circulation of knowledge, never posted on Europeana, and one of the great merits of ECLAP will be to make it easily accessible on-line, browse-able and searchable for all.

In the ECLAP Project:

- Content partner institutions are providing content with IPR issues already solved, or that have to be solved during the project. There are existing contracts with the persons and parties involved in the copyrights of the contents to preserve and disseminate these valuables documents (e.g., contracts between institutions and performers, etc., to be able to use their digitalized documents). Content declared in the DOW will be provided to ECLAP and Europeana, and it will be accessible online, according to ECLAP guidelines and procedure. A high resolution/quality version of the same content will be directly obtainable from the institutions, if available.
- Content partners may have an archive of additional content in addition to the portion that is going to be offered and used for Europeana and ECLAP. ECLAP Project is going to establish and provide services to cultural heritage institutions to help them in understanding how their content can be made accessible on internet and to help the performing art collections to respect the current European directives and local/regional laws related to copyright and privacy.

In the following sections the flow of actions that each Content Partner will have to follow in order to publish its content on the ECLAP Portal and provide it to Europeana will be described.

The use of ECLAP Portal and services for performing arts institutions as a multi-channel intelligent content distribution will demonstrate how performing arts institutions can benefit from the usage of this powerful platform in conjunction with Europeana for their day-to-day activities. Furthermore, the services that ECLAP will provide for collecting, integrating and enriching performing arts content will be the added value by which the institutions will be interested to continue to support ECLAP activities.

It needs to be noted that Europeana has provided a core set of interoperable licenses that cover rights information for objects in Europeana [eu_rights]. The ECLAP Plaform will be fully compliant with this model: each content uploaded in the ECLAP Portal and sent to Europena will be associated to one of the licenses allowed by Europeana (for details see section **Errore. L'origine riferimento non è stata trovata.**), allowing Europeana to access the content/metadata and to inform users about the license associated to each content.

7.1 General IPR management

This section is structured as follow. In order to describe the flow of actions, rules, procedures, etc. that each Content Partner will follow to publish its content on the ECLAP Portal and provide it to Europeana, it is fundamental to introduce some common definitions that will be used in the following sections. Then a description of the general IPR workflow is provided. Finally the general design of the IPR Wizard is described.

7.2 Roles and Users

To clarify the general scenario on IPR related to ECLAP, the Consortium identifies specific user roles that are involved in the IPR management in some manner. They are:

- **Content Providers** (CP). They will exploit the ECLAP services in the future (institutions involved in providing content) can be:
  - original ECLAP partners or
  - affiliated partners;
- **ECLAP Portal**, the service portal itself;
- **Public ECLAP Users** of the ECLAP portal: people not registered on the Portal;
- **Registered ECLAP Users** on the ECLAP portal: they can be further classified according to their profile. On the other hand they have to be **registered to one or more groups/channels** and accepted by the group leader (so that they are accreditated); Moreover, registered users can be:
  - **Educational Users** (EDU) b**elongin to a workplace (University**, S**chool Res**earch center, etc.), having a specialization (student, reasearcher, professor, etc.), see Figure 7.2.1.
  - **Not Educational Users** (NOT EDU)
- **Europeana**, the service portal itself;
- **Europeana Users**, public users on the Europeana portal.
- **Trusted Users**: a registered user (coming from Consortium Partners and Affiliated Partners) with particular privileges, like group responsible, root, etc.
- **WF IPR User**: WorkFlowIPRUser, is a registered user with the privileges to edit the IPR Permission by using the IPR Wizard tool.

To be registered on the ECLAP Portal, Public Users will have to accept the ECLAP Terms of Use during the account creation as mandatory step to have the access to ECLAP services. The ToU expressively specify that the User is responsible for the correctness and accuracy of the information reported in his user profile. Since there is no possibility to control the correctness of the information provided in the profile for each single user, Registered Users can be considered as Educational Users only on the basis of the information provided in the profile, that can be considered as a self-certification. But, as additional level of control, to have the access to content available only for educational use, the user has also to ask to be registered to a group/channel so that he has to be accreditated by the group coordinator, that in this phase can also check the accuracy of the information included in the profile.

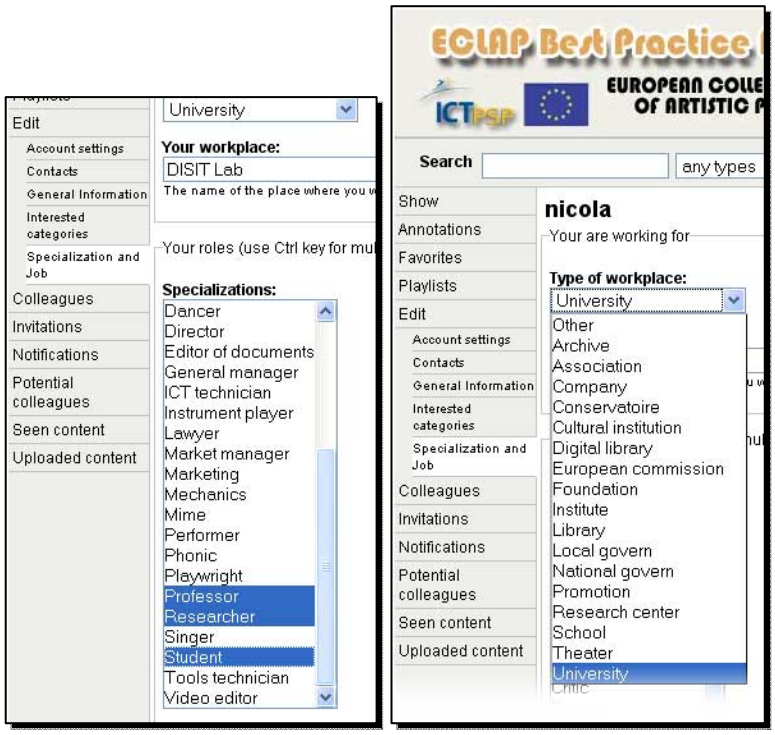


Figure 7.2.1

The following image Figure 7.2.2 shows the general scenario related to IPR involving all the identified roles in the value chain.
To simplify the description of the following image, the distinction between the metadata ingestion process and content ingestion process is necessary.

Regarding the metadata, the procedure foresees that when the metadata are ingested from the content owner (independently if the ingestion will be done as a single file upload or via a massive ingestion), the metadata will be provided to ECLAP with a CC0 1.0 Universal Public Domain Dedication by default (as defined also in the Europeana Agreeement [eu_agreement]). This license grants ECLAP the rights "to publish, make available, reproduce, distribute, display, transmit, extract, re-utilize and store the Metadata and its derivatives in all forms, formats and media", and "to translate the Metadata (or authorise others to do so) into other languages, create adaptations, summaries, combinations, or extracts of the Metadata".
As aggregator of Europeana, ECLAP ingests the metadata and performs also adaptation procedures to make the metadata consistent with the Europeana metadata model. The metadata will be sent to Euroepana only when the metadata will be linked to a reacheble resource and IPR issues will be correctly defined.

Regarding the content ingestion, the procedure is more complex and foresees the following main steps:

- to guarantee the ECLAP services, ECLAP acquires from the content provider a non-exclusive license to use, adapt, distribute, prepare derivative works, display, and perform the Content, in connection with the ECLAP Service. This license is necessary since the ECLAP has to perform different operations on the content (for example to automatically extract a preview, to published a version adapted for mobiles, etc.). This is called "Default license for ECLAP" in the following image. Figure 7.2.2;
- Content is ingested appling the stronger restrictions by default (if not in Public Domain), that means that the content is in this phase not available for the public, but is only accessible internally for ECLAP Trusted Users (they have to verify that the ingested content is not in confliuct with the ECLAP Terms of Use);
- Content Provider can relax the access to the content by defining permissions for the final users by using the IPR wizard tool (if the content is not in Public Domain). This operation is performed by WF IPR Users.
- Content Provider links a license to the content valid for the ECLAP users (as defined in the Europeana Agreement);
- Only when all steps are completed (i.e. access permissions have been defined, a valid license is linked to the resource for the final users, the content itself is accessible via a valid url and the metadata are correctly available), the content is published on the ECLAP Portal and the metadata are sent to Europeana.

These aspects are discussed in detail in the following.

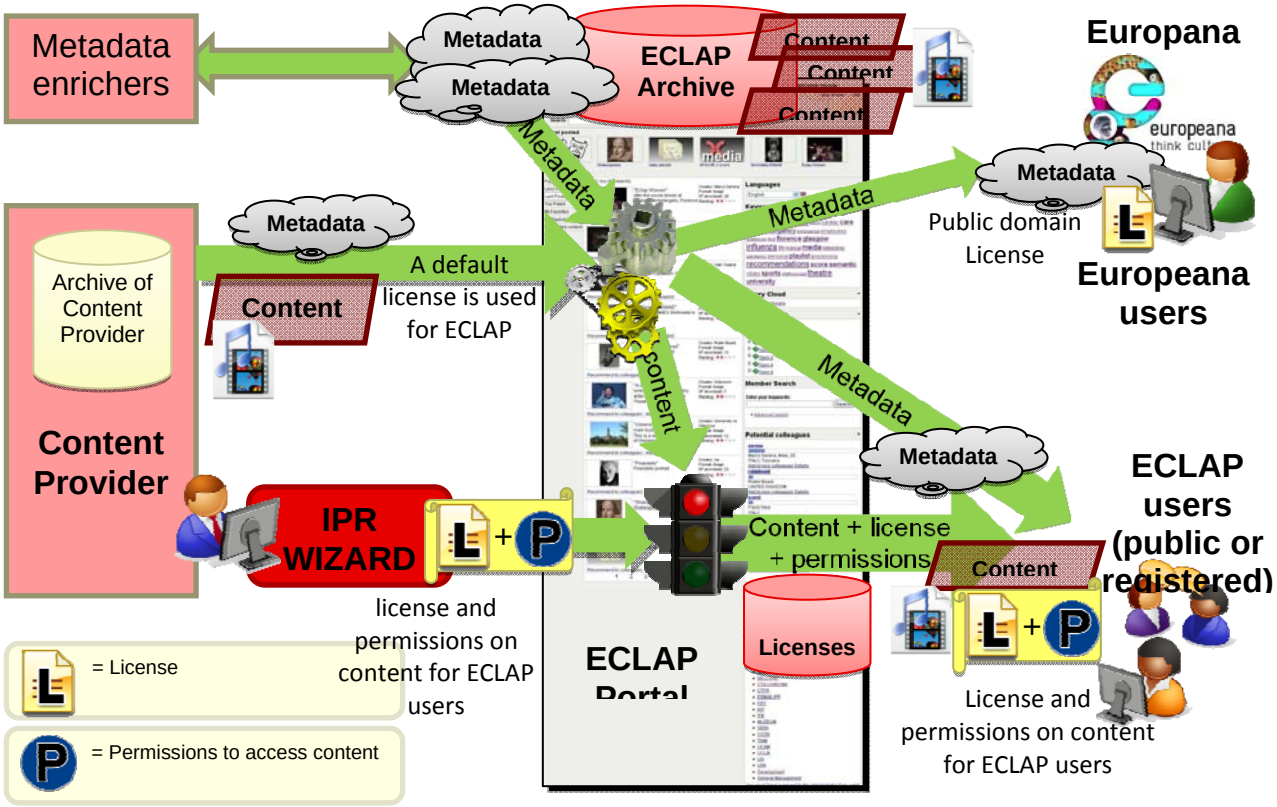


Figure 7.2.2

It is necessary now to better describe each user role, starting from the Content Partners that are the main users involved in the value chain described Figure 7.2.2.

Content Provider (CP) is interested in to make accessible and retrievable its content for Europeana and through ECLAP Portal. A CP uses the ECLAP Portal services such as: indexing, metadata enrichment, content upload and publication, social network, educational tools, IPR Wizard, etc. To access to ECLAP services CP has to:

- have available digitised content to be provided on ECLAP;
- accept ECLAP portal 'Terms of Use';
- have the rights to publish the content they provide on ECLAP, so that ECLAP can provide a valid link to the content to Europeana;
- provide a sufficient set of metadata to enrich its content;
- define IPR rules for the ECLAP final users, by defining a license and eventual restrictions to be applied on the content available via the ECLAP portal for specific users.

All the content and metadata that the Content Providers (CP) make accessible to Europeana through the ECLAP Portal has to be 'LICENSED'. This means that each content (and metadata) must have its associated license containing terms and conditions under which the content will be accessible. Only the CP has to guarantee that the content can be published and distributed via ECLAP according to the Terms of Use with the restrictions/permissions in the final use defined and imposed by the CP itself on the ECLAP portal.

ECLAP Portal (EP) has to:

- provide tools to help CPs in understanding how their content can be made accessible on the Portal and by means of Europeana (this means that the CPs can decide, by using the ECLAP Portal tools, under which conditions their content can be used by defining for each content item specific access permissions and a license reference, see section **Errore. L'origine riferimento non è stata trovata.**), clarifying aspects related to IPR;

- publish on the ECLAP Portal the content items/files, taking under account rights on it and according to the defined permissions defined by each CP that are applied on the content item/files;
- manage metadata and content also in connection with Europeana;
- provide to each CP access to a great amount of knowledge, information related to ECLAP services, content and tools;
- provide additional services (indexing, metadata enrichment, content upload and publication, social network, educational tools, adaptation, annotation, streaming, distribution, etc.).

Public ECLAP Users (PU): are users visiting ECLAP Portal that are not registered to the portal. A PU is interested in having access to the content according to the terms and conditions defined by the CP and by the Portal 'Terms of Use'.
In any case, PU can:

- view only a restricted set of content available on the ECLAP Portal (only content defined as publicly accessible);
- make queries and view all the metadata associated with the content available on the ECLAP Portal, also for that content that is not accessible for non registered users;
- request (moderated channels) to become a Registered User to have more services and to access to the content in which he/she is interested in.

Registered Users (RU) are users registered on in the ECLAP Portal. Moreover they can also be enrolled in groups and/or channels, classified as educational or non educational users, etc. A RU is interested in to have access to the content according to the Portal 'Term of Use' and to the conditions defined by each CP, but he/she is also interested in other activities such as: access the content for educational activities, enrich the content metadata, participate to ECLAP portal social activities, etc.
RU can:

- access to the content on the basis of CPs restrictions (e.g. RU can access to the content related to groups in which he/she is registered in);
- make queries and view all the metadata associated to the content available on the ECLAP Portal, also if the content is accessible only for users registered to specific groups or channels.

Europeana Users (EU) are people accessing to the Europeana portal and retrieving information related to content available on the ECLAP Portal. Like Public Users, the EUs are interested in accessing the content according to the terms and conditions defined by the CP.
Each EU can access the content available in ECLAP Portal thought a valid link posted in Europeana. He has to respect the license defined by CP related to each content.

7.3 General workflow and IPR workflow

As briefly discussed in the previous section, all content (metadata and digital item files) must follow a precise general workflow before it can be connected to Europena via its metadata. Each content has to be:

- **uploaded** in the ECLAP Portal (according to the different procedure defined in other sections (6.2) of this deliverable);
- **enriched** metadata in the ECLAP Portal (according to the different procedure described in sections (6.2 and 6.1) of this deliverable);
- **associated to an IPR license** (throught the IPR wizard, see section **Errore. L'origine riferimento non è stata trovata.**) to be exposed to the final users.

Content uploaded/ingested will be available on ECLAP portal with maximum restrictions. While metadata will be immediately available for indexing and search for all kind of users. Only content presenting a (i) sufficient set of metadata (e.g., Europena mandatory metadata) and (ii) IPR information and a license defined (one from the set admitted by Europeana:Rights), the metadata will be published on Europeana.

In this section all the services provided by the ECLAP Portal to the Content Partners are detailed. Together with the actions, rules, procedures that they have to respect in order to associate use restrictions and a license to their content, publish the content on the ECLAP Portal and connecting it to Europeana.

Regarding the **CONTENT**, each CP will have to:

- **upload the content accepting the ECLAP 'Terms of Use'** that will cover many aspects related to the ECLAP Portal behaviours, policies and also related to the IPR workflow (a specific section for the Content Partners will be present to clarify that each CP will allow the ECLAP Portal to manage, enrich, store, reformat, transcode etc. their content, for more details see section **Errore. L'origine riferimento non è stata trovata.**).
- **define the permissions** on the content: the CP has to define the access permissions (for a detailed description see section **Errore. L'origine riferimento non è stata trovata.**)
- **associate a license:** the license that the final users have to respect and that will be chosen from a list of available models accepted by Europeana (the IPR Wizard will help the CP during this action, see sections **Errore. L'origine riferimento non è stata trovata.** and **Errore. L'origine riferimento non è stata trovata.**).

Regarding the **METADATA**, each CP has to:

- upload metadata on the ECLAP portal under the Public Domain (CC0 1.0), this because according to the **Europeana Data Aggregator Agreement** [eu_agreement], the ECLAP Portal will have to provide the metadata to Europeana under Public Domain license (CC0 1.0). So the CP has to grant the same license to the ECLAP Portal.

In more details, according to the **Europeana Data Aggregator Agreement** it is clearly indicated that:
"*Article 4 Licence of rights for Metadata from Data Aggregator to third parties*
1. With respect to Metadata of the Data Aggregator, the Data Aggregator grants Europeana Foundation the right, to allow third parties for non-commercial purposes only and on a non-exclusive, worldwide, royalty-free basis to:
a. to publish, make available, reproduce, distribute, display, transmit, extract, re-utilize and store the Metadata in all forms, formats and media whether now known or hereafter developed (including without limitation in print, digital and electronic form) throughout the world;
b. to translate the Metadata into other languages, to create adaptations, summaries or extracts of the Metadata or to make other Derivatives based on the Metadata and exercise all of the rights set forth in (a) above in such translations, adaptations, summaries, extracts and Derivatives, provided that such exercise of rights only takes place under the same or compatible licensing conditions as herein specified;
The rights from 1.a) and b) are communicated to Third Parties through the Europeana Terms of Use v1.0 or a future version thereof containing the same licensing elements or other similar Terms/Contracts containing the same licensing elements.
It is understood that Europeana Foundation cannot grant more rights to Third Parties than conferred in this Agreement. The scope of limitations and exceptions of copyright law or applicable sui generis database rights will not be affected by additional restrictions in the Europeana Terms of Use."

So that CP has to **allow** ECLAP portal to provide metadata to Europeana according to this agreement.

7.4 ECLAP Terms of Use

The Terms of Use (ToU) is a document available in any Web site that defines a set of rules which are set up by ECLAP (as the owner of an intellectual property and services) to govern how it has to be legally used. Terms of Use are applied to let ECLAP users know specifically what can and cannot be done to the content and services offered by ECLAP. By accessing to the ECLAP Portal users implicitly accept the ECLAP ToU

The **Terms of Use** is a document containing the main ECLAP Portal policies, best behaviours the user have to follow, site organization, etc (provided in draft as an Annex to this document). The ToU is described in the IPR section because it fundamental to be consistent with the IPR workflow, as described before. In fact,

each Content Provider that wants to be allowed to publish content and metadata and to use the other services provided by the ECLAP portal, as first step has to accept the ECLAP Tems of Use.

A draft version of the ECLAP Terms of Use is include as Annex I of this deliverable. The Terms of Use will be improved and discussed with the help of all partners and legal experts.

The Terms of Use is structured as follow:

- Common Definitions;
- Acceptance of Terms of Use with indication of a legal entity representing the services provided by ECLAP;
- General description of the service offered by ECLAP:
  - description of the document scope;
- General Use of the Service, permissions and restrictions:
  - permissions granted by ECLAP and restricions applyed in the use of the services provided in the ECLAP Portal;
- Terms regarding content and conduct:
  - information regarding the sole responsibility of users for information provided in the profile account and for content and comments uploaded in ECLAP. This part is the most complex since ECLAP provides different services according to the type of registered user accessing to it.
- ECLAP service Termination Policy for content and account:
  - declarations about the possibility for ECLAP to terminate the user's access to the services and to unpublish content considered potentially offensive or obescene;
- Copyright infringements:
  - how to cope with copyright infringements in ECLAP;
- Warranty Discaimer:
  - statement to declare that the use of the ECLAP Portal services and content is at own risk of the CP;
- Limitation of Liability:
  - statement to declare that the ECLAP Portal has no reponsibility in case of inaccuracy, incompleteness, errors and mistakes for the content and metadata published;
- Indemnity:
  - acceptance for users to defend, indemnify and hold harmless ECLAP Portal,
- Ability to accept terms of service:
  - statement to be accepted by the CP that has to affirm that he is entitled to accept this terms of use;
- Other General Issues
- Date of the Terms of Use

7.5 Content Permissions for final users

As stated before, a content is published on the ECLAP Portal associated with a license for final users that each CP can define according to its needs (using the IPR Wizard, see sections 7.6 and 7.7). Each content item uploaded on the ECLAP portal is published by default with maximum restrictions that grant the access only to **Trusted Users**.

Permissions assigned to a content is a way to specify the access conditions to it. Permissions managed on the ECLAP Portal can be referred to the following aspects:

- **access** to the content (for example the content can be accessible via progressive download and/or download)
- user **device** (for example, the content can be played via a PC and/or a mobile device, iPad, etc.)
- content **resolution** (for example, the content can be accessible only in a reduced Low Resolution and/or in High resolution)

- **user role** (for example, the content can be played by registered users only and/or public users and/or educational users, etc.).

Taking into account all these different aspects and the amount of permissions managed by the ECLAP Portal, a list of permissions (Figure 7.5.1) has been realised.These permissions can be applied on content by the CP by using the IPR Wizard tool (for a detailed description of the permissions and their relations, see section 7.6 while for the IPR Wizard see section 7.7). The Yes and No and ☺ reported in the other columns are only examples, and have to be interpreted as follow:
YES, means a permission that has been granted by the CP using the IPR Wizard tool;
NO, means a permission that cannot be granted since it is not coherent with other permissions previously granted with YES;
☺ means permissions that have to be considered as implicit if a YES has been granted.
For example, as indicated in the first line of the following table, if the "Play on mobile browser" permission has been allowed for Public Users, the same permission is implicit also for registered users.

Type of Content	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
				Group subscribed USER	
				NOTEDU	EDU
VIDEO	Play on mobile Browser	YES	YES	☺	☺
VIDEO	Download via mobile Browser	YES	No	YES	☺
VIDEO	Play on mobile App	YES	No	No	Yes
VIDEO	Download via mobile App	YES			
VIDEO	Play on PC in Low Definition and Medium Definition	YES			
VIDEO	Download on PC in Low Definition and Medium Definition	YES			
VIDEO	Play on PC in High Definition	YES			
VIDEO	video HD PC download	YES			
AUDIO	download-PC	YES			
AUDIO	play-PC	YES			
AUDIO	download-mobile-Browser	YES			
AUDIO	play-mobile-Browser	YES			
AUDIO	download-mobile-Apps	YES			
AUDIO	play-mobile-Apps	YES			
PDF	PDF document access (PC and mobile)	YES			
IMAGES	Image access (PC and mobile)	YES			
HTML	HTML access (PC and mobile)	YES			
ANIMATIONS	Animations access (PC and mobile)	YES			
OTHER	ZIP, XLS, etc. (PC and mobile)	YES			

Figure 7.5.1

7.6 Questionnaire

To realize an appropriate model for the Content and Metadata Ingestion on the ECLAP Portal, it is necessary to have detailed and technical information about the content status of each Content Partner (CP).
A questionnaire has been distributed to all Content Partners regarding the following main topics:

- General contacts
- Content and metadata Upload methods
- Metadata standards and formats, etc.
- IPR on content (licenses, permissions, etc.)
- Collection topics
- Etc.

Here is the detailed description of the possible answers for each category. In this paragraph the aspects related to the Content and its IPR management will be specifically described.

- **Contacts**: CP role (university,e tc.), person responsible for ingestion, person responsible for IPR, etc.
- **Content type**: video, audio, text, image, html, animation, etc.
- **Content format**: it depends from the type (e.g. for the videos: flv, mov, avi, MPEG1, MPEG2, SWF, RM, WMV, etc.)
- **Content Upload method**: Hard Disk (the CP will deliver contents stored into a Hard Disk), http (the CP will provide a list of HTTP URL for each content available on a own or hosted Web server), ftp (the CP will provide a list of FTP URL and related access credential for each folder containing contents available on a own or hosted FTP server), OAI-PMH (the CP will provide OAI-PMH metadata ingestion containing valid URLs for retrieving content), etc.
- **Content IPR status specification**: Public Domain, IPR not cleared, content associated to a specific license (that has to be provided by the CP), Orphan Work, etc.
- **IPR standard / registration**: if this information is registered, a standard can be used (for instance: MPEG-21 REL, OMA DRM), or it can be collected in various fields in CP's metadata schema.
- **Content Rights holders agreements**: fundamental to establish if CP's institution got an agreement with a collecting societies of rights holders regarding the management of royalties on the content that it will provide to ECLAP (chooses between: 'No, but we DO expect to have to pay royalties for ECLAP content', 'No, and we DONT expect to have to pay royalties for ECLAP content', 'Yes, and we DON'T expect to have to pay royalties for ECLAP content', 'Yes, and we DO expect to have to pay royalties for ECLAP content')
- **Content Technological protection**: a CP has to declare the technology eventually used to protect its digital content for online use (digital watermarking, scarring, low resolution, etc).
- **Content Restrictions/Permissions**: they depend on the content type and reflect the table described in section **Errore. L'origine riferimento non è stata trovata.**. Each CP has to communicate to which ECLAP users and under what conditions the content will be accessible/downloadable, etc.
- **Metadata upload method** (same as what described for content upload method): Hard disk, http, ftp, OAI-PMH, etc.
- **Metadata standard**: if present the CP can select among CDWA, CIDOC-CRM, Dublin Core, EAD, FRBR, ISAD(G), MAB, MARC, METS, MIDAS, MODS, museumdat, Object ID, SPECTRUM, TEI, VRA, etc.
- **Metadata format**: the CP has to specify the format in which the metadata are written (sending the metadata files, possibly in xml if the exist).
- **Metadata Language**
- **General description**
- **Topics**
- **Time period**

7.6.1 Questionnaire Structure

The questionnaire has been organised and divided into two parties. The first one is related to Content Partner general information such as the contact details of the person in charge of IPR issues, metadata and terminology used by each CP, person responsible for ingestion, etc.
The second part is related to the collection of detailed description of each Content Partner's Items. This section is the most relevant and useful for the clarification of many aspetct related to IPR and for the conseguently design of the IPR Wizard according to the Partners' needs.

In this process both Content Partners and Technical Partners was involved. During the definition of the questionnaire structure, has been decided to clarify the concept of collection in order to establish a common methodology to analyze the content status. For this reason the concept of *Content Set* has been defined to avoid confusion with the common definition of "Collection" that, especially for Content Provider managing resources referred to cultural heritage, has a specific meaning.

A **Content Set (CS)** is a group of items having ALL the following common characteristics:

- Same Identifier, type and format;
- Same Upload method;
- Same Metadata Model (i.e. Dublin Core);
- Same File Type (i.e. all video, all audio, etc.);
- Same method of content upload on ECLAP (i.e. via FTP, via Hard disk, etc.);
- Same Permissions;
- Same IPR status (i.e. all orphan work, all public domain, etc) and standard for recording and managing IPR, Rights holders agreements, etc.;
- Same Metadata standard/format/topics.

The questionnaire has been distributed to Content Partners as an excel file:

- One sheet for the first page (also containing an introduction to the questionnaire);
- One sheet to explain the 'Content Set' concept and the questions related to second part;
- 6 sheets, one for each relevant content type: video, audio, text, image, html, animation;
- 2 sheet to connect (if present) each 'Content Set' to its metadata file and to its license.

7.6.2 Type of permissions

Specific questions have been submitted to content Partner to specify the type of permissions they would like to apply to their content. These information are fundamental and reflect the permissions that are going to be discussed in the following section for the IPR Wizard. Access permissions to be applied depend on Content Set type (video, audio, image, pdf/html/annotation/…). The content can be accessible/downloadable/etc. by different type of users:

- Public users: users that are not registered in the ECLAP Portal
- Registered users:
  - Not subscribed to groups or channels
  - Subscribed to groups or channels
  - Educational
  - Non educational
  - Trusted user: a registered user (coming from Consortium Partners and Affiliated Partners) with particular privileges, like group responsible, root, etc
  - WF IPR user: a registered user with the privileges to edit the IPR Permissions by using the IPR Wizard tool (see section **Errore. L'origine riferimento non è stata trovata.**)

As said (see Figure 7.5.1) permissions that can be applied depend on Content type:

- Video: 8 different permission types can be applied. They are referred to the following aspects:
  - play and/or download a content;
  - platform used (PC, mobile supported by an ECLAP application, mobile without ECLAP application support using only the common Browsers)
  - resource quality, among High Definition Quality (HD), Low Definition (LD) and Medium Definition (MD).
- Audio: 6 different permissions. They are referred to the following aspects:
  - play and/or download a content;
  - platform used (PC, mobile supported by an ECLAP application, mobile without ECLAP application support using only the common Browsers)
- Pdf/images/html/annotations/etc : only access permission can be defined (e.g. for a pdf there is no differences between the 'download' and 'play' permission).

Each permission is associated to a question on the questionnaire:

PDF/etc.

Permission applied	Question for each Content Set	Possible answers

Document access (PC and Mobile)	'Which are the users that can access (play on web page and download) the content of this Content Set?‘	• All ECLAP Users • Only users registered to a content group • None

AUDIO

Permission applied	Question for each Content Set	Possible answers
Audio download-PC	'Which are the users that can download the content of this Content Set in Low Definition (LD) and Medium Definition (MD) on PC?'	• All ECLAP Users • Only users registered to a content group • None
Audio play-PC	'Which are the users that can play on line (streaming or progressive) the content of this Content Set in Low Definition (LD) and Medium Definition (MD) on PC?'	• All ECLAP Users • Only users registered to a content group • None
Audio download-mobile-Browser	'Which are the users that can download the content of this Content Set from mobile via Browser?'	• All ECLAP Users • Only users registered to a content group • None
Audio play-mobile-Browser	'Which are the users that can play (streaming or progressive) the content of this Content Set on mobile via Browser?'	• All ECLAP Users • Only users registered to a content group • None
Audio download-mobile-Apps Content Organizer	'Which are the users that can download the content of this Content Set from mobile via ECLAP applications?'	• All ECLAP Users • Only users registered to a content group • None
Audio play-mobile-Apps Content Organizer	'Which are the users that can play (streaming or progressive) the content of this Content Set on mobile via ECLAP Applications?'	• All ECLAP Users • Only users registered to a content group • None

VIDEO

Permission applied	Question for each Content Set	Possible answers
Video download PC HD	'Which are the users that can play the content of this Content Set in High Definition Quality (HD), on PC?'	• All ECLAP Users • Only users registered to a content group • None
Video play PC HD	'Which are the users that can play the content of this Content Set in High Definition Quality, on PC?'	• All ECLAP Users • Only users registered to a content group • None
Video download-PC- LD and MD	'Which are the users that can download the content of this Content Set in Low Definition (LD) and Medium Definition (MD) on PC?'	• All ECLAP Users • Only users registered to a content group • None
Video play-PC- LD and MD	'Which are the users that can play online (streaming or progressive) the content of this Content Set in Low Definition (LD) and Medium Definition (MD) on PC?'	• All ECLAP Users • Only users registered to a content group • None

Audio download-mobile-Browser	'Which are the users that can download the content of this Content Set from mobile via Browser?'	• All ECLAP Users • Only users registered to a content group • None
Audio play-mobile-Browser	'Which are the users that can play (streaming or progressive) the content of this Content Set on mobile via Browser?'	• All ECLAP Users • Only users registered to a content group • None
Audio download-mobile-Apps Content Organizer	'Which are the users that can download the content of this Content Set from mobile via ECLAP applications?'	• All ECLAP Users • Only users registered to a content group • None
Audio play-mobile-Apps Content Organizer	'Which are the users that can play (streaming or progressive) the content of this Content Set on mobile via ECLAP Applications?'	• All ECLAP Users • Only users registered to a content group • None

7.6.3 IPR Model: relationships among rights/permissions

As it has happened in other studies or in the development of standards (such as: MPEG-21 REL and RDD ontology, IFIP ontology, OMA DRM ODRL rights, CC relationships among rights, etc.) the relationships among the rights identified have been analysed.

These relationships have been classified on the basis of the content type to which they are applied. So for the Pdf/images/animations/html/etc. only one permission is present (Figure 7.6.3.1) while for the Audio (Figure 7.6.3.2) and Video (Figure 7.6.3.3) permissions and their relations are more articulated.

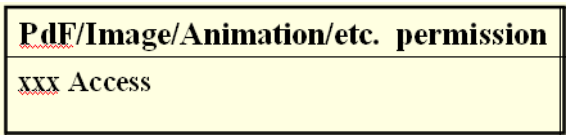


Figure 7.6.3.1

The model permissions reported in Figure 7.6.3.3 and Figure 7.6.3.4 are ordered on the basis of two different aspects: Control and Value.

- **Value,** that means that the value of the resource is increasing from bottom to top: for example to assign to a user the permission of download a video/audio gives to the user more values in terms of content than assigning to him/her the permission of only playing it;
- **Control,** that means that the control that can be applied on the resource is increasing from top to bottom: for example to assign to a user the permission of playing a content from mobile through an ECLAP application gives to the Partners more control on user actions (ECLAP applications can recognise the users and register useful information in term of action done etc.) than leaving them playing the content only via a WEB Browser.

These relations have been studied and modelled also basing on logical and technical aspects. They have been accepted by partners and the same model has been used for the first release of the IPR wizard. In the following figures the arrows are posed to explain that some permissions implicitly involves other permissions.

We can take into account the following two cases for the Audio permissions, that can clarify the arrows meaning and the permission relations (Figure 7.6.3.2):

- **red arrow between** 'Audio download-PC' → 'Audio play-PC': if a Content Partner allows ECLAP registered users to download the audio content, the CP implicitly allows them also to playing it (play via streaming and/or progressive download). This because from a technical point of view, if someone downloads a content (without encryptions or protection) from the web he/she can play/view it on its PC whenever he wants.
- **violet arrow between** 'Audio download-PC' ←→ 'Audio download-mobile-Browser' (note that they are bidirectional): if a Content Partner allows ECLAP registered users to download a content from PC, implicitly allows them also to download the same content from a mobile device. This because the users can download a content via a browser in their PC, then transfer the content into a mobile device, so that the application of a restriction to avoid the download via mobile can be easily moved around and has no sense to be applied. It is also true the vice-versa and, as highlighted in the following figure by the red arrows, also the possibility to play the audio content whenever they want is implicit.

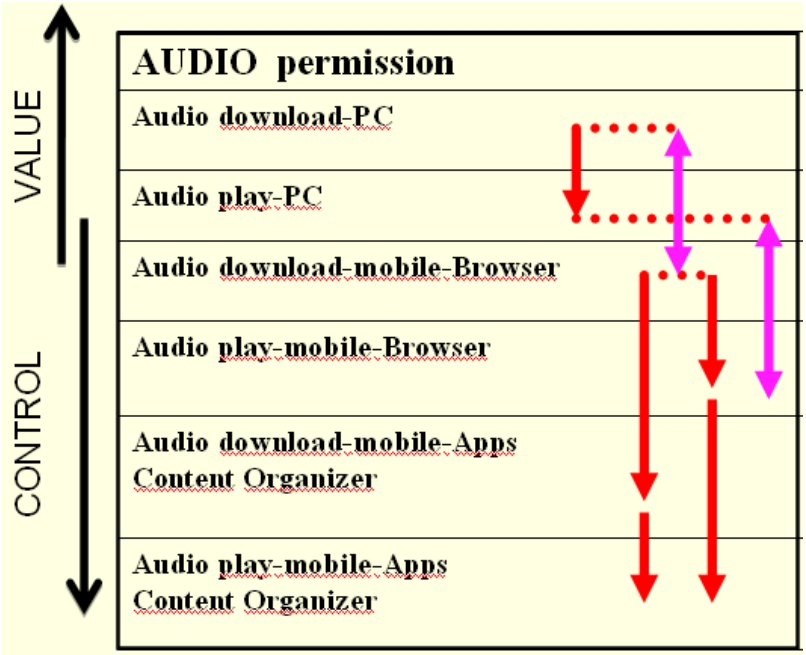


Figure 7.6.3.2

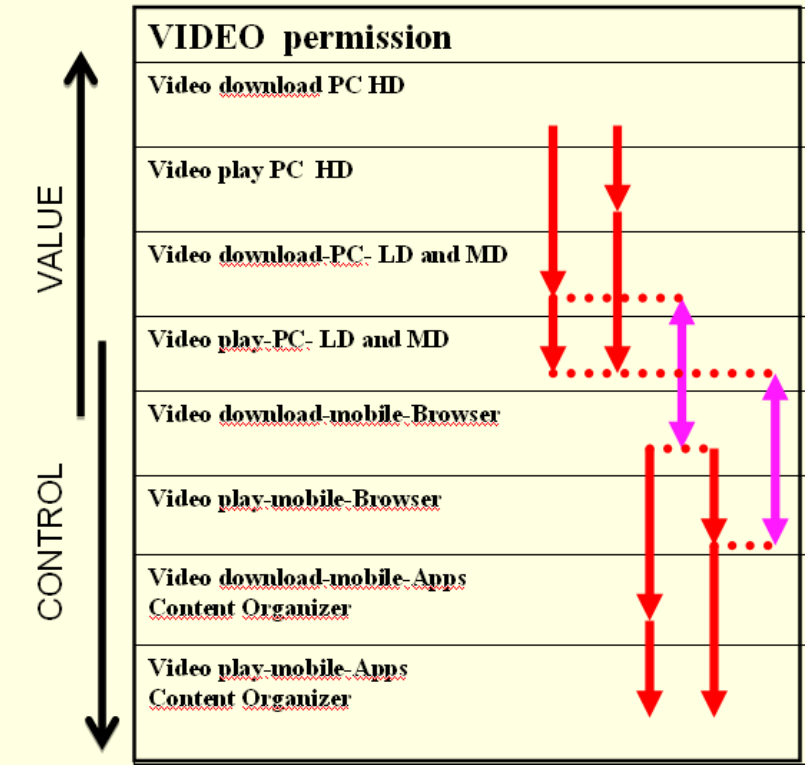


Figure 7.6.3.3

In Figure 7.6.3.3, the rights/permissions model related to video content is presented, In that case, a distinction is performed between Video in HD and MD/LD. This model allows the CP to control the access at their valuable HD video content.

In Figure 7.6.3.4 and Figure 7.6.3.5 some samples with related permissions relations (in the form of arrows) are presented. These samples have been created in order to show the permissions relationships: they explain what happens in terms of permissions applied to a content when a CP (more precisely the CP IPR responsible) selects specific permissions and the permissions that will be implicitly allowed. In these tables permissions hypothetically chosen by a CP has been coloured in yellow (with the text 'Yes') and the permissions implicitly allowed basing on the permission relations explained above have been coloured in green (with ☺).

Some Audio permission samples (Figure 7.6.3.4):

- EX1: the CP allows the ECLAP users to **download a content from PC**. In this a case all the arrows (red and violet) that are going from top to bottom are involved and all the other permissions will be automatically allowed. So that ECLAP users automatically can:
    - download the content from PC;
    - play the content from PC;
    - download the content from mobile via Browser;
    - play the content from mobile via Browser;
    - download the content from mobile via ECLAP applications;
    - play the content from mobile via ECLAP applications.

- EX2: the CP allows the ECLAP users to **play a content on mobile via Browser**, In this case only two arrows are involved: the red that connects 'play-mobile-Browser' to 'play-mobile-Applications', and the violet arrow that connects 'play-mobile-Browser' to 'play-PC'. So that ECLAP users automatically can:
    - play the content on mobile via Browser;
    - play the content on mobile via ECLAP Applications;
    - play the content on their PC.

- EX3: the CP allows the ECLAP users to: 1) **play a content from PC** and 2) **download a content from mobile applications**. So that ECLAP users automatically can:
    - play the content on their PC;
    - play the content on mobile via Browser;
    - download the content from mobile via ECLAP Applications;
    - play the content on mobile via ECLAP Applications.

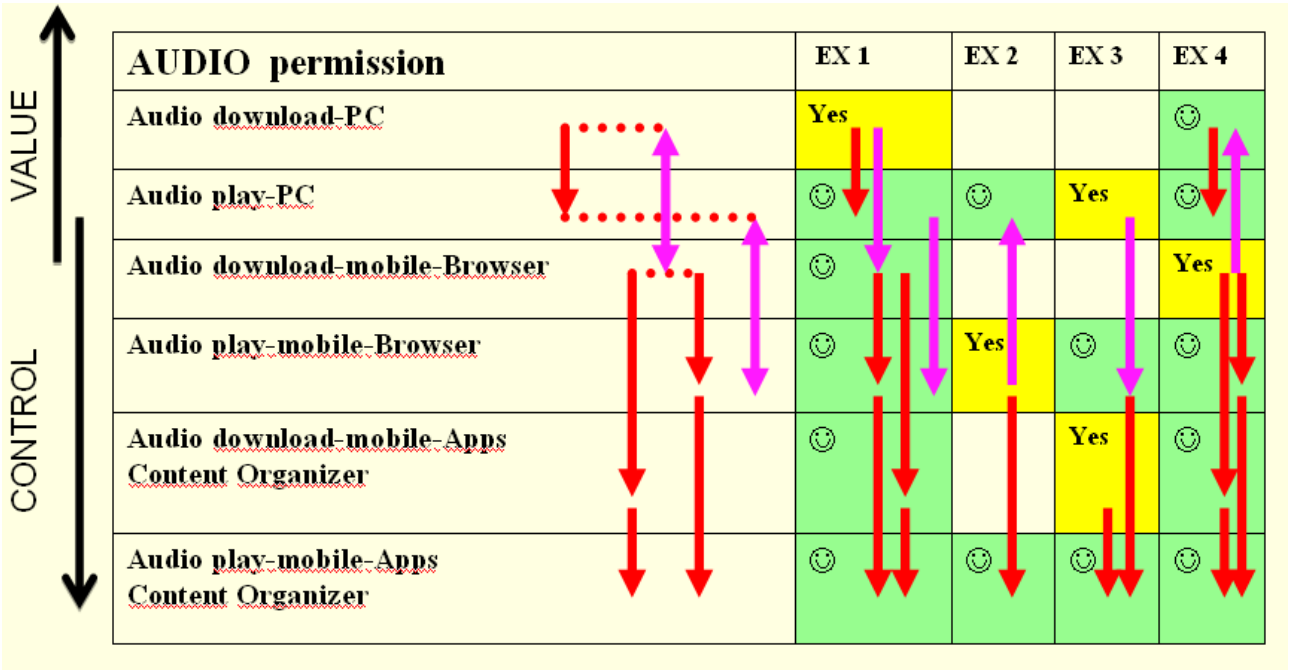


Figure 7.6.3.4

For the Video permissions samples, the same methodology is followed, as you can see in Figure 7.6.3.5.

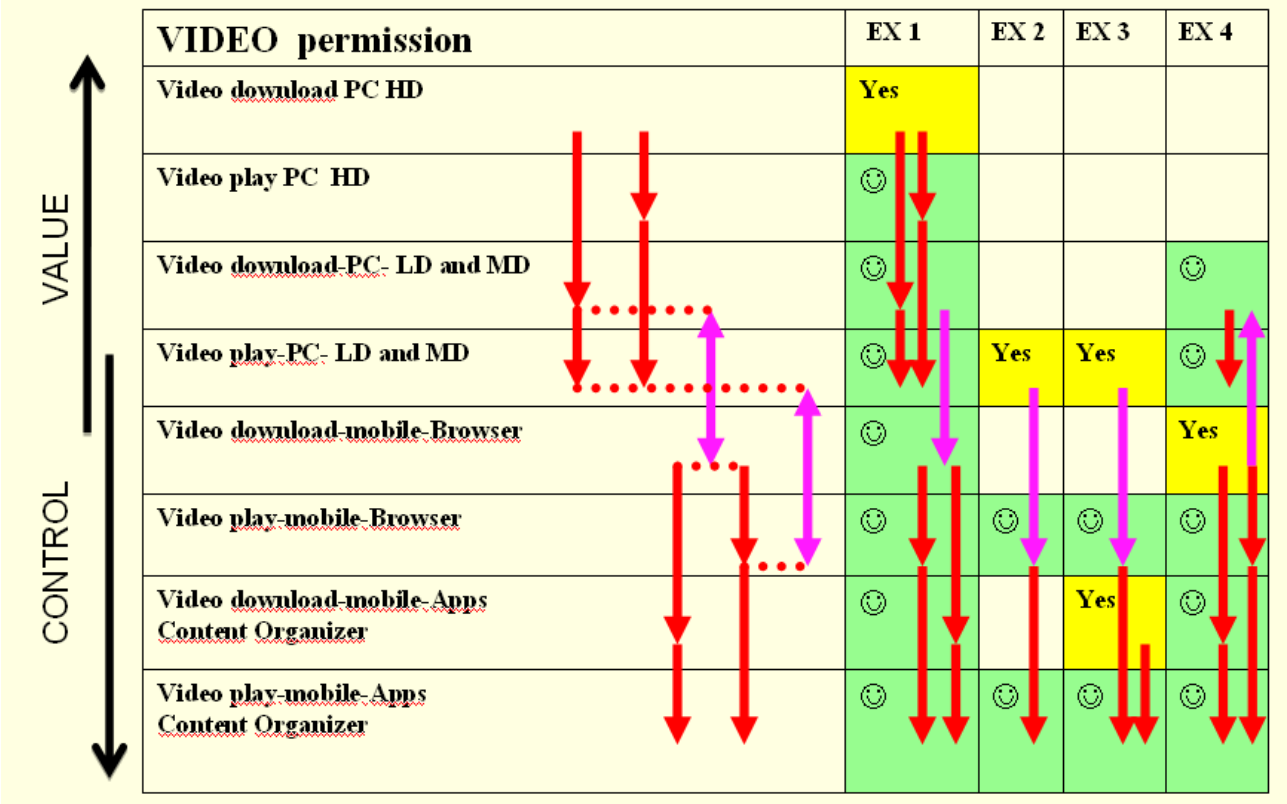


Figure 7.6.3.5

It is relevant to underline that it will be possible to apply different permissions for different users. The user roles identified in this context are the following:

- trusted user: the person responsible for content ingestion (at least one for each CP), that can always access to content via PC browser and mobile;
- public users;
- ECLAP registered users enrolled or not to a the group/channel on which the content is published:
    - educational,
    - not educational.

The IPR Wizard will take into account all these aspects, for a detailed description see section **Errore. L'origine riferimento non è stata trovata.**.

7.7 IPR Wizard

The IPR Wizard will be added to the ECLAP Portal as a Drupal custom module.

The role of the IPR Wizard will be relevant to help the Content Partners to assign the right permissions and to choose the license (one of that allowed by Europeana, [Eu_rigths]) that will be associated to it when it will be published on ECLAP Portal and in Europeana.

The association of the content to a license and the definition of the permissions are a mandatory conditions for publishing the content: if a Content Partner does not provide all these information, content will not be published and will remain accessible only internally.

In order to satisfy this conditions, the IPR Wizard will perform questions to the CP to establish what type of permissions the CP wants for its content and for which kind of users. Then it will also help the CP to choose one of the possible licenses that can be associated to the content.

Ehen a CP will use the IPR Wizard to assign permissions and the license to a specific content, the IPR Wizard will know the following information:

- Type of content (audio, video, document, image, animation, etc.), object Identifier (AXOID), the user and the Content Partner that is using the Wizard, groups/channels to which the content will be visible, etc.;
- Relationships among permissions (sse section **Errore. L'origine riferimento non è stata trovata.**);
- Type of users (in terms of their role in the ECLAP Portal or the group/channels in which they are enrolled in) to which apply the permissions.

Moreover it will start assigning as default the maximum restrictions (Figure 7.7.1): only people who have the role of 'trusted user' in the ECLAP Portal will access the content. Trusted users are those people in charge of managing the content ingestion (responsible for IPR, metadata, etc., see section 6.3).

Type of Content	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
				Group subscribed USER	
				NOT EDU	EDU
VIDEO	Play on mobile Browser	YES	No	No	No
VIDEO	Download via mobile Browser	YES	No	No	No
VIDEO	Play on mobile App	YES	No	No	No
VIDEO	Download via mobile App	YES	No	No	No
VIDEO	Play on PC in Low Definition and Medium Definition	YES	No	No	No
VIDEO	Download on PC in Low Definition and Medium Definition	YES	No	No	No
VIDEO	Play on PC in High Definition	YES	No	No	No
VIDEO	video HD PC download	YES	No	No	No
AUDIO	download-PC	YES	No	No	No
AUDIO	play-PC	YES	No	No	No
AUDIO	download-mobile-Browser	YES	No	No	No
AUDIO	play-mobile-Browser	YES	No	No	No
AUDIO	download-mobile-Apps	YES	No	No	No
AUDIO	play-mobile-Apps	YES	No	No	No
PDF	PDF document access (PC and mobile)	YES	No	No	No
IMAGES	Image access (PC and mobile)	YES	No	No	No
HTML	HTML access (PC and mobile)	YES	No	No	No
ANIMATIONS	Animations access (PC and mobile)	YES	No	No	No
OTHER	ZIP, XLS, etc. (PC and mobile)	YES	No	No	No

Figure 7.7.1

We can proceed with some examples in order to better expose the IPR Wizard logic structure and to better understand the relations among the permissions and the IPR Wizard, starting with the simplest case until getting to the most complex one and taking into account that:
- in the following Figures the permissions hypothetically chosen by a CP have been coloured in yellow (with the text 'Yes') and the permissions implicitly allowed by the IPR Wizard basing on the permission relations explained above have been coloured in green (with ☺);

- also relations among users are present (orange arrows in Figure 7.7.2):
    - if a CP assigns a permission to a 'Public User' then the same permission will be automatically applied to all ECLAP 'Registered Users'
    - if a CP assigns a permission to a Non Educational User ('NOT EDU') then the same permission will be automatically applied also to Educational Users ('EDU').

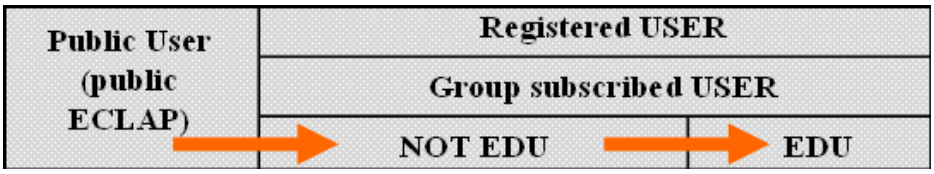


Figure 7.7.2

As declared in the previously, for the pdf/images/animations/html/etc. only one permission is present (Figure 7.7.3 , Figure 7.7.4, Figure 7.7.5) so none permission relations have to be taken into account: in this case the IPR Wizard will consider only the role of the users into the ECLAP Portal:

- Example 1 (Figure 7.7.3): the CP allows all 'Public Users' to **access** (both from PC than from mobile) to its content ('xxxx') and implicitly the Wizard will assign to the content also the same permission to all ECLAP Registered users.
- Example 2 (Figure 7.7.4): the CP allows all 'NOT EDU' users to **access** (both from PC than from mobile) to its content ('xxxx') and implicitly the Wizard will assign to the content also the same permission to all ECLAP 'EDU' users.
- Example 3 (Figure 7.7.5): the CP allows only 'EDU' users to **access** (both from PC than from mobile) to its content ('xxxx'), in this case none permission is implicitly involved.

Type of Content	Specific kind AXOID	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
					Group subscribed USER	
					NOT EDU	EDU
xxxx	Sdf7875…	Access (PC and mobile)	YES	YES	☺	☺

Figure 7.7.3

Type of Content	Specific kind AXOID	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
					Group subscribed USER	
					NOT EDU	EDU
xxx	Sdf7875…	Access (PC and mobile)	YES	No	YES	☺

Figure 7.7.4

Type of Content	Specific kind AXOID	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
					Group subscribed USER	
					NOT EDU	EDU
xxx	Sdf7875…	Access (PC and mobile)	YES	No	No	Yes

Figure 7.7.5

In the Audio case (Figure 7.7.6), six different permissions can be allowed by the CP, so the Wizard has to take into account both the relations among permissions and the role of the users into the ECLAP Portal:

- Example 4: if a CP allows all 'NOT EDU' users to **download an audio content from PC**, the Wizard will implicitly assign (☺):

  - all the other permission to 'NOT EDU' users, basing on the relations among permissions (following the vertical red and violet arrow in the figure)
  - all the permission to the "EDU" users, basing on the relations among users (following the horizontal orange arrows).

Type of Content	Specific kind AXOID	Permissions applied	Trusted User (private access no	Public User (public ECLAP)	Registered USER	
					Group subscribed USER	
					NOT EDU	EDU
AUDIO	Sdf75…	**download-PC**	YES	NO	YES	☺
AUDIO	Sdf75…	**play-PC**	YES		☺	☺
AUDIO	Sdf75…	**download-mobile-Browser**	YES		☺	☺
AUDIO	Sdf75…	**play-mobile-Browser**	YES		☺	☺
AUDIO	Sdf75…	**download-mobile-Apps**	YES		☺	☺
AUDIO	Sdf75…	**play-mobile-Apps**	YES		☺	☺

Figure 7.7.6

In the case of a Video content (Figure 7.7.7), eight different permissions can be managed by the CP, so that the Wizard has to take into account all the relations among permissions and the role of the users into the ECLAP Portal:
- Example 5: if a CP allows all 'NOT EDU' users to **play an audio content from mobile via Browser**, the Wizard will implicitly assign:

- basing on the relations among permissions (following the vertical red and violet arrow in the figure):
  - 'NOT EDU' users can also play the audio content on PC in LD and MD quality
  - 'NOT EDU' users can also play the audio content on mobile via ECLAP Applications
- basing on the relations among users (following the horizontal orange arrows):
  - also 'EDU' users can play the audio content from mobile via Browser
  - also 'EDU' users can play the audio content on PC in LD and MD quality
  - also 'EDU' users can also play the audio content on mobile via ECLAP Applications

Type of Content	Specific kind AXOID	Permissions applied	Trusted User (private access no restrictions)	Public User (public ECLAP)	Registered USER	
					Group subscribed USER	
					NOT EDU	EDU
VIDEO	Sdf75…	download-PC- HD	YES	NO		
VIDEO	Sdf75…	play-PC- HD	YES			
VIDEO	Sdf75…	download-PC- LD and MD	YES			
VIDEO	Sdf75…	play-PC- LD and MD	YES		☺	☺
VIDEO	Sdf75…	download-mobile-Browser	YES			
VIDEO	Sdf75…	play-mobile-Browser	YES		YES	☺
VIDEO	Sdf75…	download-mobile-Apps	YES			
VIDEO	Sdf75…	play-mobile-Apps	YES		☺	☺

Figure 7.7.7

After the permission definition, the CP has to select one license to be associated to the content. This license will be compliant with what has been defined by Europeana and reported in the 'Guidelines for the *europeana:rights* metadata element', [eu_rights].

The IPR Wizard will propose to the CP to choose a license among the set of licenses allowed by Europeana and on the basis of the permissions previously defined. This means for example that if a CP define some restrictions on its content (e.g. 'this pdf can be accessible only by students'), the IPR Wizard will not allow the CP to associate to it the 'Public Domain Mark'.

If the CP has classified the content as Public in ECLAP (all permissions allowed to all ECLAP users, that also means no restrictions), the Wizard will propose the following licenses:

- Public Domain Mark (http://creativecommons.org/publicdomain/mark/1.0/)
- CC – Zero (universal, http://creativecommons.org/publicdomain/zero/1.0/)
- Rights Reserved - Free Access (http://www.europeana.eu/rights/rr-f/)

While if the CP has imposed some restrictions on the content (has allowed only some permissions or only some users), the Wizard will propose a different set of licenses:

- CC BY (v3.0 Unported, http://creativecommons.org/licenses/by/3.0/)
- CC BY-SA
- …
- CC BY-NC-ND
- Rights Reserved - Paid Access (http://www.europeana.eu/rights/rr-p/)
- Rights Reserved - Restricted Access (http://www.europeana.eu/rights/rr-r/)
- Unknown (http://www.europeana.eu/rights/unknown/)

When accessing to a content ECLAP users have to respect the license associated to that content. This license will be visible through a link in the ECLAP Portal (and the url of the license will be sent to Europeana as one of the mandatory metadata related to the content - '**`europeana: rights`**').

7.7.1.1 Description and draft user interface

Each Content Partner will define permissions related to a specific content and the license to be applied by accessing to the content editing user interface (Figure 7.7.1.1.1) and by selecting the link "IPR Wizard".

The IPR Wizard will propose a set of questions allowing the CP to define permissions on the content access and to associate a license to it for the final users as stated in the previous sections.

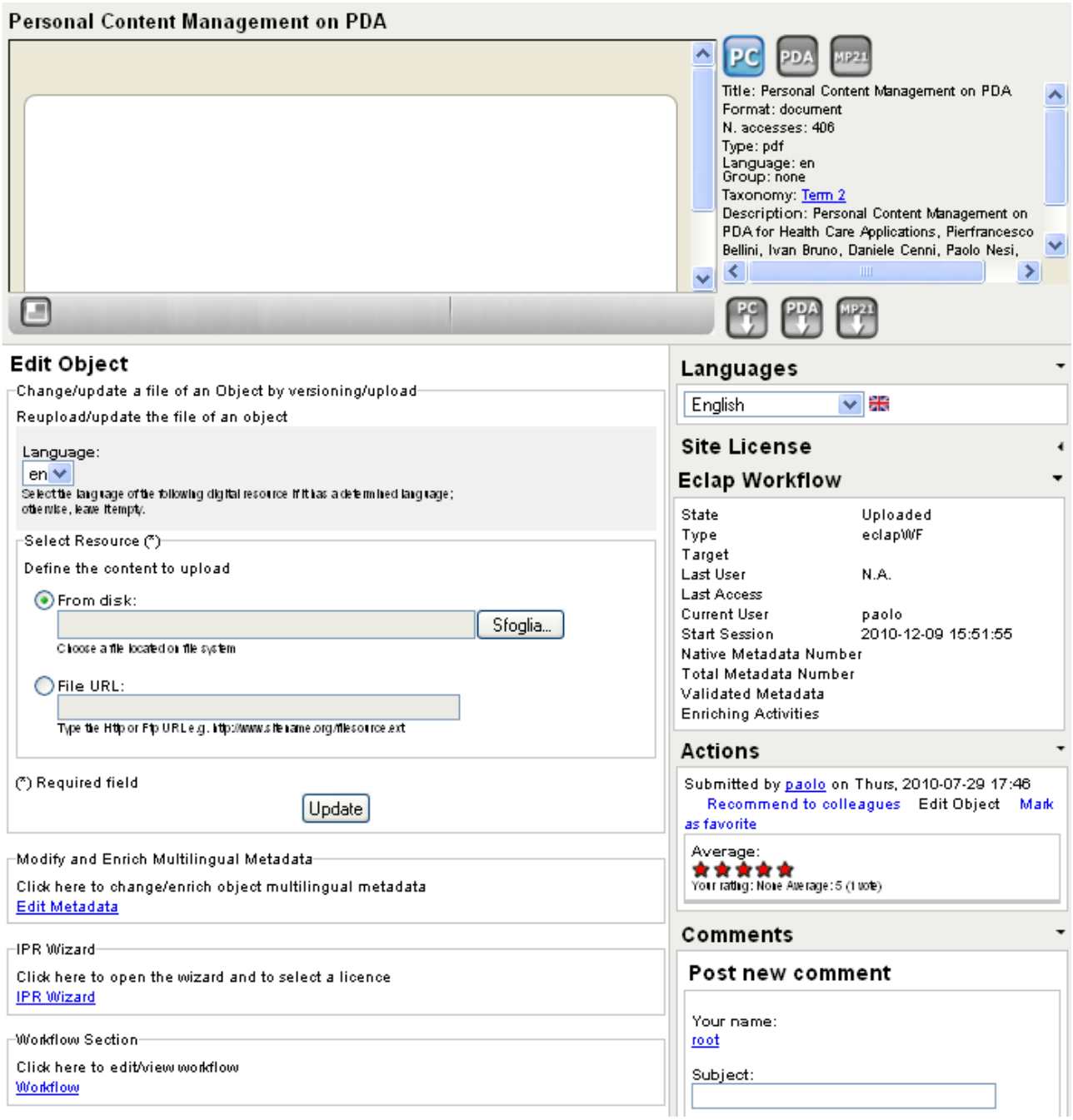


Figure 7.7.1.1.1

7.7.1.2 Data model description

To store ipr information the tables *ipr_license* and *ipr_permission* will be used.
Table *ipr_license* will contain the association of the license url identifying the license type (e.g. http://creativecommons.org/licenses/by/3.0/) with a human readable description.
The table fields will be:

- licenseTypeUrl, VARCHAR(255)
- description VARCHAR(255)

Table *ipr_permission* will store the association of each content axoid with its permissions.
The table fields will be:

- axoid, VARCHAR(60)
- permission, VARCHAR(30)

- userType, ENUM('trusted', 'public', 'registered', 'edu', 'notEdu')

The permission values will be:

- download-pc
- play-pc
- download-pc-hd
- play-pc-hd
- download-pc-ldmd
- play-pc-ldmd
- download-mobile-browser
- play-mobile-browser
- download-mobile-app
- play-mobile-app
- access

7.7.1.3 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
iprWizard	Drupal module	

7.8 Redirecting Users to Content Providers

When a content is published on the ECLAP Portal it will be visible according to permissions defined by the Content Provider. Contents published on the ECLAP Portal can be viewed using the embedded Player (Figure 7.8.1. and see section 11) and on the right some metadata are visible (they can be different with respect to the metadata provided to Europeana). They include: some DublinCore metadata, Additional fields to manage the content in the ECLAP Portal (Content Identifier,Group, taxonomy, language, User, etc.), IPR info, etc.

Regarding the IPR information, they will be:

- **License:** a link to the License associated to the content (if the content is registered on Europeana, the license will be one of the licenses allowed by Europena in [eu_rights])
- **Provider:** a link to Redirect the user to the Content Providers. It is useful to contact them, make requests, have more information on the IPR, etc.

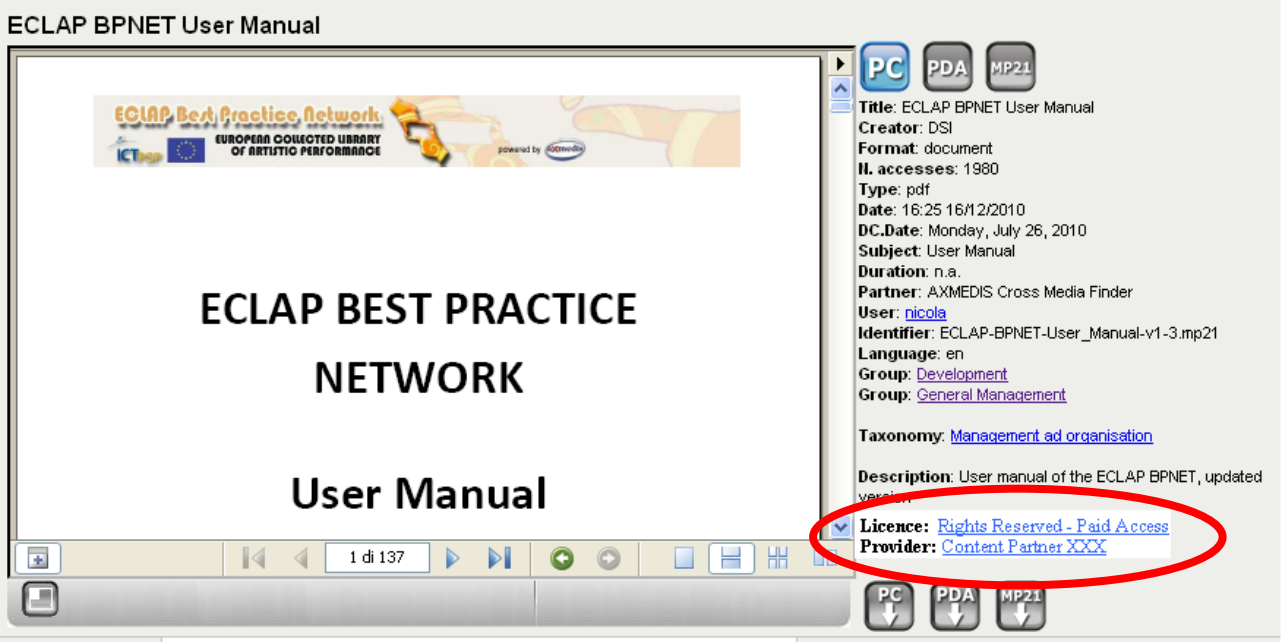


Figure 7.8.1

7.8.1.1 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
axmedis	Drupal module	

8 Multilingual Taxonomy Editor (B&G)

Next to having a folksonomy consisting of user tags (see 10.3), the ECLAP portal will provide a multilingual taxonomy which will allow users to search and browse through the ECLAP content by using the taxonomy terms in their own. The taxonomy is a controlled vocabulary of performing arts terms in various axes (e.g. historical period, genre) with a hierarchical structure which is used for classifying ECLAP's digital objects.

The taxonomy in ECLAP will be defined by a working group of ECLAP consortium partners that are professionals from the performing arts world.

Currently the most important functionalities for setting up and maintaining a multilingual taxonomy have already been implemented using default Drupal modules. However several aspects in these default modules need to be extended in order to suit the needs for ECLAP. The following needs to be improved:

- The user interface for editing taxonomy terms in different languages needs to be made more user friendly
- The default database model for storing taxonomy terms should be updated in order to improve the performance of the search engine
- The import/export function does not support the export/import of a multilingual taxonomy

The extended taxonomy module will offer functionalities for adding, updating and deleting terms in the hierarchy as well as offering these functionalities for organizing the translations of terms.

8.1 Editing the hierarchy of terms

For manipulating the structure and hierarchy of the taxonomy a few key users from the ECLAP consortium should be assigned. These users must be part of the working group described in the head of this section.

Adding terms
To add terms, the user must first:

- login to the ECLAP portal
- navigate to the taxonomy back-end section
  - press an "add new term" link ***or***
  - select a node in the taxonomy and then press the "add new term" link

After pressing the "add new term" link, the user must enter the name of the term in English in order to add it. The user can also provide translations of the terms in other languages, but these fields are not mandatory in order to create the new term.

Editing terms
In ECLAP content partners of different nationalities need to be able to edit the translations of the taxonomy terms in their native language. This type of user should not be allowed to change the structure of the taxonomy and should not get the rights to add or delete terms.

To edit terms, the user can click any term in the taxonomy and click an "edit" button. The user is directed to a form where all the different translations of the term can be edited.

Whenever the user edits the main term, the English term, he or she might either:

- intend to correct a spelling or typing error in the term
- intend to change the actual word or meaning of the term

Because of this uncertainty, whenever changing the English term, the system will ask the user whether the translations of the term should be kept (in case of a spelling or typing error) or deleted (in case the meaning of the term has changed). Only users that have the rights to change the hierarchy of the taxonomy are able to change the main term in English.

Deleting terms
In order to delete terms from the taxonomy, the user must first select one or more terms in the taxonomy and click on a delete button. When clicked the system will either show:

- a message verifying whether the user is sure he or she wants to delete the selected terms (when the terms have no sub-terms)
- a message verifying whether the user is sure to delete the selected terms and all its sub-terms (when the term contains sub-terms)

Moreover when the system detects items in the portal that that have been annotated with one of the terms that is about to be deleted, the system will also verify:

- whether the user is sure he or she wants to delete the selected terms and all annotations made with the selected terms, and if so, if this term should be replaced with another one.

When the user confirms both messages, all the selected terms and sub-terms will be deleted from the taxonomy. Also all annotations made with the selected terms, on content items, will be removed from the database and index.

8.2 Importing/exporting

The export functionality can be used to export the taxonomy into RDF/XML [rdf]

The import functionalities will be able to import the following formats:

- RDF/XML
- XML

Unlike in the current version of the current taxonomy editor, the export function will produce an RDF/XML containing all terms and all translations of these terms.

8.3 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
Drupal Internationalization module	Drupal module	http://drupal.org/project/i18n
Drupal taxonomy_xml module		http://drupal.org/project/taxonomy_xml

Third-party software	**Version**	**Notes**

9 Multilingual Indexing and query/browsing (DSI)

This section reports how the metadata/content, comments, web pages indexing will be done and how it will be accessed.
Indexing will be based on a *Solr* service [solr] installed on a Tomcat servlet container.

9.1 Elements to be indexed

	Language	Reindex	Add to index	Update on index	Delete from index
Media Object	Their own defined into RootObjectInfo table as deflanguage or into DCMI.language	via reindex rule	via upload rule	via update rule, may be not useful. Also when the generation of FileSecco is done, the rule update the Lucene index since the flags into RootObjectInfo are changed as well via drupal, MetadataEnricher. The changes are done into the axDB and into the Lucene Index. This happen from XMF admin and from MetadataEnricher.	Via delete rule called from XMF admin
Web pages	Their own language	via reindex rule	via drupal when created	via drupal when modified	via drupal when deleted
Forum topic	The language of the group	Via reindex rule	via drupal when created	via drupal when modified	via drupal when deleted
Comments	To a web page: The page laguage To a content: content language In a forum: group language	via reindex rule	via drupal when created	via drupal when modified	via drupal when deleted

9.2 Metadata indexing

The following table reports the metadata set used for indexing:

Name[1]	Note[2]	Present in Play window[3]	Multiple instances[4]	Language[5]	Frontal Search & Advanced Multilanguage Search[6]	Advanced content search Supported Metadata[7]
Contributor	DCMI term	Yes	Yes	Yes		Yes

[1] Name of the metadata term.
[2] Can be: DCMI if it is a Dublin Core term; ECLAP if it is an internal term managed by the ECLAP BPNET.
[3] If the term is shown during the play of the resource.
[4] The term can be present in multiple instances.
[5] Term available in different languages.
[6] If YES the metadata is used in the full text search and in Advanced Search in the "Advanced Multilanguage Search of Objects" field.
[7] If YES the metadata is used in the advanced search of content for objects, pages, forums, comments.

Coverage	DCMI term	Yes	Yes	Null		Yes
Creator	DCMI term	Yes	Yes	Yes		Yes
Date (DC.date)	DCMI term Last update of metadata	Yes	No	Null		Yes
Description	DCMI term	Yes	Yes	Yes	Yes	Yes
Format	DCMI term	Yes	NO, not only our format but also other kind such as tape, dvd, etc.	Null	Yes	Yes
Identifier	DCMI term	Yes	Yes	Null		Yes
Language	DCMI term	Yes	No	Null		Yes
Relation	DCMI term	Yes	Yes, it should be a link to the source files	Null		Yes
Rights	DCMI term	Yes	Yes	Yes, it may be a general statement		Yes
Source	DCMI term	Yes	Yes	Yes		Yes
Subject	DCMI term	Yes	Yes	Yes	Yes	Yes
Title	DCMI term	Yes	Yes	Yes	Yes	Yes
Type	DCMI term	Yes	No	Null	Yes	Yes
Group	ECLAP term	Yes	Yes	Yes	No	Yes
Taxonomy	ECLAP term	Yes	Yes	Yes	Yes	Yes
N. accesses (also called httpdownload)	ECLAP term (the so called httpdownload)	Yes	No	No	No	Yes (httpdownload)
Date (different from DC.Date)	ECLAP term Last update of file	Yes	No	No	No	No
Duration	ECLAP term Duration time for audio and video	Yes	No	No	No	Yes
Partner (Publisher on the RootObjectInfo)	ECLAP term Affiliation among those in the user registration	Yes	No	No	No	Yes
User (uid link)	ECLAP term: ECLAP portal nickname on the portal	Yes	No	No	No	No
Abstract	DCMI term	No	Yes	Yes	No	Yes
Publisher	DCMI term	No	Yes	Yes	No	Yes
axoid	ECLAP term, AXOID of the	No	No	No	No	Yes

	content					
axoidref	ECLAP term, not used	No	No	No	No	Yes
cluster	ECLAP term	No	No	No	No	Yes
creationDate	ECLAP term	No	No	No	No	Yes
deflanguage	ECLAP term, coding of language of the digital resource	No	No	No	No	Yes
dx	ECLAP term, dimension on X for images and video	No	No	No	No	Yes
dy	ECLAP term, dimension on Y for images and video	No	No	No	No	Yes
filesecco	ECLAP term, coding of file type and extension	No	No	No	No	Yes
governedObject	ECLAP term, DRM protected or not	No	No	No	No	Yes
iphone	ECLAP term, 1 for yes, 0 for no (content valid for iPhone)	No	No	No	No	Yes
lastModificationDate	ECLAP term	No	No	No	No	Yes
latitude	ECLAP term	No	No	No	No	Yes
longitude	ECLAP term	No	No	No	No	Yes
mobile	ECLAP term, 1 for yes, 0 for no	No	No	No	No	Yes
modified	ECLAP term	No	No	No	No	Yes
nid	ECLAP term, internal NODE ID	No	No	No	No	Yes
nohttp	ECLAP term, deprecated	No	No	No	No	Yes
nop2p	ECLAP term, deprecated	No	No	No	No	Yes
nvoti	ECLAP term, deprecated	No	No	No	No	Yes
p2pdownload	ECLAP term	No	No	No	No	Yes
pcview	ECLAP term, 1 for yes, 0 for no	No	No	No	No	Yes
Pda	ECLAP term,	No	No	No	No	Yes

	1 for yes, 0 for no (content valid for PDA)					
playnumber	ECLAP term, deprecated	No	No		No	Yes
progressivepc	ECLAP term, deprecated	No	No		No	Yes
progressivertsp	ECLAP term, deprecated	No	No		No	Yes
published	ECLAP term, 1 for yes, 0 for no	No	No		No	Yes
ranking	ECLAP term, a copy of the vote	No	No		No	Yes
resolution	ECLAP term	No	No		No	Yes
sourcefile	ECLAP term, internal use only	No	No		No	Yes
sourceurl	ECLAP term, internal use only	No	No		No	Yes
Stb	ECLAP term, 1 for yes, 0 for no	No	No		No	Yes
xmlObjectUri	ECLAP term, internal use only	No	No		No	Yes
Drupal contents	Title, description, body of Drupal pages, forums, comments	No	Yes	Yes	Yes	Yes
Rich text documents (doc, docx, ppt, pptx, xls, xlsx, htm, html, pdf)	Documents attached to Drupal contents	No	Yes	Yes	Yes	Yes

9.3 Multilingual indexing & search

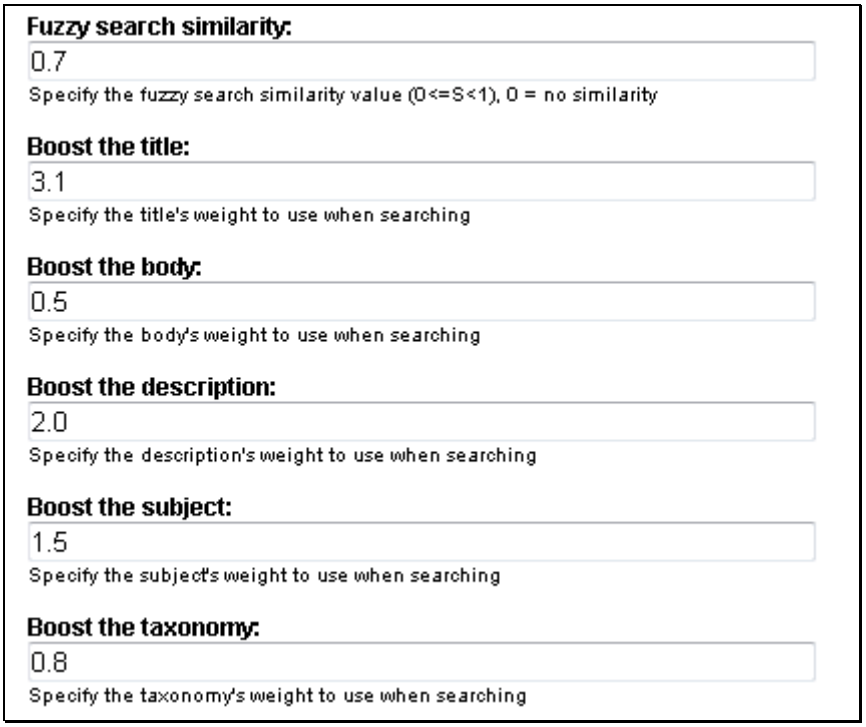
This section reports how metadata and texts in different languages is indexed using Solr and how searches are performed in the frontal search and in the advanced search.
The main features and functionalities of the indexing service should be the following:

- Each Drupal content (page, forum comment) and Axmedis content has to be indexed in the Solr index;
- Rich text documents attached to the Axmedis object have to be parsed and indexed in the Solr index;
- The administrator should be able to rebuild automatically from scratch the Solr index in case of index corruption;
- Digital contents have to be indexed in a single Multilanguage index;

The main features and functionalities of the searching service should be the following:

- Each Drupal content (page, forum comment) and Axmedis content has to searchable in the Solr index;
- The searching service should be divided in simple and advanced search;
- Fuzzy search and wildcards must be possible both from the simple and the advanced search;
- Boosting of terms should be possible for the administrator;
- Faceted search should be allowed both from the simple and the advanced search;
- Search result must be presented in relevance descending order (scoring) with pagination;

Metadata to be indexed should be translated into different languages by a separate translation service, based on a Javascript rule.
The boost and weigting of different query aspects are set up as in the following figure. Their values would be better tuned when the portal will be more populated by significant content. The following panel is accessible to root administrator of the ECLAP portal.



9.3.1 Digital Content Indexing

A JSP service, based on Tomcat, should be available for content indexing. Drupal should be allowed to call this external service with relevant parameters needed to index the content, retrieved by querying the MySQL database (metadata, documents attached etc.). The service should index, update and delete existing contents. Indexing service must be implemented in Java using the SolrJ client API. Each time an user insert, update or delete a content from the Drupal portal, the service should be called by a Drupal module, and then it should start assembling the object data to be indexed in Solr. Once completed the service should return a success/failure notification to the Drupal caller. At the time of indexing the indexing service should extract the content type and language by querying in the Drupal/Axmedis db tables, following this schema

Content	Language
Drupal Page	Page language defined in Drupal db table
Drupal comment	Language of the page, group, object to which the comment is attached
Drupal Forum	Language of the group to which the forum is attached

Axmedis Object	Language of the object defined in Axmedis db table

Metadata are indexed in the Solr index using the following schema

Solr Document Field	**Type** **T = tokenized** **U = untokenized**	**Localization**	**Description**
resource	String, U	NO	content resource (object, page, comment)
axoid	String, U	NO	Axmedis object id
axoidref	String, U	NO	Axmedis object ref
cluster	int	NO	cluster
creationDate	Long	NO	Date of content creation (timestamp)
duration	String, U	NO	Content duration time
dx	int	NO	Content x resolution
dy	int	NO	Content y resolution
filesecco	String, U	NO	Resource extension (e.g. pdf)
governedObject	int	NO	1 if the object is protected, 0 otherwise
httpdownload	long	NO	Number of content downloads
iphone	int	NO	1 if the object is an iPhone content, 0 otherwise
lastModificationDate	long	NO	Last time content was modified (timestamp)
latitude	double	NO	latitude
longitude	double	NO	longitude
mobile	int	NO	1 if the object is a mobile content, 0 otherwise
modified	int	NO	1 if the content has been modified
nid	long	NO	Drupal id of the content
nohttp	int	NO	1 if http download link is available
nop2p	int	NO	1 if p2p download link is available
nvoti	long	NO	Number of votes for the content
p2pdownload	int	NO	Number of p2p downloads
pcview	int	NO	1 if the object if for pcview, 0 otherwise
pda	int	NO	1 if the object if for pda, 0 otherwise
playnumber	long	NO	Number of times the object was played
progressivertsp	int	NO	1 if the content is progressive rtsp, 0 otherwise
progressivepc	int	NO	1 if the content is progressivepc, 0 otherwise
published	int	NO	1 if the content has been published on portal
partner	String, U	NO	Name of the content owner partner
ranking	long	NO	Content raking
resolution	String, U	NO	Content resolution type (high = H, low = L)
sourcefile	String, U	NO	Content file path
sourceurl	String, U	NO	Content source url
stb	int	NO	1 if the content is for stb, 0 otherwise
xmlObjectUri	String, U	NO	Relative content path
deflanguage	String, U	NO	Original metadata language

videoQuality	String, U	NO	Video quality, M, H
creator	String, U	NO	Creator name
taxonomy	String, U	NO	Taxonomies of the content
group	String, U	NO	Groups of the content
format	String, U	NO	Content format (DC)
date	String,U	NO	Content creation date (DC)
type	String, U	NO	Content type (DC)
identifier	String, U	NO	Content identifier (DC)
language	String, U	NO	Content Metadata language (DC)
coverage	String, U	NO	Content coverage (DC)
relation	String, U	NO	Content metadata relation (DC)
contributor	String, U	NO	Content metadata contributor (DC)
taxonomyGenre	String, U	NO	Content taxonomy genre id if available
taxonomyHistoricalPeriod	String, U	NO	Content taxonomy historical period id if available
taxonomyManagementandOrganisation	String, U	NO	Content taxonomy and organisation id if available
taxonomyPerformingArts	String, U	NO	Content taxonomy performing arts id if available
taxonomySubject	String, U	NO	Content taxonomy subject id if available
device	String, U	NO	device
durationTime	String, U	NO	Duration time
uploadTime	date	NO	Date of upload
cid	long	NO	Comment drupal id
timestamp	String, U	NO	timestamp
All DC Fields (e.g. title, creator, format etc.)	Text, T	YES	DC metadata fields

9.3.1.1 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
buildIndex.jsp service	Java Servlet	Password protected Java Web application
Axmedis module	Drupal module	Solr searching is coded in this module
luceneIndex module	Drupal module	Module that performs insert/update/delete of contents calling buildIndex.jsp service

Third-party software	**Version**	**Notes**
SolrJ API Client for Solr	Java API	Java client for Solr Index
Apache Tika	Java API	Library for document parsing

9.3.2 Rich Text Documents indexing

Documents attached to the content should be sent to the Solr Index Instance through HTTP/XML for parsing. Solr Service should use the Apache Tika Library to perform the document parsing, supporting the main document formats (doc, docx, ppt, pptx, xls , xlsx, pdf, html, htm, txt etc.). The whole document structure should be indexed by the Solr service and stored in a custom document field, based on the language of the document itself (e.g. doc_en, pdf_en, ppt_en etc.).

9.3.3 Rebuild Index Service

The rebuild service must be a Java service written using the SolrJ API, and invoked as a Javascript rule by the AXCP Axmedis Platform. The service should be allowed to retrieve needed data for each contet to be

indexed as the standard indexing service interacting with Drupal. The rebuild service should perform taxononmy/group extraction for each object, storing the result in a cache table in db for faster reindexing.

9.3.4 Multilanguage Index

The Solr index must be a single Multilanguage index, thus to allow a fast access and easy of management. Each of the above reported field to be indexed in 9.2, must be tagged with a _locale suffix to allow language filtering for each field in the document structure at query time.

9.3.5 Digital Content Search

Each document in the Drupal portal should be searchable in the portal. Thus means that querying for a string contained in a Drupal page, forum, comment or an Axmedis object, should result in matching the list of contents with that search term. Querying by taxonomy/group related to the content should provide match too.

9.3.6 Simple and Advanced Search

Simple full-text search and advanced search should be available for the user.
Simple search in the top center are of the portal, should allow the user to refine its search with a basic content type menu (archive, audio, crossmedia etc.) while advanced search should provide extended functionalities (i.e. metadata search, or content search filtered by partner and language). User should be allowed to compose an arbitrary number of Boolean clauses in the advanced search page, thus allowing the building of a rich metadata query; for example restricting the search to some metadata fields only matching any or all of them (OR/ALL).

9.3.7 Fuzzy search and wildcards

Searches must be performed with fuzzy technique too. The querying string must be compared to similar strings in the index to retrieve documents with a high degree of similarity (e.g. “documant” should match “document”), thus allowing an efficient search in case of mistyping. This fuzzy weight should be customizable by the administrator in the portal. Each query string should be automatically suffixed with a special wildcard, in a transparent way to the user, to allow searching of substrings (e.g. query “test” matches “testing”).

9.3.8 Boosting of terms

Each field in the Solr document structure should be boosted with a value, customizable by the administrator, so to allow a search by giving more relevance to some field in respect to others. (e.g. title, subject, description etc.). For the search tuning, in the settings sections of the portal, the administrator should be able to change the boosting for these search fields:

- Title
- Body
- Description
- Subject
- Taxonomy

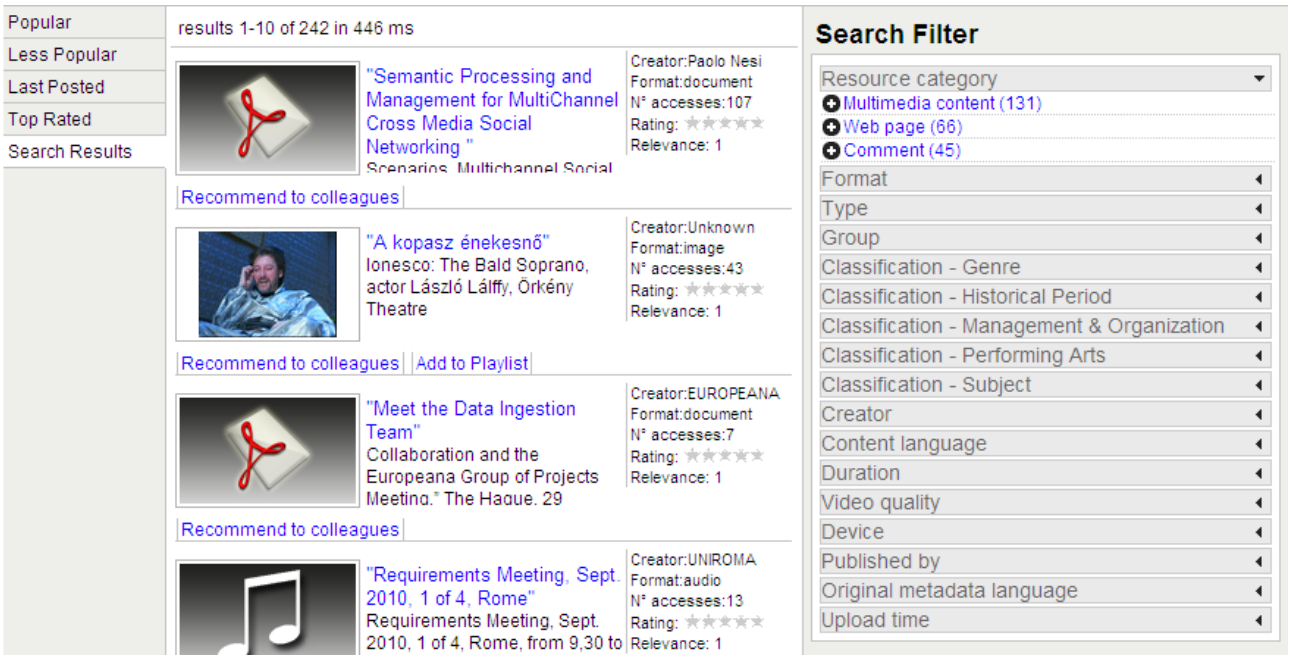
The administrator should be also able to change the fuzzy search similarity in the same section. (< 1 means fuzzy logic, = 1 means Boolean).

9.4 Faceted search

Faceted search should be allowed both from the simple and advanced search. Each faceted term should be indexed untokenized in the Solr index, thus enabling a faceting count based on the whole facet. The user should select/remove any facet in any order to refine the search. Adding/removing a facet would result in adding/deleting a search filter and perform again the search query with/without it. Relevant facets should be:

- Resource Category
- Format
- Type
- Group
- Classification - Genre
- Classification – Historical Period
- Classification – Management & Organisation
- Classification – Performing Arts
- Classification – Subject
- Creator
- Content Language
- Duration
- Video Quality
- Device
- Publisher
- Original Metadata Language
- Upload Time

These facets can be subject to change. For instance, locations and dates (different from historical period) can be added



9.4.1 Result sorting and scoring

Matching documents should be presented in relevance ascending order; this means that the first document is the one supposed to be more relevant to the query string, and the last one the less. Scoring should be based on the occurrence of the query string in the indexed document fields: a higher number of occurrences of a string or similar string would result in a higher score for the document. Each document should be presented as a result with a thumbnail and its relevant data (i.e. title, description, rating, creator, score) in the user language interface chosen by the user (or if not available in the English or original metadata language). Results should be paginated (typically 10 per page).

10 Content Enrichment, Annotations and Aggregations (DSI, BnG)

This section describes how content enrichment, content annotation and content aggregation is performed.

10.1 Metadata translations and validations (DSI)

Translating metadata in different languages is a kind of metadata enrichment, metadata will be translated automatically using an external service and then will be validated (and modified) by a human. These activities will be controlled using the workflow.
See sections **Errore. L'origine riferimento non è stata trovata.** and 6.7 for details on how automatic metadata translation and metadata validation will be done.

10.2 Association with Taxonomy (DSI)

The association of content with the taxonomy terms can be done using the MetadataEditor (see 6.5.4).

10.3 Content tagging and Folksonomy management (B&G)

By incorporating support for user tags (free text terms users can add to ECLAP content) and through this enabling the creation of a folksonomy [Weinberger08], ECLAP provides additional means for users to find and appreciate content on the portal.

A folksonomy is a set of categories that are the result of the tags that are added to digital objects by users. In other words: a folksonomy emerges through collective tagging efforts. Every time a user adds a tag, it is stored in the database, indexed, and added to the folksonomy.

10.3.1 Motivations for tagging

Research [Velsen09] on the motivations of people that tag online materials have shown that the reasons are:

- Motivations related to indexing (in order to make content easier to find for all users)
- Motivations related to socializing (using specific tags for fun/socializing)
- Motivations related to communication (friends using tags to group content for their own convenience)

In ECLAP the user group most likely to be motivated for indexing is the group of professional content providers responsible for uploading performing arts materials. Next to having the option to annotate their content by using terms from ECLAP's taxonomy (see xxx), these users are likely to use the option of free tagging in order to be able to provide a more accurate index for their material.

Another group likely motivated to use tagging for improving the indexing of content are the members of the Educational user group. Teachers and students could be motivated to use specific tags for specific assignments making it more convenient to point out relevant items of content for those specific assignments or lessons.

Motivations related to socializing and communications are most likely to apply to Leisure users. In some cases, this kind of tagging can be similar to leaving a comment.

The functionalities of user tagging are explained in the following chapters

10.3.2 Functionalities

Adding tags
In ECLAP, the user can tag all different types of content, meaning:

- the actual content: videos & images of performing art
- collections
- playlists

The way the user can add a tag is by navigating to one of the types of content described above and then clicking a link: “add tag”, which will open a form where the user can type in a list of tags separated by a comma's.

Whenever tags are added to an item, the search index of ECLAP is updated so that:

- the item can be found when a user performs a search query having the same text as the tag
- the item can be found when a user clicks on a tag (see 'Searching using tags')

Deleting tags

Each user in ECLAP can delete tags he or she added to an item before. Tags from other users can not be deleted, unless the user is logged in as an administrator (see the next section).

When a tag is deleted, the system will update the search index in order to remove the reference to the content.

Flagging & blacklisting tags

Whenever a user detects an offensive or highly inappropriate tag, he or she is able to flag it by pressing a button labelled “Flag”, that is shown when hovering over the tag with the mouse pointer. Flagging means the tag is being added to a list of possibly inappropriate or offensive tags that should be deleted by the administrator(s) of ECLAP.

When logged in as an administrator, the user can consult the flagged tags and delete them. The effect of the deletion by the administrator does not only delete the current tag of this user but also:

- deletes all occurrences of this tag (of all users)
- adds the tag to a black list

Whenever a tag is added to the black list, users can no longer add this tag. Whenever the user adds this tag it is simply deleted right after saving.

Searching using tags

Tags are displayed in the portal in several ways. The most prominent visualization is the tag cloud of which an example is shown in the picture below:

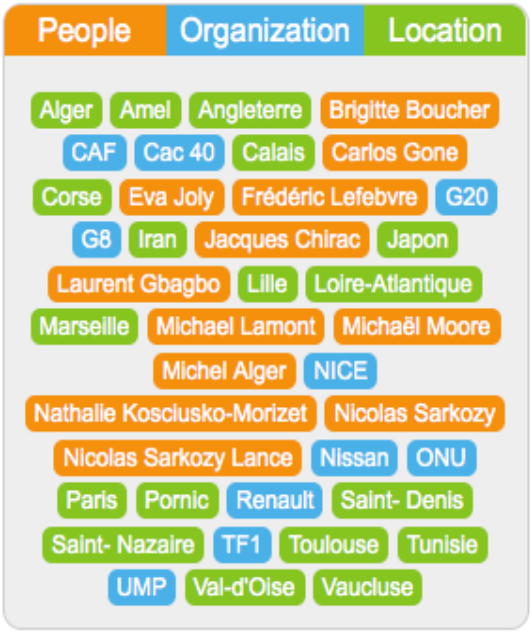


Fig 10.5.1. Tag cloud as shown on Voxalead: http://voxaleadnews.labs.exalead.com

In the tag cloud, the most used tags, meaning the most items that have be tagged with the same word, are displayed in a larger font than the tags that are less used. Moreover, each tag is a hyperlink which can be clicked, after which the user is directed to a result page displaying all the items in the portal that were tagged with the selected tag (see xxx). Also as shown in Figure 10.5.1 The tags will be categorized, using different colors in the cloud. In ECLAP the different categories will be:

- Users from the content partner user group
- Users from the educational/research user group
- Users from the public domain

With this additional categorization it is possible to see the distinction of usages of tagging amongst the different user groups.

As user tags can be added in different languages, the system will use the language set in the user profile to present the tag cloud showing tags in that language only. Should there be a lack of terms available in the preferred language, English tags will be displayed as well.
The system will present the tag cloud in English to unregistered users.

Next to having tag clouds, tags will also be presented on the detailed page of every item (see xxx), which also work hyperlinks as described above for the tag cloud. (see xxx).

10.3.3 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
Tagging module	Drupal module	This module will be newly developed

Third-party software	**Version**	**Notes**

10.4 Comments, votes (DSI)

10.4.1 Comments

Users should be able to comment on content they see on the portal. Comments associated with some objects should be visible when viewing an object. It should be possible to add and browse comments without reloading the page through Ajax calls.

10.4.1.1 Description and draft user interface

This functionality is prvided by the drupal core module comment, which handles comments saving, viewing and modifying, and by the custom module ajaxcomments, which adds Ajax support to comments.
When a user views an object the Javascipt function AjaxTabsPlayer.loadPlayer of the ajaxTabsPlayer.js makes an Ajax call to the URL http://bpnet.eclap.eu/drupal/?q=axmedis/view/_AXOID_ . On the server side this request is handled by the function axmedis_view of the axmedis module. This function retrieves, among other object's information the comment list and the comment form. On the client side the Javascript function inserts the comment list into the page.

When the user submits the comment form the function AjaxComments.submit in the Javascript file ajaxcomments.js is called. It fires a POST Ajax call to the URL http://bpnet.eclap.eu/drupal/?q=ajax_coments_post/_ID_ where _ID_ is the object numeric id. On the server side this request is handled by the function ajax_comments_post of the drupal module ajaxcomments. This function uses the comments module to submit the form.

When the Ajax call ends successfully, on the client side, another Ajax call is issued to the URL http://bpnet.eclap.eu/drupal/?q=ajax_comments_render /_ID_. This request is handled on the server side by the PHP function ajax_comments_render of the ajaxcomments module. It renders the HTML list of the comments associated to an object ordered by the time they were added.
On the client side the javascript file removes the old comment list and adds the new one.

10.4.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
ajaxcomments	drupal module	
comment	drupal module	
axmedis	drupal module	

10.4.1.3 Data model description

Comment information are stored into the database table *comments*, defined by the comments module.

10.4.1.4 Configuration options

At the URL http://bpnet.eclap.eu/drupal/?q=admin/content/comment it's possible to view all comments posted and delete or unpublish them.
At the URL http://bpnet.eclap.eu/drupal/?q=admin/content/node-type/_TYPE_ where _TYPE_ is a node type, is possible to:

- allow comments for that specific node type,
- to change the way they are viewed
- if the comment subject is required or not

10.4.2 Votes

User should be able to vote on content. When viewing a content users should see the average of all votes assigned by users to it. They should also be allowed to rate the content, if they never did so, or to change their rating, if they did assign a vote to the object. Users are not allowed to vote multiple times on the same object, but only to change their previously assigned vote.

10.4.2.1 Description and draft user interface

When a registered users views an object, a box as in the picture below is shown.

The red stars indicate the average vote associated with the object.
Clicking on the stars generates an Ajax call which records the new vote on the database. For example, if the user clicks on the fourth star, he assigns the vote 4 to the object.
This functionality is provided by two contributed Drupal modules: Fivestar (http://drupal.org/project/fivestar) an Voting Api (http://drupal.org/project/votingapi).
The first module provides the user interface and the administration configuration options, while the Voting Api module is responsible for storing and updating the votes.
The voting Api provides some hooks, to allow other modules to perform some specific actions when a vote is stored or updated.

In particular the hook `hook_votingapi_results` is fired after all the results have been calculated and saved. It is triggered for modules that wish to respond to vote results, but not alter them.
This hook is implemented in axmedis_votingapi_results in the axmedis_vote.inc file. It stores the new ranking result after a vote in the rootobjectsinfo table of the axmedis database.

10.4.2.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Voting Api	drupal module	
Fivestar	drupal module	

10.4.2.3 Data model description

Information about votes assigned is stored in the votingapi_vote table of the Drupal database.
The average vote of every axmedis object is also stored in the rootobjectsinfo table of the axmedis database.

10.4.2.4 Configuration options

Some options about votes can be configured for each content type at http://bpnet.eclap.eu/drupal/?q=en-US/admin/content/types.
In particular the administrator can:

- Enable or disable votes
- Choose visualization style

10.5 Annotations, MyStoryPlayer (DSI)

MystoryPlayer is an application allowing the user to build non linear narrative experience through annotations upon multimedia objects such video, images and audio contained in ECLAP BpNet.
The most important feature of MyStoryPlayer is that there is no difference between media and the user's annotations, because both categories are referred to multimedia objects and they are temporally connected.

10.5.1 Add an annotation

This functionality allows a user to create an annotation on a multimedia object such as Video, Image or Audio.

10.5.1.1 Description and draft user interface

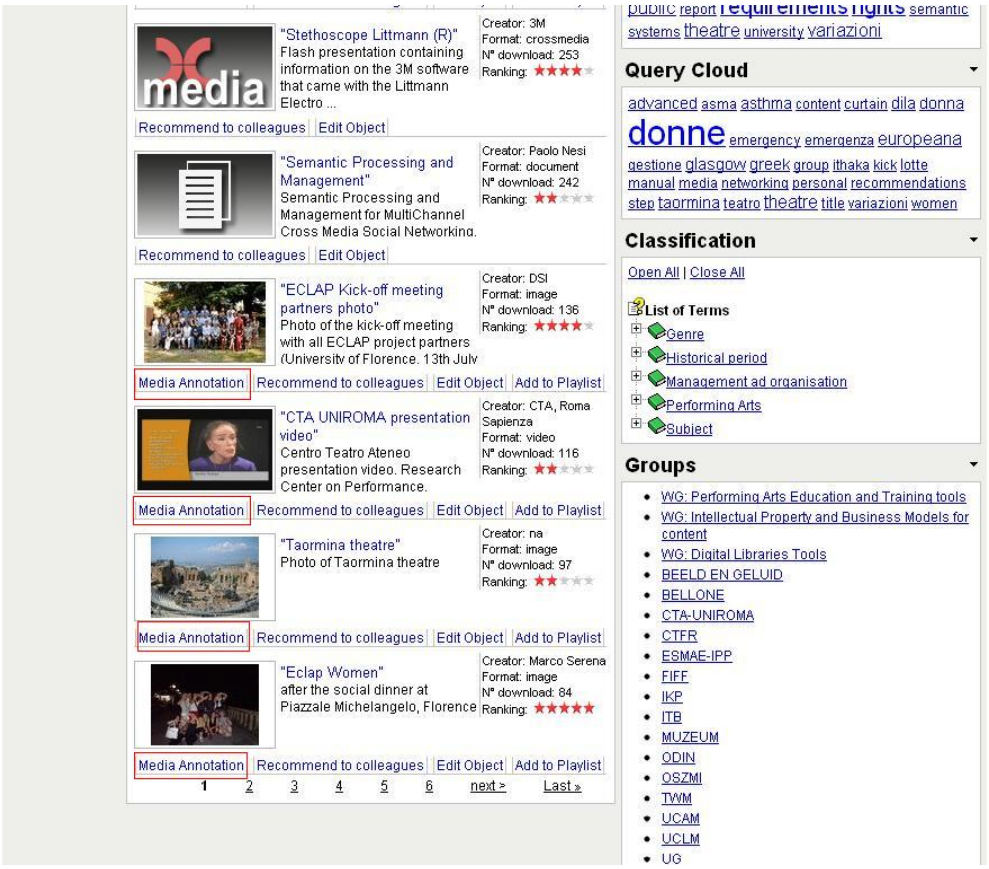


Figure 10.5.1 link MediaAnnotation

For these three types of object (images, audio, video) a link called “MediaAnnotation” will be visible, just under the preview. This link will be created after a query in the MySql database to check the extension of the object, through the function *extentions_ok()*.
The link “MediaAnnotation” will be visible only for whose users with the permission.
Clicking on this link, a block will appear on the right side of the page.
This block will be created through a jQuery call from the function “*addToAnnFromPlayer()*” inside the *annotations* module. The block will be created without reloading the page, and to the function will be passed the *axoid* of the object, the *title* of the media, the *type* of media and the *id* of the user who is making the annotation.
These information are useful for the system to build the annotation.
All the html code needed to fill this block is generated by the function *addToPlaylistFromPlayer()*, through the jQuery function *append()* that associates the html to the div *annotationsBox*.
Every time the block is populated, a function, in JavaScript file *annotations.js*, will create a temporary file with the extension *.xan* that is useful to not lose the information while the user is editing his annotation.
The schema of the filename is : *userId_timestamp.xan*.
To not lose information, in the *annotations.module* there is a function called *parseXMLAnn()*, that parses this temporary file filling the block of MediaAnnotation every time the page is reloaded, to check if there is a pending annotation on the portal.
For example, if the page is refreshed, the content will not be lost, so the user can continue with his annotation session.
Only one temporary annotation per user can exists.
Another mode to add annotation is clicking on link *MediaAnnotation* in *Actions Panel*, while a media is playing.

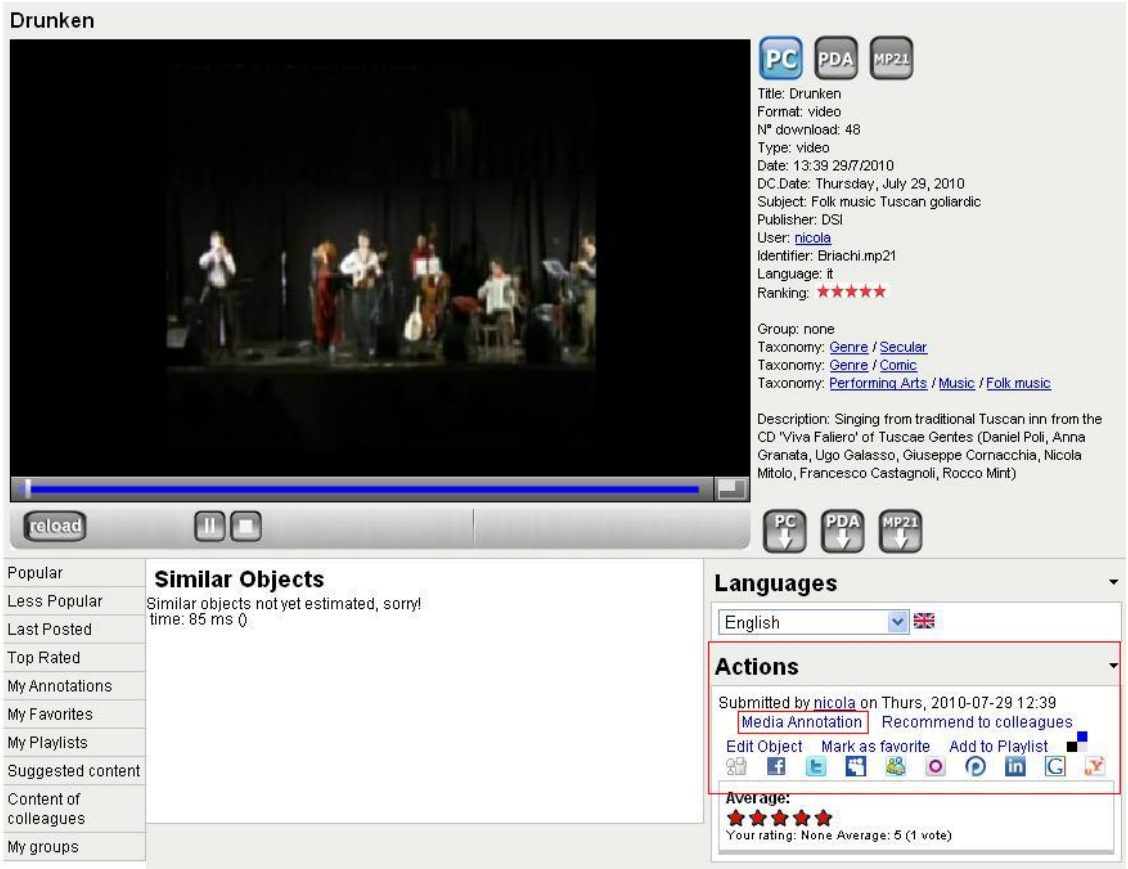


Figure 10.5.2

Depending on the order which the media is chosen, the semantic related to the annotation will be different.
First of all, we have to describe the mechanism of an annotation in MyStoryPlayer.
Each annotation is composed by two media.

1. Media Annotated
2. Media Reference

The user, once clicked on the link MediaAnnotation, can edit the annotation choosing for each media, the parts in which he/she is interested in, in order to create the relation between the two media.
Depending on the type of media, a proper player will be loaded allowing the user to select start and end of the parts interested in the annotation.

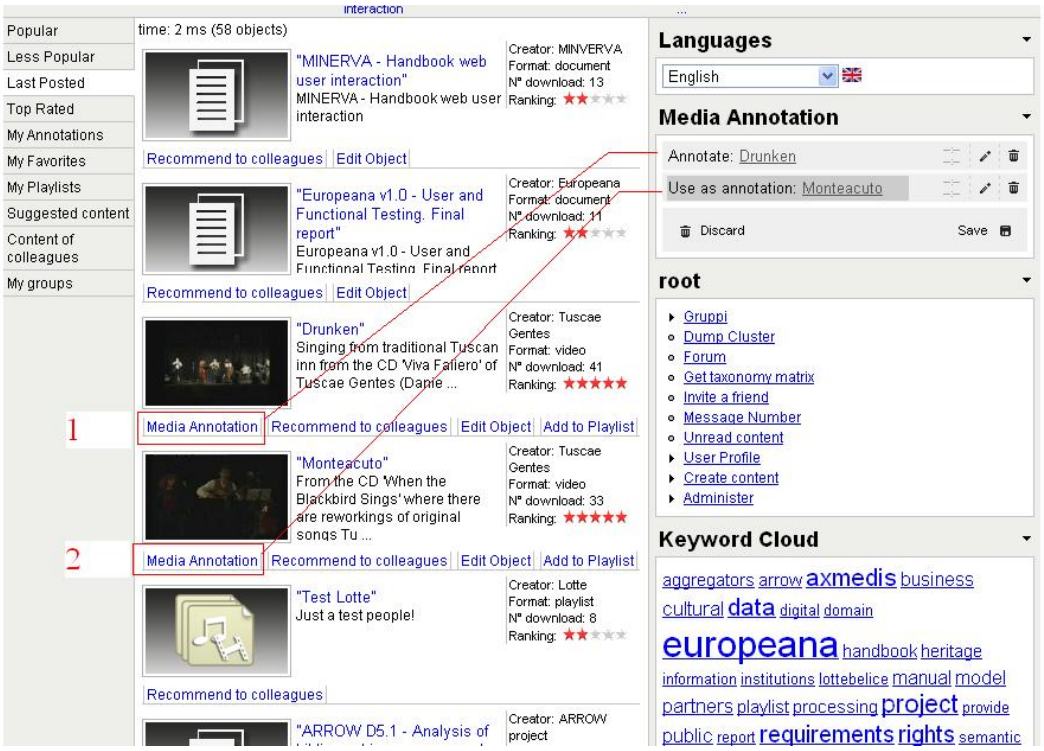


Figure 10.5.3

This block is built by file JavaScript *annotations.js*, called by the module *annotations*, and depending on the user's choices, it changes its contents.
Clicking on the pencil icon, it will be possible to view the media and for this purpose a proper player will be loaded, containing the suitable buttons to choose the begin and the end of annotation or media reference.
Another TextField will appear, the *Text Description* of the annotation.

Figure 10.5.4

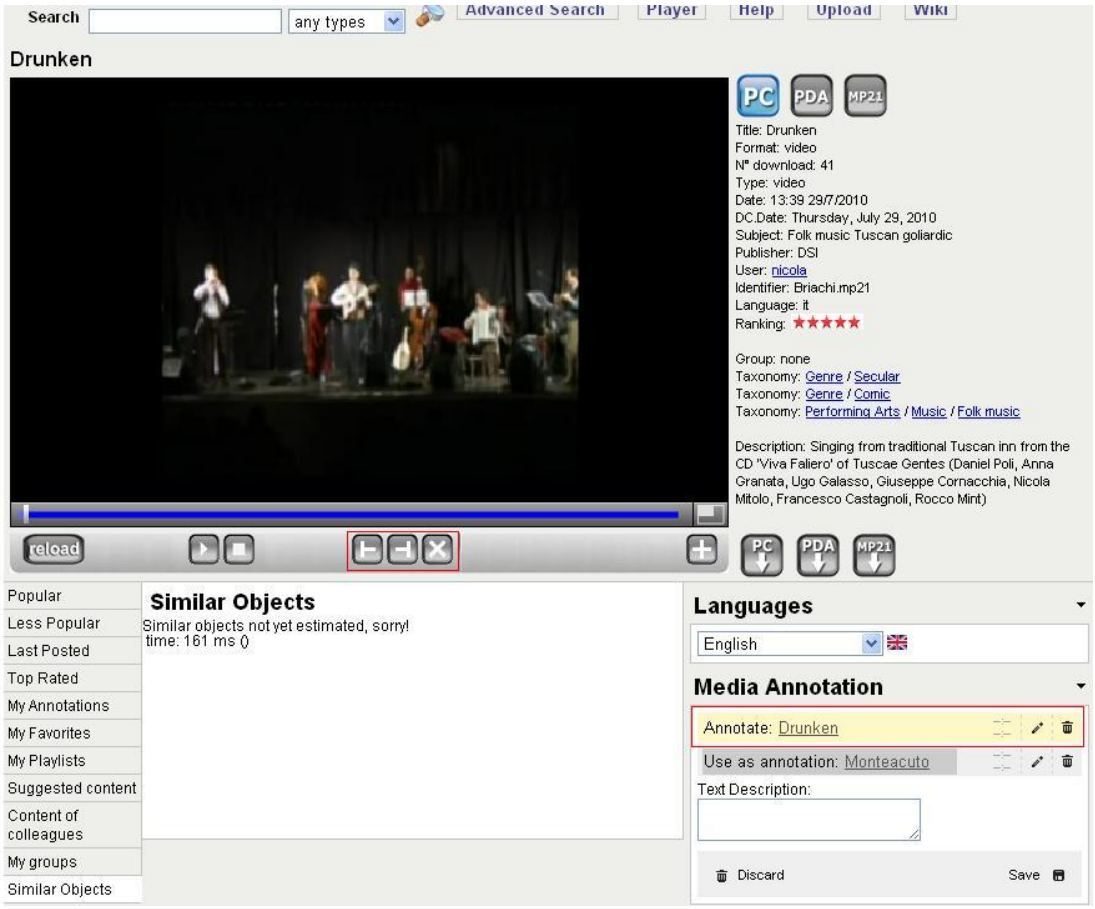


Figure 10.5.5

The function *ajaxTabPlayer.loadPlayer()* is called to load the proper player depending on the type of media. If an image is used as media to annotate, the default length will be 20 seconds, on the contrary, if it is chosen as media to use as annotation, the default length will be 5 seconds.

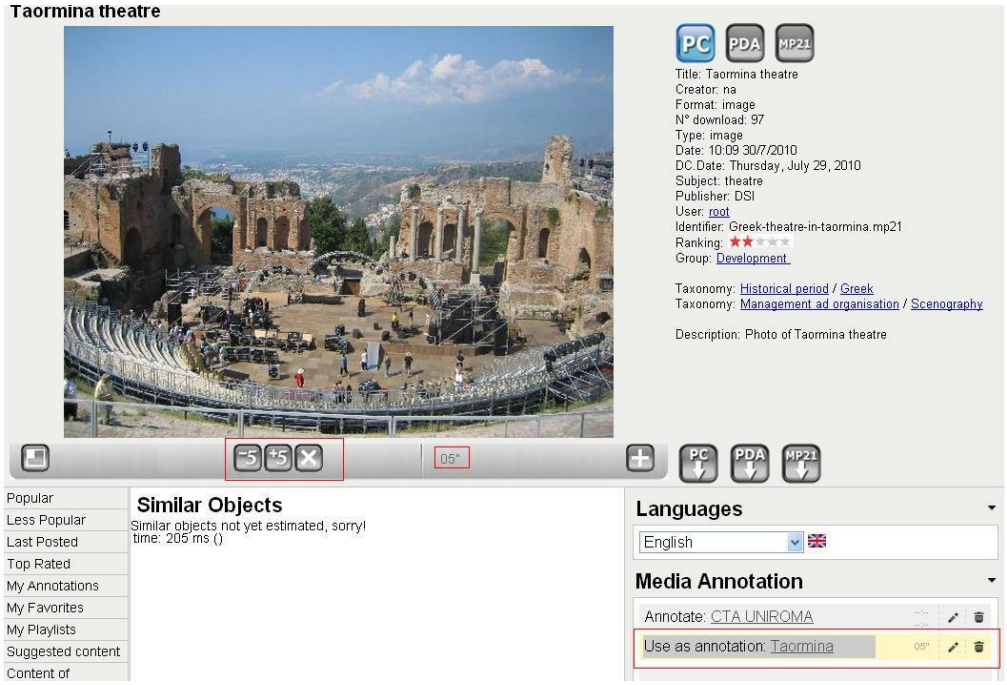


Figure 10.5.6

To choose the length of annotation an user can click on the buttons below the video, and on the temporal line will appear the highlight of the annotation in red.

Figure 10.5.7

The player is realized in ActionScript and through an external public interface can communicate with the JavaScript file *annotations.js* that will update the block with the time of begin and end of annotation.
The same procedure can be utilized for Media Reference.
At the end, the block will appear in this way:

Figure 10.5.9

In the text description box, the user can:

- Add a description of the annotation that is creating.
- Delete an item from the annotation box simply clicking on the garbage icon.
- Reset the block, clicking on the *Discard* button on the bottom left side of the block.

This action will call, after a confirm request dialog, the file *destroyAnnotation.php* that will erase the temporary file.

10.5.1.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
annotations	Drupal module	

10.5.1.3 Configuration options

In order to upload the annotations done by the users on the RDF database, it is necessary to set the url on a table of MySql DB. In this way, every time an annotation is saved, the url of RDF DB in which upload it, will be taken simply querying the table properties of MySql db Axdbv4.

Name	**Context (drupal, DB,…)**	**Notes**
rdfRepositoryUrl	Table Properties of Axdbv4 database	http://localhost:8080/openrdf-sesame/repositories/msptest

10.5.2 Save Annotation

10.5.2.1 Description and draft user interface

Once the user has edited the annotation box, he/she can click on the *Save* button to save his annotation.
A dialog box will appear asking confirm to the user.
The procedure of saving annotations will upload:

- The database *axdbv4* through MySQL call, on the *annotation* table,
- the Sesame repository *msp* containing the RDF onthology, useful to playback the annotation.

In the *annotation* table will be saved:

- *idAnnotation as key*
- *idUser*
- *Timestamp of annotation*
- *axoidMediaAnnotated*
- *axoidMediaReference*
- *startTime Annotation*
- *endTime Annotation*

- *startTime MediaReference*
- *endTimeMediaReference*
- *textDescription*
- *imageAnnDuration*
- *imageRefDuration*

This will be done by a call to the file *createAnnotation.php*, giving a url such like "*createAnnotation.php?&user="+uid+"&ts="+tsAn+entriesAn"* where *user* is the userId, *ts* is the timestamp of annotation and *entriesAn* is a string containing all the parameter of annotation such as:

- *node*
- *title*
- *mediatype*
- *axoid*
- *filesecco*
- *sourcefile*
- *segmentfrom*
- *segmentto*

The store of RDF triples on the Sesame Repository will be done by the file *createRDFAnnotation.php*.
The parameters passed are the same as before.
The structure of RDF annotation is composed following this schema:

<idAnnotation> <type> <Annotation>
<idAnnotation><isAnnotationOf><MediaAnnotatedURI>
<idAnnotation><startsAt><segmentFrom>
<idAnnotation><endsAt><segmentTo>
If the mediatype annotated is an image, the previous two lines are replaced by the one below.
<idAnnotation><hasDuration><imgDuration>
<idAnnotation><hasMediaReference><MediaReferenceURI>
<idAnnotation><hasTextDescription><textDescription>
<MediaReferenceURI><refStartsAt><segmentFrom>
<MediaReferenceURI><refEndsAt><segmentTo>
If the mediatype of mediaReference is an image, the previous two lines are replaced by the one below.
< MediaReferenceURI ><hasDuration><imgRefDuration>
<MediaReferenceURI><refsTo><axoidMediaReference>

NB: Two parameters *segmentFrom* and *segmentTo* for *MediaAnnotated* and *MediaReference* are not the same value. These are distinct values taken from the string *entriesAn*.
During the update on the RDF repository, another check is done on the multimedia objects involved in annotation.
If this media is not present inside the ontologic model, further triples code is added to the Database. This code is:
<MediaAnnotatedURI><type><mediaType>
<MediaAnnotatedURI><hasURL><URLMediaAnnotated>
<MediaAnnotatedURI><title><titleMediaAnnotated>

The *URLMediaAnnotated* is composed by three part:

- *baseUri* (obtained by a query to database on the table *properties*).
- *axoid*
- *extension* (identified by *filesecco*).

The same rule is valid for the *MediaReference*.

10.5.3 View Annotation

10.5.3.1 Description and draft user interface

This functionality allows users to view media previously annotated.
The user can access to these media in three ways:

- Clicking on *MyAnnotations* link and choosing one in the list (if there exists one),
- Clicking on his profile on link *Annotations*, producing the same result of the first option,
- Simply by clicking on a content previously annotated

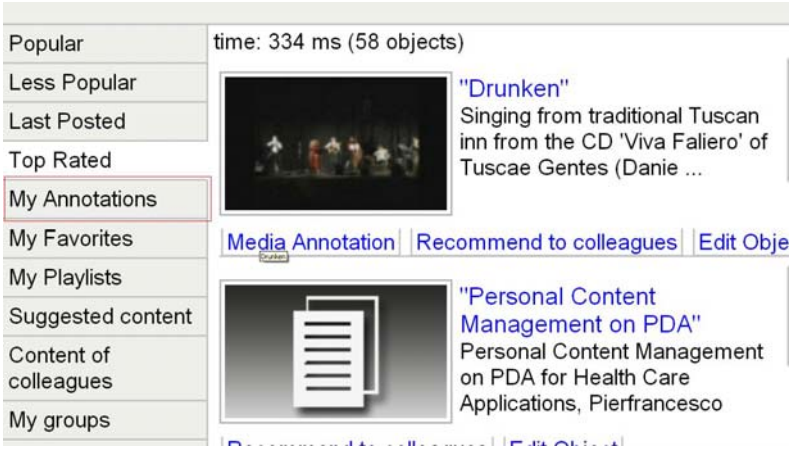


Figure 10.5.10

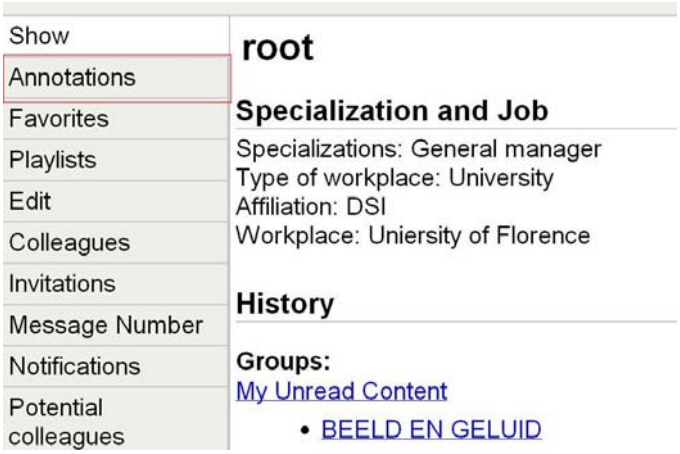


Figure 10.5.11

Figure 10.5.12

In the first two cases, the *annotations.module* will produce a query to database on the table *annotation* to provide the annotations done by the user logged in.
With the *theme_annotations* function, the module will provide the user a page with all formatted results.
The results will provide all the annotations done by the user, showed by media annotated, just as is done now on MyStoryPlayer front end, as you can see in figure below
Moreover, the system will provide for each annotation the date of submission.
The results will be shown in the page and the user can click on one of them to load the MyStoryPlayer for the vision.

Figure 10.5.13

If the user click on the title of video, the player will start from the begin of video, if the user click on an annotation result, the player will start from the point in which the annotation starts.

The player:

- will be loaded through a php call, giving as parameters the axoid of the media and the idAnnotation chosen,

- will start to play the media with the annotations related to,
- all the others RDF triples related to the mediaAnnotated will be loaded too, allowing the users to navigate inside the annotated structure.

This operation will be done by the player, that will query the Sesame Repository, loading all triples related to the playing content, depending on the user's actions on the player.

In the third case, MystoryPlayer front end will be called through php call, giving the axoid as a parameter.
The page of MyStoryPlayer will load the player, which will load all the triples related to the media, and starting his reproduction

The interface of MyStoryPlayer is shown in the below figure.

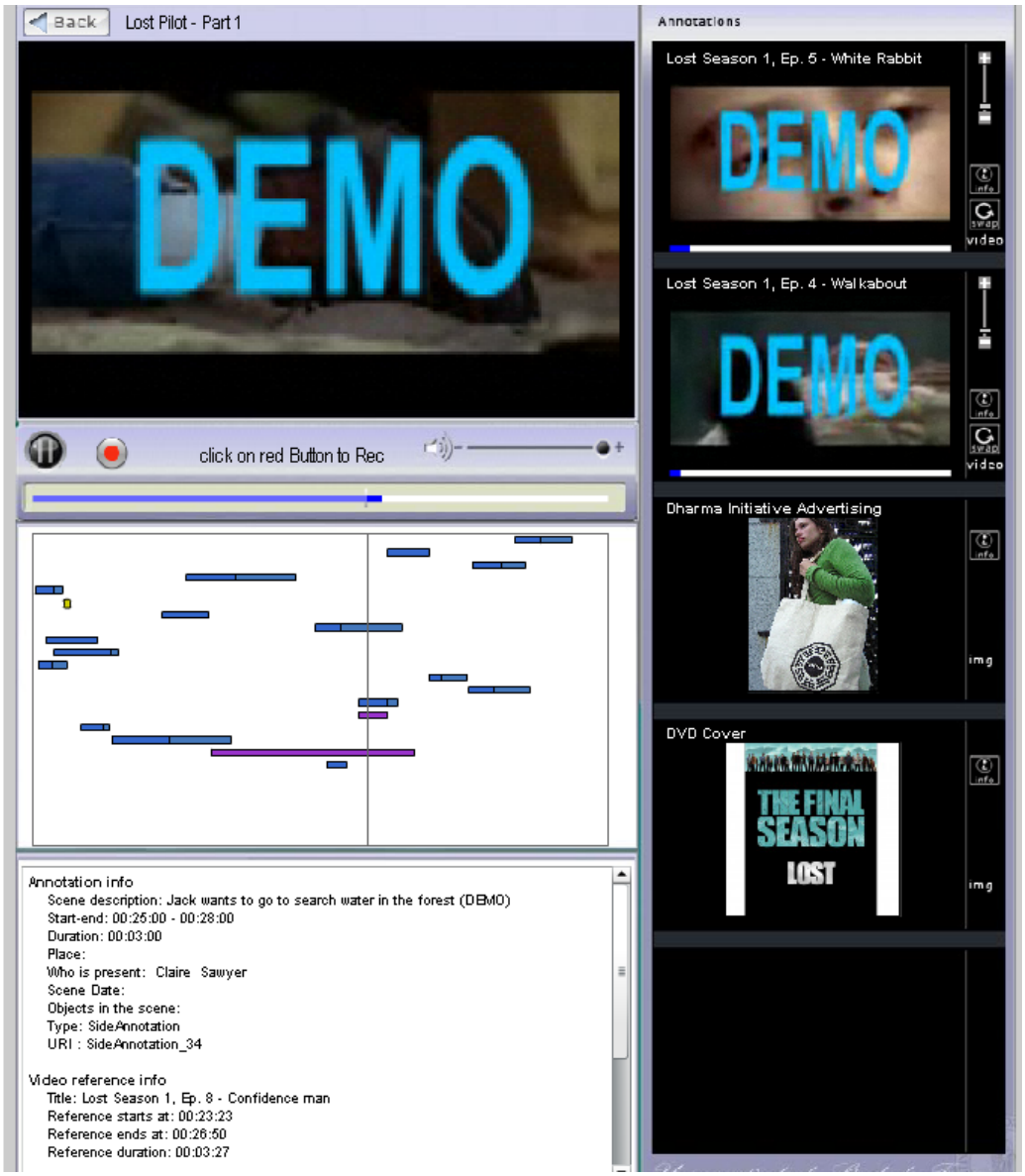


Figure 10.5.14

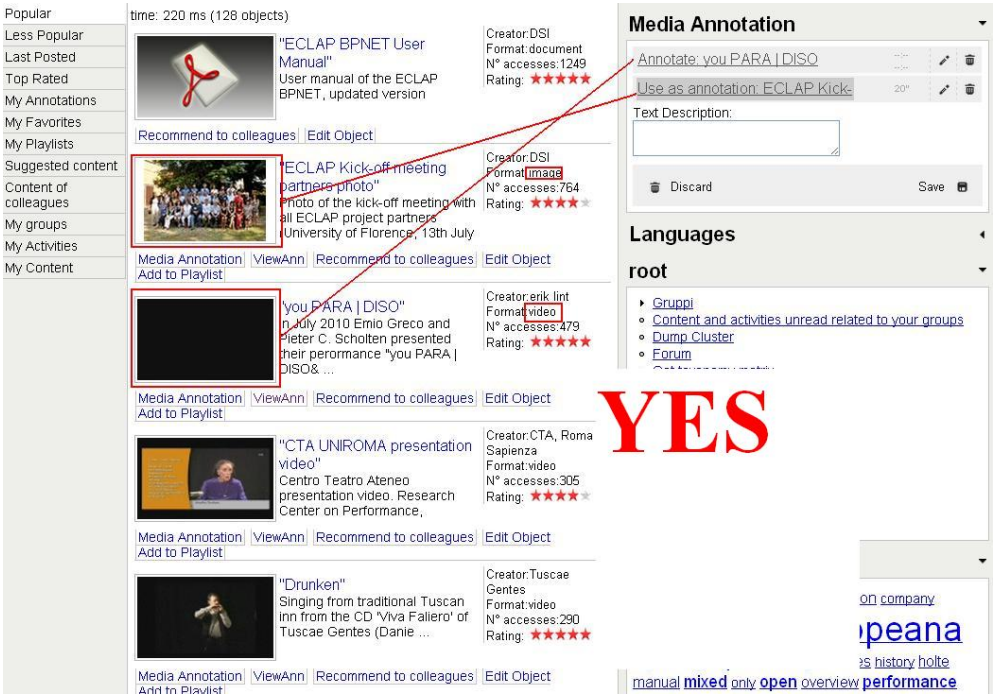
This player will be embedded in the portal, loaded like the other players.
The functionalities of this player are:

- Navigating among the annotation structure,
- Swap media loading another RDF triples,
- Switch the volume on/off among the active playing media,
- Record an experience, save it and share it with other users.

The last case MyStoryPlayer will be loaded, is when a user choose to play a media previously annotated. The module annotations will make a query on database asking if some annotations are related to it, if yes, MyStoryPlayer will be loaded on another tab in the browser with the media and all annotations related to it.

10.5.4 What is going to be done

Up to now, there are some limitations in the annotation module, and something has to be done to get complete the integration of the annotation module with MyStoryPlayer.
First of all, the users can't annotate an image, but can use it to annotate a video.



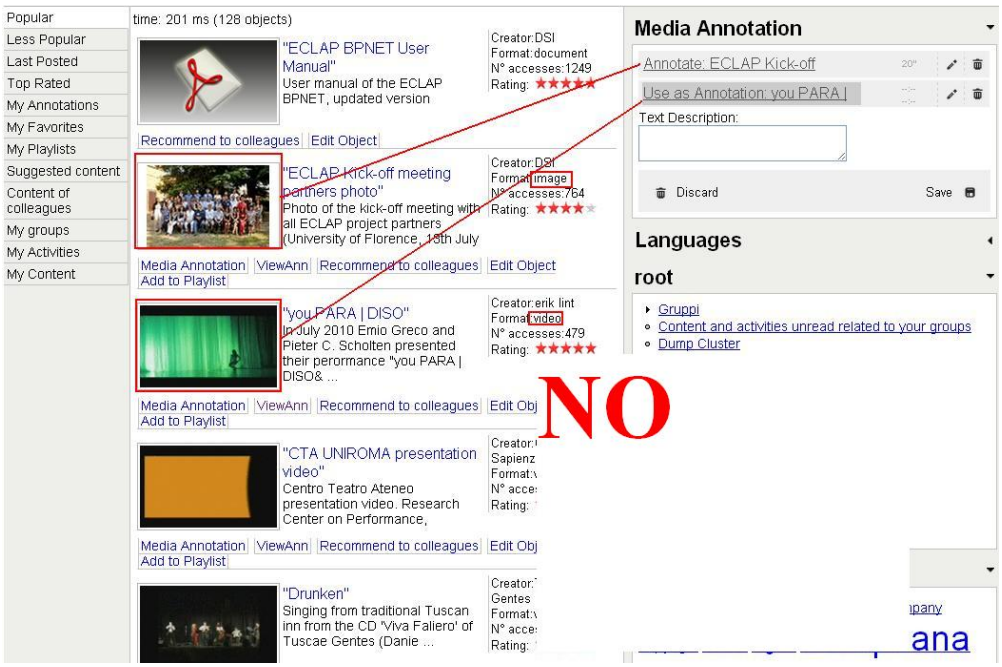


Figure 10.5.15

If a user makes an annotation without specifying the length of annotation or media reference, the system misinterprets the duration in the play/view session.
This problem will be solved assigning as default value the duration of video involved in annotation.
If both annotation and media reference have no length specified, the durations of both videos will be taken as default, and in view session two videos will start synchronously. This case could be represented by an annotation which involve the same video performance but registered from two points of view, or in case of educational environment, in which there is a video of a lesson, and aside the slides proposed that are played synchronously with the main video of the teacher.
Up to now, it is possible to search for annotations only on MyStoryPlayer front end, clicking on the Search Annotation button.
In future it will be possible to search annotations through free text query, or by type, by indexing on database all text descriptions related with annotations done and querying it through Lucene.

Figure 10.5.16

10.6 Playlists (DSI)

This module allows users to create, organize and save some playlists among multimedia objects in BpNet portal.
Users can choose some pieces of media selecting by a proper player interface, creating a list of media, which will be reproduced (only for the pieces chosen) following the order in which is been created.
Functionalities:

- Create a Playlist,
- Save a Playlist,
- PlayBack of Playlist.

10.6.1 Create a Playlist

10.6.1.1 Description and draft user interface

Under the preview of media (audio, video, images) a link will be created, named “Add to Playlist”.
There is a function (*extensions_ok()*) inside the module defining the available extensions to create playlists.
These are:

- *Mp3*
- *Bmp*
- *Jpg*
- *Gif*
- *Png*
- *Flv*
- *mp4*

This link will be visible for everybody, but only the registered users can create playlist.

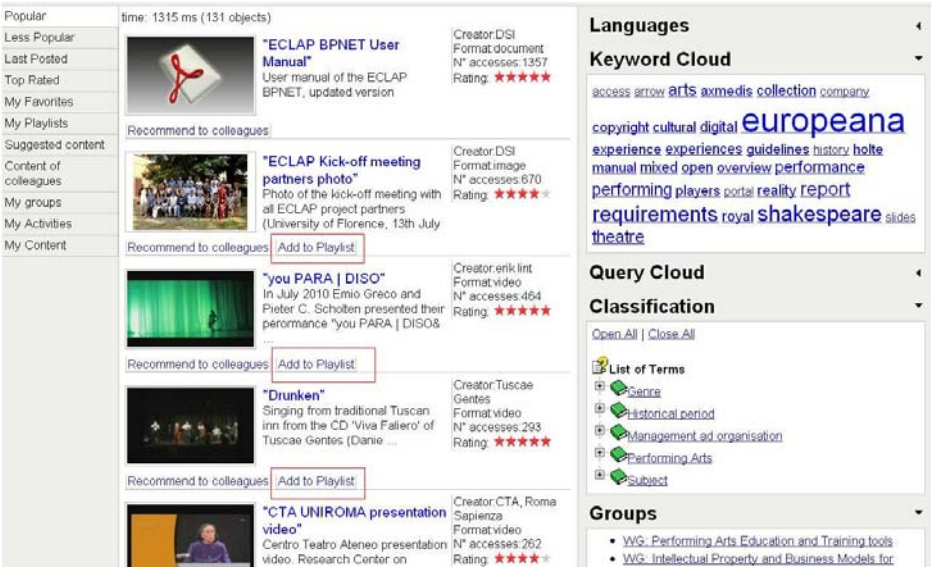


Figure 10.6.1

In figure 10.6.1 we can see the link just under the preview of media, while in the figure 10.6.2 we show the link in the *actions* box, in the case in which the user is watching a media.

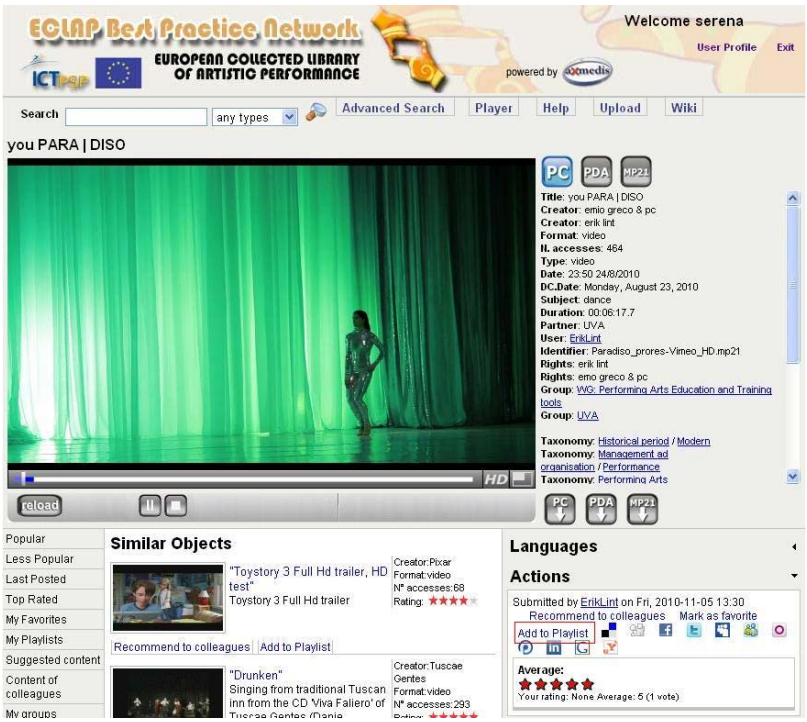


Figure 10.6.2

Clicking on link will be created, through a jQuery call, a block (called *Compose Playlist*) in the right side of the page.
The function associated with this operation is *addToPlaylistFromPlayer()*, inside *playlists.module*.
The block will be created without reloading the page, and to the function will be passed the *axoid* of the object, the *title* of the media, the *type* of media and the *id* of the user who is making the playlist.
Every time an item is added to the block, a temporary file is updated, inserting all information regarding the playlist.
This file is useful to not lose the information about playlist even if the page is reloaded.
This action is done by an AJAX call to the *createPlaylist.php* file.
The function of playlist module, called *parseXML()* check if there is a file in the folder *temp_pl* and parse it, refilling the playlist block every time the page is reloaded.
The schema of the filename is : *userId_timestamp.xpl.*
Once a media is added to playlist block, this will appear as in figure 10.6.3.

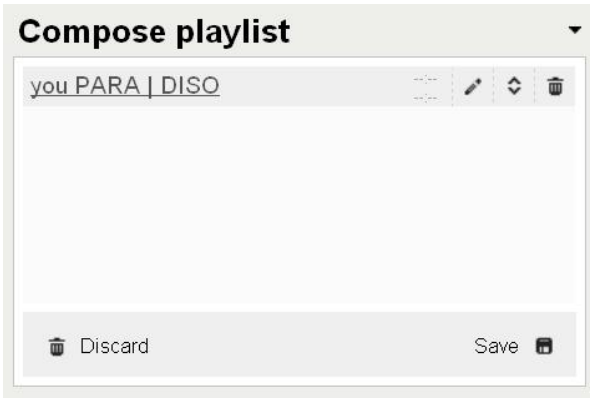


Figure 10.6.3

All the html code needed to fill this block is generated by the function *addToPlaylistFromPlayer()*, through the jQuery function *append()* that associates to the div *playlistsBox* the html.

10.6.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Playlists module	Drupal module	

10.6.2 Edit a Playlist

10.6.2.1 Description and draft user interface

User can add media to playlist box as much as he want.
Through the up/down arrows icon the user can choose the order of the items.
For each item, the user can click on the pencil icon to edit the playlist.
Edit the playlist means that the user can choose the length of the pieces of media he want to include in his playlist.
If no piece is selected, the media will be played entirely.
A player will be loaded through a jQuery call *ajaxTabPlayer.loadPlayer()*.
This player contains the suitable buttons to choose a start and end of part of media.

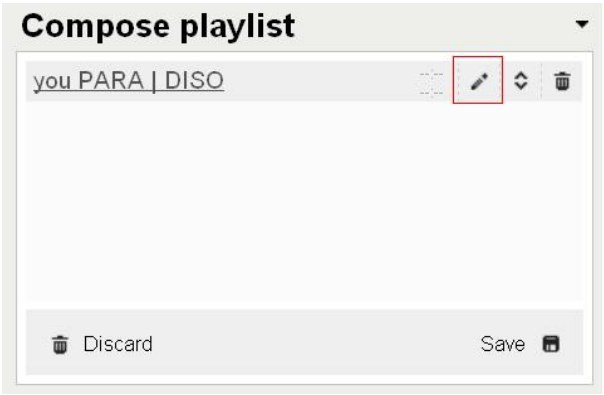


Figure 10.6.4

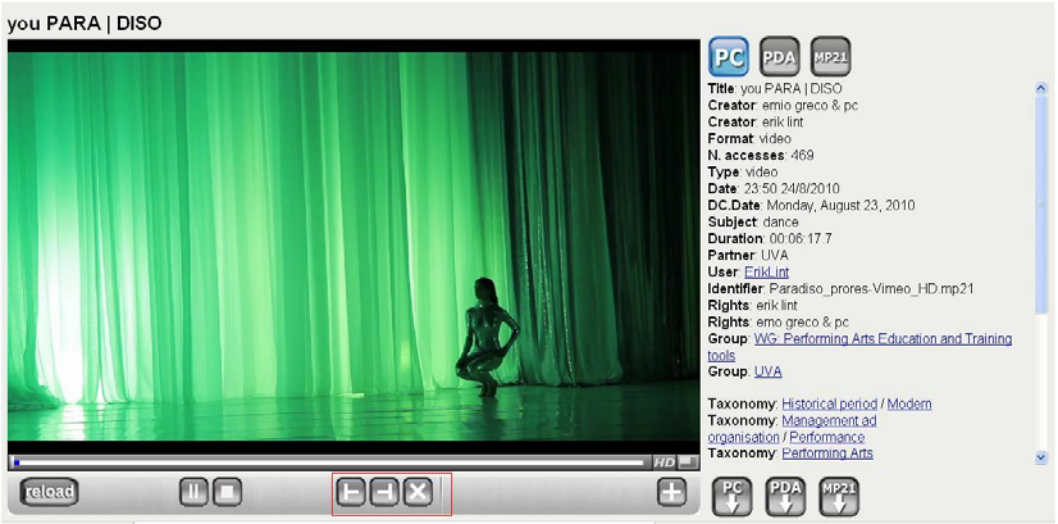


Figure 10.6.5

Depending of the type of media, a proper player will be loaded.
In figure 9.10.5 we can see the player of video, and in figure 10.6.6 we can see the player loaded for pictures.

To choose the length of a piece of video, the user can click on the buttons below the video, and on the temporal line the highlight will appear to show which part is selected.
In this case, a fixed default length is set as 5 sec.

Figure 10.6.6

The user can click on the proper button to modify the length of image in his playlist.
The video Player is realized in ActionScript language and through an external interface can communicate with JavaScript *playlists.js* that will update the block with the time of begin and end of that media for the playlist.
The functions used to allow the set of actions for editing playlist on player are:

- *setFrom()*
- *setTo()*
- *undoSelection()*
- *getTimeFromPL()*
- *alterImageduration()*

This functions are associated to the mouse click on the player's button.
The last one, obviously, is used to modify the length of images.
For all item is possible to utilize the same procedure.
An example of edited playlist is shown in figure 10.6.7.

Figure 10.6.7

As we can see in the figure, it is possible to change the order of the items, simply by clicking and drag and drop on the icon selected in red.
The jQuery widget sortable will be called for this.

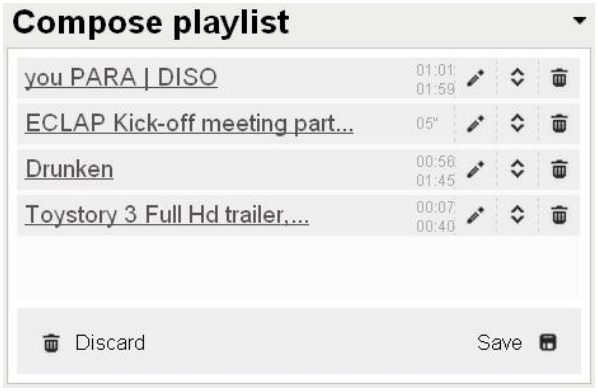


Figure 10.6.8

The box will be updated by jQuery function in playlists.js.
Users can erase some media simply by clicking on garbage icon in correspondence of the item, or cancel all items of the playlist clicking on the *Discard* button.

10.6.3 Save a Playlist

10.6.3.1 Description and draft user interface

After edited the block, users can save a playlist on the database.

- This can be done simply by clicking on *save* button.
- This action will call *ugc_upload_form* in the *ugc.module*.
- The page will be shown as *axmedis_page* theme.
- The hook *playlist_form_alter* is necessary to modify some rules of saving .

In fact, *ugc_upload_form* is suitable to upload contents. For the playlist case, it is not necessary to upload any content, as the playlist is saved as an object with *.xpl* extension to the database.
It's up to the user to insert the metadata related to the playlist, so for this the *upload_form* is used.
For this purpose is been created the file *upload_playlist.js* where is called the function *checkUploadFieldsPL()* associated to the event *onsubmit*.
Playlist_upload_form_validate take the temporary file *.xpl* in the *temp_pl* folder, and rename it following the schema "*playlist_userID_timestamp.xpl*" and save it in the same folder stated by *ugc.module* through the function *variable_get().*
If the operation is successfully done, the temporary file is deleted.

An example of upload module is shown in figure 10.6.9 and 10.6.10.
For details, please regard this module see section 6

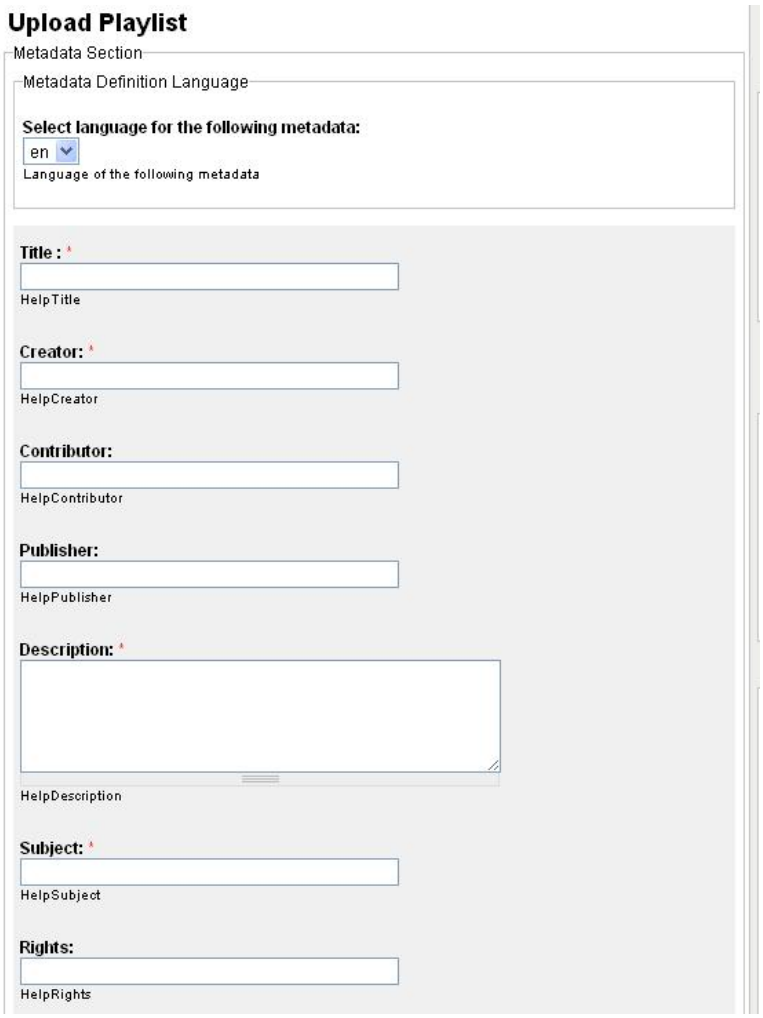

Upload Playlist
Metadata Section
Metadata Definition Language
Select language for the following metadata:
en
Language of the following metadata
Title : *
HelpTitle
Creator: *
HelpCreator
Contributor:
HelpContributor
Publisher:
HelpPublisher
Description: *
HelpDescription
Subject: *
HelpSubject
Rights:
HelpRights

Figure 10.6.9

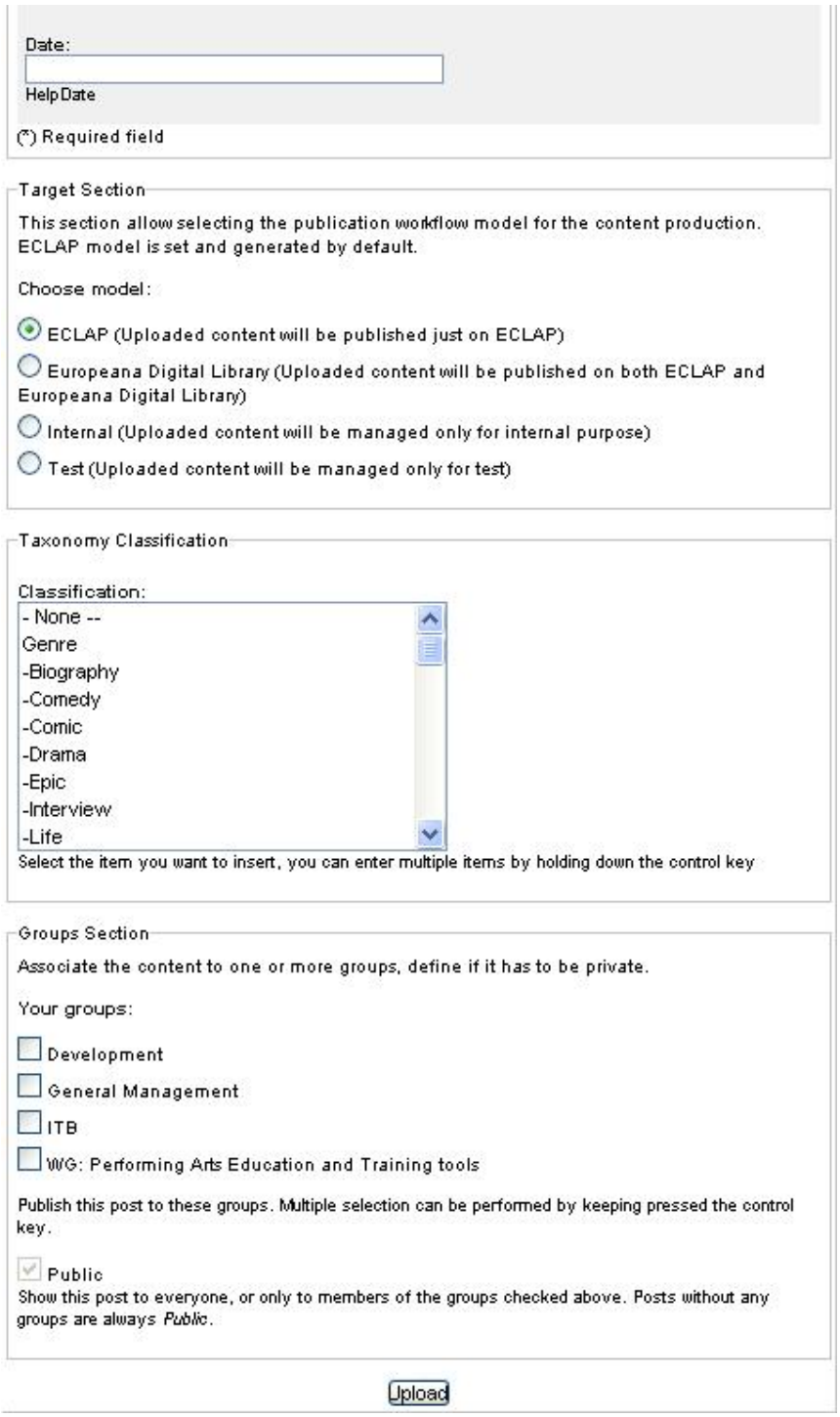


Figure 10.6.10

10.6.4 Playback of playlist

10.6.4.1 Description and draft user interface

The visualization of a list of playlist created by the user is visible through the links "*MyPlaylists*" in the home page and "Playlist" on the user profile.
The function related to this action is *theme_playlist*. This function make:

- Query on the database to get the list of playlist for a specific user
- Put the results on the page

The playback phase begin when the user chooses the xpl file to reproduce.
The player xpl.jsp is loaded.
The function *pl_playback_arrange()* :

- Keep the metadata and fill the div *playlistDetails* through the function *fillPlaylistdetails()*
- Fill the block *Playlist Playback*, calling through an *AJAX* call the *parsePlaylist.php* file that parse the *xpl* and procude the html code
- Make the bind of actions to do when a playlist file is selected
- Prepare the *nodesArray* containing the references to the DOM involved in the playlist, managed by the function *pl_next()* that call them one by one.
- Begin the playback calling the function *pl_next()*.

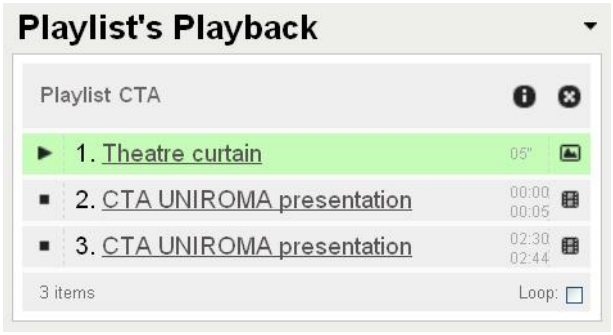


Figure 10.6.11

In the figure 9.10.11 is shown an example of playback of a playlist.
Clicking on info icon is possible to see all the metadata regarding the playlist, as we can see in figure 9.10.12.

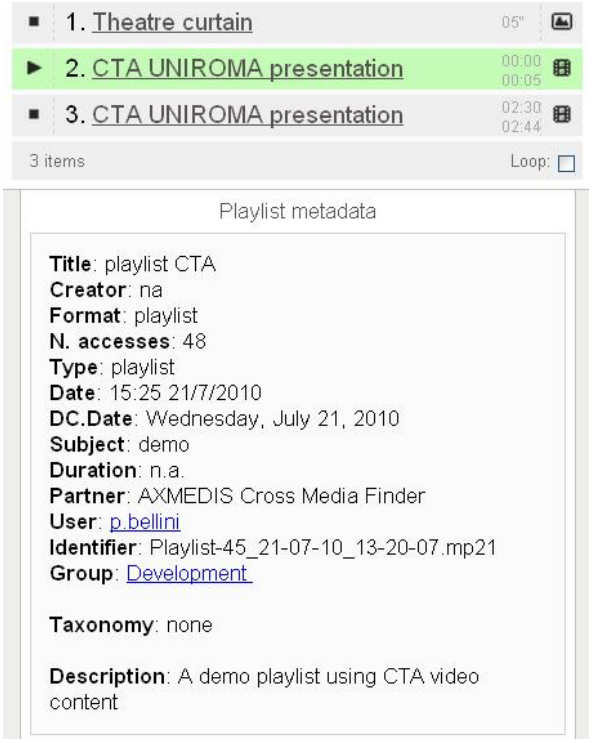


Figure 10.6.12

10.7 Courses as in e-learning (DSI)

The e-learning activity integration allows users of the ECLAP social network to publish educational content and to exploit all the advantages provided by the use of a complete and effective tool for creation and management of on-line courses in an integrated manner.

The main functionalities here after detailed are:

- General course list
- Course creation request
- Course creation
- Course management
- Registration of users to courses

The user roles involved are the following:

- Registered users
- Student
- Teacher
- Site Administer

Each course will be grouped in a specific category, in order to better classify all ECLAP course.

These functionalities will be added by integrating the Moodle (http://moodle.org/) services in the ECLAP Portal (drupal module: 'moodle'). Moodle is the most diffused Learning Content Management System to achieve portals for e-learning activities.

Note that the ECLAP site administrator can manage both Drupal side and Moodle. A more detailed description of actual e-laerning activities can be found in [eclap_mum].

10.7.1 Course list and visualisation

User access: all registered users

Each ECLAP registered user can see that in the Portal are present some courses: this information will be visible in a lateral block called "e-Learing coures"

10.7.1.1 Description and draft user interface

When a user wants to see the ECLAP courses list, he/she has to look at the lateral block called "e-Learning courses" and choose one of the following links, Figure 10.7.1:

- "All courses": a page containing a list of all courses present in the site will be visible (Figure 10.7.2). Here will be provided the following services:
    - For users not enrolled to courses: the course program (or a short textual description) will be visible (Figure 10.7.3) and instructions for the subscription will be detailed (Figure 4)
    - For users enrolled at least to one course: the course program (Figure 10.7.5) and the course topics and activities will be accessible (Figure 10.7.6)
- "All course categories": a page containing all course categories will be visible (Figure 10.7.7)
- "All teachers": a page containing all teachers will be visible (Figure 10.7.8), and the related ECLAP profiles will be directly accessible (clicking on teacher names)
- "My e-Learning activity":
    - For users not enrolled to courses: a message advising the user that he/she is not subscribed to any course (Figure 10.7.9) and the instructions for the subscription will be detailed (Figure 10.7.4)
    - For users enrolled at least to one course: his/her courses (the list of the courses of which he is a student or a teacher, Figure 10.7.10) and the related course topics and activities will be accessible (Figure 10.7.6)

Figure 10.7.1

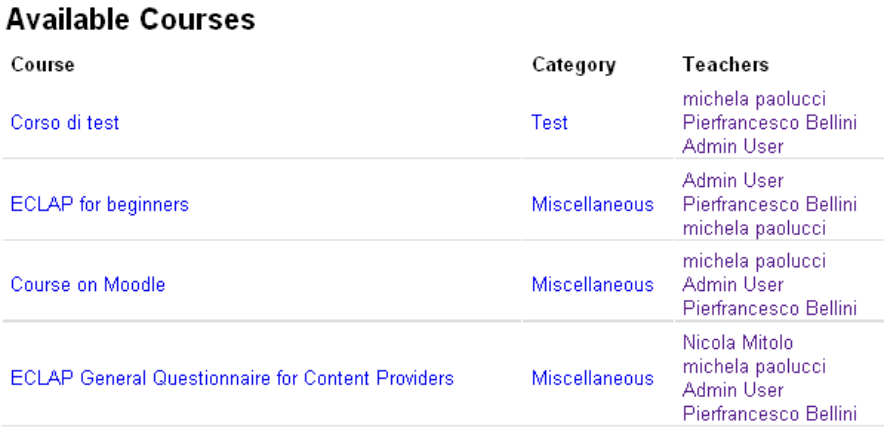


Figure 10.7.2

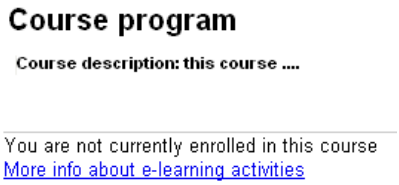


Figure 10.7.3

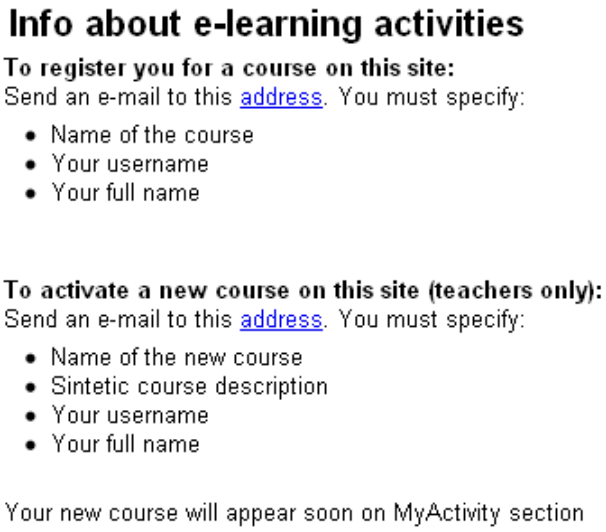


Figure 10.7.4

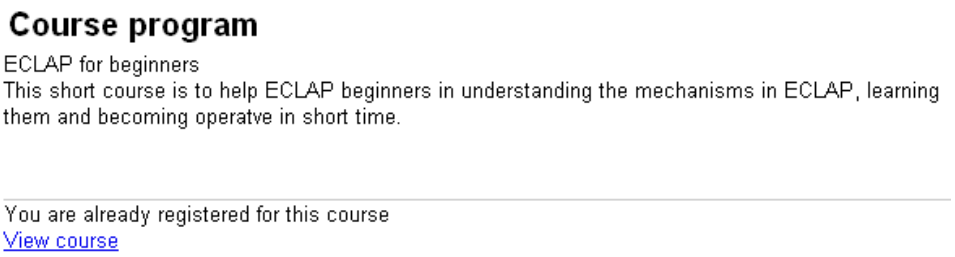


Figure 10.7.5

Figure 10.7.6

Figure 10.7.7

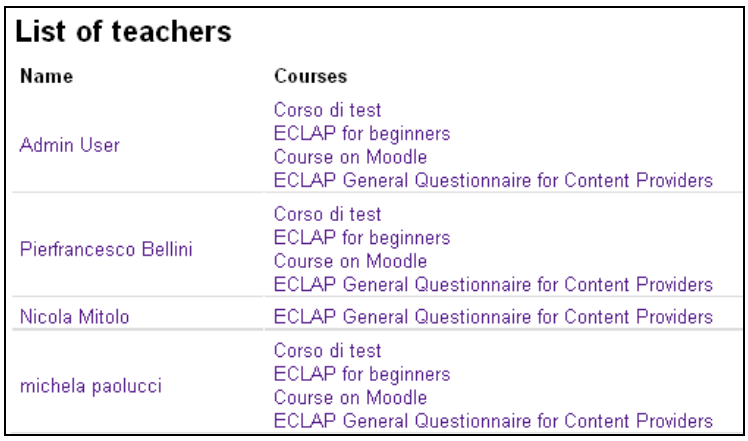


Figure 10.7.8

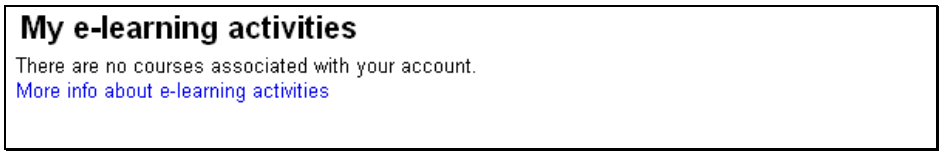


Figure 10.7.9

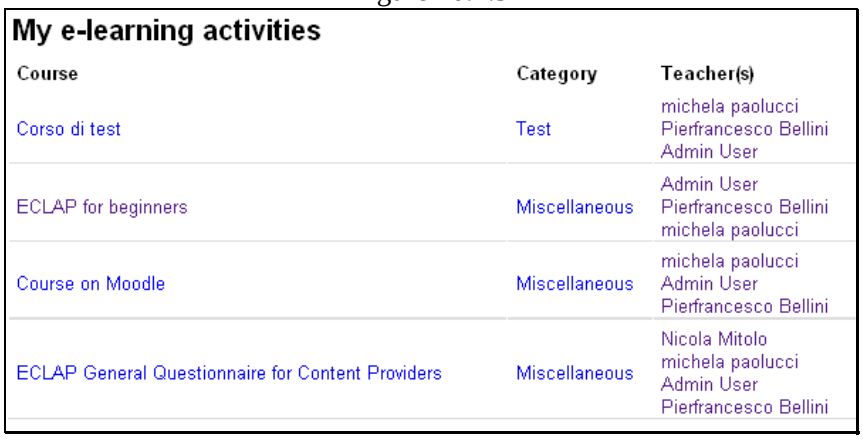


Figure 10.7.10

10.7.1.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
moodle module	Drupal module	
block module	Moodle module	
mod module	Moodle module	

Third-party software	**Version**	**Notes**

Moodle LCMS	1.9	http://download.moodle.org/

10.7.2 Course creation request

User access: teachers

All teachers can see the ECLAP courses list (see 10.7.1) and to the site administrator to add a new course

10.7.2.1 Description and draft user interface

As described in the previous paragraph (see 10.7.1) each user can request a new course creation. In the ECLAP Portal will be provided the instruction to make the request to the site administrator (Figure 10.7.11).

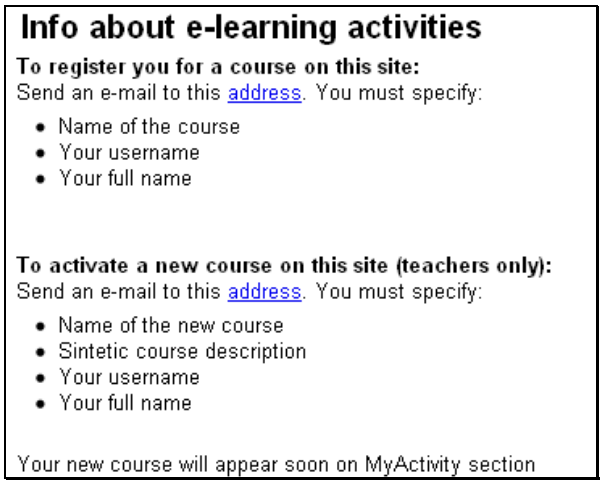


Figure 10.7.11

10.7.3 Course Creation

User access: site administrator

This activity will be accessible only for the site administrator.
As said in the e-Learning activities introduction, we suppose the site administrator will be the administrator of both Drupal and Moodle side.

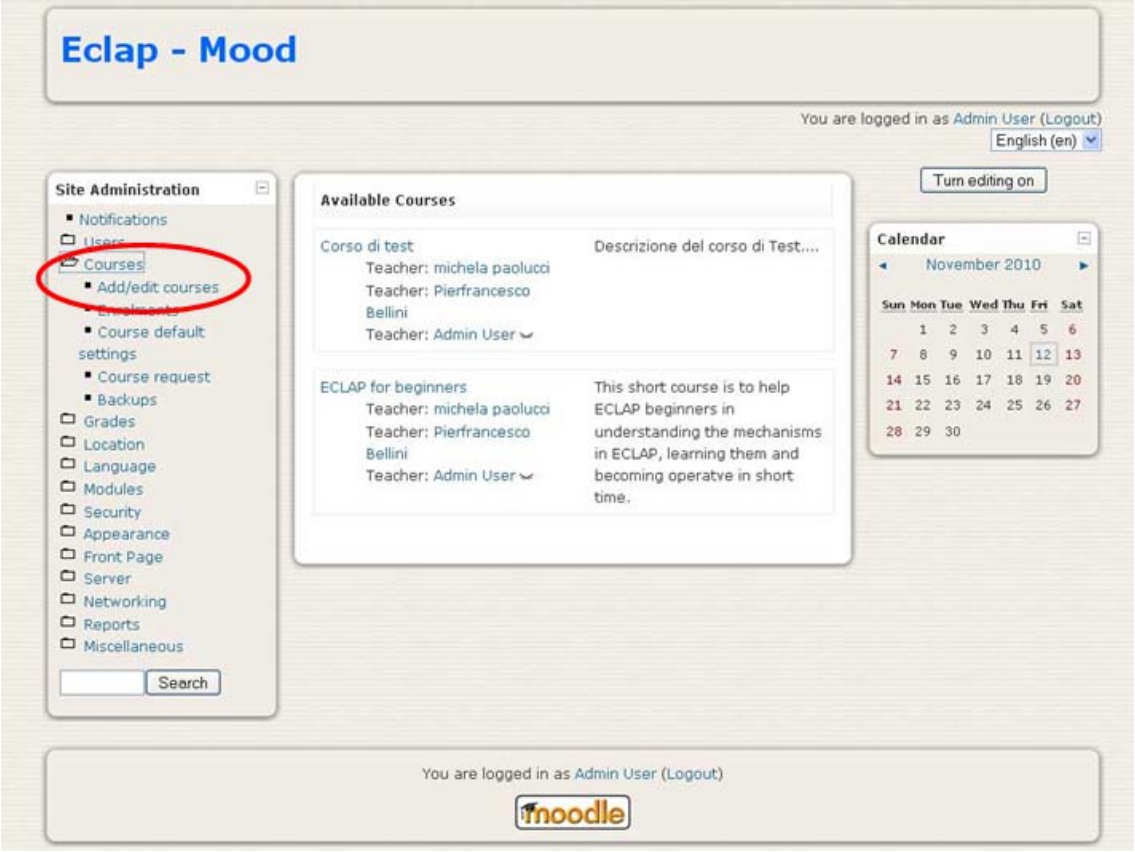


Figure 10.7.12

The course creation functionality will be probably realised only accessing through the moodle side: in order to have a more detailed description you can see the Moodle manual [eclap_mum].

10.7.4 Course management

User access: site administrator, teachers

The course creation functionality will be realised from Moodle side: the Drupal functionalities will be integrated in the moodle course editing, expecially the 'Collections' realised in The ECLAP portal (Drupal) will be useful to realise e Moodle course, see 10.8.4. A link to Moodle side, 'You can modify this course', will be present in each course Topic page, Figure 10.7.13.

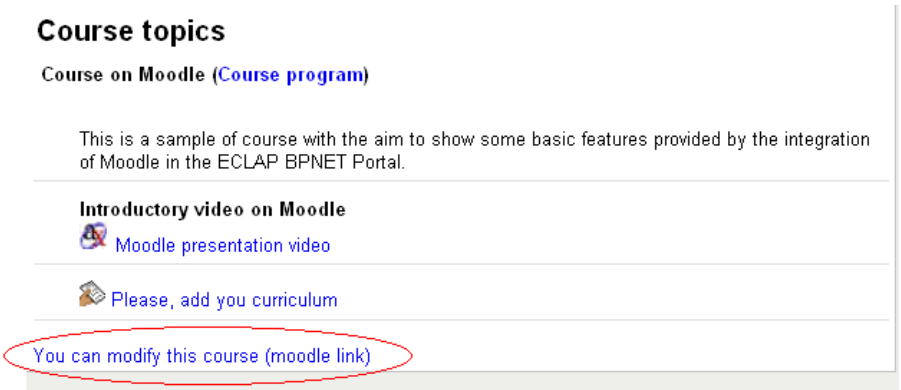


Figure 10.7.13

In order to have a more detailed description you can see the Moodle manual [eclap_mum].

10.7.5 Registration of users to courses

User access: site administrator, teachers

Each teacher will be allowed to register to his/her course all ECLAP users that request it to him/her.

10.7.5.1 Description and draft user interface

Also in this case, the functionality will be performed through the Moodle side, a direct link to the correct page will be available for all teachers, Figure 10.7.14.

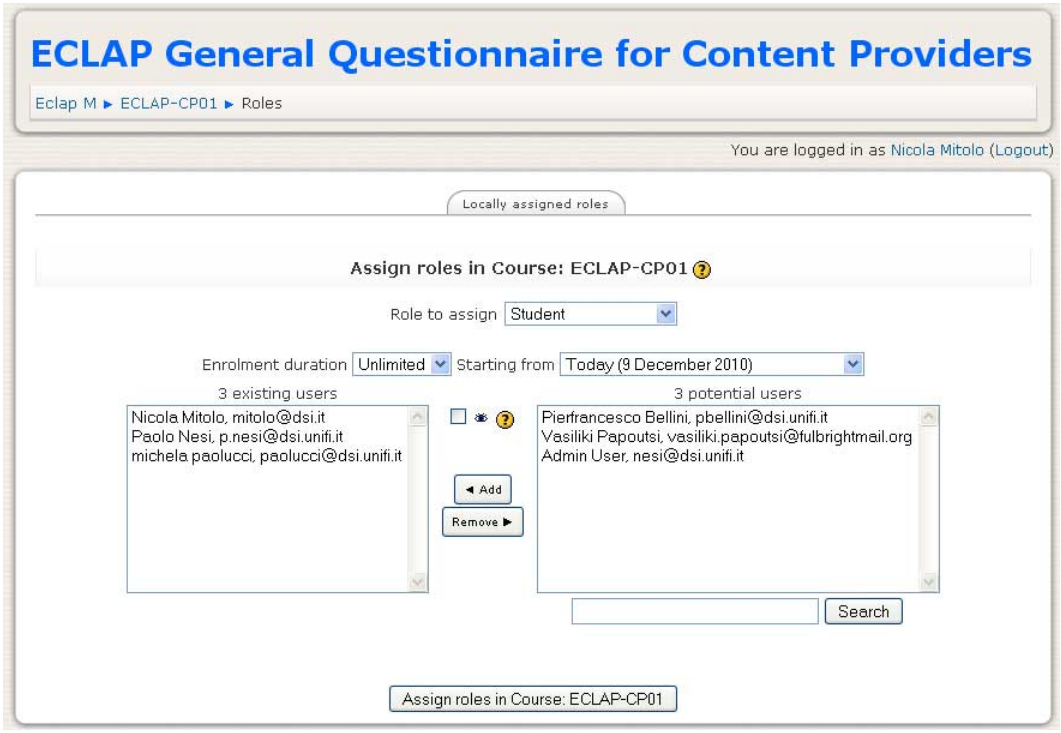


Figure 10.7.14

In order to have a more detailed description you can see the Moodle manual [eclap_mum].

10.8 Collections (DSI)

Collections will be groups of multimedia contents. From a technical point of view, the work done to realize this service is similar to what will be done for Playlists (see 10.6), while the final purpose of it is quite different: will be fundamental for educational use.
ECLAP users will be interested in collecting a set of contents that he/she thinks could be useful for his/her future lessons or courses. Each user can search content in the ECLAP Portal (see Section 9), create a set of 'Collections', reuse it in the e-learning activities (if she/he is a teacher or will be promoted to this role).

Each Collection will have two different states:

- draft: the collection will be visible only to the creator in a draft form
- published: the collection has been uploaded as new ECLAP content and it will be visible to all registered users.

Here after are listed the main functionalities that will be created in order to provide to ECLAP users a useful service:

- Create/update a Collection
- Collections list access and playing

- Collection saving
- Use of Collections in e-learning courses (see also 10.7)

These functionalities will be implemented in the ECLAP module ‘collection’.

10.8.1 Create/Update a Collection

User access: all registered users

All ECLAP users interested in collecting a set of contents can create a new “Collection” or modify one of those previously created by themselves.

10.8.1.1 Description and draft user interface

When a user wants to add a content to a Collection, he/she has to (Figure 10.8.1):

- click on the link “Add to Collection” that will be created and visible under the preview of all multimedia content available in ECLAP Portal. After this, a link to the selected content will be inserted into the section “Compose” of the “Collection” lateral block
- now the user can discard the content and choose a new one from all available ECLAP resources or he/she can add it to:
  - a new Collection: in this case the user has to fill in the field “Create a new collection” with the new name and automatically the content will be added to this new collection
  - one of his/her previously created collections: he/she has to click on button “Add here” near the related collection title
- after having inserted the content in the collection, it will be visible in the “Collections list” section

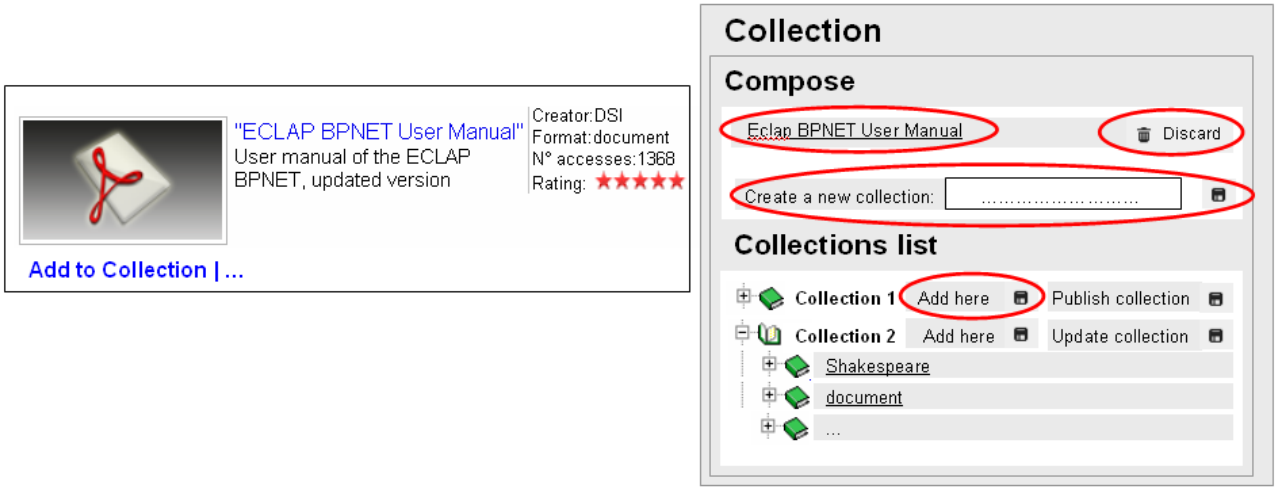


Figure 10.8.1

10.8.1.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
axmedis	Drupal module	Needed for the player and for the multimedia content management
collection	Drupal module	

10.8.1.3 Data model description

Collections will not be realised using a drupal standard module: it will be produced using a custom module. Considering that collections will be useful for e-learning activities developed on Moodle (see 4.4.3), two tables will be created: collection, collection_objects.

These tables have not to be put in the Drupal or in the Moodle database but in an external one, to better allow the communication between the two Content Management Systems.

Here after the 'collection' necessary fields:

- collection_id (integer): key used to retrieve the collection created
- uid (integer): identifier of who has composed the collection
- collection_name: (varchar)
- collection_axoid (varchar): identifier of each content belonging to the collection (is NULL if the collection is private, while contains the identifier if the collection is published on ECLAP)

Table: 'collection' fields:

Column Name	Datatype	NOT NULL	AUTO INC	Flags	Default Value	Comment
collection_id	INTEGER	✓	✓	☑ UNSIGNED ☐ ZEROFILL		
uid	INTEGER	✓		☑ UNSIGNED ☐ ZEROFILL		
collection_name	VARCHAR(60)	✓		☐ BINARY		
collection_axoid	VARCHAR(60)			☐ BINARY	NULL	

Here after the 'collection_objects' necessary fields:

- collection_id (integer): key used to retrieve the object created
- axoid (varchar): identifier of each object that belongs to the collection

Table: 'collection' fields:

Column Name	Datatype	NOT NULL	AUTO INC	Flags	Default Value	Comment
collection_id	INTEGER	✓		☑ UNSIGNED ☐ ZEROFILL		
axoid	VARCHAR(60)	✓		☐ BINARY		

10.8.2 Collections list access and playing

User access: all registered users

For each registered user a list of all the collection he/she has created will be visible in the Portal pages as a lateral block. This functionality is fundamental in order to allow users to view the work done to select, group and collect contents basing on his/her purposes and with the final scope of reusing them in e-learning context.

10.8.2.1 Description and draft user interface

Each registered user will be able to see the collections that he/she has previously created accessing to the Portal (not dependently from its state: draft or published). This list will be present in a lateral block, the same described in the previous paragraph, but in this case only the Collection list section will be visible,
Figure 10.8.2.
Note that the other one section ("Compose") will be visible only when a user will click on the link "Add to Collection", (see 10.8.3).

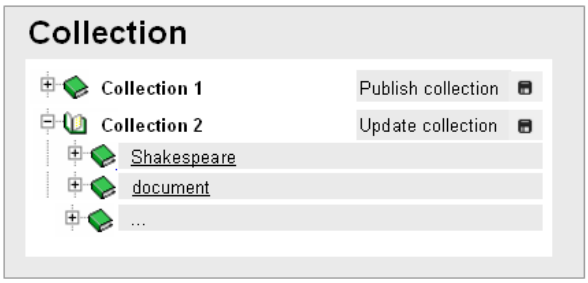


Figure 10.8.2

In order to play the collection, two service will be available if the user will:

- Click on collection name: the first object of the collection will be visible through a player
- Click on one content belonging to a collection: the content selected will be visible through a player.

The lateral block (Figure 10.8.3) will always be visible to navigate into the collection structure and, if needed, to update or publish it.

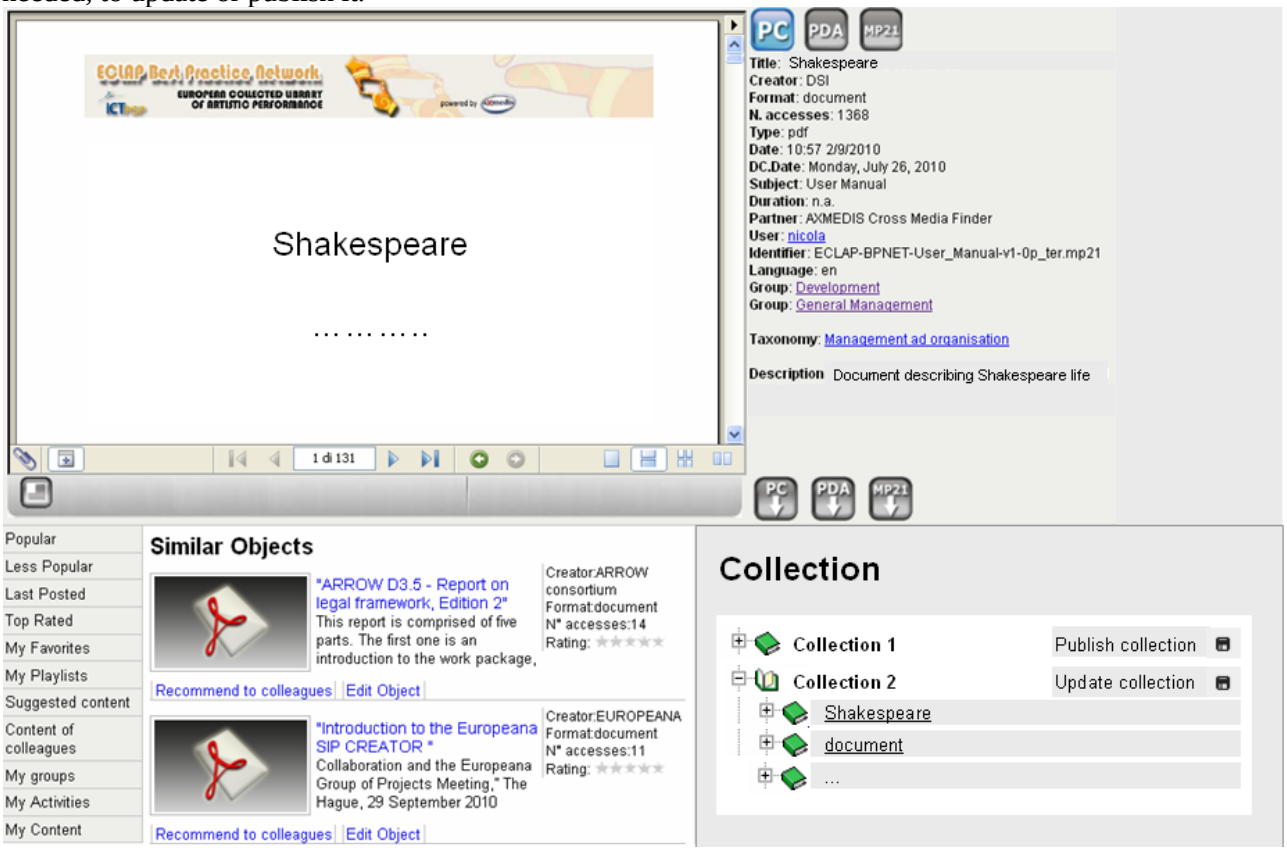


Figure 10.8.3

10.8.3 Collection saving

As just said in the introduction, each Collection will have two different states:

- draft: the collection will be visible only to the creator in a draft form
- published: the collection has been uploaded as new ECLAP content and it will be visible to all registered users.

These two states have a specific order: at the beginning all the collections will be created in a ' draft' state and will be visible in the Portal only for their creators. When the creator will decide to save a collection, it will pass from the ‘draft’ state to the ‘published’ one.

10.8.3.1 Description and draft user interface

User access: all registered user (that will have create at least one collection)

All collections will be visible in a lateral block (Figure 10.8.4) with the following differences:

- if a collection is in the 'draft' state: each user can see and press the 'Publish collection' button, so accessing to the collection upload page, Figure 10.8.5
- if a collection is in the 'published' state: each user can see and press the 'Update collection' button and update the content.

When the user press the "Publish collection" button he/she will access to the upload page, the same actions describe for the playlists will be activated (see 10.6.3):

An example of upload module is shown in Figure 10.8.5. For details, see Chapter 6.

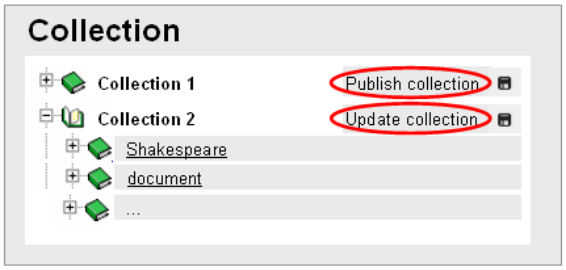


Figure 10.8.4

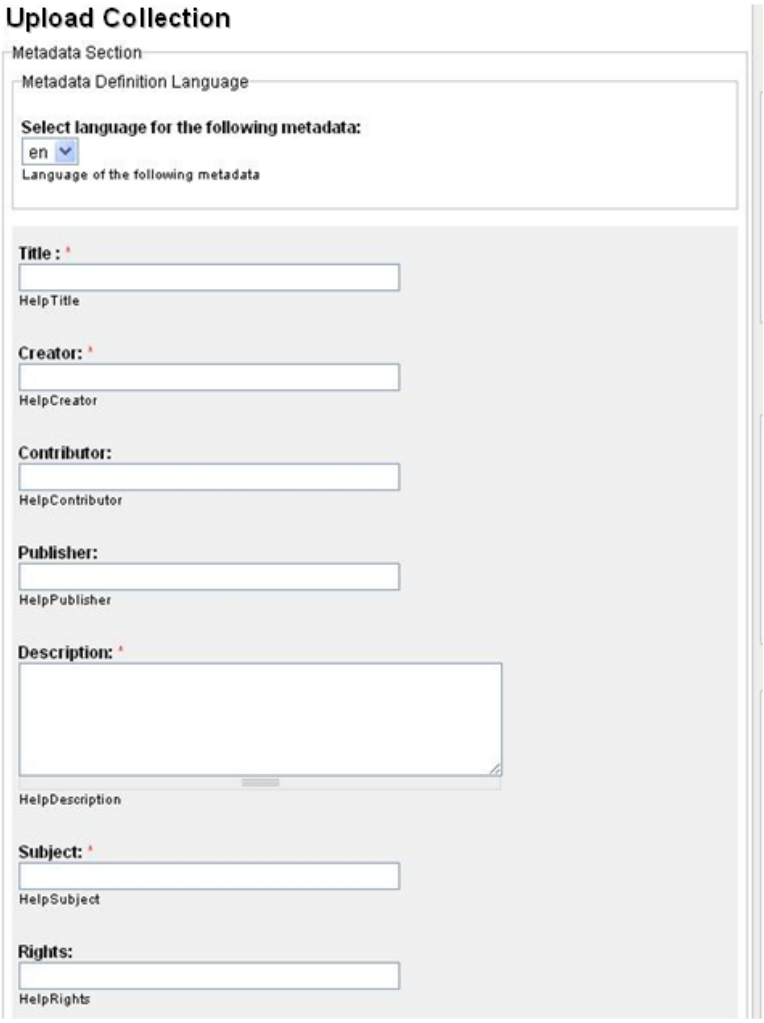

Upload Collection
Metadata Section
Metadata Definition Language
Select language for the following metadata:
en
Language of the following metadata
Title : *
HelpTitle
Creator: *
HelpCreator
Contributor:
HelpContributor
Publisher:
HelpPublisher
Description: *
HelpDescription
Subject: *
HelpSubject
Rights:
HelpRights

Figure 10.8.5

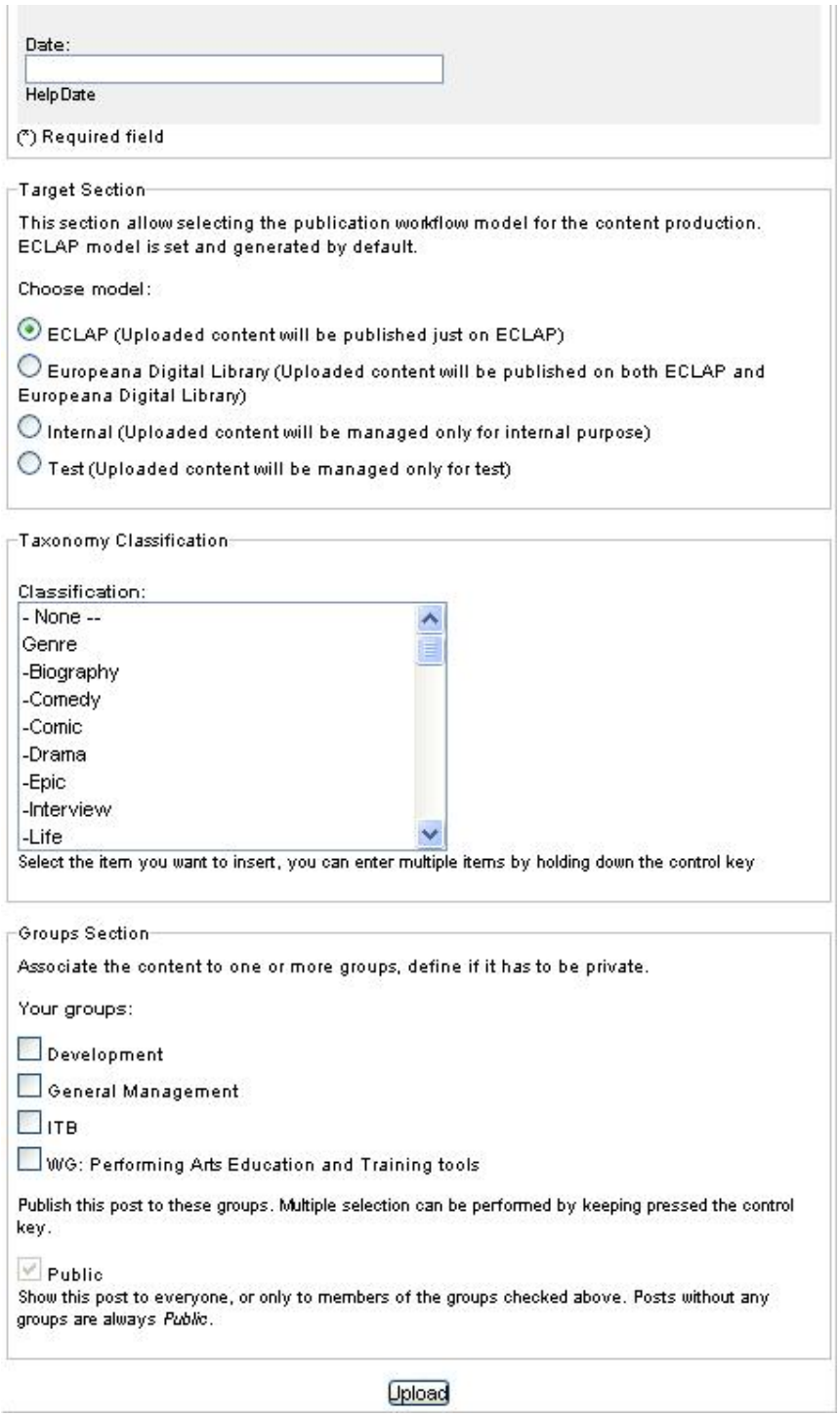


Figure 10.8.6

10.8.3.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
ugc.module	drupal module	A new format (xcl) has to be added as valid for the content upload
collection	drupal module	

10.8.4 Use of Collections in e-Learning courses

User access: site administrator, teachers

All teachers will be allowed to use the Moodle standard modality to realise a course, moreover and additional functionality will be added: they will can use also ECLAP multimedia contents to create their lessons.

10.8.4.1 Description and draft user interface

They will group interesting multimedia contents by visiting the ECLAP Portal and creating Collections (see 10.8.1), then the teachers will have their collections available also for their course creation and add them in the course activities, Figure 10.8.7.

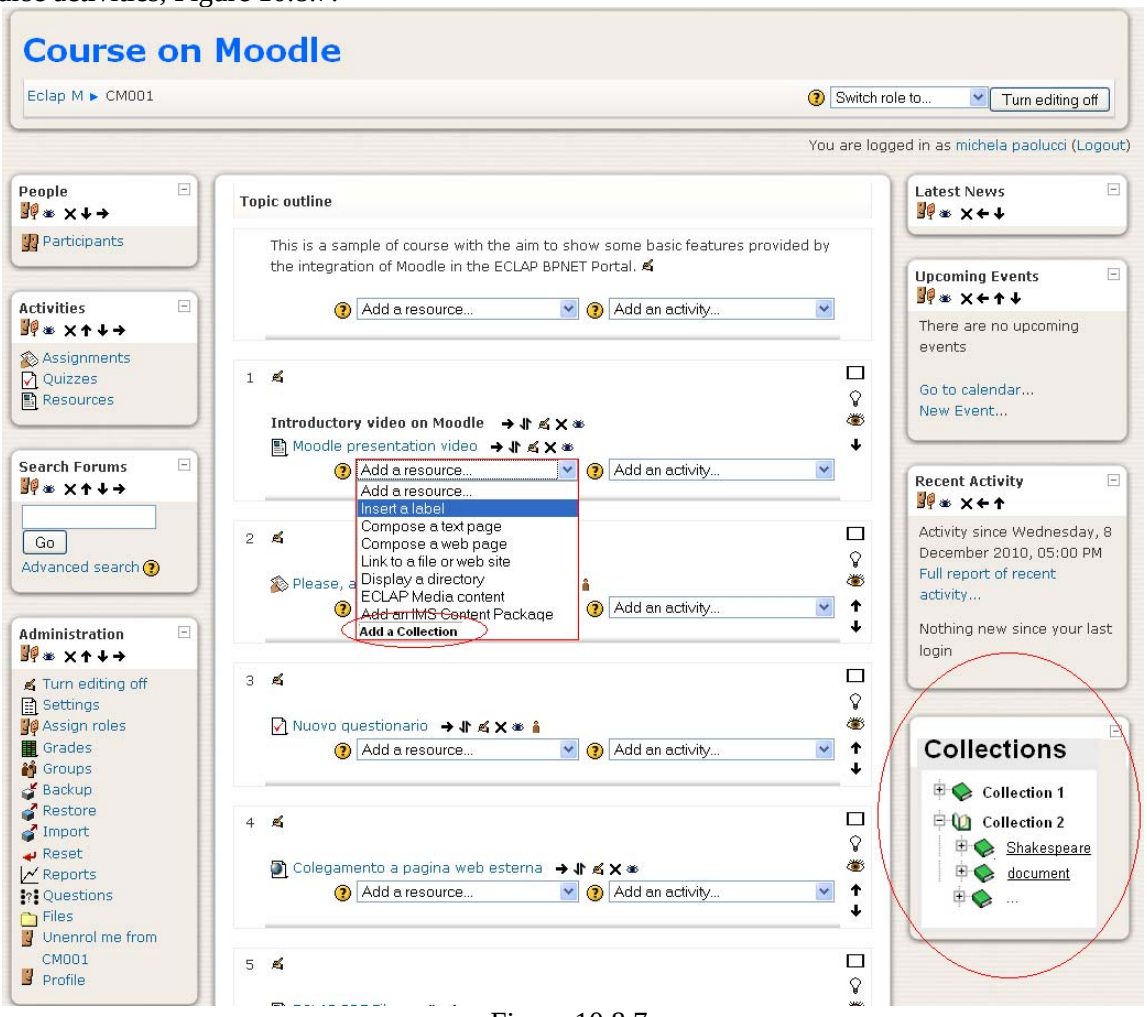


Figure 10.8.7

In details (Figure 10.8.8), the 'Collection' lateral block will allow the teacher to:

- See the Collections or the single content through the ECLAP player (clicking on Collection name or content name, see 10.8.2)
- add his/her personal collection to the actual course, pressing the button "Add to course"

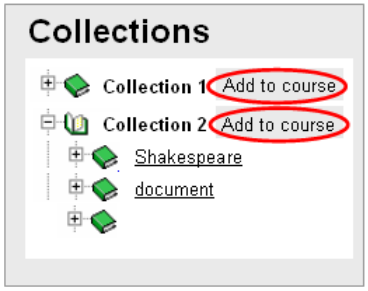

Collections
Collection 1
Add to course
Collection 2
Add to course
Shakespeare
document

Figure 10.8.8

11 Player tools for PC and Mobiles (DSI)

11.1 Content formats

The following table reports for each file format identified by the file extension how it is classified (Format/Type) and if it is usable from PC, iPhone/iPad, WindowsMobile 6.5 (and in which file format)

File extension	Classification		PC		Apple iPhone iPad	WM PDA
	Format	Type	PC	Single file		
PDF	Document	PDF	Yes	Yes in PDF	Yes in PDF	Yes
PPT, PPS, PPTX, PPSX	Document	Slide	Yes	Yes in PPT	*(no)	*(no)
DOC, DOCX	Document	Document	Yes	Yes in DOC	*(no)	*(no)
Other kinds of document	Document	Document	Yes	Yes in original format	No	No
XLS/XLSX	Document	Excel	Yes	Yes in original format	No	No
Zip, rar	Archive	Archive	Yes	Yes in original format	No	No
PNG	image	image	Yes	Yes in PNG	Yes in PNG	Yes
GIF	image	image	Yes	Yes in GIF	Yes in GIF	Yes
JPEG, JPG	image	image	Yes	Yes in JPEG, JPG	Yes in JPEG, JPG	Yes
TIF, TIFF	image	image	Yes	Yes converted into PNG	Yes converted into PNG	Yes
BMP	image	image	Yes	Yes converted into PNG	Yes converted into PNG	Yes
Other kinds of images	image	image	Yes	Yes converted into PNG	Yes converted into PNG	Yes
MP3	audio	audio	Yes	Yes converted into MP3	Yes converted into MP3	Yes
AAC	audio	audio	Yes	Yes converted into MP3	Yes converted into MP3	Yes
WMA	audio	audio	Yes	Yes converted into MP3	Yes converted into MP3	Yes
WAV	audio	audio	Yes	Yes converted into MP3	Yes converted into MP3	Yes
Other kinds of audio	audio	audio	Yes	Yes converted into MP3	Yes converted into MP3	Yes
swf	crossmedia	flash	Yes	swf	(no)	(Yes)
AVI	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
WMV	video	video	Yes	Yes converted into FLV	Yes	Yes

					converted into Mp4	
MP4	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
M4V	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
MP2	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
MOV	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
3GP	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
FLV	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
MPG	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
DVX, DIVX	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
Other kinds of video	video	video	Yes	Yes converted into FLV	Yes converted into Mp4	Yes
Mp21, AXM, M21 (with HTML, HTM, XHTML)	crossmedia	HTML	Yes	Mp21, AXM, M21 (only Windows)	HTML (only if html)	Yes
Mp21, AXM, M21 (with SMIL, SMI)	crossmedia	SMIL	Yes	Mp21, AXM, M21 (only Windows)	HTML (only if html)	Yes
Mp21, AXM, M21 (with anything else)	crossmedia	SMIL	Yes	Mp21, AXM, M21 (only Windows)	No	Yes
EXE, MSI, CAB	tool	tool	Yes	Yes in original format	No	No

11.1.1 Video formats

The video formats characteristics used by the video players on PC (based on Flash), iOS devices, WinPhone7, WinMobile 6.5 are the following:

Device	**Video Frame Size**	**Container**	**Video codec**	**Video bitrate**	**Audio codec**	**Audio bitrate**
PC Low Definition	(512|384) x 288	FLV	H263	320 kbps	MP3	64 kbps
PC Mediun Definition	(852|640) x 480	FLV	H264	800 kbps	AAC	96 kbps
PC High Definition	(1280|960) x 720	FLV	H264	2000 kbps	AAC	96 kbps
iPhone, iPod Touch, iPad, Windows Phone	640 x (360|480)	MP4	MPEG4	512 kbps	AAC	96 kbps

7, Android						
iPad application	1024 x (768|576)	MP4	MPEG4	2000 kbps	AAC	96 kbps
Windows Mobile 6.5	240 x 180	MP4	MPEG4	128 kbps	AAC	32 kbps

Display size: values between () are adapted on the basis of the original aspect ratio (16:9 or 4:3)

11.2 Media Tools vs Formats

In the following table is reported if and how the different features are available on the different platforms:

	IE, Chrome, Firefox, Safari	**MAC, Linux**	**iPad**	**iPhone, iPod**	**Windows Mobile**
Video, Audio, Image, Doc, … playback	Yes	Yes	Yes	Yes	Yes
Content Organizer	Yes, via web	Yes, via web	Yes	Yes	Yes
Cross Media, direct in the web page	Yes as Html MPEG-21: IE, FF	Yes html	Yes html	Yes html	Yes html
Cross media, MPEG-21	Yes	---	Yes via App, XML based	Yes via App, XML based	Yes via App MPEG-21
Audio visual playlists	Yes	Yes	(Yes)	(Yes)	---
Non linear story telling	Yes	Yes	---	---	---
Collection, Essay	Yes	Yes	Yes	Yes	---

Via App: means by using an Application for the mobile
XML based: means that the additional information is provided via a specific XML file
Yes HTML: means that the cross media content is shown as an HTML including javascripts

11.3 PC Web Player

The PC Web player should allow to play a content on a PC from the web portal. The functionalities to be supported are:

- Open a content
- Download a content
- Audio/video playback control (play, pause, stop, seek, full screen)
- Video quality selection

The platforms to be supported are the most common:

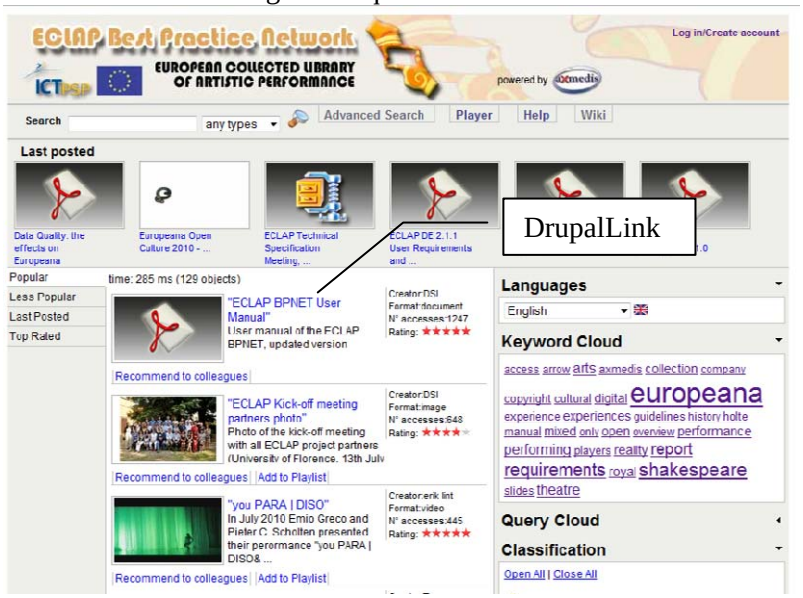
- Windows XP, Vista, 7, with Internet Explorer 7/8, Firefox, Opera, Chrome, Safari
- MAC OS X with Safari, Firefox
- Linux with Firefox

11.3.1 View a content

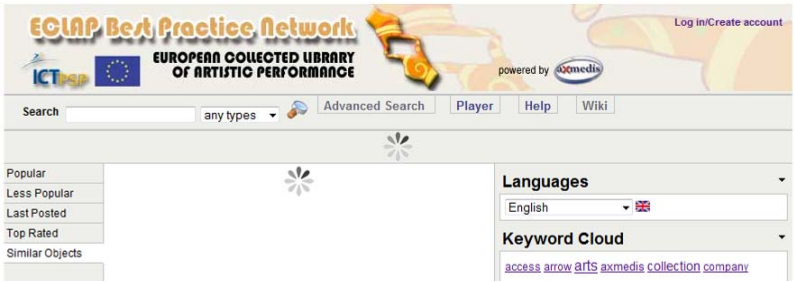
This functionality should allow a user selecting a content on the portal to show it. Depending on the type of content (audio/video, document, etc.) a different player should be used. This operation should be allowed only if the content is accessible for the user. This functionality should be used using AJAX, no page reload should happen when selecting a content to be shown.

11.3.1.1 Description and draft user interface

1. When a page containing a list of content to be opened is presented, JQuery is used to bind the click on all elements of class “DrupalLink” to call the function *AjaxTabsPlayer.loadPlayer*, the link associated is something like “?q=home&axoid=<axoid>&…”



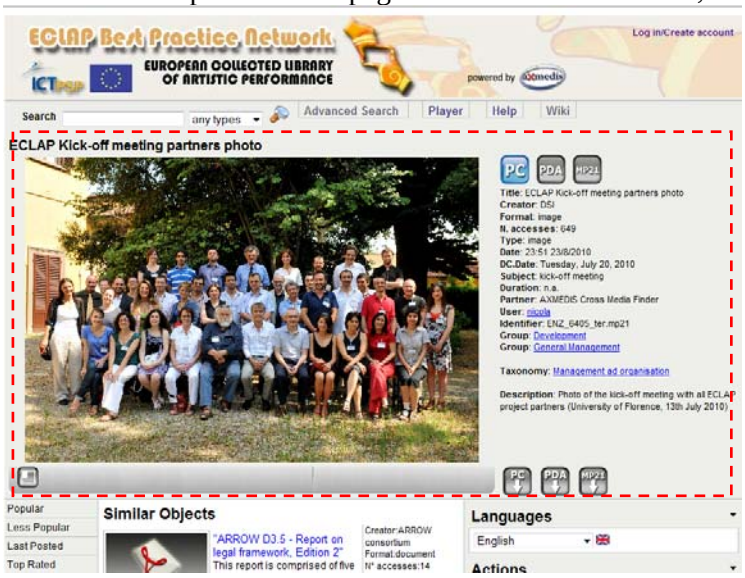
2. When the user clicks the function *AjaxTabsPlayer.loadPlayer* is called
3. The axoid of the content to be opened is get from the link clicked
4. An waiting animated gif is put in the region where the player will be added



5. An http request using JQuery is performed to drupal axmedis module via url like ?q=<locale>/axmedis/view/<axoid>&section=…
6. The axmedis module when receiving an url like ?q=<locale>/axmedis/view/<axoid> executes the function *axmedis_view* with the axoid as parameter
7. On the basis of the axoid the nid of the object is retrieved (using the axmedis_obj table)
8. Using the nid the permission to access to the content is checked for the current user
9. The node is loaded using the nid
10. On the basis of the axoid the metadata related to the content is collected from the DB, and it is used to report them in the html result, the metadata will be presented in a specific drupal block on the left side.
11. Depending on the file extension (*filesecco* field in *rootobjectinfo* table) (flv, mp3, pdf, etc.) , the platform (windows, linux, macosx, iphone, etc.) and the browser (ie, firefox, opera, safari, etc.) the proper visualizer is identified. The visualizer is identified checking if in the configuration there is an entry like the following (in the reported order) that associate to the php page to be used for the rendering:
    a. “player_<platform>+<browser>_<extension>”
    b. “player_<platform>_<extension>”
    c. “player_<extension>”

    For example “player_gif” associate to “image.php” while “player_iphone_mp4” associate to iphone_mp4.php

12. The visualizer is called to generate the proper HTML code, it gets as parameters the AXOID, the content url, the platform, the content title, etc.
13. The access to the content is logged in the axdbv4.download table reporting the content downloaded, the user IP with user geo localization, etc. moreover the content access counter is incremented in RootObjectsInfo.
14. The axmedis_viewer function returns the html with the viewer code and with the node rendering containing the comments, votes and ranking to the original JQuery request
15. The content is updated in the page as well as the comments, voting and ranking for the content.



Once opened different views of the content can be activated:

- PC view, (the default one) display the raw digital resource
- PDA view, to show the MPEG21 object that can be used on a Windows Mobile 6.5 device
- MPEG-21 view, to see as MPEG21 the content

For PC view depending on the content type a different viewer is used:

- For flv video and mp3 a Adobe Flash plugin is used
- For pdf the Adobe acrobat reader plugin is used
- For images the browser viewer is used
- For html content the browser is used
- For swf content the Adobe Flash player is used

For viewing MPEG21 content the AXMEDIS plugin needs to be installed.

The selection of the different views will be performed in the following way:

1. The views selectors are of class “DeviceLink”, JQuery is used to bind the click to call *AjaxTabsPlayer.loadDevicePlayer*, each one is a link to “?q=home&axoid=<axoid>&device=<type>&…” where <type> can be “pc”, “pda” and “mp21”
2. When the view selector is pressed the Javascript function is called
3. The axoid of the content to be opened is get from the link clicked
4. An waiting animated gif replaces the selected button
5. An http request using JQuery is performed to drupal axmedis module via url like ?q=<locale>/axmedis/view/<axoid>&device=<type>&section=…

6. The request is received by the axmedis module and it produces the appropriate rendering (in the same way as when opening content)
7. The returned html replaces the viewer in the page

The drupal block containing the Actions when viewing a multimedia content will allow to:

- Download the content for PC, PDA and as MPEG21
- Add a tag
- Add to favorites
- Recommend to colleagues
- Add the content to a Playlist (if image, audio or video)
- Add a Media Annotation (if image, audio or video)
- Add the content to a Collection (if image, audio, docuement or video)
- Share the content on social networks
- Edit the object (if allowed)

The drupal block containing the metadata of the content will contain the following information and the information will be divided in sections that can be visually collapsed:

- **Title**: (from DC, 1 or more)
- **Alternative**: (from DC, 0 or more)
- **Subject**: (from DC, 0 or more)
- **Coverage**: (from DC, 0 or more)

- **Technical**:
  - N. Accesses
  - Format, Type (from root object info)
  - Video quality: LD, MD, HD (if a video)
  - Duration (if applicable)
  - Upload date (from root Object)
  - Group (0 or more)
  - Partner
  - Upload User
  - Workflow type
  - AXOID
- **Classification**:
  - Creator (from DC, 0 or more)
  - Contributor (from DC, 0 or more)
  - Publisher (from DC, 0 or more)
  - Format, Type (from DC)
  - Date (from DC, 0 or more)
  - Created (from DC, 0 or more)
  - Issued (from DC, 0 or more)
  - Language (from DC, 0 or more)
  - Identifier (from DC, 0 or more)
  - Source (from DC, 0 or more)
  - Description (from DC, 0 or more)
  - Taxonomy term (0 or more)
- **IPR info**:
  - Rights (from DC, 0 or more)
  - IPR owner page
  - Europeana:rights
  - Public/private

  - Visible on EDL (yes/no)
  - Permissions
  - Mobile Permissions
- **People**:
  - Adapter (0 or more)
  - Translator (0 or more)
  - Dramaturge (0 or more)
  - Director (0 or more)
  - Assistant director (0 or more)
  - Scenographer (0 or more)
  - Light designer (0 or more)
  - Sound designer (0 or more)
  - Stage management (0 or more)
  - Costume designer (0 or more)
  - Makeup designer (0 or more)
  - Mask designer (0 or more)
  - Hairdresser (0 or more)
  - Composer (0 or more)
  - Choreographer (0 or more)
  - Casting (0 or more)
  - Cast (0 or more)
- **Location & Events**:
  - City of the performance
  - Venue of the Performance
  - Date of first representation
  - Date of recording
- **Other descriptions**:
  - Keywords
  - Artistic movements and acting styles
  - Performing Art Group
  - Summary

11.3.1.2 Dependencies

Internal component	**Type (drupal module, AXCP rule, Java Servlet, Other)**	**Notes**
axmedis	Drupal module	

11.3.1.3 Data model description

The tables used from the *axdbv4* database are:

- *RootObjectsInfo*, for technical metadata
- *DCMI*, for Dublin core metadata
- *axinfo*, for axmedis metadata
- *did*, for content location information
- *download*, for logging content accesses

The tables used from the *drupal* database are:

- *axmedis_obj*, to associate the axoid to the drupal nid
- *term_node* to get taxonomy id associated with a nid
- *term_data* to get the taxonomy name
- *og_access_post*, to see if the content is public
- *og_ancestry* to get the group associated to a nid

- *nodes*, to get the group name

The tables used from the *cache_index* database are:

- *taxonomy_language*, to get the translation of a taxonomy name from English to another language
- *group_language*, to get the translation of a group name from English to another language

11.3.1.4 Configuration options

Name	Context (drupal, DB,…)	Notes
player[_<platform>[+<browser>]]_<extension>	DB	Name of the php file to render a media type for a platform/browser
fileseccoenabled	DB	Indicates if raw media content can be accessed (enables PC view)
uriflashplayer	DB	url to get the a/v flash player
baseuri	DB	The prefix for urls to access content (e.g. http://bpnet.eclap.eu/axmedis)
AxRepository	DB	The prefix for local access to content (e.g. c:\\folder\\repository\\

11.3.2 Download content

This functionality will allow the user to download the content he/she is viewing. Depending on IPR restrictions the download may be forbidden or available only to registered users.

11.3.2.1 Description and draft user interface

The content download will be accessible from the viewer with three buttons allowing to download the raw content, the MP21 file for PDA (Windows Mobile 6.5) and the MP21 file for PC.

The download will work in this way:

1. Using JQuery the function *AjaxTabsPlayer.download* is bind to the click of all elements referring to axmedis/download (a[href*=axmedis/download]), download urls are ?q=<locale>/axmedis/download&id=<axoid>&title=<title>&device=<type>
2. When the user clicks on a download button the function is called
3. The function makes a request for the HEAD to the url to get the content mimetype, if the mimetype contains “application” the download can proceed otherwise the request is done to get the error message (the user cannot download the content)
4. the download request is received from function *axmedis_http_download* in axmedis drupal module
5. the function using the axoid evaluates if the user can access to the content, if the user cannot access an error is reported
6. the content location is found using the axoid, if the *device* is “pc” or unspecified the proper content file is determined (on the basis of *filesecco* field and on the basis of the user platform) otherwise if device is “pda” or “mp21” the mpeg21 file for PDA or for PC is provided
7. the file is sent to the browser for download, in the http response header the filename is derived from the content title.

8. If the file is sent correctly to the browser the action is logged in the axdbv4.download table with information about the user (uid, IP address, geo location , axoid, …) and the content access counter is incremented in *RootObjectsInfo*

11.3.2.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
axmedis	Drupal module	

11.3.2.3 Data model description

The tables used from the *axdbv4* database are:

- *RootObjectsInfo*, for technical metadata (filesecco)
- *did*, for content location information
- *download*, for logging content download

The tables used from the *drupal* database are:

- *axmedis_obj*, to associate the axoid to the drupal nid
- *og_access_post*, to see if the content is public
- *og_ancestry* to get the group associated to a nid

11.3.2.4 Configuration options

Name	Context (drupal, DB,…)	Notes
baseuri	DB	The prefix for urls to access content (e.g. http://bpnet.eclap.eu/axmedis)
AxRepository	DB	The prefix for local access to content (e.g. c:\\folder\\repository\\

11.4 iPhone/iPad application

The iPhone/iPad application will support to:

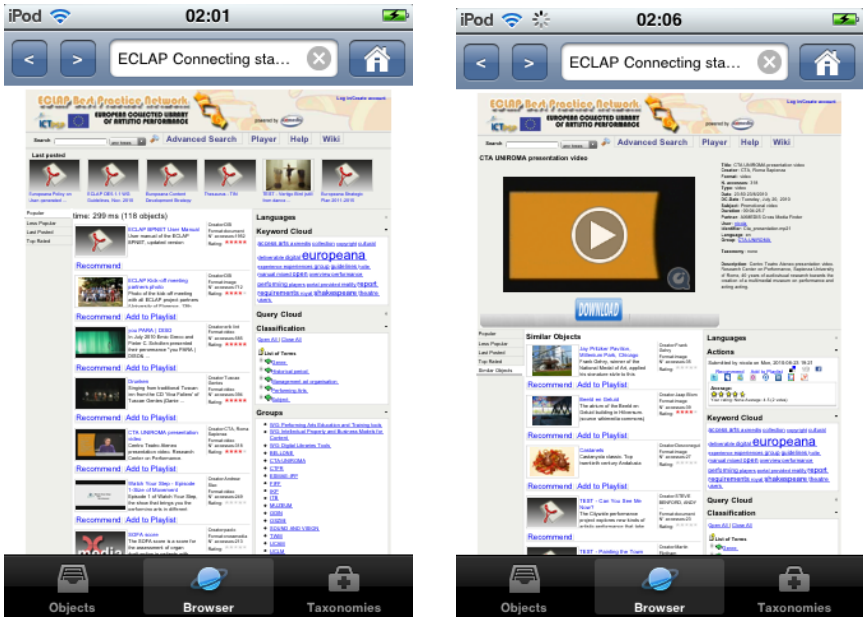
- browse the content on the portal
- download content from the portal
- list local content
- show local metadata
- show local content
- browse local content via taxonomy
- search local content
- remove local content

11.4.1 Browse content on the portal

11.4.1.1 Description and draft user interface

The application integrates a web browser allowing to access to the portal, a modified UserAgent string is provided to the portal allowing the customization of the web content in case of access using the application.

The user can select the portal she wants to use, she may also add some new portal and the list of portals can be automatically updated.



11.4.1.2 Configuration options

Name	Context (drupal, DB,…)	Notes
DefaultWebAddress		

11.4.2 Download content from the portal

11.4.2.1 Description and draft user interface

1. The user can download a content by clicking on the download button,
2. the application intercepts this click and it asks confirmation for the download,
3. The download starts getting the link to the XML file containing the metadata and the links to the content files (can be many in case it is a HTML based content)
4. The application begin to download each content nedded and shows its progress
5. When the download ends the application parses the metadata and store it in a local database with information on the content pieces
6. The application shows the new list of local content

The download url is identified by the application when the url contains “axmedis/download”
Like: http://bpnet.eclap.eu/drupal?q=axmedis/download&id=<axoid>&device=iphone
It provides the xml with content metadata and the links to the content:

```
<?xml version="1.0" encoding="UTF-8"?>
<AxmedisObject axoid="urn:axmedis:00000:obj:4f30d313-102a-4e6e-9b45-716b0ef3aaf1">
  <DublinCore>
    <title lang="en">Watch Your Step - Episode 1-Size of Movement</title>
    <creator lang="en">Andrew Slac</creator>
    <subject lang="en">Movement</subject>
    <type>video</type>
    <format>video</format>
    <language>en</language>
```

```
    <publisher lang="en">lottebelice</publisher>
    <rights>Creative Commons license: Attribution 3.0 United States</rights>
   </DublinCore>
   <AxInfo>
    <Version>7</Version>
    <Revision>0</Revision>
    <ObjectCreationDate>2010-07-27T16:32:29</ObjectCreationDate>
   </AxInfo>
   <Metadata>
    <extendedData xmlns="urn:axmedis:extended:01">
     <origin version="1.0" url="http://bpnet.eclap.eu/drupal/">ECLAP</origin>
     <classification type="taxonomy">
       <category vocabulary="Classification" id="234" >Research</category>
       <category vocabulary="Classification" id="224">Documentary</category>
       <category vocabulary="Classification" id="12">Modern</category>
       <category vocabulary="Classification" id="17">Interview</category>
     </classification>
     <permissions>
       <auth type="public">Public</auth>
       <auth type="groups">BEELD EN GELUID</auth>
     </permissions>
     <user>
       <uid type="uid">218</uid>
     </user>
    </extendedData>
   </Metadata>
   <Resource url="http://bpnet.eclap.eu/axmedis/.../AXMEDIS09345.mp4"/>
  </AxmedisObject>
```

To properly associate the object with the taxonomy the application downloads from the portal the description of the taxonomy for the terms that are related with the downloaded content.

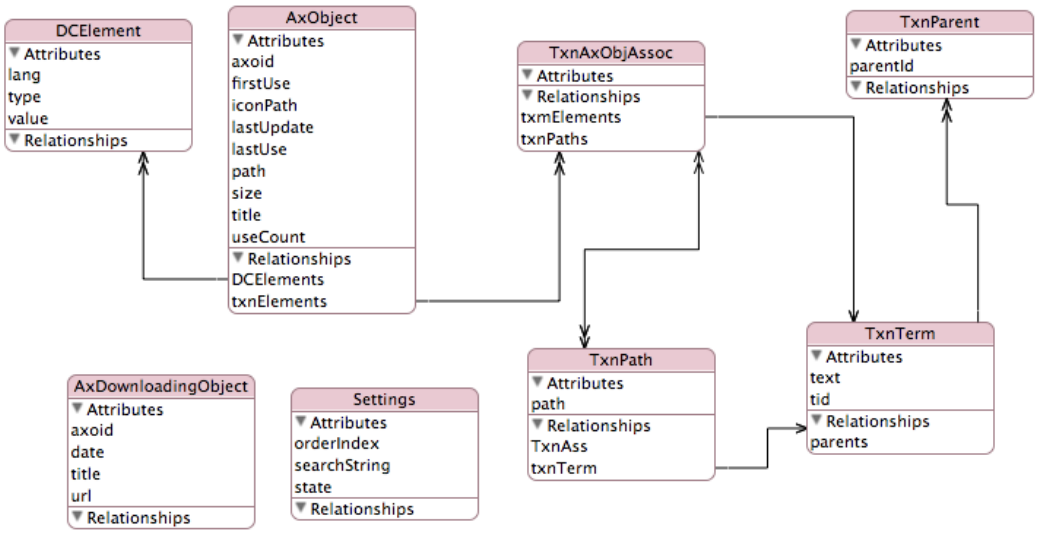
The request will be done asking for a taxonomy id the paths in the taxonomy that end to this id.

A request can be like:
http://bpnet.ecla.eu/drupal?q=axmedis/taxonomy&tid=123
Which should return an XML like the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<TaxonomyPaths>
  <Term id=”123”><Name lang=”en”> Flyer</Name></Term>
 <Path>
  <Term id=”340”><Name lang=”en”>Dissemination</Name></Term>
  <Term id=”303”><Name lang=”en”>Management and organization</Name></Term>
 </Path>
</TaxonomyPaths>
```

11.4.2.2 Data model description

The *AxObject* table is used to contain information about the content available locally, each row is associated with many rows in the *DCElement* table containing the Dublin core metadata (title, subject, format, type, etc.).
The table *TxtTerm* is used to represent each term in the taxonomy, while the table *TxnParent* is used to associate each term with parent terms of each term. Table *TxnAxObjAssoc* is used to associate each content with many taxonomy terms. Table *TxnPath* is generated form the taxonomy data and it is used to associate each term to all the paths where the term is present.



11.4.3 List local content

11.4.3.1 Description and draft user interface

The application shows the list of local content as a list, containing the title, the size and an icon to identify the content type (image, video, audio, text, etc.)
The user can sort the list in different ways:

1. By title (default)
2. By size
3. By use count
4. By last use
5. By file type

On iPad more information in this list can be reported

11.4.3.2 Configuration options

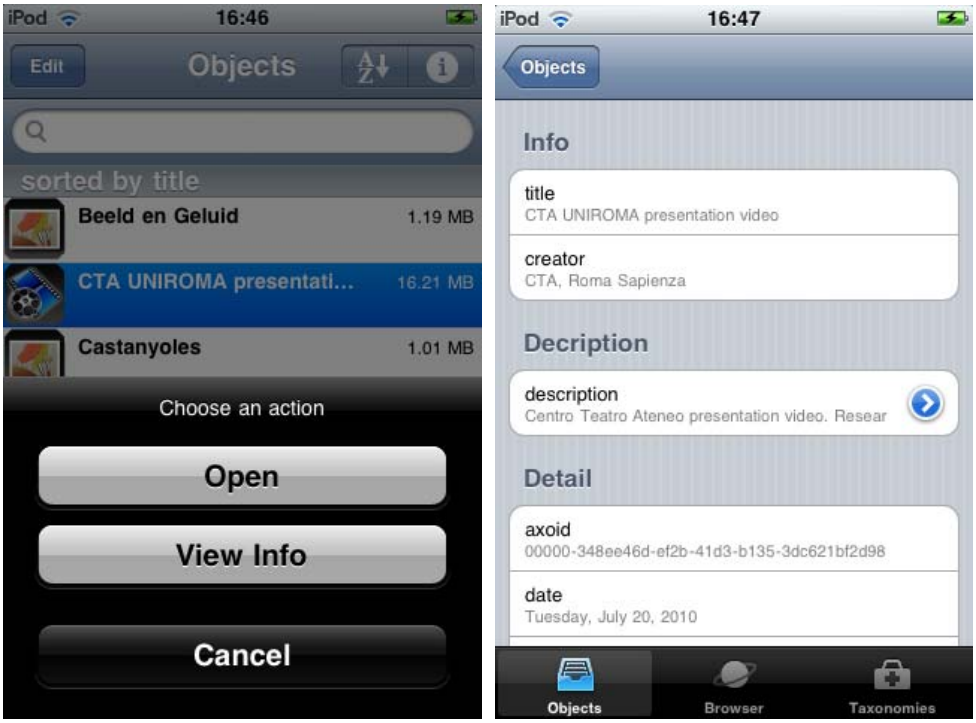
Name	Context (drupal, DB,…)	Notes

DefaultSortType		

11.4.4 Show local metadata

11.4.4.1 Description and draft user interface

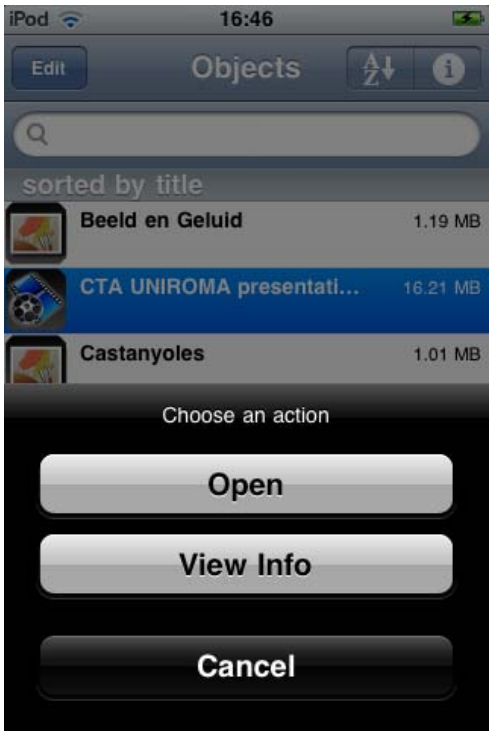
In a list when the user select a content the user is asked to open a content or view the associated metadata. When pressing the “View Info” button the metadata of the content is presented



11.4.5 Show local content

11.4.5.1 Description and draft user interface

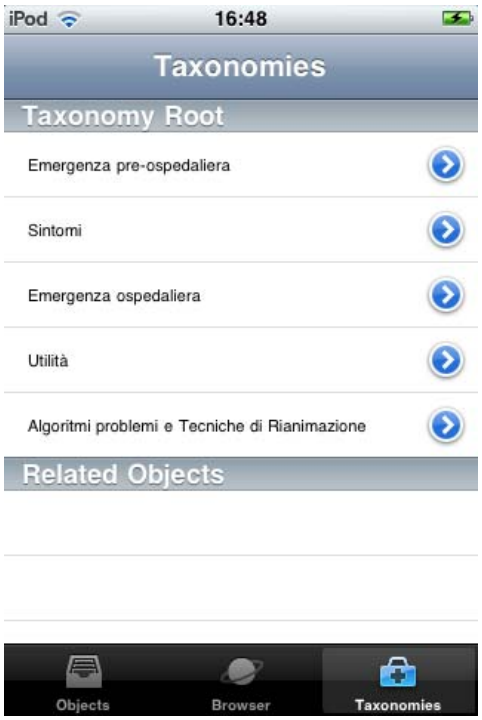
When the user select a content and choose to open it, depending on the content type the appropriate viewr is used. The content is accessed from the local storage.



11.4.6 Browse local content via taxonomy

11.4.6.1 Description and draft user interface

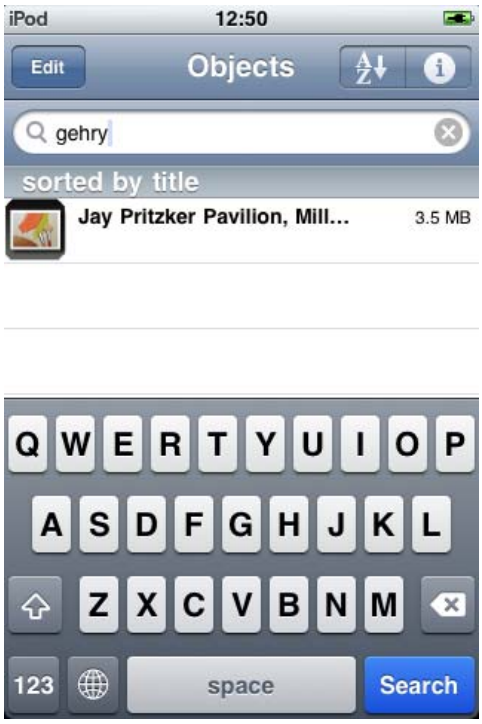
The user when selecting the taxonomy view will see for each portal a specific taxonomy.
When selecting a term in the taxonomy the user will see all the related terms and all the objects related directly and indirectly with the selected term.



11.4.7 Search local content

11.4.7.1 Description and draft user interface

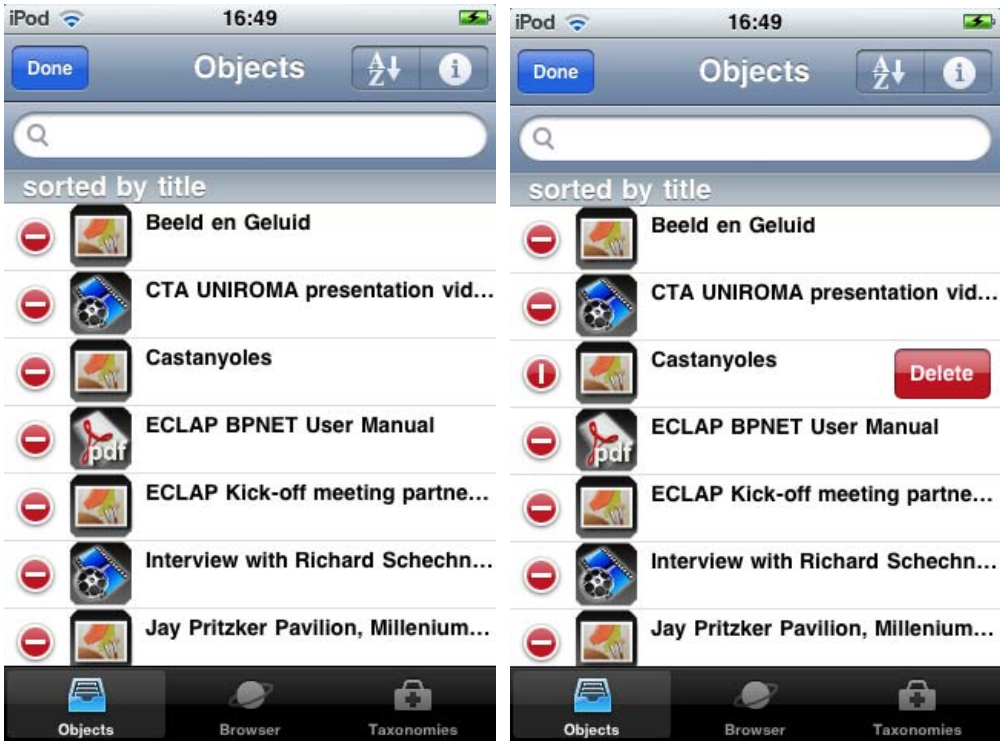
The user can search on the local content using the search field, and content matching the search that is found in the descriptive fields (title, description, subject) is reported in the list. The search is done while the user is typing.

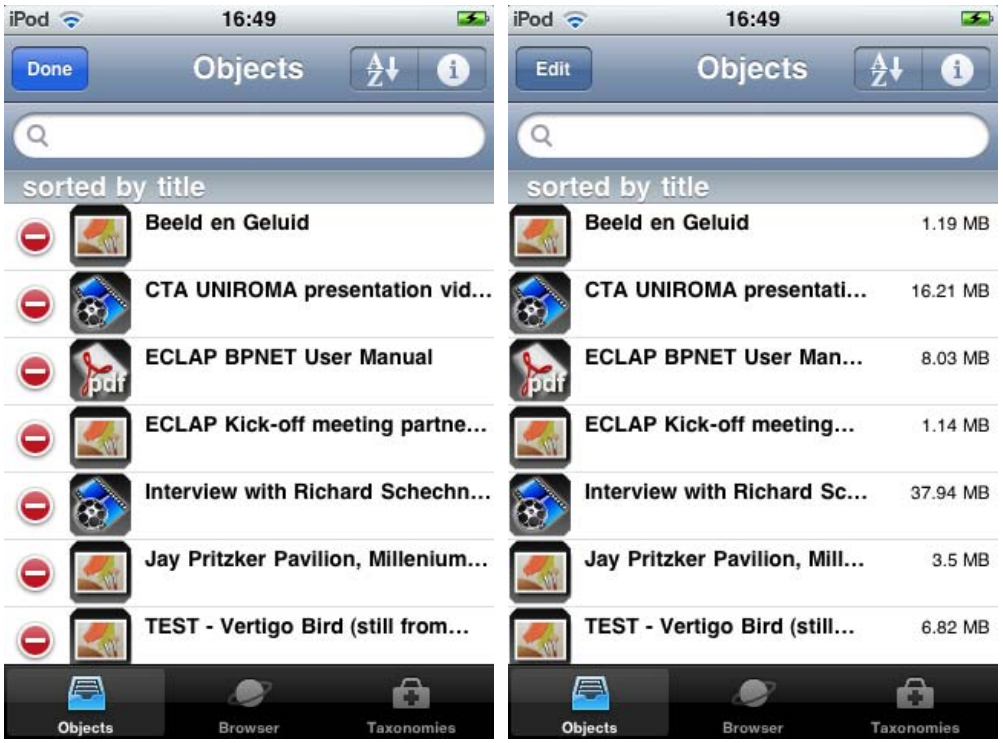


11.4.8 Remove local content

11.4.8.1 Description and draft user interface

The user can remove a content from the local repository by tressing the Edit button in the list, then selecting the content to be removed and then press the Delete button to config the deletion. At this point the application will remove the content from the local database and all the files stored locally.





11.5 Windows Mobile 6.5 application

A Windows Mobile 6.5 application will be updated to support the user in accessing and using content from the portal (and other compatible portals).
The functionalities available will be:

- browse the content on the portal
- download content from the portal
- list local content
- show local metadata
- show local content
- browse local content via taxonomy
- search local content
- remove local content

11.5.1 Browse content on the portal

11.5.1.1 Description and draft user interface

The user selecting the Web icon will be able to select the portal from which to download content. The InternetExplorer will be used to browse the portal. Due to the limitations of InternetExplorer a specific version of the site it is used. This portal allows to browse content and to download content only as mp21 files.

11.5.1.2 Configuration options

Name	Context (drupal, DB,…)	Notes
WebStartPage		Url where to start the web navigation

11.5.2 Download content from the portal

11.5.2.1 Description and draft user interface

The user when select a download link the axoid is identified from the url and it is checked if the same content is already available, in this case it is asked to the user if she wants to open this content. Otherwise it

is asked to the user to download the content (a mp21 file). When the content is downloaded the metadata is extracted from it and stored in a local database to be used for search and presentation.

11.5.2.2 Data model description

The *AXObj* table is used to contain information about the content available locally, each row is associated with many rows in the *DCElem* table containing the Dublin core metadata (title, subject, format, type, etc.). The table *TxtTerm* is used to represent each term in the taxonomy, while the table *TxnParent* is used to associate each term with parent terms of each term. Table *TxnAxObjAssoc* is used to associate each content with many taxonomy terms. Table *TxnPath* is generated form the taxonomy data and it is used to associate each term to all the paths where the term is present.

Table *AXObj*

- id INTEGER PRIMARY KEY
- axoid TEXT
- path TEXT
- iconpath TEXT
- useCount INTEGER
- firstUse INTEGER
- lastUse INTEGER
- protected BOOLEAN
- title TEXT
- size INTEGER
- lastModified BLOB
- lastModificationDate TEXT
- lastUpdateDate TEXT

Table *DCElem*

- id INTEGER
- type TEXT
- value TEXT
- lang TEXT

Table *TxnTerm*

- tid TEXT PRIMARY KEY
- text TEXT,
- useCount INTEGER

Table *TxnParent*

- parentId TEXT
- tid TEXT

Table *TxnAxObjAssoc*

- tpath TEXT
- id INTEGER
- tid TEXT

Table *TxnPath*

- tid TEXT
- path TEXT

11.5.3 List local content

11.5.3.1 Description and draft user interface

The user will be able to see a list of the local content, this content will be shown ina Grid or Tabular way.
In the settings the user can specify the ordering type:

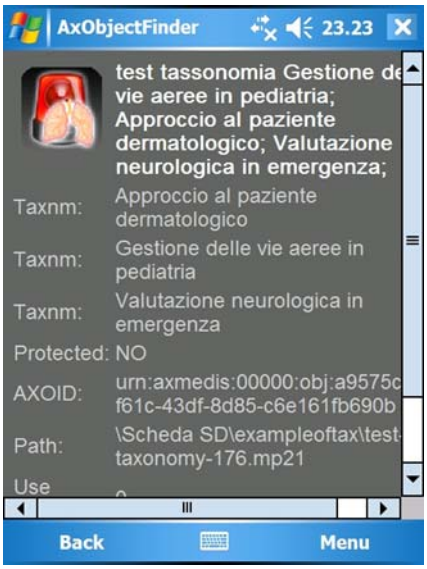
- **Alpha**: alphabetical order, simply based on the object title or filenames, when it comes to files.
- **Most recently used**: from most recently used to less recently used.
- **Less recently used**: from less recently used to most recently used.
- **Most used:** from most used to less used; this is the best solution for users preferring to have most used objects within reach.
- **Less used**: from less used to most used; this can help to understand which are the files the user has neglected more.
- **Taxonomy**: files are ordered and displayed according to taxonomical criteria.
- **Format**: depending on format, namely audio, video, images, documents, cross-media, etc.

11.5.4 Show local metadata

11.5.4.1 Description and draft user interface

When the user selects an item in the list he/she can see the metadata stored for this content:

- The Dublin core metadata
- The taxonomy terms associated with the content
- The AXOID identifier
- The full path name of the file
- The use count



11.5.5 Show local content

11.5.5.1 Description and draft user interface

When the user selects a content in a list he/she can open the associated content using the appropriate viewer. For mp21 files the AxPDAPlayer is used. The use count and the last use time is updated for the opened content.

11.5.6 Search local content

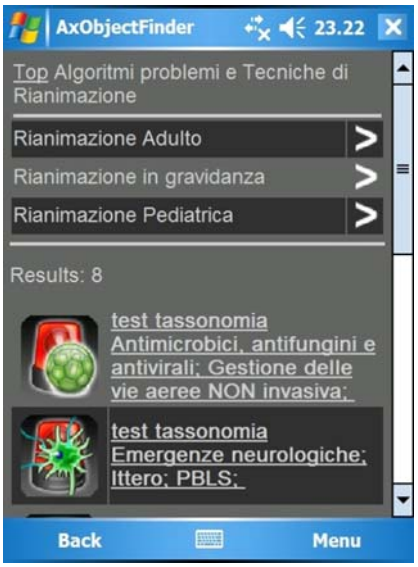
11.5.6.1 Description and draft user interface

The user can search for a text in the metadata stored locally for the content.
The search is done in any Dublin core metadata field.

11.5.7 Browse local content via taxonomy

11.5.7.1 Description and draft user interface

The user can browse the taxonomy selecting the taxonomy terms and reporting the list of the children terms and the list of all content associated with the the selected term directly or indirectly with children terms.



11.6 Windows Phone 7 application

An application for Windows Phone 7 similar to the one for the iPhone will be developed.
The functionalities provided will be the same:

- browse the content on the portal
- download content from the portal
- list local content
- show local metadata
- show local content
- browse local content via taxonomy
- search local content

- remove local content

12 Integration with Europeana (DSI)

This section reports how metadata of ECLAP content will be sent to europeana.
Europeana gets metadata using the OAI-PMH protocol, metadata should be provided using the Europenana metadata format that until Jan 2011 is the Europeana Semantic Elements (ESE) XML format but starting from Jan 2011 metadata should be provided using the Europeana Data Model (EDM). However the ESE format is semantically a subset of EDM. The publication to europeana is one of the step (the last) of the ECLAP internal workflow. An AXCP rule will be run to get the metadata from the ECLAP database map it to EDM/ESE and publish it on the OAI-PMH server where it will be available for europeana. The AXCP rule will take also care of the generation of the image to be used by europeana as a thumbnail or preview on the europeana portal.

12.1 Mapping ECLAP metadata to ESE (DSI)

Mapping ECLAP metadata to Europeana Semantic Elements (ESE) [eu_ese, eu_ese_map] is quite straightforward, the ESE elements are:

- **DC & DCTERMS,** these elements are present in the ECLAP schema;
- **Country** (country of the provider), this element is constant since the provider is the ECLAP project;
- **Data Provider** (the content provider), the name of the content provider for the specific item, it can be provided using the partner acronym that is present in the ECLAP schema;
- **Is Shown At, Is Shown By** (urls for content access), this elements can be constructed using the axoid
- **Language** (language of the provider), this element is constant since the provider is the ECLAP project;
- **Object** (url of the thumbnail/preview) this element con be provided using the axoid to refer to the appropriate url;
- **Provider** (the organization sending data to europeana), this element is constant
- **Rights** (url for copyright status of an object to the domain name where that status is defined), this information will be present in the IPR information;
- **Type** (one of TEXT, IMAGE, SOUND, VIDEO), this element can be derived from the ECLAP format;
- **Unstored** (information indexed but not shown)
- **URI** (europeana internal)
- **User tag** (europeana internal)
- **Year** (a point of time associated with an event in the life of the original analog or born digital object), this element can be derived from the date field

12.2 Mapping ECLAP metadata to EDM (DSI)

The new Europeana Data Model (EDM) [eu_edm, eu_edmspec] will be used by europeana for metadata ingestion starting from Jan 2011. The new model uses semantic web technologies, it is based on already defined standards as ORE, DublinCore and SKOS. The core requirements for EDM were:

1. Distinction between “provided object” (painting, book, program) and digital representation
2. Distinction between object and metadata record describing an object
3. Allow for multiple records for same object, containing potentially contradictory statements about an object
4. Support for objects that are composed of other objects
5. Standard metadata format that can be specialized
6. Standard vocabulary format that can be specialized
7. EDM should be based on existing standards

However at the time of writing it is not completely defined how the the ingestion of EDM based metadata will be done.

As EDM now supports the delivery of aggregated content, ECLAP can use Collections as a kind of aggregated content that may be provided to europeana.

Moreover we can define performing arts specific specialization for some properties to provide more detailed information. For example some new properties can be defined in the following way:

eclap:director *rdfs:subPropertyOf* dc:creator.
eclap:lightDesigner *rdfs:subPropertyOf* dc:contributor.
eclap:dateOfPerformance *rdfs:subPropertyOf* dc:date.
…

12.2.1 Basic content

For example the case of a single video can be represented in the following way (using the Turtle syntax):

eclap:aggregation_10453 a **ore:Aggregation;**
dc:creator “ECLAP”;
ens:aggregatedCHO **<urn:axmedis:0000:obj:abc…>.**

<urn:axmedis:0000:obj:abc…> a **eclap:Content**;
dc:title “you PARA | DISO”@en;
dc:creator “emio greco & pc”;
eclap:director “erik lint”;
eclap:lightDesigner “xyz”;
eclap:dateOfPerformance “2010/07/15”;
dc:description “In July 2010 Emio Greco and…”@en;
dc:description “Nel Luglio 2010 Emio Greco e…”@it;
dc:format “video”;
ens:type “VIDEO”;
ens:object <http://bpnet.eclap.eu/europeana-thumbnails/04e0c...00.png>;
ens:isShownAt <http://bpnet.eclap.eu/drupal/?q=en-US/home&axoid=urn:axmedis:00000:obj:04e0c...&section=europeana>
ens:haveType **eclap:taxonomy/performingarts/dance**;
ens:haveType **eclap:taxonomy/subject/utopy**.

12.2.2 Aggregated content

The example of an aggregated content is the following (using the turtle syntax) where two content are aggregated in a Collection.

eclap:Collection *rdfs:subClassOf* ore:Aggregation;
***rdfs:subClassOf* eclap:Content.**

<urn:axmedis:0000:obj:abc…> a **eclap:Content**;
dc:title “you PARA | DISO”@en;
…
<urn:axmedis:0000:obj:0123…> a **eclap:Content**;
dc:title “Divina Commedia, Paradiso”@it;
…

eclap:aggregation_10231 a **ore:Aggregation;**
dc:creator “ECLAP”;
ens:aggregatedCHO **<urn:axmedis:0000:obj:a1b2…>.**

<urn:axmedis:0000:obj:a1b2…> a **eclap:Collection**;
dc:title “Paradise from past to future”@en;
ore:aggregates **<urn:axmedis:0000:obj:abc…>;**

ore:aggregates **<urn:axmedis:0000:obj:0123…>.**

12.3 Publication on europeana (DSI)

The publication to europeana is controlled by the ECLAP workflow, when the responsible user finds that the content is ready to be published and the content metadata has to be forwarded to europeana an AXCP rule will be activated. This AXCP rule will:

1. acquire the metadata from ECLAP database for the content to be sent to europeana;
2. map this metadata to the EDM schema;
3. store the mapped metadata to the OAI-PMH server database;
4. produce the image to be used by europeana to create the thumbnails.

The thumbnails used by europeana portal are generated from the <object> tag that should point to an image resource with a width of at least 200px [eu_image]. The image will be produced for images and videos and it will be available via HTTP. In case of videos an animated gif may be produced if supported by europeana.

12.4 OAI-PMH Server (DSI)

An OAI-PMH Server will be setup to allow europeana to harvest ECLAP metadata. Not all ECLAP content have to be available via europeana, a separate DB will be used to contain the metadata to be provided.
A PHP based implementation of an OAI-PMH server will be used and customized to support the rendering of metadata as EDM. An AXCP rule will be used to to publish content for europeana, this rule will be activated by the workflow.

12.4.1 OAI-PMH service

The OAI-PMH service will provide the protocol functionalities:

- Identify
- ListMetadataFormats
- ListIdentifiers
- ListRecords
- ListSets
- GetRecord

12.4.1.1 Dependencies

Third-party software	Version	Notes
phpoai2	1.8.0	

12.4.1.2 Data model description

A specific data base will be used to contain the data to be provided to europeana
The axoid will be used to identify each record and for each record the rendring as EDM and optionally as oai_dc will be provided.
The *oai_records* table will be defined as:

- **serial** int(11) NOT NULL AUTO_INCREMENT
- **url** varchar(255) DEFAULT NULL
- **oai_set** varchar(255) DEFAULT NULL
- **datestamp** datetime DEFAULT NULL
- **deleted** enum('false','true') NOT NULL DEFAULT 'false'
- **oai_dc** text
- **edm** text
- **ese** text

12.4.1.3 Communication protocol description

The module will support the OAI-PMH protocol v 2.0 as defined in “The Open Archives Initiative Protocol for Metadata Harvesting” (http://www.openarchives.org/OAI/openarchivesprotocol.html)

12.5 Searching on europeana (B&G)

In order to bring Europeana and ECLAP even closer together, the ECLAP portal will offer the option of adding Europeana items to the results of any ECLAP user's search query. In order to fulfil this functionality, an additional module, called the Europeana module, will be developed.

In the following chapters the module's functionalities are described in detail.

12.5.1 Functionalities

The module works as follows: whenever a user enters a search query in either the simple search bar on the main page or in the advanced search page (see **Errore. L'origine riferimento non è stata trovata.**), this query is forwarded to the Europeana module which will in turn provide related Europeana items in the ECLAP user interface.

The Europeana module will be implemented as a separate Drupal component in the ECLAP infrastructure. The module will basically work in the following way:

- take any search query as input
- transform the search query to a Europeana API call
- call the Europeana API to retrieve relevant items from Europeana
- display the Europeana items in the user interface

In order to keep the distinction between ECLAP search results and the items presented in the Europeana module clear for the user, the results from Europeana will not be presented in the main list of search results, but rather as and additional box or panel in the user interface. If the user is not interested in Europeana content, he or she can always hide the box in the user interface by clicking a hide button located on the Europeana panel. By navigating to the user settings, the user can always reenable displaying Europeana panel.

12.5.2 Dependencies

Internal component	Type (drupal module, AXCP rule, Java Servlet, Other)	Notes
Europeana module	Drupal module	This will be a new module in the framework

Third-party software	Version	Notes
Europeana API	1.0	To use the API an official API key has to be requested

Using the Europeana API

In order to communicate with the Europeana API an API key has to be requested from the technical staff of Europeana. More specifically: a test key has to be requested for the development version of the module. Whenever the module is ready to be deployed on the live ECLAP portal, another official API has to be requested and used.

Communication protocols

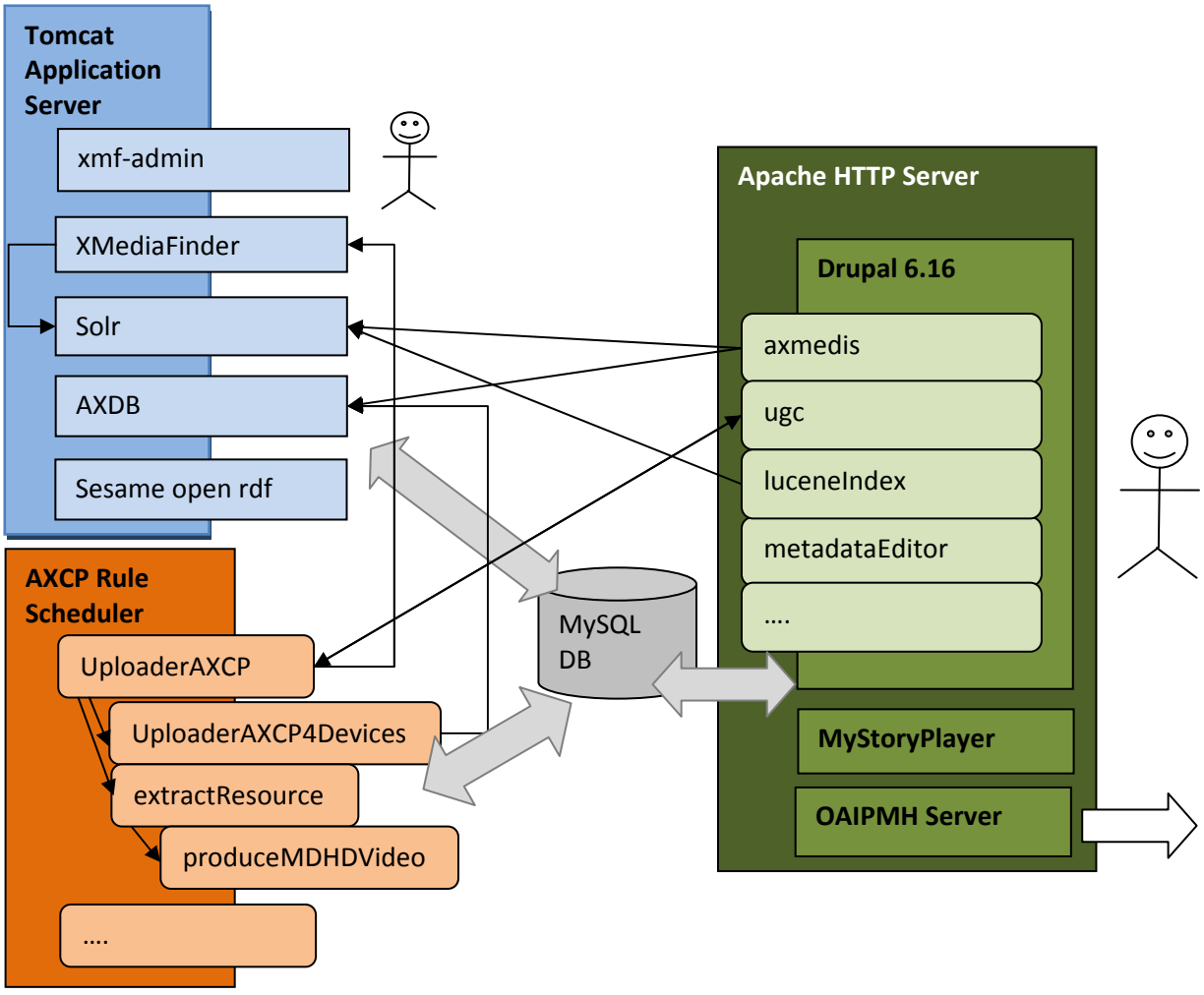
The Europeana module uses HTTP requests to communicate with the Europeana API. The response content type of Europeana is of the MIME type: text/xml and is compliant with the Atom/RSS2.0 specifications.

13 Detailed Technical Architecture

In this section is reported a more detailed description of the technical software architecture. The three main parts are:

- The Apache HTTP Server with PHP provides:
  - a Drupal (v6.16) based site configured with a set of custom modules, it is used to provide the ECLAP front-end interface
  - a OAI-PMH server (for europeana harvesting),
  - the MyStoryPlayer interface for content annotation view
- A Tomcat Application Server providing some back-end functionalities like content administration, Solr based search and the AXMEDIS Database
- The AXCP Rule Scheduler managing a set of AXCP Grid Nodes is used for asynchronous tasks like media adaptation and ingestion

In the following figure the main components are depicted reporting some of the modules used and some of the dependencies among components.



Some of the Drupal custom modules are the following:

- **axmedis,** provides:
  - most/less download list
  - most ranked list
  - last posted list
  - search (using Solr service), using faceted filters

    - advanced search (using Solr service)
    - content play
    - content download
- **service_links,** allows to show social icons to share content on social networks
- **ajaxcomments,** allows to add/edit/remove comments to content
- **related_objects,** shows a list of content related with other content
- **playlists,** allows to create playlists (using *ugc* module for upload)
- **annotations,** allows to annotate audio visual content
- **collection,** allows to create content collection
- **ugc,** allows to upload content (uses the UploaderAXCP rule)
- **edit_axmedis_obj,** allows to access functionalities:
    - edit metadata
    - update content
- **metadataEditor**, allows to edit content metadata in all languages
- **iprWizard**, allows to define the IPR management for content
- **luceneIndex**, used to update comments, forums posts and content in the Solr service when are inserted/changed/removed from drupal (uses the Solr service)
- **eclapworkflow**, allows to manage and control the workflow for content management
- **user_information**, defines the user profile
- **users**, allows user search
- **axfriends**, allows to connect users becoming colleagues
- **potentialFriends**, allows to show potential colleagues of a user
- **favourites**, allows to define favourite content
- **user_recommendation**, allows to recommend to a user content he/she may be interested in.
- **eclap_mailman**, allows to manage mailing lists
- **kwcloud**, allows to show a words cloud based on metadata of content in the portal (a java console app is used to generate the words)
- **querycloud**, allows to show a words cloud based on queries made on the portal (a java console app is used to generate the words)
- **datastat**, allows to create content use statististics
- **graphstats**, allows to show to social metrics

The WebApplications used are the following:

- **xmf-admin,** allows to administer content:
    - **search**
    - **edit metadata**
    - **publish content**
    - **remove content**
- **XMediaFinder**, provides services for:
    - Content play
    - Proxy to Solr for index insert/update
- **AXDB**, provides services for MP21 object upload
- **Solr**, service for indexing free text data
- **Sesame open-rdf**, service for storing RDF data, it has owlim support for owl reasoning.

Some of the AXCP Rules running on the AXCP platform are:

- **UploaderAXCP, UploaderAXCP4Devices, extractResources, produceMDHDVideo,** used in the content web upload process
- **AXCPOAI-PMH, AXCPHarvester, AXCPContentInjection, AXCPRetrieval,** used for metadata and content ingestion from NTUA
- **MetadataTranslation**, used for metadata translation
- **europeanaPublication**, used to publish an object on the OAI-PMH server fro europeana

- **DivideAndCallClusteringRule, ClusterObjects,** used to calculate content similarity
- **checkNeighbourly, calculateAllNeighbourly,** used to calculate user distance

14 User Manual (DSI)

A User Manual [eclap_um] explaining the functionalities available in the ECLPA Prortal has been provided and published on the ECLAP Portal as both downloadable PDF and on-line help.

- ECLAP User Manual (in PDF) [eclap_um]
- ECLAP on-line help: http://bpnet.eclap.eu/help/eclap_bpnet_user_manual_v1-0.htm
- 'ECLAP proposed e-learning functionalities user manual' in PDF [eclap_mum]

The User Manual is included in this deliverable as Annex

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16 Glossary

AXCP	AXMEDIS Content Processing
AXOID	AXMEDIS Object Identifier
C→C	Content to Content
CP	Content Provider
DC	Dublin Core
DCMI	Dublin Core Metadata Initiative
EDL	European Digital Library
EDM	Europeana Data Model
EMIS	ECLAP Metadata Ingestion Service
EP	Europeana Portal
ESE	Europeana Semantic Elements
ESSP	ECLAP Social Service Portal

EU	Europeana User
HD	High Definition
IPR	Intellectual Property Rights
LD	Low Definition
MD	Medium Definition or Metadata
MP21	MPEG 21
MSP	My Story Player
OAI-PMH	Open Archive Initiative – Protocol for Metadata Harvesting
PDA	Personal Data Assistant
PP	Privacy Policy
PU	Public User
RU	Registered User
SNA	Social Network Analysis
ToU	Terms of Use
U→C	User to Content
U→U	User to User
WFIPRUser	Workflow IPR User

17 ANNEX I – ECLAP TERMS OF USE

Draft v08, 31 Jan, 2011

Definitions

- **Service**: ECLAP website or any ECLAP products, software, data feeds, and services provided to you on, from, or throught the ECLAP tools.
- **Simple User**: a single user that access to the ECLAP service portal. It can be registered or not registered to ECLAP.
- **Affiliated Partner**: an institution or a single user that has signed the Affiliation Agreement with ECLAP coordinator to access the ECLAP services.
- **Consortium Partner**: an institution that has signed the ECLAP Consortium Agreement and Grant Agreement with the ECLAP ccordinator.
- **Europeana**: The Europeana website (http://www.europeana.eu), its Data and its machine interfaces (note: The specific URL may change in later iterations of the site) managed by the Europeana Foundation.
- **Content**: text, metadata, animations, 3D content, annotations, playlists, courses, collections, software, scripts, graphics, photos, sounds, music, videos, audiovisual combinations, interactive features and other materials you may view on, access through, or contribute to the ECLAP website.
- **Trusted Users**: a registered user (coming from Consortium Partners and Affiliated Partners) with particular privileges, like group responsible, root, etc.
- **WF IPR User**: WorkFlowIPRUser, is a registered user with the privileges to edit the IPR Permission by using the IPR Wizard tool.

Service description

ECLAP is an nteractive online service provided by the ECLAP consortium in Italy (The operator). The operator provides users of the ECLAP with access to a technical platform for the exchange of data on the Internet via suitable devices. The online service is provided for registered and non registered users, as defined in the previous section ”Definition”.

The service includes, but is not limited to, services in the area of communications through which users are given the opportunity to register, create a profile, publish information about themselves that is visible to all

other users of the service, create or join groups, invite friends to these groups, search for other users within groups, publish information about themselves, create and manage courses, upload and view content, etc..

Members may view the profiles of other members and contact them. Certain data pertaining to the contact established between members is stored and made accessible to the users.

ECLAP is exclusively intended for personal-private use by its members and must not be used for commercial purposes unless this has been explicitly consented to by ECLAP in writing.

1. Your Acceptance

1. 1. By using or visiting the ECLAP website or any ECLAP products, software, data feeds, and services provided to you on, from, or through the ECLAP tools (collectively the "Service") you signify your agreement to

- (1) these terms and conditions (the "Terms of Use"),
- (2) ECLAP's privacy notice, found at <link> and incorporated herein by reference, and
- (3) ECLAP's Community Guidelines, found at <link> and also incorporated herein by reference.

If you do not agree to any of these terms, the ECLAP privacy notice, or the ECLAP Community Guidelines, please do not use the Service.
1.2. Although we may attempt to notify you when major changes are made to these Terms of Use, you should periodically review the most up-to-date version <link>. ECLAP may, in its sole discretion, modify or revise these Terms of Use and policies at any time, and you agree to be bound by such modifications or revisions. Nothing in these Terms of Use shall be deemed to confer any third-party rights or benefits.

2. Service

2.1. These Terms of Use apply to all users of the Service, including users who are also contributors of Content on the Service. “Content” includes the text, metadata, animations, 3D content, annotations, playlists, courses, collections, software, scripts, graphics, photos, sounds, music, videos, audiovisual combinations, interactive features and other materials you may view on, access through, or contribute to the Service. The Service includes all aspects of ECLAP, including but not limited to all products, software and services offered via the ECLAP website, such as the ECLAP services, the ECLAP Players, the ECLAP Content Upload service, ECLAP IPR Wizard and other applications.
2.2. The Service may contain links to third party websites that are not owned or controlled by ECLAP. ECLAP has no control over, and assumes no responsibility for, the content, privacy policies, or practices of any third party websites. In addition, ECLAP will not and cannot censor or edit the content of any third-party site. By using the Service, you expressly relieve ECLAP from any and all liability arising from your use of any third-party website.
2.3. Accordingly, we encourage you to be aware when you leave the Service and to read the terms and conditions and privacy policy of each other website that you visit.

3. ECLAP Users’ Accounts

3.1. In order to access some features of the Service, you will have to be registered in the ECLAP portal by creating an ECLAP account. You may never use another's account without permission. When creating your account, you must provide accurate and complete information. You are solely responsible for the activity that occurs on your account, and you must keep your account password secure. You must notify ECLAP immediately of any breach of security or unauthorized use of your account.
3.2. Although ECLAP will not be liable for your losses caused by any unauthorized use of your account, you may be liable for the losses of ECLAP or others due to such unauthorized use.

4. General Use of the Service—Permissions and Restrictions

ECLAP hereby grants you permission to access and use the Service as set forth in these Terms of Use, provided that:
4.1. You agree not to distribute in any medium any part of the Service or the Content without ECLAP's prior written authorization, unless ECLAP makes available the means for such distribution through functionality offered by the Service.
4.2. You agree not to alter or modify any part of the Service.
4.3. You agree not to access Content through any technology or means other than the video playback pages of the Service itself, the ECLAP tools, or other explicitly authorized means ECLAP may designate.
4.4. You agree not to use the Service for any of the following commercial uses unless you obtain ECLAP's prior written approval:

- the sale of access to the Service;
- the sale of advertising, sponsorships, or promotions placed on or within the Service or Content; or
- the sale of advertising, sponsorships, or promotions on any page of an ad-enabled blog or website containing Content delivered via the Service, unless other material not obtained from ECLAP appears on the same page and is of sufficient value to be the basis for such sales.

4.5. Prohibited commercial uses do not include:

- uploading an original content to ECLAP, or maintaining an original channel or group on ECLAP, to promote your business or artistic enterprise;
- any use that ECLAP expressly authorizes in writing.

4.6. If you use the ECLAP Upload service, you agree in the tems and rules hereafter defined.
4.7. You agree not to use or launch any automated system, including without limitation, "robots," "spiders," or "offline readers," that accesses the Service in a manner that sends more request messages to the ECLAP servers in a given period of time than a human can reasonably produce in the same period by using a conventional on-line web browser. Notwithstanding the foregoing, ECLAP grants the operators of public search engines permission to use spiders to copy materials from the site for the sole purpose of and solely to the extent necessary for creating publicly available searchable indices of the materials, but not caches or archives of such materials. ECLAP reserves the right to revoke these exceptions either generally or in specific cases. You agree not to collect or harvest any personally identifiable information, including account names, from the Service, nor to use the communication systems provided by the Service (e.g., comments, email) for any commercial solicitation purposes. You agree not to solicit, for commercial purposes, any users of the Service with respect to their Content.
4.8. In your use of the Service, you will comply with all applicable laws.
4.9. ECLAP reserves the right to discontinue any aspect of the Service at any time.

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In addition to the general restrictions above, the following restrictions and conditions apply specifically to your use of Content.
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5.3. You agree not to circumvent, disable or otherwise interfere with security-related features of the Service or features that prevent or restrict use or copying of any Content or enforce limitations on use of the Service or the Content therein.

5.4. You understand that when using the Service, you will be exposed to Content from a variety of sources, and that ECLAP is not responsible for the accuracy, usefulness, safety, or intellectual property rights of or relating to such Content. You further understand and acknowledge that you may be exposed to Content that is inaccurate, offensive, indecent, or objectionable, and you agree to waive, and hereby do waive, any legal or equitable rights or remedies you have or may have against ECLAP with respect thereto, and, to the extent permitted by applicable law, agree to indemnify and hold harmless ECLAP, its owners, operators, affiliates, licensors, and licensees to the fullest extent allowed by law regarding all matters related to your use of the Service.
5.5. If the content is provided by an Affiliated or by a Consortium Partner, the content is provided by the Service according to the specific restrictions specified by the content provider itself and defined by using the ECLAP tools. No restrictions are apllicable on content provided by simple registered users.

6. What ECLAP can do with your content

6.1. As a ECLAP account holder you may submit Content to the Service. You understand that ECLAP does not guarantee any confidentiality with respect to any Content you submit.
6.2. You shall be solely responsible for your own Content and the consequences of submitting and publishing your Content on the Service. You affirm, represent, and warrant that you own or have the necessary licenses, rights, consents, and permissions to publish Content you submit;
6.3. By providing content in ECLAP, you grant ECLAP the right to extract, store, transform and to make available Previews of visual content (images and videos) on ECLAP Portal and on Europeana.eu. Europeana and ECLAP will only use the Preview in relation to the Content item it represents. In case the Preview is not available, ECLAP will show a general Preview icon associated to the content.

6.4 If you are a **Simple User**, you license to ECLAP all patent, trademark, trade secret, copyright or other proprietary rights in and to such Content for publication on the Service pursuant to these Terms of Use. For clarity, you retain all of your ownership rights in your Content. However, by submitting Content to ECLAP, you hereby grant ECLAP a worldwide, non-exclusive, royalty-free, sublicenseable and transferable license to use, reproduce, adapt, distribute, prepare derivative works, display, and perform the Content in connection with the Service and ECLAP's (and its successors' and affiliates') business, including without limitation for promoting and redistributing part or all of the Service (and derivative works thereof) in any media formats and through any media channels. You also hereby grant each user of the Service a non-exclusive license to access your Content through the Service, and to use, reproduce, display and perform such Content as permitted through the functionality of the Service and under these Terms of Use. The above licenses granted by you in Content you submit to the Service terminate within a commercially reasonable time after you remove or delete your contributions from the Service. You understand and agree, however, that ECLAP may retain contribution you removed, but not display, distribute, or perform. The above licenses granted by you in user comments you submit are perpetual and irrevocable.
6.5. If you are an **Affiliated Partner**, for Metadata you provide, you hereby grants ECLAP a non-exclusive, worldwide, royalty free license on copyright, even for commercial purpose, related rights and the sui generis database right, whereby ECLAP shall have the right:

a) to publish, make available, reproduce, distribute, display, transmit, extract, re-utilize and store the Metadata and its Derivatives in all forms, formats and media whether now known or hereafter developed (including without limitation in print, digital and electronic form) throughout the world;
b) to translate the Metadata (or authorise others to do so) into other languages, create adaptations, summaries, combinations, or extracts of the Metadata or other Derivatives based on the Metadata and exercise all of the rights set forth in (a) above in such translations, adaptations, summaries, combinations, extracts and Derivatives;

6.6. If you are an **Affiliated Partner**, to permit the provision of the Service in accordance with the purpose of the Site and the Affiliation Agreement signed with ECLAP, **Affiliated Partner** grant ECLAP a non-exclusive license to use, adapt distribute, prepare derivative works, display, and perform the Content in

connection with the Service and ECLAP's (and its successors' and affiliates') business, including without limitation for promoting and redistributing part or all of the Service, according to the restriction applied by you via the IPR Wizards ECLAP tool.

6.7. For content provided by **Affiliated Partners**, after the content upload the restrisctions applied by default to the content will be the most restrictive. The content will be accessible only to a small group of trusted users and will not be accessible to public users or registered users until permissions will be defined.

6.8. To make available the content to the final users, the **Affiliated Partner** has to relax restrictions applied by using the IPR Wizard tool. The IPR wizard tool can be used to relax or restrict the following permissions:

Type of Content	**Restriction applied**	**RECIPIENT**
VIDEO	Play on mobile Browser	ECLAP public user
VIDEO	Play on mobile Browser	ECLAP registered user to the specific group
VIDEO	Download via mobile Browser	ECLAP public user
VIDEO	Download via mobile Browser	ECLAP registered user to the specific group
VIDEO	Play on mobile App	ECLAP public user
VIDEO	Play on mobile App	ECLAP registered user to the specific group
VIDEO	Download via mobile App	ECLAP public user
VIDEO	Download via mobile App	ECLAP registered user to the specific group
VIDEO	Play on PC in Low Definition and Medium Definition	ECLAP public user
VIDEO	Play on PC in Low Definition and Medium Definition	ECLAP registered user to the specific group
VIDEO	Download on PC in Low Definition and Medium Definition	ECLAP public user
VIDEO	Download on PC in Low Definition and Medium Definition	ECLAP registered user to the specific group
VIDEO	Play on PC in High Definition	ECLAP public user
VIDEO	Play on PC in High Definition	ECLAP registered user to the specific group
VIDEO	video HD PC download	ECLAP public user
VIDEO	video HD PC download	ECLAP registered user to the specific group
PDF	PDF document access (PC and)	ECLAP public user
PDF	PDF document access (PC and)	ECLAP registered user to the specific group
IMAGES	Image access (PC and)	ECLAP public user
IMAGES	Image access (PC and)	ECLAP registered user to the specific group
HTML	HTML access (PC and)	ECLAP public user
HTML	HTML access (PC and)	ECLAP registered user to the specific group
ANIMATIONS	Animations access (PC and)	ECLAP public user

ANIMATIONS	Animations access (PC and)	ECLAP registered user to the specific group

6.9. If you are a **Consortium Partner**, for Metadata you provide, you hereby grants ECLAP a non-exclusive, worldwide, royalty free license on copyright, even for commercial purpose, related rights and the sui generis database right, whereby ECLAP shall have the right:

a) to publish, make available, reproduce, distribute, display, transmit, extract, re-utilize and store the Metadata and its Derivatives in all forms, formats and media whether now known or hereafter developed (including without limitation in print, digital and electronic form) throughout the world;
b) to translate the Metadata (or authorise others to do so) into other languages, create adaptations, summaries, combinations, or extracts of the Metadata or other Derivatives based on the Metadata and exercise all of the rights set forth in (a) above in such translations, adaptations, summaries, combinations, extracts and Derivatives;

6.10. If you are a **Consortium Partner**, to permit the provision of the Service, **Consortium Partner** grant ECLAP a non-exclusive license to use, adapt distribute, prepare derivative works, display, and perform the Content in connection with the Service and ECLAP's (and its successors' and affiliates') business, including without limitation for promoting and redistributing part or all of the Service, according to the restriction applied by you via the IPR Wizards ECLAP tool.

6.11. For content provided by **Consortium Partners**, after the content upload the restrisctions applied by default to the content will be the most restrictive. The content will be accessible only to a small group of trusted users and will not be accessible to public users or registered users until permissions will be defined.

6.12. To make available the content to the final users, the **Consortium Partner** has to relax restrictions applied by using the IPR Wizard tool. The IPR wizard tool can be used to relax or restrict the following permissions:

Type of Content	**Restriction applied**	**RECIPIENT**
VIDEO	Play on mobile Browser	ECLAP public user
VIDEO	Play on mobile Browser	ECLAP registered user to the specific group
VIDEO	Download via mobile Browser	ECLAP public user
VIDEO	Download via mobile Browser	ECLAP registered user to the specific group
VIDEO	Play on mobile App	ECLAP public user
VIDEO	Play on mobile App	ECLAP registered user to the specific group
VIDEO	Download via mobile App	ECLAP public user
VIDEO	Download via mobile App	ECLAP registered user to the specific group
VIDEO	Play on PC in Low Definition and Medium Definition	ECLAP public user
VIDEO	Play on PC in Low Definition and Medium Definition	ECLAP registered user to the specific group
VIDEO	Download on PC in Low Definition and Medium Definition	ECLAP public user

VIDEO	Download on PC in Low Definition and Medium Definition	ECLAP registered user to the specific group
VIDEO	Play on PC in High Definition	ECLAP public user
VIDEO	Play on PC in High Definition	ECLAP registered user to the specific group
VIDEO	video HD PC download	ECLAP public user
VIDEO	video HD PC download	ECLAP registered user to the specific group
PDF	PDF document access (PC and)	ECLAP public user
PDF	PDF document access (PC and)	ECLAP registered user to the specific group
IMAGES	Image access (PC and)	ECLAP public user
IMAGES	Image access (PC and)	ECLAP registered user to the specific group
HTML	HTML access (PC and)	ECLAP public user
HTML	HTML access (PC and)	ECLAP registered user to the specific group
ANIMATIONS	Animations access (PC and)	ECLAP public user
ANIMATIONS	Animations access (PC and)	ECLAP registered user to the specific group

6.13. You further agree that Content you submit to the Service will not contain third party copyrighted material, or material that is subject to other third party proprietary rights, unless you have permission from the rightful owner of the material or you are otherwise legally entitled to post the material and to grant ECLAP all of the license rights granted herein.

6.14. You further agree that you will not submit to the Service any Content or other material that is contrary to the ECLAP Community Guidelines, currently found at <*link*>, which may be updated from time to time, or contrary to applicable local, national, and international laws and regulations.
6.15. ECLAP does not endorse any Content submitted to the Service by any user or other licensor, or any opinion, recommendation, or advice expressed therein, and ECLAP expressly disclaims any and all liability in connection with Content. ECLAP does not permit copyright infringing activities and infringement of intellectual property rights on the Service, and ECLAP will remove all Content if properly notified that such Content infringes on another's intellectual property rights. ECLAP reserves the right to remove Content without prior notice.
6.16. In accordance with the EC Directive 2001/29/EC and regional laws Users registered as Students, Researchers, University … [to be defined], have minor restrictions in the usage of the Content if the use of the Content is for educational and scientific purposes.

7. Content termination policy

7.1. If you are a **Simple User**, you are entitled to delete your content file and comments without asking any permission to the ECALP.
7.2. In case of content posted in ECLAP by **Affiliated Partners** or by a **Consortium Partner**, since ECLAP is an Aggregator of Europeana and the purpose of being affiliated or partners is to provide content to Europeana, the metadata provided by the partners are largerly posted in the Europeana portal. ECLAP as Europeana Aggregator has the duty to maintain the metadata and the corresponding digital resources (file) available and linked to the link provided by ECLAP to Europeana. Thus, the deletion of a digital resource file posted is in contrast with the agregation agreement between ECLAP and Europeana. In the case of grave problems, that bring to the need of removing a singular content file, several solutions can be arranged to

solve those problems allowing you to remove the content, please contact the ECLAP coordinator at info@eclap.eu .

8. Account termination policy

8.1. ECLAP will terminate a user's access to the Service if, under appropriate circumstances, the user is determined to be a repeat infringer.
8.2. ECLAP reserves the right to decide whether Content violates these Terms of Use for reasons other than copyright infringement, such as, but not limited to, pornography, obscenity, or excessive length. ECLAP may at any time, without prior notice and in its sole discretion, remove such Content and/or terminate a user's account for submitting such material in violation of these Terms of Use.
8.3 For Affiliated Partners and Consortium Partners the account termination policy is regulated by the corresponding Contract.

9. Copyright infringments

9.1. If you are a copyright owner or an agent thereof and believe that any Content infringes upon your copyrights, you may submit a notification by providing our Copyright Agent with the following information in writing:

- A physical or electronic signature of a person authorized to act on behalf of the owner of an exclusive right that is allegedly infringed;
- Identification of the copyrighted work claimed to have been infringed, or, if multiple copyrighted works at a single online site are covered by a single notification, a representative list of such works at that site;
- Identification of the material that is claimed to be infringing or to be the subject of infringing activity and that is to be removed or access to which is to be disabled and information reasonably sufficient to permit the service provider to locate the material;
- Information reasonably sufficient to permit the service provider to contact you, such as an address, telephone number, and, if available, an electronic mail;
- A statement that you have a good faith belief that use of the material in the manner complained of is not authorized by the copyright owner, its agent, or the law; and
- A statement that the information in the notification is accurate, and under penalty of perjury, that you are authorized to act on behalf of the owner of an exclusive right that is allegedly infringed.

ECLAP's designated Copyright Agent to receive notifications of claimed infringement is [Name, Address, email, fax, tel.]. For clarity, only copyrights infringment notices should go to the Copyright Agent; any other feedback, comments, requests for technical support, and other communications should be directed to ECLAP customer service through <link>. You acknowledge that if you fail to comply with all of the requirements of this Section, your copyrights infringment notice may not be valid.
9.2. Counter-Notice. If you believe that your Content that was removed (or to which access was disabled) is not infringing, or that you have the authorization from the copyright owner, the copyright owner's agent, or pursuant to the law, to post and use the material in your Content, you may send a counter-notice containing the following information to the Copyright Agent:

- Your physical or electronic signature;
- Identification of the Content that has been removed or to which access has been disabled and the location at which the Content appeared before it was removed or disabled;
- A statement that you have a good faith belief that the Content was removed or disabled as a result of mistake or a misidentification of the Content; and

- Your name, address, telephone number, and e-mail address, a statement that you consent to the jurisdiction of the federal court in San Francisco, California, and a statement that you will accept service of process from the person who provided notification of the alleged infringement.

If a counter-notice is received by the Copyright Agent, ECLAP may send a copy of the counter-notice to the original complaining party informing that person that it may replace the removed Content or cease disabling it in 10 business days. Unless the copyright owner files an action seeking a court order against the Content provider, member or user, the removed Content may be replaced, or access to it restored, in 10 to 14 business days or more after receipt of the counter-notice, at ECLAP's sole discretion.

10. Warranty Disclaimer

YOU AGREE THAT YOUR USE OF THE SERVICES SHALL BE AT YOUR SOLE RISK. TO THE FULLEST EXTENT PERMITTED BY LAW, ECLAP ITS OFFICERS, DIRECTORS, EMPLOYEES, AND AGENTS DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, IN CONNECTION WITH THE SERVICES AND YOUR USE THEREOF. ECLAP MAKES NO WARRANTIES OR REPRESENTATIONS ABOUT THE ACCURACY OR COMPLETENESS OF THIS SITE'S CONTENT OR THE CONTENT OF ANY SITES LINKED TO THIS SITE AND ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ANY (I) ERRORS, MISTAKES, OR INACCURACIES OF CONTENT, (II) PERSONAL INJURY OR PROPERTY DAMAGE, OF ANY NATURE WHATSOEVER, RESULTING FROM YOUR ACCESS TO AND USE OF OUR SERVICES, (III) ANY UNAUTHORIZED ACCESS TO OR USE OF OUR SECURE SERVERS AND/OR ANY AND ALL PERSONAL INFORMATION AND/OR FINANCIAL INFORMATION STORED THEREIN, (IV) ANY INTERRUPTION OR CESSATION OF TRANSMISSION TO OR FROM OUR SERVICES, (IV) ANY BUGS, VIRUSES, TROJAN HORSES, OR THE LIKE WHICH MAY BE TRANSMITTED TO OR THROUGH OUR SERVICES BY ANY THIRD PARTY, AND/OR (V) ANY ERRORS OR OMISSIONS IN ANY CONTENT OR FOR ANY LOSS OR DAMAGE OF ANY KIND INCURRED AS A RESULT OF THE USE OF ANY CONTENT POSTED, EMAILED, TRANSMITTED, OR OTHERWISE MADE AVAILABLE VIA THE SERVICES. ECLAP DOES NOT WARRANT, ENDORSE, GUARANTEE, OR ASSUME RESPONSIBILITY FOR ANY PRODUCT OR SERVICE ADVERTISED OR OFFERED BY A THIRD PARTY THROUGH THE SERVICES OR ANY HYPERLINKED SERVICES OR FEATURED IN ANY BANNER OR OTHER ADVERTISING, AND ECLAP WILL NOT BE A PARTY TO OR IN ANY WAY BE RESPONSIBLE FOR MONITORING ANY TRANSACTION BETWEEN YOU AND THIRD-PARTY PROVIDERS OF PRODUCTS OR SERVICES. AS WITH THE PURCHASE OF A PRODUCT OR SERVICE THROUGH ANY MEDIUM OR IN ANY ENVIRONMENT, YOU SHOULD USE YOUR BEST JUDGMENT AND EXERCISE CAUTION WHERE APPROPRIATE.

11. Limitation of Liability

IN NO EVENT SHALL ECLAP, ITS OFFICERS, DIRECTORS, EMPLOYEES, OR AGENTS, BE LIABLE TO YOU FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES WHATSOEVER RESULTING FROM ANY (I) ERRORS, MISTAKES, OR INACCURACIES OF CONTENT, (II) PERSONAL INJURY OR PROPERTY DAMAGE, OF ANY NATURE WHATSOEVER, RESULTING FROM YOUR ACCESS TO AND USE OF OUR SERVICES, (III) ANY UNAUTHORIZED ACCESS TO OR USE OF OUR SECURE SERVERS AND/OR ANY AND ALL PERSONAL INFORMATION AND/OR FINANCIAL INFORMATION STORED THEREIN, (IV) ANY INTERRUPTION OR CESSATION OF TRANSMISSION TO OR FROM OUR SERVICES, (IV) ANY BUGS, VIRUSES, TROJAN HORSES, OR THE LIKE, WHICH MAY BE TRANSMITTED TO OR THROUGH OUR SERVICES BY ANY THIRD PARTY, AND/OR (V) ANY ERRORS OR OMISSIONS IN ANY CONTENT OR FOR ANY LOSS OR DAMAGE OF ANY KIND INCURRED AS A RESULT OF YOUR USE OF ANY CONTENT POSTED, EMAILED, TRANSMITTED, OR OTHERWISE MADE AVAILABLE VIA THE SERVICES, WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY, AND WHETHER OR NOT THE COMPANY IS ADVISED OF THE

POSSIBILITY OF SUCH DAMAGES. THE FOREGOING LIMITATION OF LIABILITY SHALL APPLY TO THE FULLEST EXTENT PERMITTED BY LAW IN THE APPLICABLE JURISDICTION.
YOU SPECIFICALLY ACKNOWLEDGE THAT ECLAP SHALL NOT BE LIABLE FOR CONTENT OR THE DEFAMATORY, OFFENSIVE, OR ILLEGAL CONDUCT OF ANY THIRD PARTY AND THAT THE RISK OF HARM OR DAMAGE FROM THE FOREGOING RESTS ENTIRELY WITH YOU.
The Service is controlled and offered by ECLAP from its facilities in Italy. ECLAP makes no representations that the Service is appropriate or available for use in other locations. Those who access or use the Service from other jurisdictions do so at their own volition and are responsible for compliance with local law.

12. Indemnity

To the extent permitted by applicable law, you agree to defend, indemnify and hold harmless ECLAP, officers, directors, employees and agents, from and against any and all claims, damages, obligations, losses, liabilities, costs or debt, and expenses (including but not limited to attorney's fees) arising from: (i) your use of and access to the Service; (ii) your violation of any term of these Terms of Use; (iii) your violation of any third party right, including without limitation any copyright, property, or privacy right; or (iv) any claim that your Content caused damage to a third party. This defense and indemnification obligation will survive these Terms of Use and your use of the Service.

13. Ability to Accept Terms of Use

You affirm that you are either more than 18 years of age, or an emancipated minor, or possess legal parental or guardian consent, and are fully able and competent to enter into the terms, conditions, obligations, affirmations, representations, and warranties set forth in these Terms of Use, and to abide by and comply with these Terms of Use. In any case, you affirm that you are over the age of 13, as the Service is not intended for children under 13. If you are under 13 years of age, then please do not use the Service. There are lots of other great web sites for you. Talk to your parents about what sites are appropriate for you.

14. Assignment

These Terms of Use, and any rights and licenses granted hereunder, may not be transferred or assigned by you, but may be assigned by ECLAP without restriction.

15. General

You agree that: (i) the Service shall be deemed solely based in Italy; and (ii) the Service shall be deemed a passive website that does not give rise to personal jurisdiction over ECLAP, either specific or general, in jurisdictions other than Italy. These Terms of Use shall be governed by the internal substantive laws of the Italian State, without respect to its conflict of laws principles. Any claim or dispute between you and ECLAP that arises in whole or in part from the Service shall be decided exclusively by a court of competent jurisdiction located in Florence, Italy. These Terms of Use, together with the Privacy Notice at <link> and any other legal notices published by ECLAP on the Service, shall constitute the entire agreement between you and ECLAP concerning the Service. If any provision of these Terms of Use is deemed invalid by a court of competent jurisdiction, the invalidity of such provision shall not affect the validity of the remaining provisions of these Terms of Use, which shall remain in full force and effect. No waiver of any term of these Terms of Use shall be deemed a further or continuing waiver of such term or any other term, and ECLAP's failure to assert any right or provision under these Terms of Use shall not constitute a waiver of such right or provision. ECLAP reserves the right to amend these Terms of Use at any time and without notice, and it is your responsibility to review these Terms of Use for any changes. Your use of the Service following any amendment of these Terms of Use will signify your assent to and acceptance of its revised terms. YOU AND ECLAP AGREE THAT ANY CAUSE OF ACTION ARISING OUT OF OR RELATED TO THE SERVICES MUST COMMENCE WITHIN ONE (1) YEAR AFTER THE CAUSE OF ACTION ACCRUES. OTHERWISE, SUCH CAUSE OF ACTION IS PERMANENTLY BARRED.

Dated: January, 2010

18 ANNEX II – ECLAP PRIVACY POLICY

Draft version, Jan 2011

1. Purpose

This document sets out ECLAP's commitment to your privacy and to the protection of personal data (the "Data") collected and processed in connection with your use of the Website, under the terms and conditions set out in the Terms of Use. The conditions apply to registered users of ECLAP as well as non-registered-members. We therefore recommend that you read this Privacy Policy carefully.

At ECLAP your privacy is of paramount importance. As the custodians of your personal information, we have developed this policy to ensure that your privacy is always protected while you are using the ECLAP network.

By accessing or using the website, you agree to our Privacy Policy. If you do not agree to these terms, please do not access or use this site.

ECLAP processes your personal data in conformity with this privacy policy and with the strict rules of Italian and European data protection legislation. The Italian Law - Decree 30.06.2003 n. 196 - provides that the treatment of the collected personal data (i.e. data related to individuals and companies) has to be performed in a correct, transparent and lawful manner.

Data controller of the collected data is ECLAP, with registered office at Firenze, Via di S. Marta 3.

Data subjects (i.e. individuals or companies which data are collected and carried out by ECLAP) may, at any time, verify the treated data and exercise all the rights set forth in art. 7 of Law by Decree 30.06.2003 n. 196, by selecting the menu "privacy" on the ECLAP website.

This privacy policy is a part of our Terms of Use and should be read carefully, as it specifies which rights you have and how you can exercise your rights. Any use of the website implies the entire acceptance of this privacy policy.

2. A special note about children

We do not knowingly market to or encourage children, minors or anyone under the age of 18 to use our service and we request that children do not submit information to us.

In principle everybody can use ECLAP and everybody can create a ECLAP account. Children under the age of 13 are not permitted to register with ECLAP. It is ECLAP's policy not to collect any information from anyone under the age of 13.

In any case, you affirm that you are over the age of 13, as the Website is not intended for children under 13. If you are under 13 years of age, do not use or access the ECLAP website at any time or in any manner.

If you are the parent or legal guardian of a child under 13, and that child has somehow registered with ECLAP, please send an e-mail to info@eclap.eu for instructions on how to cancel your child's registration. In the e-mail, please provide your full name and address, your child's full name and address, your relationship to the child, your daytime and evening telephone numbers, your email address and a signed statement that

you are the child's parent or legal guardian. ECLAP will use this information only to verify that you are the child's parent or legal guardian and for no other purposes.

3. About ECLAP and the information we collect

In our online registration form, we ask you to provide us with certain information such as your name, your email address, your gender, your date of birth, your location details and some optional details about yourself. These details are available to you anytime, and capable of being corrected or updated through your "Profile" page.

At your own discretion, you may choose to post additional facts about yourself. During the creation of your ECLAP account you can indicate what your interests are as part of your profile. This is useful for other users who are viewing your profile but also for ECLAP because in this way we will be better able to adjust ECLAP to your wishes.

Please also remember that content that you post may reveal sensitive personal data about you e.g. about your health. If you volunteer sensitive personal data to us, you explicitly consent to our using such information as described in this Privacy Policy.

If you send us personal correspondence, such as emails or letters, or if other users or third parties send us correspondence about your activities or postings on the website, we may collect such information into a file which is only accessed by authorized personnel. We may also collect other users' comments about you in our complaints department.

ECLAP automatically receives and records information from your computer and browser, including your IP address, cookie information, software and hardware attributes, and other automatically generated information about your surfing behaviour during your use of ECLAP. This information consists for instance of your IP address (number of your computer making it possible to recognise your computer), the browser type (computer program to enable the viewing of internet pages) that you use, the pages you visit and “cookies”.

- The website uses cookies to identify you as a user of the website, to remember your preferred language and to facilitate navigation on the website. 9

- You can disable cookies in your internet browser, although some parts of the website will then no longer function correctly.

4. Our use of your information

We internally use personal information of our users to statistically analyze site usage, to comply with applicable law, to improve our content and product offerings as well as to customize our site's content and layout. We may also use personal information about you to deliver information to you that, in some cases, are targeted to your interests, such as targeted banners and promotions. We believe these uses allow us to improve our website and better tailor your online experience to meet your needs. We use personal information to resolve disputes, troubleshoot problems and enforce our Terms of Use.

You may wish to receive emails from us in respect to new message notifications, or for other purposes related to the use of the website. You can opt in or out from these messages via your "Settings" page.

Your profile data will be available to other users of the website if you select the 'Any users' access setting. If you have registered on one of our partner websites, your profile information will be available to all users of the Badoo social network whether via our website or our partners' websites.

By registering on the website you acknowledge and agree that the profile data and other postings that you provide, including sensitive personal data, may be accessed from countries outside the Italy. Please note that countries outside Europe may have lower standards of data protection than the Italy.

5. Disclosure of your information

We do not sell or rent out any personal information about you to any third party. We do disclose information in aggregate for marketing and promotional purposes. However, in these situations, we do not disclose any information that could be used to personally identify you. Certain information, such as your password is not disclosed in aggregate at all.

We reserve the right to disclose your personal information as required by law and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

6. Your use of other users' information

You may not use other users' information for commercial purposes, to spam, to harass, or to make unlawful threats. We reserve the right to terminate the accounts of those who misuse other users' information or who otherwise violate the Terms of Use.

7. Control of your password

You may not disclose your password to any third parties or share it with any third parties. If, despite the foregoing, you lose control of your password, you may lose substantial control over your personal information and may be subject to legally binding actions taken on your behalf. Therefore, if your password has been compromised for any reason, you should immediately change your password. This can be done via your "User Profile" page.

8. Reviewing and changing your personal information

Once you register, you will be able to review and change much of your personal information including:

- Your contact email address;
- Your profile, photographs, and videos;
- Your city, region, and country of residence;
- Your password.

We welcome any comments or queries you may have, so please feel free to send a message to info@eclap.eu, including for the purposes of altering your information or changing your settings.

9. Data security

ECLAP has security measures in place to protect and prevent the loss, misuse, and alteration of the information under our control. ECLAP uses industry standard efforts to safeguard the confidentiality of your

personal information such as firewalls. While "perfect security" does not exist on the Internet, our technical experts at ECLAP work hard to ensure your secure use of our site.

10. Deleting your Profile

Registered users of ECLAP can process, modify, correct, update, or partially or fully delete their personal data at any time. Users can also cancel their membership at any time without reason by accessing the option “settings” and clicking the button “cancel membership” there. By cancelling one’s membership, the entire dataset stored in the user profile will be completely deleted or, if we are legally obliged to store this data for a certain time period, the profile will be locked and then deleted. The user’s relationship with ECLAP ends upon cancellation of membership.

11. Invite a Friend

If a user decides to use our Invitation option to invite a friend to our site, we ask them for the friend's email address. ECLAP will automatically send the friend an email inviting them to join the website. ECLAP stores this email address for the purpose of automatically associating the friend with the user sending the invitation. ECLAP does not sell these email addresses or use them to send any other communication besides invitations. The friend may contact ECLAP to request the removal of this information from our database.

By providing us with information about a friend, you confirm that they have given you their informed consent to do so.

12. Public forums on ECLAP

Information that users publish in any public forums on ECLAP, e.g. in weblogs (“blogs”), postings, ads, etc. can be seen, read, and commented on by other ECLAP users.

13. Copyright Notification

ECLAP does not permit copyright infringing activities and infringement of intellectual property rights on its Website, and will remove all Content if properly notified that such content infringes on another's intellectual property rights according to the rules described in the Terms of Use. ECLAP reserves the right also to terminate a User's account, if they are determined to be a repeat infringer.

14. General Information

Support: If you take advantage of our support through the contact form or user “support” option, your enquiry will be stored in a database together with the details you voluntarily make there (if applicable). Our support team only uses this information to process your enquiry. Data compiled in this manner is also used by ECLAP for statistical analyses. Neither the raw data, nor the results of these analyses are made accessible in part or whole to third parties.

Access to the ECAP server: We store your data on highly secure ECLAP servers located in Italy. Only a small number of specially authorised people have access to these servers. Information pertaining to your identity is only collected by us if you have explicitly given us permission to do so.

Any queries? Privacy is a sensitive point, and rightly so. I hope it is clear that this is extremely important to us. If you have any queries, please don't hesitate to contact us at info@eclap.eu.

15. Changes to this Privacy Policy

If we decide to change our privacy policy or email practices, we will post those changes to this privacy statement, the homepage, and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

We reserve the right to modify this privacy statement at any time, so please review it frequently. If we make material changes to this policy, we will notify you here, by email, or by means of a notice on our homepage.