

New ways of transforming Drupal from CMS to LCMS

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Abstract

There is a constant global effort to improve the e-learning experience. This includes several aspects, like: new ways of elaborating the educational materials, improving the new applied pedagogies, but also new paths of assuring and delivering the educational process.

The present paper is describing a new e-learning tool developed by AltFactor that plays the role of a Learning Management System. Together with Drupal, the well - known Content Management System, the result is a complex LCMS that can be used as an integrated e-learning solution. The solution has been successfully tested on a group of 40 students, that have studied a two - module Project Management course.

Keywords: LCMS, SCORM, e-learning

1. Introduction

Even if the paradigm of e-learning has remained unchanged to the same levels since ancient times, the way the information that should ensure the educational process is passed from one teacher to his pupils is changing every day.

The mechanism of learning is, of course, the same, but the race to deliver wide – impact, high – quality, cost – effective training has raised the tools offered by ICT to new levels that have imposed themselves in the activity of trainers and content developers.

Nowadays, there are at least four main types of actors in the field of e-learning: e-trainers, e-pupils, content developers and content management system developers, each of them playing a very clear role.

AltFactor has earned the reputation of content developer, proving a solid experience in elaborating educational materials for students of different ages: from 6 to 65 years old. The present paper is revealing the efforts AltFactor has done recently in designing a complete e-learning solution: developing a LCMS.

2. A Content Management System

A content management system, usually known as CMS, is an application used to control and manage any workflow needed to collaboratively create, edit, review, index, search, publish any type of Web content or digital resources. A CMS can be successfully used to implement a large range of applications, from simple websites to complex corporate

applications. It is used all over the world to power government portals, corporate intranets and extranets, ecommerce sites, nonprofit outreach, schools, church, and community sites.

AltFactor's solution is based on Drupal, a free and open source CMS written in PHP that is used for many types of web applications, ranging from small personal blogs to large corporate and political sites and even front end for some other web application like CRMs (Client Relations Management), ERPs (Enterprise Resource Planning) or LMSs (Learning Management System) systems.

One of its main advantages is the modularity that is accomplished by the simplicity of developing or installing third party or in-house custom - built plug-ins (modules). The standard release (Drupal core) contains basic features common to most CMSs. These include the ability to register and maintain individual user accounts, administration menus, RSS-feeds, customizable layout, flexible account privileges, logging, a blogging system, an Internet forum, and options to create a classic brochureware website or an interactive community website.

Because of its modularity, Drupal is also referred to as being a CMF (Content Management Framework). Although Drupal offers a sophisticated programming interface for developers, no programming skills are required for basic website installation and administration.

Drupal can run on any computing platform that supports both a web server capable of running PHP version 4.3.5+ (including Apache, IIS, Lighttpd, and nginx) and a database (such as MySQL or PostgreSQL) to store content and settings.

2.1 LMS vs LCMS

The primary objective of a learning management system (LMS) is to manage learners, keeping track of their progress and performance across all types of training activities. By contrast, a learning content management system (LCMS) manages content or learning objects that are served up to the right learner at the right time.

AltFactor's platform is a LCMS as, in addition to managing the administrative functions of online learning (the LMS functions), it provides tools to deliver and manage instructor-led synchronous and asynchronous online training based on reusable learning object methodology.

Simply explained, the primary educational problems an LCMS solves are

- centralized management of an organization's learning content for efficient searching and retrieval;
- productivity gains around rapid and condensed development timelines;
- productivity gains around assembly, maintenance and publishing / branding / delivery of learning content.

3. AltFactor's LCMS

AltFactor's educational platform is based on the Drupal CMS (Figure 1). The starting point of view was very simple: to be as friendly and lightweight as possible for both user categories: teachers and students.

The platform is structured in order to ensure a smooth educational process. A teacher can upload his own courses, monitor the students progress – activity on the platform and

grades obtained on the on-line tests, upload bibliographical materials for off-line study, post messages in the News section or on the Calendar section, send personal messages to his students and, of course, moderate discussions in the Forum.

A student on the platform can study the courses he is assigned to, view his grades and his progress, send personal messages and post messages in the Forum.

Other roles are course secretary – for monitoring the educational process, course administrator and platform administrator – key roles for managing the educational and the technical aspects of a LCMS.

Only an administrator can create a new course and upload its content to the platform. After course creation at least one teacher must be assigned to that particular course. Of course, it is possible to have more than one teacher assigned to one course.

The next step is to assign the students to the course and to a specific trainer. In this moment an e-mail is automatically sent to the student with details concerning the course. If the student ignore this e-mail, or after a period of inactivity on the platform, other e-mails are sent to the student in order to remind him about his duties.

A teacher, a secretary or an administrator can observe some general statistics and personal statistics. In the general statistics section reports about a course can be monitored, like: number of users, SCOs finished, SCOs started, total time spent on the course.

In the personal statistics section, reports about students can be monitored, like: what SCOs are finished or not, how many times a SCO has been accessed, the SCORM status of the SCO, the total time spent inside each SCO and total time spent studying the course.

Figure 1. AltFactor's LCMS Home Page

3.1 The Educational Component

What we usually name the educational component is in fact the SCORM 2004 player which plays the content packed in SCORM 2004 zip packages. This component is built using Action Scrip 3.0 technology, using Adobe Flex SDK and javascript that links the part written in Flash (the SCORM tree) with the Drupal, written in php technology. The

data is sent both ways in order to record and show the user progress. The Drupal is able to store data received from the flash to its own database and then send it back when it is needed (e.g. the student is able to continue the course at the exact SCO when he pushed the Suspend button and left the training session).

The whole application is encapsulated in a module that can be easily installed – it is only one click away. At this moment the module is designed only for Drupal version 5, but it can easily be rewritten for Drupal version 6 if anyone should need it or from technical reasons. In order to define the whole educational process, this module has to be installed with another one that defines the notions of class, tutor and student, assessment reporting & tracking.

The access to the educational content is granted upon the rights granted by the administrators to certain courses. The user has to enter his unique username and password only one time, when he is logging on the LCMS. Every user has a unique id, so the platform is able to report to Drupal different statistics about one user, regarding his progress: time spent on the platform, time spent on a certain educational material, SCOs finished, grades or other reports that one tutor may need.

The navigation between the course's SCOs is ensured by using the SCORM tree or the *previous* and *continue* buttons – if the SCORM package does not hide them, using the *hideLMSUI* function. The SCORM is not responsible for the navigation inside the SCO, only the programmer being in charge to resolve this small scale navigation. Of course, one solution is to use only one SCO screen.

In order to briefly sum up the functions of the player, we have to mention that the application is designed to:

- import course packed SCORM 2004;
- upload SCORM packages on the server;
- unzip SCORM packages;
- verify the manifest.xml file;
- save the SCORM objectives values in the Drupal database;
- save the lom (the key words) in the Drupal database.

By choosing *Courses* from the menu, the user will choose from a list with the courses he is assigned to, the one he wants to study (Figure 2):

The screenshot shows the LCMS interface with the following components:

- Navigation Menu (Left):**
 - Acasă
 - Parteneri
 - Descrierea cursurilor
 - Știri
 - Forum
 - Contact
 - Meniu
 - Catalog note
 - Cursuri
 - Biblioteca
 - Avizier
 - Creează conținut
 - Contul meu
 - Comentarii
 - Asignează formator
 - Inscrie cursant
 - Control acces
 - Reguli acces
 - Roluri
 - Utilizatori
 - Statistici generale
 - Statistici per user
 - leșire
- Main Content Area:**

Acasă > Lista cursuri disponibile

Lista cursuri disponibile

| Nume curs | Operatiuni | Descriere |
|---------------|----------------|----------------------|
| Course name 1 | start | Course description 1 |
| Course name 2 | start | Course description 2 |
| Course name 3 | start | Course description 3 |
| Course name 4 | start | Course description 4 |
| Course name 5 | start | Course description 5 |
| Course name 6 | start | Course description 6 |
| Course name 7 | start | Course description 7 |
| Course name 8 | start continua | Course description 8 |
- Right Sidebar (Avizier virtual):**

Examen la cursul de management de proiect
Beldiman Liviu - 14/04/2009 12:31:27
(vizibilă de la data de 14/04/2009)

Examenul pentru cursul de Management de Proiect este programat pentru data de 30 mai 2009, orele 11.00

>Citește anunțul integral...

Modulul de planificare strategică
Beldiman Liviu - 30/03/2009 15:04:57
(vizibilă de la data de 30/03/2009)

Modulul II al cursului on-line de proiect management - planificare strategică - este disponibil pentru studiu pana la data de 15 mai 2009

Figure 2. List of courses available on the LCMS

After choosing the course, the user will be able to access the player on another browser page, where he will be able to study the educational materials available for the selected course.

If the course has been previously accessed, but not finished, besides the *Start* button a *Continue* button appears so that the student can continue the study from the exact point where he suspended his training session.

According to SCORM 2004 standard, the player interface is divided into two parts (Figure 3): the navigational tree on the left and the educational content on the right. The graphical layout of the player can be easily changed according to the beneficiary visual identity, while the content interface and graphical layout can be very easy designed and implemented so they fit the beneficiary needs. For example, for the applications elaborated in flash, the .swf file that contains the educational application is accompanied by another .swf file, that defines the graphical user interface. This later file can be easily modified.

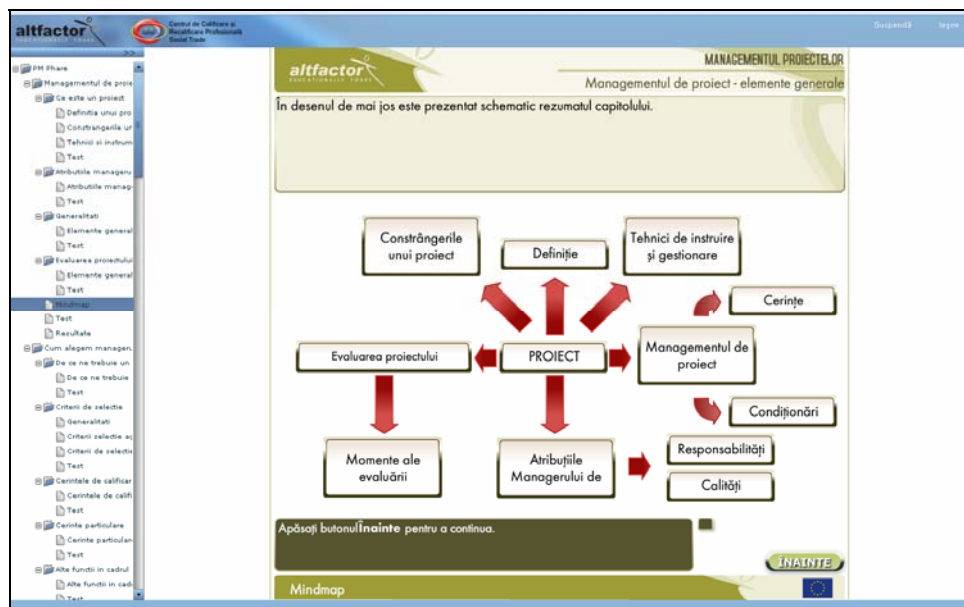


Figure 3. The SCORM 2004 player

4. Conclusions

This long - distance educational solution is used by AltFactor together with one partner (an authorized long - life learning provider from the local market) in order to provide on-line courses for Project Management. Even if the economic crisis has a great impact on economy and on people's will to spend money for studying, the clear advantages of e-learning seem to determine many students to choose this form of instruction that provides them the much needed diplomas.

Also the funds provided by the European Union through different kinds of structural financial programs are helping e-learning to develop by providing opportunities to purchase the necessary hardware infrastructure, to connect to high speed Internet lines, and then to develop an integrated e-learning solution, with an electronic curricula that covers the society present and future needs.

For the future, two main actions are planned: to improve the features of our LCMS in order to provide better services for our partners and clients and to develop more on-line courses with high impact on the national market in order to improve the educational offer.

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