TEN Competence
Building The European Network for Lifelong Competence Development

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For Lifelong Competence Development

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Project Report

ID5.11: Updated roadmap

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Summary of Changes

Version	Section(s)	Synopsis of Change
0.1	All	Draft: Table of Contents
0.2	All	Added some content and prepared for Salzburg WP5-roadmap meeting
0.3	4.2 and 4.3 2 and 4.1 3.5	Added by Giunti Added by UPF Added by SU
0.3	2.1 3.2 3.4 4.1	Rewritten sentence, unclear sentence Typo "Aggregation is more suitable than "Groupping" Rewritten sentence
1.1	all	Applied corrections suggested by reviewers

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1 Introduction (Leader: GiuntiLabs)

WP5 has been addressed to a new approach since focus meeting in Sestri Levante on March 2007. The current approach of WP5 is oriented to knowledge discovery instead of knowledge search.

Knowledge discovery can be achieved by means of community through tagging / commenting / rating of knowledge resources. Nevertheless, the specific community functionalities will be developed by WP8, whilst WP5 will focus in supporting the community through a proper structure of resource repository.

2 Summary of state of the art in the field (UPF)

In a life-long learning environment, in which the learners define their own education in relation to their learning needs, new demands regarding the management of the educative resources appear: the learner becomes the centre of the learning resource creation. In this frame, it appears the necessity of a space for offering knowledge, a space to find, search, explore, create and share elements or objects that would be relevant for the learners' learning objectives. Some studies underline that there is a demand of new services, and an increasing need for distance education. As a consequence, it is necessary to provide tools that offer interactive experiences. In addition, globalization of communication, entertainment, and information provides a big quantity of resources to learners, creating a new and continually changing learning space [5].

In the last few years, a number of new repositories and systems were developed for the sharing and reuse of educative contents, however these systems are lacking in many respects and do not meet the requirements that arise from this type of context. It must be a space not only of exchange of educational contents but a system for the collaborative design and creation of these contents.

In this section perform an overview of the state of the art of the educational repositories developed that we take as a reference and to the Web 2.0 ideas and tools. Both fields have served as the basis for defining the main requirements of the system.

2.1 Repositories

Scamardalia and Bereiter stated few years ago the necessity of restructuring the school as communities "in which the construction of knowledge is supported as a collective goal (...)" [8]. They considered that the role of the educational technology was to "replace the classroom discourse patterns with those having more natural extensions to knowledge-

building communities outside schools walls" and support for a social structures and dynamics for a progressive knowledge building. They proposed the basis for a beginning of specifications for knowledge-building discourse: a) focus on problems and depth of understanding in which explaining is the major challenge, b) decentralized, open knowledge environments for collective understanding; and c) productive interaction within broadly conceived knowledge-building communities. They conceived these types of communities as a space in which people are engaged in producing knowledge objects that are shared, edited and readapted according to their necessities.

Some years later, these ideas and those that arise from them, became a base for the construction of the educational communication systems for supporting the interactions among learners

In the following, we only go through the most relevant educational repositories projects developed that inspired part of the work in WP5.

With the exploding popularity of the Internet and the Web, a special interest for the construction of the Digital Repositories has been growing. These types of tools have been considered as the means for the socialization of the knowledge building process. An example of this is the Knowledge Pool System ARIADNE [9]. It was an European educational digital library project initiated in 1996 by the European Commission's telematics for education and training program. The core of this infrastructure was a distributed library of digital reusable educational components called the Knowledge Pool System (KPS). It consist on a distributed digital library of education resources delivers reusable components to teachers and learners from different cultures and with different languages. The most innovative aspect of ARIADNE was its metadata. The metadata is the information about the resources stored in the repository. The new aspect that this project proposed was the semi-automatically generation of this metadata. Since the typical end user of this system was thought to be a teacher, this process should be simple and easy.

Another project focussed on building learning object repositories was the Portals for On-line Objects in Learning (POOL). A learning object in this project's framework was considered as any digital file to construct e-learning experiences and as the building blocks of e-learning that can be reused. The efforts of this project resulted in the development of two technologies, POOL, POND and SPLASH, a distributed architecture for peer-to-peer networks of learning object repositories and CanCore, a metadata protocol for cataloguing learning objects. The combination of both, the distributed architecture and the protocol, were the main contributions of this work. They open the doors to a new type of repositories not only as a data store, but also as a means of discovering and distribution learning objects. In our work, the Learning Object concept becomes the Knowledge object used in different learning contexts.

Finally, one of the most recent projects of educational repositories is the OpenDock project. The main aim was to develop a space for sharing eLearning activities and resources in Vocational Education and Training (VET). It included as the added value the

possibility of reusing the resources of different Units of Learning (UoLs) defined in IMS Learning Design among different institutions. Another important aspect to remark is that, in comparison with ARIADNE that made use of Oracle database, it is Open Source software, which made it less expensive to run and maintain.

WP5 take some of the ideas underlying these projects (the reusability concept, the distributive architecture, the use of open source software...) to propose an adequate space for sharing digital objects in life-long learning contexts. Furthermore, a proposal of a system including also the innovative technical characteristics of the Web 2.0, as it is explained in the following.

2.2 Web 2.0

As O'Reilly says, one of the main characteristics of the Web 2.0 era is that *Users add value* to the knowledge development by actively contributing in its construction [3]. We adopt this idea and define, as one of the main challenges of the project, to develop an "architecture of participation". Therefore WP5 creates a system taking into account the concepts and services related with the Web 2.0 in order to develop a tool where the users can share digital objects using functionalities such as: rating, comment or add tags. The goal is to create this participative architecture as a side effect for the user [4]. This is, to develop a system that makes the participation arise naturally from the user by encouraging him/her in the knowledge construction. However, to promote this participation it is necessary to provide an architecture easy-to-use, increasing user access a consequence of the collaboration in course activities [5]. We also assimilate another important concept of the Web 2.0: the openness of its services.

In this project we assimilate the ideas that arise from the Web 2.0 as one requirement and, as at the same time, as one of the key points in the development process.

3 Summary of WP5 contributions

3.1 WP5 contributions to RTD over first 30 months (UPF)

The contributions of the WP5 contributions over the first 30 months can be divided in two lines: the conceptual and the technical contributions. The first line consists on a more theoretical study about the existing repository systems and Web 2.0 in order to create an environment adapted to the life-long learners' necessities. As a result, we have developed a theoretical framework for the Knowledge Resource Management system (KRMS). The second line corresponds to a more technical contribution that has resulted in a tool called LearnWeb2.0 based on this first theoretical study.

This section provides an overview of the main contributions of WP5 in the construction of a repository for life-long learning. Firstly, we go through the theoretical framework developed, the KRMS. Secondly, we explain the resulting tool LearnWeb2.0.

3.1.1 The KRSM

The aim of WP5 is to create the tools and the necessary environments to help the learners on these activities. With this objective, we have developed the Knowledge Repository Management System (KRMS). We adopted the concept of Learning Object defined as "any digital resource that can be reused to support learning" [1, 9] and extend the term to Knowledge Object to define any type of object that can be created, shared, distributed or edited using this tool.

The KRMS system aims to be an innovative environment for the knowledge objects' management in which different objects such as videos, images or documents are handled depending on the pedagogical necessities of the learner. We have defined these pedagogical needs in three contexts: Knowledge mining Knowledge personalization and Knowledge transfer [2]. These three contexts define an interaction space in which the KOs are managed by the learner (see Fig. 1). We developed it with the aim of providing an approach of the main functionalities that the tools or systems should accomplish in order to describe a complete scenario for the user. Moreover, the KRMS aims to be not only the basis for a repository of knowledge objects used in life-long learning contexts but also a space for participation through elements created by the same users of the system.

Another objective of this project is to promote the concept of a common and participatory knowledge by creating a community of knowledge building and using the repository as a tool to exchange KOs. This idea has been introduced to the system by adopting the philosophy of the Web 2.0 (see section 1.1.2). We decided to create an innovative repository for allowing an easy access to different Web 2.0 services and an easy management of Knowledge Objects across these service: the LearnWeb2.0 tool.

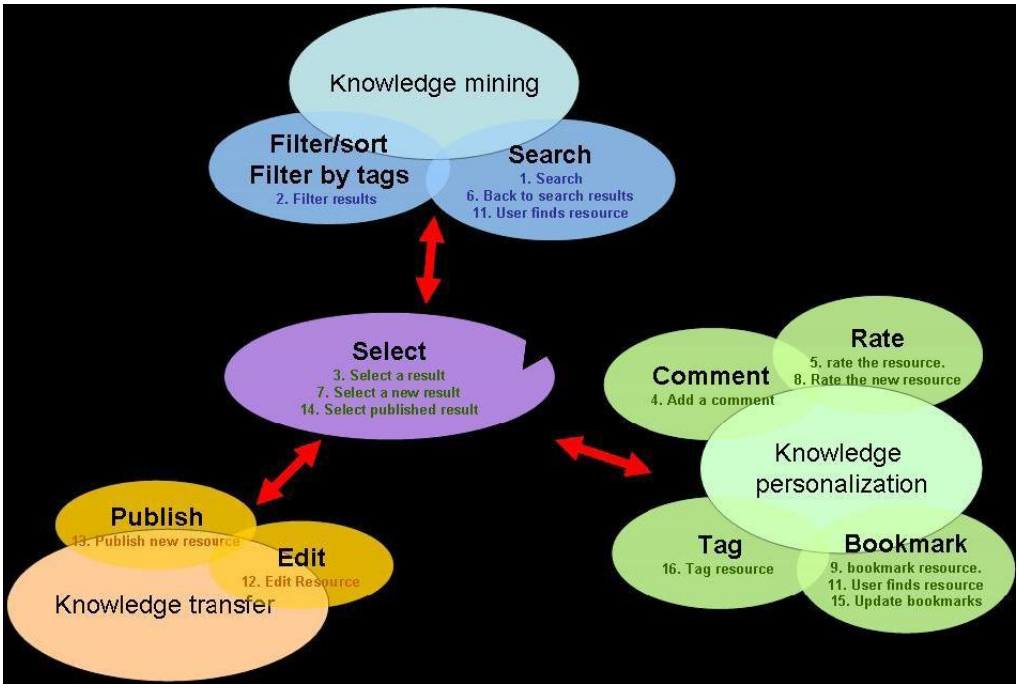

Figure 1 - Final interaction design schema for KRSM

3.1.2 The LearnWeb2.0 tool

Under the theoretical perspective of the KRMS and as a result of a development process based on the ideas that arise from it we have created a tool called LearnWeb2.0. This tool aims to be a solution for the objects management in an life-long learning context that adopts the last improvements on the technology of participation: the Web 2.0 technology.

This tool consists on the integration of different Web 2.0 services into a same environment. Developers use the open API's that the Web 2.0 services offers [4], and integrate various services in the KRSM as a 'mash-up'. The repository offers various services such as: Flickr or YouTube. The users can use their functionalities to create KOs and save them in the system with a metadata file to add 'meaning'. With the contributions of the users the repository grows and the users can learn about the information that others users add in their LOs.

In the report called Social Software and Learning [6] written in the UK by the Nesta-funded FutureLab, it is reviewed the potential impact of social software on education. The report explains that this is a trend that provides a greater emphasis on lifelong learning and supports the development of young people's skills in creativity and innovation. Then the users could use a tool as the LearnWeb as a 'Library 2.0' (a term coined by Mike Casey in 2006 [7]), creating a place where the users can produce and consume knowledge [4] using different types of KOs.

This integration also facilitates the users' access to the digital content and the participants can use different services introducing only one identification name and password. The use of one service or other could depend on: the learning objectives that the user has or the Learning Object that the user wants to manage.

We explain two examples to understand the different cases:
1) A user who is using the TenCompetence environment wants to create an activity for reaching a competence. This user wants a picture about a specific topic. This person has the possibility of search it on the repository or, if the user doesn't find the picture that s/he wants, use Flickr to find the picture without changing the environment. Once the user finds the picture, s/he can add the metadata associated to this picture in the repository and other learners can use it in the future.
2) One person wants to create an activity for a specific topic, but s/he doesn't have any idea of what types of materials s/he can use. Then s/he introduces various tags in the search engine of the repository, and find different KOs related with the topic that s/he want to create. Using the information added by other users, the learner will be able to select the KOs more adapted to her/his learning requirements.

The LearnWeb2.0 provides also the following functionalities: tagging KOs as a form of indexing objects, comment KOs as a way to recommend these objects to other learners, or rate KOs to indicate the quality of them. The KRSM tool helps the learner to organise the resources and show them more effectively. Moreover, the tool encourage shared responsibility for develop materials that the author of the KO or other learners can use in their courses. In addition the system allows also asynchronous public feedback on the KOs an elementary functionality for an environment that allows the user to create its own contents [4,5].

Using the LearnWeb2.0 the user can access to a huge quantity of KOs, contained in different Web 2.0 services, using only one tool. The users can use tools such Flickr or del.icio.us with a low-cost. They can compare their own work with works elaborated by other learners inspiring them to improve their learning process or trying to apply new ideas or techniques. This facilitates the organization of the users' digital objects that they have distributed on various Web 2.0 services. Each user will have a Home Page, where they can access to their personal resources. In addition they will consult other personal information such as: they bookmarks, tags, comments, rates and groups [ID5.14]

As a conclusion, we can remark that this tool promotes an interactive social use of Knowledge Objects that the users can share and edit using Web 2.0 with which they are already familiar to. Moreover, it is an innovative repository that organizes and structure exclusively learning digital content that can be edited by other users. As a consequence different users with different levels of knowledge can add information to the KO producing an increase in the information of the object.

3.2 Interaction models and requirements for knowledge sharing (ID5.12) (GiuntiLabs)

The main contribution of the document ID5.12 is the scenario production. Twelve scenarios have been devised, in different contexts: academic, professional, personal. The role of social software as a basis for knowledge sharing has been confirmed, as well as the adequacy of web2.0 paradigm.

The extracted challenges are:

- **Interoperability**: the ability to combine several web2.0 existing tools (via API) as a synergic base for knowledge sharing
- **Identity management**: the ability to sign-on a single time and to operate with several external tools without requiring re-signing

The functional requirements extracted from the scenarios are:

- Searching (simple and advanced search of knowledge resources)
- Browsing the resource repository
- Discovering resources through tags, keys, comments, categories
- Social bookmarking
- Aggregating
- Sharing resources among users
- Recommending resources via rating/commenting
- Downloading/uploading resources into appropriate repository

The non- functional requirements extracted from the scenarios are:

- Usability and accessibility (friendly user interface, effectiveness of results)
- Reliability
- Performances
- Security
- Internationalization

3.3 Core services requirements (ID5.14) (GiuntiLabs)

The activity done in the development of this deliverable has been focussed mainly in technical aspects. An exhaustive tool map of existing web2.0 tools has been defined, mapping pedagogical needs to primitive activities.

The pedagogical needs have been clustered into three general domains being:

- Knowledge mining.
- Knowledge transfer.
- Knowledge personalisation.

A complete classification of the tools has been set up, for the selection of the most appropriate tools and a final list of web2.0 tools has been drawn up for the integration in the KRSM tool called LearnWeb2.0.

The design specification of LearnWeb2.0 encompasses:

- Users
- Resources
- Metadata
- Categories
- Groups
- Tags
- Comments
- Rates
- Popularity

From the architectural point of view, the LearnWeb2.0 tool is composed by separated elements, in order to allow flexibility and estensibility:

- Web application
- Web services
- Adapters (drivers for the diverse Web2.0 tools)
- Metadata manager
- Identity manager
- Publishing managers
- Toolbars

The complete functionalities of LearnWeb2.0 have been described, along with the complete list and description of services, clustered in the following categories:

- Web services exposed by KRSM
- KRSM access API-Lite
- KRSM management API-Lite

3.4 LearnWeb2.0 (former KRSM Web Tool) (ID5.7) (GiuntiLabs)

LearnWeb2.0 is the new name of the former KRSM tool.

The main difference is the completely new architecture in web infrastructure. All processing is performed at server side and the client is merely a browser. A new look & feel has been designed.

The development of LearnWeb2.0 has been carried out by the development team, splitting the task among the diverse partners.

The developed tasks are:

- manage identity
- implement KRService
- implement ImageDriver (search+get+upload)
- implement VideoDriver (search+get+upload)
- implement AggregationDriver (search+get+upload)
- implement AudioDriver (search+get+upload)
- implement GenericDriver (search+get+upload)
- implement css esthetic (ask to OUNL)
- implement LearnWeb homepage
- implement LearnWeb viewer page
- implement LearnWeb upload page
- implement LearnWeb search+found+ordering page
- implement toolbars for firefox (search+tag+rate)
- metadata editor
- integration of various components in a unique tool

Several contacts among developers have been maintained.

The integrated architecture is shown in the below figure:

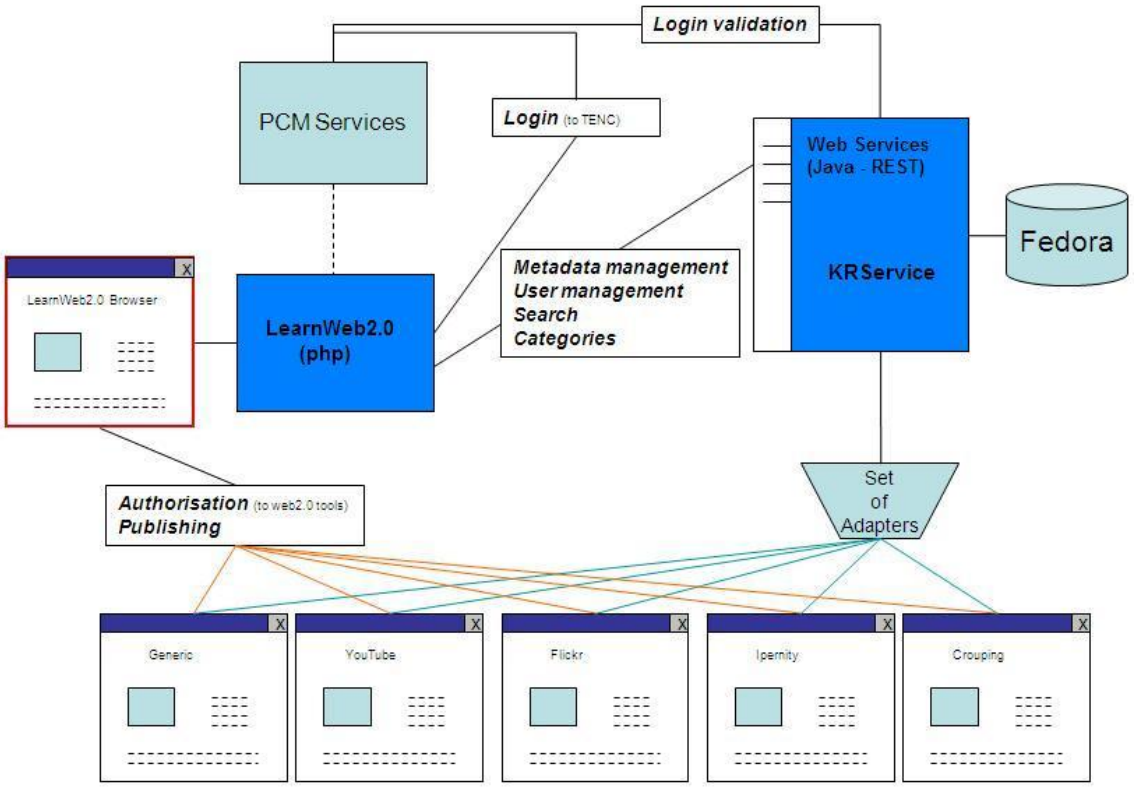

Figure 2. LearnWeb2.0 architecture

3.5 Metadata editor and repository service (ID5.18) (SU)

3.5.1 Repository service

LearnWeb2.0 uses a Fedora digital repository [1] to store knowledge resources (i.e. metadata in Dublin Core, the URL of the resource or the content of the resource). The Fedora repository system is an open source, digital object repository system using public APIs exposed as web services. Fedora also supports definition of flexible digital object models, relationships between objects, metadata in Dublin Core, and has many other useful features.
LearnWeb2.0 extends the standard Dublin Core metadata by providing additional author-oriented and user-oriented information:

- owner/publisher
- list of categories
- list of tags
- list of comments
- ratings of resources
- ratings of comments
- popularity of resources
- etc.

This is achieved by designing and implementing a Digital Object Model in Fedora as shown on Figure 1. Each LearnWeb2.0 object is represented as a digital object in Fedora with corresponding datastreams. The relations between the objects are represented and implemented by defining appropriate Fedora relationships. A number of methods are also defined for extracting information about the objects by creating several Behavior Definition Objects and Behavior Mechanism Objects. These methods are exposed by Fedora as web services. LearnWeb2.0 web services make extensive use of all these services together with the Fedora APIs.

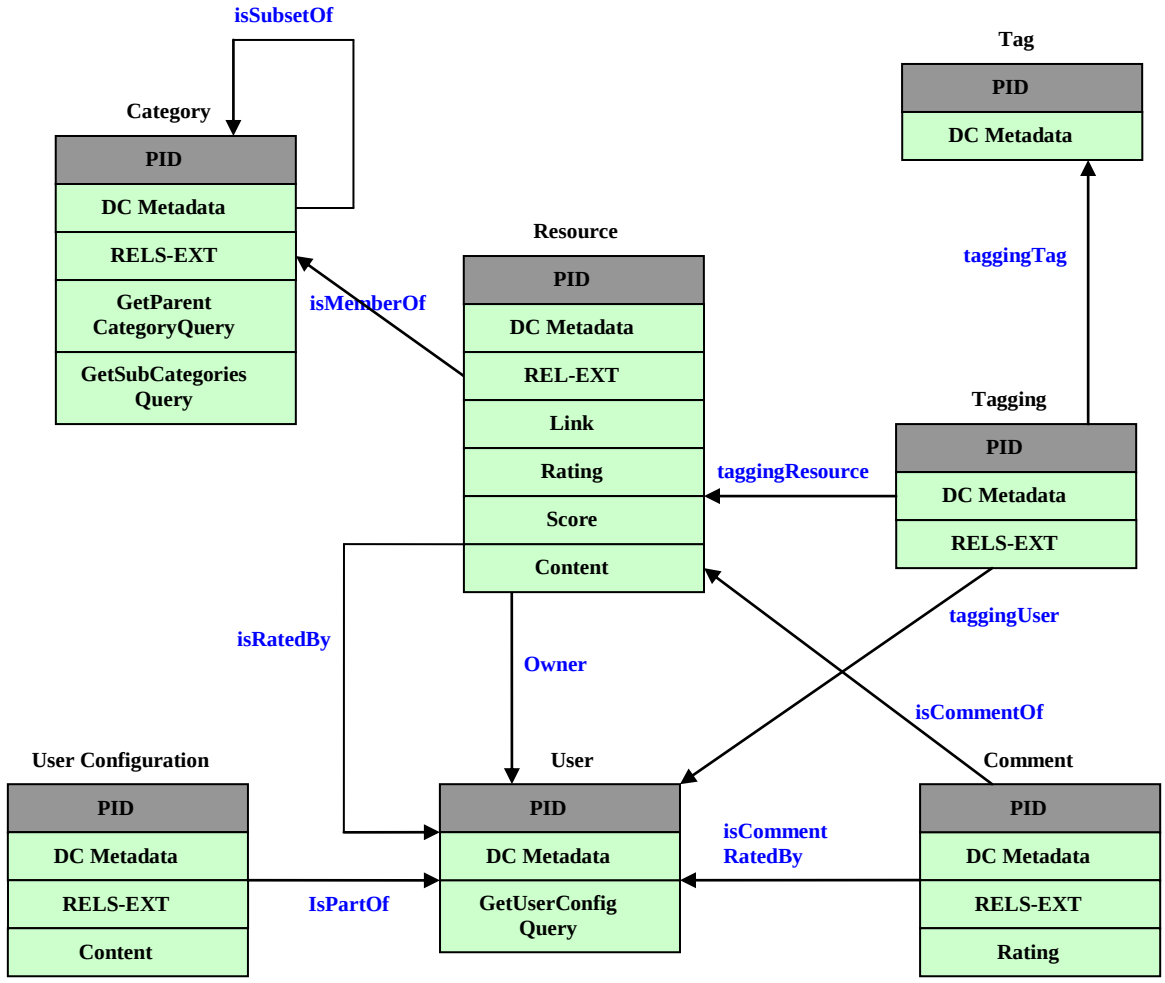

Figure 3. Fedora Digital Object Model

3.5.2 Metadata editor

The Metadata editor is designed to edit/update the Dublin Core metadata that is stored for each resource in the Fedora repository. The editor is a web based application written in PHP using the CakePHP framework. It uses the web services exposed by LearnWeb2.0 and is integrated in the LearnWeb2.0 tool.

The metadata for the resources is based on the Dublin Core metadata standard [2]. The standard defines a simple yet effective element set for describing a wide range of networked resources. The Dublin Core standard includes two levels: Simple and Qualified. LearnWeb2.0 uses the Simple Dublin Core which comprises the following fifteen elements:

- **Title** - the name given to the resource. Typically, a Title will be a name by which the resource is formally known.
- **Subject** - the topic of the content of the resource. Typically, a Subject will be expressed as keywords or key phrases or classification codes that describe the topic of the resource.
- **Description** - an account of the content of the resource. Description may include but is not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.
- **Type** - the nature or genre of the content of the resource. Type includes terms describing general categories, functions, genres, or aggregation levels for content. LearnWeb2.0 uses for example *image, video, HTML document, PDF document*, etc. for values of this element.
- **Source** - a reference to a resource from which the present resource is derived.
- **Relation** - A reference to a related resource.
- **Coverage** - the extent or scope of the content of the resource. Coverage will typically include spatial location (a place name or geographic co-ordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity).
- **Creator** - an entity primarily responsible for making the content of the resource. Examples of a Creator include a person, an organization, or a service. Typically the name of the Creator should be used to indicate the entity.
- **Publisher** - the entity responsible for making the resource available. Examples of a Publisher include a person, an organization, or a service. Typically, the name of a Publisher should be used to indicate the entity.
- **Contributor** - an entity responsible for making contributions to the content of the resource. Examples of a Contributor include a person, an organization or a service. Typically, the name of a Contributor should be used to indicate the entity.
- **Rights** - information about rights held in and over the resource. Typically a Rights element will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights.
- **Date** - a date associated with an event in the life cycle of the resource. Typically, Date will be associated with the creation or availability of the resource.
- **Format** - the physical or digital manifestation of the resource. Typically, Format may include the media-type or dimensions of the resource. Examples of dimensions include size and duration. LearnWeb2.0 usually uses the MIME type of the resource for value of this element.
- **Identifier**- an unambiguous reference to the resource within a given context. Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. LearnWeb2.0 uses the Fedora resource identifier (in the format **resource:nnn**) for the value of this element.
- **Language** - a language of the intellectual content of the resource.

LearnWeb2.0 uses resource metadata for searching/discovering resources and for proper view/manipulation of the resources.

In LearnWeb2.0 the owner of the resource stored in the Fedora repository is responsible for supplying the metadata for the resource. Only the owner can use the Metadata editor to fill in the values of Dublin Core elements. Figure 2 shows a screenshot of the Metadata editor.

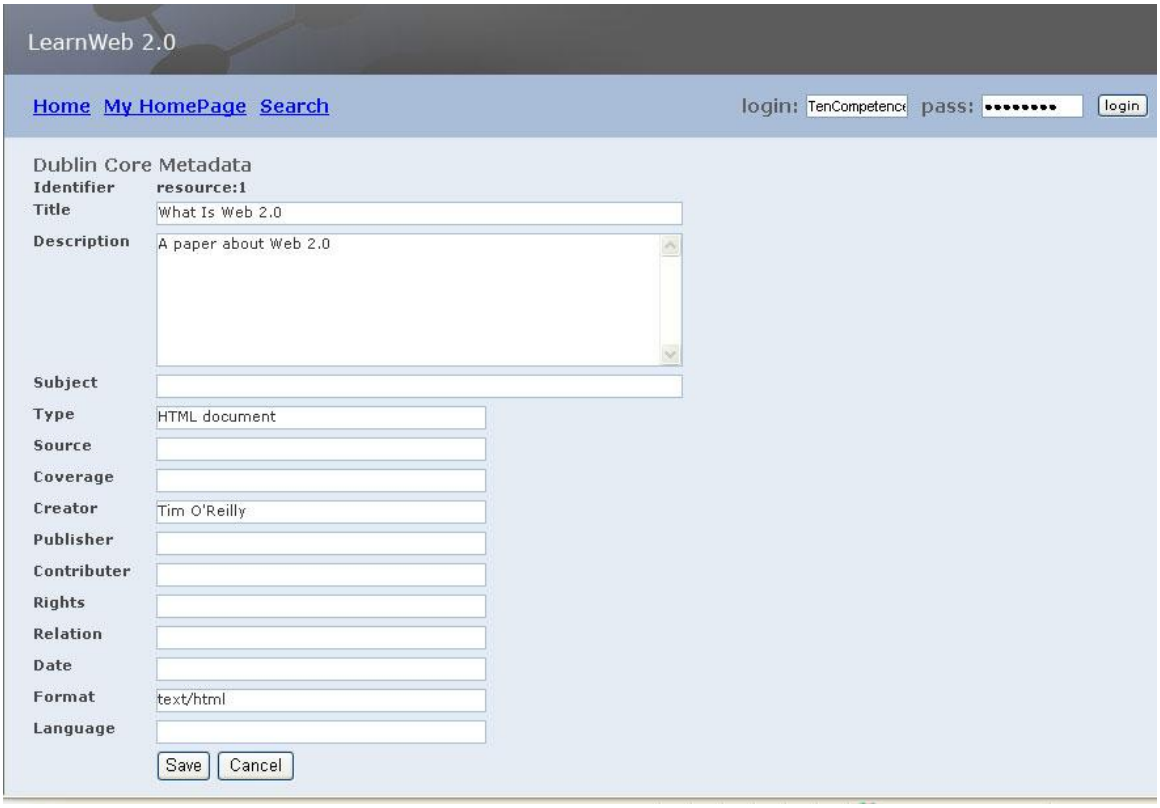

Figure 4. A screenshot of the metadata editor

When the user adds a Web resource or uploads a resource to the repository she/he also has to provide metadata for the resource using the Metadata editor.

Dublin Core metadata is sufficient to describe most of the resources used within TENCompetence project. However, some types of resources, such as Learning Objects, Learning Designs, etc., need additional metadata usually described in the Learning Object Metadata standard (LOM) [3]. The next version of LearnWeb2.0 will be extended to support LOM for such types of resources

4 Summary of Trends in the fields

4.1 Trends (UPF)

One of the future challenges is to reinforce new ways of learning, sharing and managing different digital resources through social networking tools using the same interface. The use of the open **APIs of the applications**, and the possibility of use a **Single-Sign-On**, allows the integration of different services in the same tool [11]. This helps on avoiding the anxiety effect that some users experience from having to deal with large number of services that the Web 2.0 offers [12]. The users sign in the tool, and then they can access to several Web 2.0 services, to manage different KOs and integrate all the information about the content in the same repository. Furthermore, both the KRSM framework and the LearnWeb2.0 tool offer different user scenarios that can be a contribution in understanding the potential of the different Web 2.0 services in many learning contexts [13]. We expect to extract some conclusions about the user of such a services performing in those situations.

Another expected future contribution is to add to the KRMS the possibility of organizing the resources according to their **proximity content**. This is, to provide relations within resources using the ideas added by the users in order to generate a network of resources for facilitating the navigation through the different resources using these conceptual relations.

Another idea planned for a long-term future is to integrate this educational tool using **virtual worlds** as Second Life [14], for example. These spaces are growing in popularity because they combine many features of Web 2.0: social networking, the possibility to share information, an easy way to connect with friends, a feeling of presence, and offers a sensation of connection with the community [15]. Virtual words have flexibility to simulate realistic scenarios using 3D graphics. This visualization allows representing physical objects and materials, which can increase the sensation of proximity between the learner and the KO. The Otis College of Art and Design has built a gallery, sculpture garden and meeting space in Second Life [16]. In this space, teachers and students can show their work, and can interact with the elements and talk with their colleagues about the different resources that they can find in this space (see 14 and references in there).

The development of the Web 2.0 system has facilitated the ability to collaborate at distance. As a consequence new trends on reviewing and publication of the learning materials arise. This is creating new scholarship and emerging new forms of publication [15]. The use of the KRSM as a means for this evaluating a disseminating purpose can be considered in a near future.

Another trend is the orientation of the currently situation of the web to the **Semantic Web**. It aims to transform the way in which information is extracted from documents. Thus, to generate a new space where the machine will be able to read the data and understand its content in order to organize the resources according to their meaning [17]. These new Management systems will have to take into account the *folksonomies*

introduced by the users. According to VanderWal, folksonomy is the act that the users do when they add tags, using their own vocabulary, to a resource. Then the goal is, using the tags that a person adds to a resource, to find other resources with the same tags, and then create a space with similar objects and grouping people with similar criteria. Therefore, use the vocabulary of the people as a 'human-filter'.

Tim Berners-Lee explain in the WWW2006 conference, that he believes that the future is to create a web space where will have a combination of high-powered graphics and semantic data [18].

As we have seen in this section the trend would be combine virtual worlds to represent educational scenarios and introduce in these worlds semantic data to create a community of knowledge. In the future, the repositories will be a virtual space where the users can access as nowadays users access to libraries.

4.2 Next steps (GiuntiLabs)

Next steps in the field of knowledge resources sharing and management will be focused by envisaging new scenarios.

One of the most promising directions of research is the integration of WP5 and WP8, i.e. the combination of social aspects into knowledge resources sharing and management. One area of investigation may be addressed to the study of user behavior with regards to the resources and the identification of the stimulus for a correct use of knowledge resources. Possible solutions may include user profiling and possibly rewarding/penalizing the user based on his/her behavior (similar to eBay feedbacks)

Other investigations will be addressed to studying the "quality" of resource usage and the identification of mechanisms that makes good resources emerge. To achieve this goal we will focus our attention in scouting the implications of rating the comments (it is very different from rating the resources).

Another research direction will be the exploration of resource relations, with a particular attention to "social relationship" management. The aim is to empower the knowledge discovery, exploiting the relations defined by different users. Let us consider as an example that a user defines the relation "created by" in this way:

Monalisa→createdBy→Leonardo

Now suppose that another user defines the relation:

Monalisa→hasSerigraphy→Serigraph→createdBy→AndyWarhol

These relations could be exploited for performing inferences and discover a link between Leonardo Da Vinci and Andy Warhol.

4.3 TENCompetence needs (GiuntiLabs)

In the recent meeting in Madrid and Salzburg, a series of needs have been singled out both from inter-WPs meeting and from intra-WPs.

One of the possible needs could be the adoption of an additional tool for distributed repository management. This issue will be addressed to the tool OpenDocument, developed by a TENCompetence Associate Partner.

A well-known requirement of TENCompetence is the integration of KRService (WP5 web service tool) in WP3, WP6, WP7, WP8 tools. This will be achieved with possible enhancements of WP5 exposed services. In particular, for the purpose of integration with WP8 an additional service has already been identified: "getPeopleRelevantToResource".

With regard to WP6, from Salzburg meeting, it has pointed out that ReCourse UoL will not be stored in Fedora, mainly because ReCourse needs the resource content to be locally available for zipping it into the UoL, therefore it cannot be physically stored in the Web2.0 (Flickr, YouTube,…)

A recent request outlined during Salzburg meeting is the management of resource usage history. This is important for qualifying resources by means of the usage frequency, the modification rate, the commenting amount and other statistical historical computations.

Some functionalities, already identified and described in previous internal deliverables, are still missing, although already planned for next deliverable. In particular:

- Toolbars for Firefox (and possibly MSIE)
- Collaborative resources: integration with GoogleDocs or Wiki (the latter easier).
- Sticking with Diigo (see ID5.12-sect 3.3.1.6)
- Likert Scale management (see ID5.12-sect 3.1.7)

Other TENCompetence needs deriving from WP4 are relevant to confidentiality for Pilots. In particular the requirements needed by November 2008 are:

- Management of user groups (company employees)
- Management of resource confidentiality
- Installation manual for Pilots

Last but not least, for the purpose to correctly manage the evaluation process, WP5 will open a Bugzilla account for allowing users to communicate technical details about faults.

5 Priority RTD actions

5.1 Action for next 18 months (GiuntiLabs)

From Salzburg meeting and following discussions, this action plan came out:

- June 2008
  - finishing implementation of LearnWeb
  - finishing roadmap document (this!)
- July 2008
  - Evaluation of LearnWeb, exchanging role among WP5 partners
  - Preparing deliverable to UE Commission D5.2
- September 2008
  - Finishing and reviewing deliverable to UE Commission D5.2
  - Starting new modelling and scenarios ID5.13
  - Designing integration with WP8
- October 2008
  - Finishing modelling and scenarios ID5.13
  - Starting requirements and specification ID.15
  - Preparing release for Pilots
- November 2008
  - Delivery to Pilots
  - Starting requirements and specification ID.15
- December 2008
  - Reviewing requirements and specification ID.15
- January 2009
  - Finishing requirements and specification ID.15
  - Starting implementation ID5.16
- March 2009
  - Finishing implementation ID5.16
  - Starting evaluation ID5.17
- April 2009
  - Finishing evaluation ID5.17
  - Preparing deliverable to UE Commission D5.3
- May 2009
  - Finishing and reviewing deliverable to UE Commission D5.3

A detailed plan of first months plan appears in appendix A.

6 Conclusion (Leader: GiuntiLabs)

WP5 is experiencing a transition period. It is exiting the implementation phase and it is leading to the innovation phase, passing from the evaluation phase.

A great effort has been spent in exploiting existent technologies, especially in Web2.0 tools, and this direction will continue with the exploration of new tools (Second Life)

Particular attention has been placed in the collaborative development, splitting the work among partners and planning a considerable integration phase.

Last but not least, a great emphasis has been made in integration with other WPs, for reaching a seamless integrated system.

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8 Appendix A: detailed plan (Leader: GiuntiLabs)

Planned activity for next months following Salzburg meeting

deliv	deliv name	activity	due by
ID5.10	Evaluation	ToC with assigned responsibilities	13/06/2008
ID5.11	Roadmap	Next steps, Tenc needs	18/06/2008
ID5.11	Roadmap	State of the art in the field	18/06/2008
ID5.11	Roadmap	WP5 contrib. to RTD over first 30 months	18/06/2008
ID5.11	Roadmap	Trends in the field	18/06/2008
ID5.10	Evaluation	Skype Chat 10:00 CEST	19/06/2008
ID5.11	Roadmap	Integration of document	20/06/2008
ID5.11	Roadmap	Send to partners for review	20/06/2008
ID5.7	LearnWeb	Remove duplicates from search	20/06/2008
ID5.7	LearnWeb	Set up Bugzilla	23/06/2008
ID5.7	LearnWeb	Implement profile page	23/06/2008
ID5.7	LearnWeb	Integration & debug	23/06/2008
ID5.7	LearnWeb	Implement Add Page	23/06/2008
ID5.7	LearnWeb	Implement Upload Page on Fedora	23/06/2008
ID5.7	LearnWeb	Finishing Services	23/06/2008
ID5.7	LearnWeb	Integrate view-page	23/06/2008
ID5.7	LearnWeb	Fix authentication bug	23/06/2008
ID5.7	LearnWeb	Debug corrections	26/06/2008
ID5.11	Roadmap	Reviewed	27/06/2008
ID5.7	LearnWeb	Final integration	27/06/2008
ID5.7	LearnWeb	Implement Upload Page on Web2.0 tools	27/06/2008
ID5.11	Roadmap	Final integration	30/06/2008
ID5.11	Roadmap	Delivered	30/06/2008
ID5.7	LearnWeb	Delivered	30/06/2008
D5.2	Deliv to UE	ToC with assigned responsibilities	04/07/2008
ID5.7	LearnWeb	Documentation	11/07/2008
ID5.10	Evaluation	Chapter Coding quality (code of Uhann)	15/07/2008
ID5.10	Evaluation	Chapter Coding quality (code of Altran)	15/07/2008
ID5.10	Evaluation	Chapter Impact analysis	15/07/2008
ID5.10	Evaluation	Integration of document	15/07/2008
ID5.10	Evaluation	Send to partners for review	15/07/2008
ID5.10	Evaluation	Chapter Coding quality (code of Giunti)	15/07/2008
ID5.10	Evaluation	List of improvements/enhancements	15/07/2008
ID5.10	Evaluation	Chapter Coding quality (code of SU)	15/07/2008
ID5.10	Evaluation	Chapter Validation proof	15/07/2008
D5.2	Deliv to UE	First release of the document	18/07/2008
D5.2	Deliv to UE	Send to partners for review	18/07/2008
ID5.10	Evaluation	Reviewed	22/07/2008
D5.2	Deliv to UE	Skype Chat	24/07/2008
ID5.10	Evaluation	Update the delivery	25/07/2008
ID5.10	Evaluation	Final integration	28/07/2008
D5.2	Deliv to UE	Reviewed	30/07/2008

ID5.10	Evaluation	Delivered	30/07/2008
ID5.13	Model/scenario	First ToC with assigned responsibilities	01/09/2008
ID5.13	Model/scenario	Circulate the ToC among partners	03/09/2008
D5.2	Deliv to UE	Last release of document	04/09/2008
D5.2	Deliv to UE	Submit to coordinator (Eric)	08/09/2008
ID5.13	Model/scenario	Reviewed ToC	11/09/2008
ID5.13	Model/scenario	Skype Chat	15/09/2008
D5.2	Deliv to UE	Reviewed by OUNL	22/09/2008
D5.2	Deliv to UE	Final integration	25/09/2008
ID5.13	Model/scenario	new models for Kn. sharing/manag.	26/09/2008
D5.2	Deliv to UE	Delivered to UE	30/09/2008
ID5.15	Requirements	First ToC with assigned responsibilities	01/10/2008
ID5.13	Model/scenario	Chapter new scenarios (Giunti)	03/10/2008
ID5.13	Model/scenario	Chapter new scenarios (Upf)	03/10/2008
ID5.15	Requirements	Circulate the ToC among partners	03/10/2008
ID5.15	Requirements	Reviewed ToC	13/10/2008
ID5.15	Requirements	Skype Chat	13/10/2008
ID5.13	Model/scenario	Chapter new requirements (Altran)	17/10/2008
ID5.13	Model/scenario	Chapter new requirements (Uhann)	17/10/2008
ID5.13	Model/scenario	Chapter new interaction models	17/10/2008
ID5.13	Model/scenario	First Integration	27/10/2008
ID5.13	Model/scenario	Skype Chat	30/10/2008
ID5.13	Model/scenario	Send to reviewers	30/10/2008
ID5.15	Requirements	Chapter integrat. issues	31/10/2008
ID5.15	Requirements	Chapter new entities	07/11/2008
ID5.13	Model/scenario	Reviewed	14/11/2008
ID5.15	Requirements	Chapter new architecture	14/11/2008
ID5.15	Requirements	Chapter new functionalities	14/11/2008
ID5.7	LearnWeb	Management of resource confidentiality	21/11/2008
ID5.7	LearnWeb	Installation manual	21/11/2008
ID5.7	LearnWeb	Management of user groups	21/11/2008
ID5.13	Model/scenario	Final integration	25/11/2008
ID5.13	Model/scenario	Delivered	28/11/2008
ID5.15	Requirements	First Integration	28/11/2008
ID5.7	LearnWeb	Integration of release for pilots	28/11/2008
ID5.15	Requirements	Skype Chat	05/12/2008
ID5.15	Requirements	Send to reviewers	05/12/2008
ID5.15	Requirements	Reviewed	09/01/2009
ID5.15	Requirements	Final integration	23/01/2009
ID5.15	Requirements	Delivered	30/01/2009