

# Semantic Model for Cultural Heritage Social Network and Cross Media Content for Multiple Devices

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Recently, new ways of fruition of cultural heritage content on the web have been presented. The attention of users is more focused on content oriented web sites, and in most of them several forms of content aggregation are offered in the context of social and best practice networks. In most cases, the content aggregation forms allow to collect, share, organize, make accessible digital contents in order to make easier for users the fruition, especially in cultural heritage and educational environments. Several web portals and social services are growing as indexing portals/engines, for example, collecting metadata of content (articles, video, etc.), indexing citations, indexing cultural heritage content. Those portals and services are facilitators for the creation of content, while the real content items, the digital essences, are only referred and thus they are only accessible in the original portal of the content provider. This also happens for the digital libraries of ACM and IEEE, and for Europeana.

Europeana <http://www.europeana.org> collects cultural heritage metadata coming from several institutions, universities, foundations, museums, schools of art, that represents a cultural heritage of the huge European history. Europeana foundation and portal that do not collect content items files, but only classification information (i.e., metadata), including the original URLs to the content. These URLs refer to the original content owner and/or to the content aggregator.

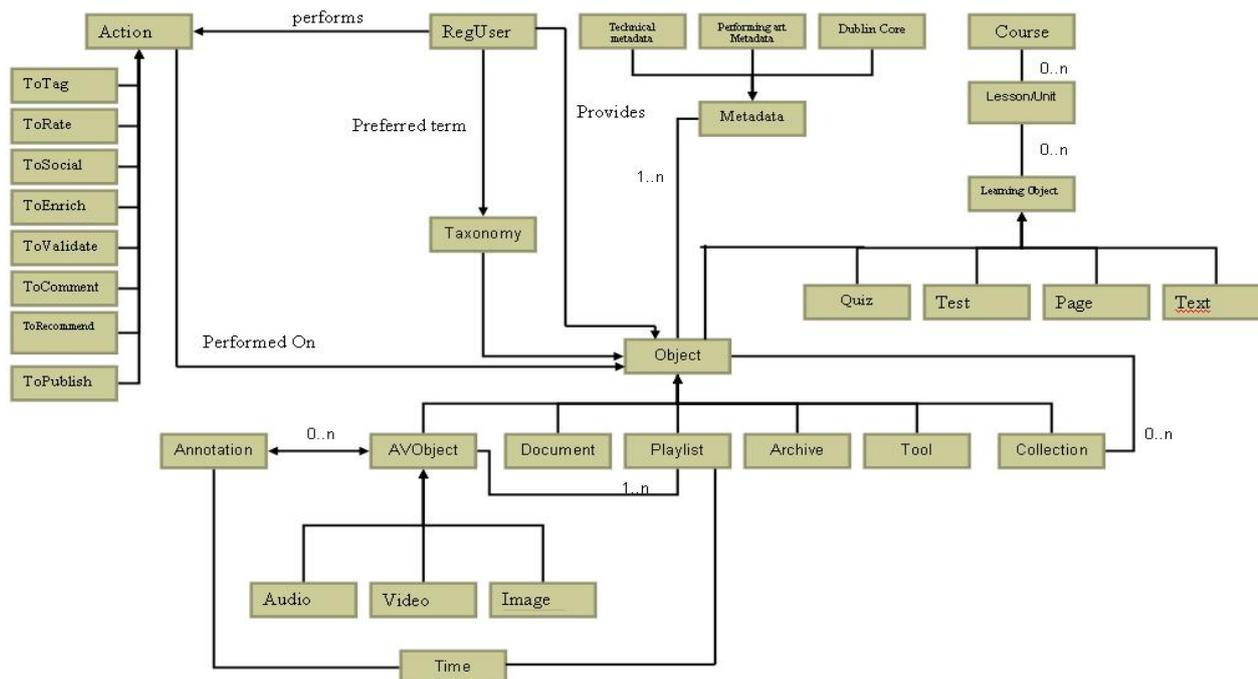
ECLAP (European Collected Library of Artistic Performance) is project to set up a Best Practice Network and service portal, making use of advanced social network semantic solutions and delivery tools for the aggregation and distribution of rich multilingual performing art content. This will result in cultural enrichment and promotion of European culture, and in improvements in learning and research in the field of performing arts. The activity performed in ECLAP is focussed on setting up an infrastructure (<http://www.eclap.eu>) for integrating multi-lingual metadata and content coming from several European Institutions in Europe, and it is open to other partners via the Affiliation. On ECLAP, users can provide and aggregate content files and metadata. Several metadata formats and modalities are supported. A large set of different metadata formats can be ingested. To this end, a metadata mapper tool has been developed, and the mapping goes towards the *ECLAP ingestion semantic model*. Once the metadata area ingested, an intelligent content processing back office (based on AXCP media grid) is capable of collecting and automatically repurposing content for distribution via pc and mobiles, coping with more than 400 digital file formats.

The ECLAP portal is capable to cope with a large range of different media kind: video, audio, images, document, slides, crossmedia (e.g., smil, mpeg-21, html, ebook as epub), animations, pdf, blog, groups, comments, news, playlists, collections, annotations, forum, archive, tools, excel, etc. In the ECLAP, portal it is also possible to create content collections, playlists, aggregation for e-learning and audiovisual annotations via the MyStoryPlayer tool (<http://www.mystoryplayer.org>).

Through ECLAP, users are able to: search, retrieve and play extensive high quality multilingual content via semantic model with fuzzy support; enrich, validate and contextualize metadata for a large set of content types; aggregate content in play lists, collections and e-learning courses; upload and share multilingual content; receive suggestions and recommendations for similar content, on

local and on Europeana; comment, annotate, tag, rate and vote on content; register and network with others colleagues; create discussion groups and distribution channels; upload digital resources for professional and user generated content; use tools to solve IPR issues with an IPR Wizard, to regulate content access; access all content via different devices such as PCs, tablets and smartphones.

The aim of the ECLAP workflow is to ingest content and metadata in a range of formats and to bring them to reach a high quality level of metadata completion to provide them to Europeana. To this end, collaborative ECLAP tools (for ingestion, metadata enrichment, editing and validation, IPR definition) have been studied and developed. Once the metadata are enriched, ECLAP is providing semantically enriched metadata mapping them from ECLAP semantic model to Europeana in EDM semantic model via an OAI-PMH ECLAP server.



In the above picture, the main part of the *ECLAP semantic model* are depicted, in which several different kinds of concepts and data are modelled ranging from content to users and their relationships (the ECLAP semantic model is much more richer than the ECLAP ingestion model). The different kind of content and also the users are associated with a thematic taxonomy in terms of genre, performing art type, historical period, subjects, management aspects, dissemination aspects, roles, etc. Also the user profile includes such a classification to allow users to express their preferences about content theme, enabling the similarity of user and content.

In the model the main ECLAP content type can be identified. The aggregations are playlists, collections, annotations and e-learning courses. In the model Object is specialized in a Collection that is associated with a set of collectable objects as document, playlist, archives, tool and audiovisual objects. An Object is associated with a set of Metadata elements. A set of Annotations can be associated with an AVObject whereas an Annotation can be associated with one or two AVObjects. In this way, an Annotation may annotate an AVObject with another AVObject. Annotation and playlist are associated with time, in order to put in relation audiovisual objects each other. Regarding the connection with users, the RegisteredUsers provides a set of Content and can perform some Actions that may modify the Content in some way, the Actions are specialized (see the figure for some of them).

The ECLAP back office engine also exploits the semantic model to provide suggestions to users on the basis of semantic similarities among users and content, and among content and content. The similarities are estimated by using a scalable clustering solution which takes into account both static and dynamic aspects of the activities performed in the portal. The technical infrastructure is based on components such as: the AXMEDIS platform for the semantic computing back office (recommendations, automated content repurposing, enrichment, etc.), open standards as XML, RDFS, OWL, SPARQL and SKOS.

In the final version of the paper and presentation, a more detailed view of the ECLAP semantic model will be presented. The aim of ECLAP is two folds. From one hand to provide service to the institutions with cultural heritage content in the area of performing art, mainly for educational purposes. The other goal is the production of enriched metadata descriptors for porting them in EDM (Europeana Data Model). To this end, it is quite interesting to see the mapping of the ECLAP semantic model created to provide services for social networking and content delivering, and the EDM which is mainly focused on digital library aspects with marginal attention to the real users.

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