Multimedia and e-Learning integration for supporting training programs in agriculture by MOODLE

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Abstract. The NODES project aims at facilitating, for adult training / lifelong training, the use of multimedia knowledge to improve competitiveness employability and mobility of handicapped adults (physical and sensorial) and of adults victims of the digital divide or of some of its components such as distance, initial level of knowledge, language, use of complex technologies. The NODES project is focused, on the wide sense, on the production and diffusion of knowledge created within public and private organizations dedicated to adult training or by individuals, through Europe. Within the project the MOODLE e-Learning system was selected and more multimedia content will be integrated into the knowledge base. The EU-Index metadatabase collects content sources for the project partners. Another target is to integrate video files into the systems. This parts are integrated by the logical and physical architectures of the NODES.

Keywords: e-learning, Moodle, Nodes project, video object, EU-index.

1. Introduction

Within the NODES European e-Learning project (Creation of a European network of multimedia resource centres for adult training) we are doing research and developments based on open source tools. The aims of the NODES are to select those open source components which are suitable for creating the network for mainly adult training / lifelong training, the use of multimedia knowledge to improve competitiveness employability and mobility of different target groups, such as rural living people and farmers. The selection criteria of open source LMS was set up by the consortium. Our studies "Survey on the existing systems (What are exists)" were consist of 4 parts: The basic elements of e-Learning Systems, The complements and integration of the e-Learning Systems, The specification of interface (Várallyai and Herdon, 2006). The result of our

research work was to select the Moodle LMS. The Moodle provides a reliable platform that supports social and collaborative learning, highly configurable and extensible, implements new features and fixes rapidly, is free of licensing costs. The members of project (France, Spain, Ireland, Hungary, Czech Republic and Romania) implemented the Moodle system creating the LMS. To integrate the different contents we had to develop the EU-index, which is the central, common and shared index database (a metadabase). The EU Index, the merging of each local - national index (based on KD - Knowledge Database - and selected links like available resources / websites / etc.). The EU-index based on the Dublin Core Patent. The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. Another important function is the multimedia content management. One of these parts is the video objects. From the about 200 Moodle modules and blocks we are using for example the AutoView Presenter which allows you to put video on-line with synchronised slides. The NODES system is used in graduate, postgraduate PhD, adult trainings programmes and it is a very successful system as an educational portal system for our faculty too (Lengyel at al, 2007).

2. The logical architecture

On the Fig. 1. you can see how build up the NODES Network (central repository) and how to connect the participant countries and the actors (trainer, learner, content designer and manager). The main parts of the logical architecture are the following:

- Learning Management System, LMS
- Local – National Repository, LNR
- Knowledge Databank Management System KD CMS / KMS
- Specific and Shared Databases, SSD
- EU Index, EUI
- Internet, Content Access and Security Rules, I-CASR
- NODE point: Physical implementation and network infrastructures
- The NODES virtual central services and infrastructure
- Asynchronous and RT (Rural Transport) Services and Support in Adult Education
- IP Networks and Internet
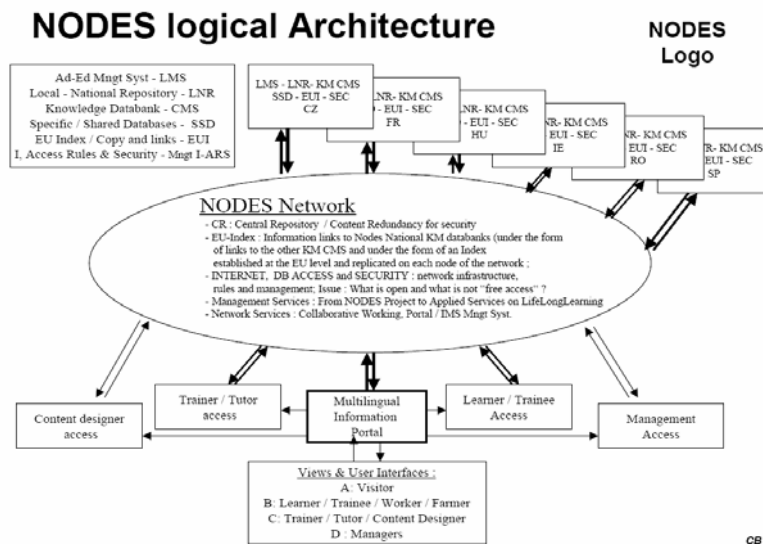- The services of the NODES project management

Fig 1. NODES Logical Architecture

3. The selection process and the selected Moodle as our LMS

We studied lot of e-Learning system. One of our tasks in the Nodes project was studying the existing open source or commercial e-learning software. The aim of the investigation of these systems is surveying the most important functional features, modules, standards, hardware and software requirements.

After the comparison of the e-Learning systems by several methods, we have to evaluate the most important parameters, which are suitable suggestion for the project management. These parameters were evaluated.

Evaluating aspects

- *Technical flexibility*: Hardware and software requirements, Support, Cost/License, Authentication
- *Learning tools:* Forums, Materials, Messenger, Chat, Exercises, Group work, Student tracking.
- *Usability:* Technical knoledge/installation, Course templates, Standards, Languages.

Reviewing these parameters, our suggestion was the Moodle or the aTutor. We examined in details these systems.. Both of them are fully compatible with the current Shareable Content Object Reference Model (SCORM) standards for sharing content between different LMSs.

Additionally, both of the systems use XML metadata to describe e-learning content within the systems. Yet, without the encumbering technical elements of the SCORM the authoring process for new courses is much simplified. Creating a new course can be as simple as designing several different 'pages' (Moodle, ATutor) of content, and then organising them so that they flow in a logical manner.

In addition to these 'course slides' consultants can then assign specific resources to accompany each slide. In Moodle and ATutor there would not be a requirement for HTML knowledge when authoring content.

The collaborative features included in the learning environments vary in both complexity and usability. ATutor is the only system to feature an internal 'e-mail' system to allow course users to intercommunicate. We believe that this is a very useful feature to have within a LMS, as it promotes collaboration between users. Additionally, each system requires a valid e-mail address to be collected from each user so communication via external e-mail systems would be entirely possible.

On an authoring note, we found that Moodle's interface for creating course content was the most intuitive, and featured a very simple to use What You See Is What You Get (WYSIWYG) editor. The use of this editor would remove the need for the consultants to learn any Internet display languages such as Hyper Text Mark-Up Language (HTML), which would significantly reduce the development time required to start creating course content.

After all we selected the Moodle which is a software package for producing internet-based courses and web sites (Lengyel at al, 2006). It is an ongoing development project designed to support a social constructionist framework of education. Moodle is provided freely as Open Source software (under the GNU Public License). Basically this means Moodle is copyrighted, but that you have additional freedoms. You are allowed to copy, use and modify Moodle provided that you agree: to provide the source to others; to not modify or remove the original license, and apply this same license to any derivative work. Moodle will run on any computer that can run PHP, and can support many types of database The word Moodle was originally an acronym for Modular Object-Oriented Dynamic Learning Environment, which is mostly useful to programmers and education theorists. It's also a verb that describes the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity. As such it applies both to the way Moodle was developed, and to the way a student or teacher might approach studying or teaching an online course.

4. The EU-Index metadabase

The EU-index, is the local implementation of the central, common and shared index. The process of updating and maintenance must be established, tested and validated. The EU Index, the merging of each local - national index (based on KD - Knowledge Database - and selected links like available resources / websites / etc.). The EU-index based on the Dublin Core Patent.

The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. On the basis of the fifteen properties table we made a

webpage, which is suitable to upload the collected data in the given structure. This webpage is open for every project partner and can be uploaded in English language the required data. We have possibilities for query from this database with the correct rights.

We developed a webpage, which is suitable to upload the collected data in the given structure. This webpage is open for every project partner and can be uploaded in English language the required data. At first time, who wants to upload material, has to register. After the successful registration everybody get an e-mail, which contains the password entering this page. It is very important, because the system is recorded the uploader name.

The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. The name "Dublin" is due to its origin at a 1995 invitational workshop in Dublin, Ohio; "core" because its elements are broad and generic, usable for describing a wide range of resources.

The fifteen element "Dublin Core" described in this standard is part of a larger set of metadata vocabularies and technical specifications maintained by the Dublin Core Metadata Initiative (DCMI).

Fig. 2. The details of the uploaded document

The full set of vocabularies, DCMI Metadata Terms [DCMI-TERMS], also includes a set of resource classes, the DCMI Type Vocabulary [DCMI-TYPE]. The terms in DCMI vocabularies are intended to be used in combination with terms from other, compatible vocabularies in the context of application profiles and on the basis of the DCMI Abstract Model [DCAM].

All changes made to terms of the Dublin Core Metadata Element Set since 2001 have been reviewed by a DCMI Usage Board in the context of a DCMI Namespace Policy [DCMI-NAMESPACE]. The namespace policy describes how DCMI terms are assigned Uniform Resource Identifiers (URIs) and sets limits on the range of editorial changes that may allowably be made to the labels, definitions, and usage comments associated with existing DCMI terms.

The list of uploaded materials can be seen the fifth most important elements, but of course we can see all the elements with click the "Details" button. The result can be seen in the Figure 2. In the "List of materials" page we can search materials by title. We can specify the category to the search, if we want. In the other case we can select the "All subject" category.

5. Video objects in the learning matarials

The educational videomaking's first element is to determine the main goal, what we want to reach with our video. Inspite of the main goal is clear – to transfer certain knowledge with the possibly best rate, with utilizing the moving-picture's possibility-, according to the level of the educational material's learning, the importance of the video's length, and its narration can be rather different. The integration of video objects into the Moodle system is very important goal for us (Szilágyi at al, 2007).

There are several possibilities to create a new curriculum in Moodle. We use the basic activities to create a course, but we can use some complementary tools too (Lengyel and Herdon, 2008). There are about 200 modules and blocks which are available from moodle.org website.

We use for example AutoView Presenter which allows you to put video on-line with synchronised slides. A web based editing interface is used to configure the video/slide sources and to set the slide trigger times. Beside this module we test and use some modules, which can be very useful in material development. I give a short list about these modules.

- Covcell Audio/Video Conferencing Tool. Conferences can be audio, video or mixed. The number of participants depends on the available bandwidth. Conferences of more than three participants can be moderated or unmoderated.
- Inwicast Mediacenter is a bloc module which adds multimedia capabilities to Moodle so that teachers can easily publish, manage and share audio and video podcasts in various formats (flash flv, mp3, mp4, wmv, mov, etc). The main purpose of this module will be distributing (Streaming) video content along with some notes + attachments to the students. Also the students can keep their personal notes about the video/teacher's note.
- Audio recorder. This learning tool allows students to record an mp3 audio file, saving to a local folder. The student can then upload it as an assignment. It works similar to the assignment module.

AutoView Presenter

This module allows you to put video on-line with synchronised slides. A web based editing interface is used to configure the video/slide sources and to set the slide trigger times.

In order to put together an AutoView presentation you will need a Macromedia Flash movie which contains the slides and a video file which can be played as a progressive download from Moodle, or alternatively a video loaded onto a streaming video server.

Slides can be prepared in Powerpoint (or similar formats), but you will need to import your slides into Open Office to create the final Flash movie. Once you have your slides in OpenOffice, use the File/Export menu option. Select Macromedia Flash (SWF) (.swf) from the file format drop down, choose a file name and save the slides. You might be able to use Flash files created by other PPT→SWF conversion software.

Alternatively, if you can't access OpenOffice to create the flash movie, you can use a set of image files. Manual creation of these files could be quite laborious; you will need to export your presentation as JPEG images

In theory any video which can be played by one of the supported video plugins could be used with these presentations. In practice, you would want a video that has been prepared with low bit rate, (56k for modem use or 256k-512k for broadband). The following file formats are recommended: MPEG 4 (.mp4), Quicktime (.mov), Windows Media (.wmv or .asf), Real Player (.rm).
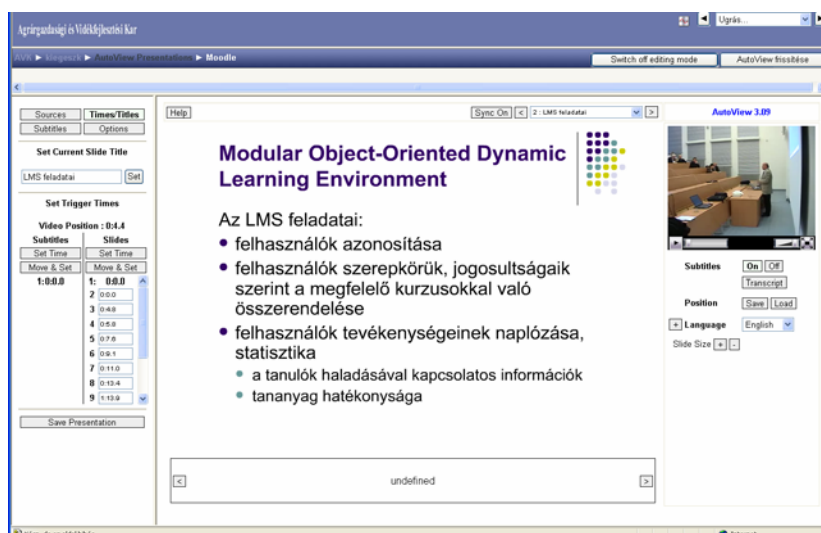

Fig. 3. Using AutoView module in Moodle

The module requires two parameters, the first is a name, and the second is an XML configuration file which AutoView will use to store the presentation data. AutoView is designed to be portable; using a separate XML configuration file

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instead of storing information in the Moodle database will make it easier for us to produce implementations for other systems. This file will be created for you by AutoView if you don't have one already, all you need to do is enter the file name you want AutoView to use for the XML config file.

Once you have set the slide titles, the linking between the video and the slides can be set up. Press the play button on the video plugin to start the video. Every time you reach a slide change point in the video, click the Move and Set button. Do this until you have set time indexes for all the slides. You can manually adjust the time indexes by typing in a time index into the boxes on the left.

6. Conclusion

In summary, Moodle is a great tool for teachers because it is a platform to save and achieve teaching material easily and a collaborative online platform for teachers and students to learn together. Besides creating courses, it is also very useful to join the online communities to keep yourself updated with the world and to know a circle of scholars that will truly encircle the globe. On moodle.org website we can easily find a lot of modules, which are very useful to extend our Moodle site with video objects. These tools help us to make teaching more effective.

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