

Metrics and requirements in Learning Management System

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Abstract

This paper is focused on the operational requirements in choosing the proper Learning Management Systems to support the on-line educational services in the academia. The general and specific requirements are compared with a set of metrics settled by the stakeholders in the stage of preparing the decision of what kind of LMS is fitted to the institutions' educational objectives.

1. Introduction

This paper is based on the National Defence University of Romania's experience in developing a set of capabilities to create, to deliver and to manage the educational on-line services. The NDU's eLearning project started in autumn 2004 and became operational in the spring of 2006.

At the beginning of this project we aimed to create an integrated system in order to make effectiveness the educational activity based on IT&C and generate, develop and manage the distance learning curricula under the national educational laws and fully according with the NATO ADL principles. It is not necessary to mention at that time we did not have a strong support and of course no budget, from higher decision level, the situation well known by the eLearning stakeholders in the world. Consequently, we made the first step trying to buy-in support, and we considered that we can do this only by demonstrating the utility, viability and performance of the results of our new educational approach.

The LMS is considered being one of the most important things in eLearning and for sure it is the only means to manage the content delivering inside the educational system. For several reasons we had a very hard decision to take as to which LMS is proper for our educational purposes. In this respect, at the beginning of our enterprise to develop an eLearning system, we tested more LMS, both commercial and open-source. Finally, we chose open-source one, not due to budget restrictions reasons but for its features offered to the home developers and tutors facilities. In this way, we selected the ILIAS LMS to be implemented at the National Defence University. This LMS is used in the others military universities' eLearning systems, as well.

Since 2005 we employ ILIAS and are very satisfied with the results of educational services provided through it and the feedback from our students and tutors' evaluation.

2. Process of choosing the proper LMS

Choosing a LMS is not a very easy job, it has to be based very strictly on requirements, metrics and standards. For this reason we created three different sets of requirements and for each of them we generate a test bed.

1. Tools and capabilities to support the content and course management
2. Tools and capabilities to support students activity and learning tracking progress
3. Technical aspects regarding the installation, administration, update, customization and others.

“A very good LMS is not the best of the market it is only perfectly fitted with your needs”. To put in practice this motto, first of all, we defined very clearly what kind of on-line educational services we want to deliver in the next few years. Practically, our institution has three different categories of on-line educational services:

1. *Full on-line courses.* All kind of activities, from subscription to final evaluation are carried out on-line. The course content is fully compliant with SCORM standards. From this result that the LMS has to support SCORM content and all features around SCORM development.
2. *Blended learning.* Parts of educational activities are made on-site and other, at least 66 %, are supported on-line. Consequently, the LMS has to provide the possibility to combine within one single curriculum SCORM content and other formats of content, such as: html, word, excel, ppt. file, pdf, pictures, video and so on.
3. *Educational services support for master and doctoral studies.* The LMS has to provide a very good virtual collaborative space between teachers and students and among them.

The table below contains an overview over the results of our evaluation broken down by required functionality.

Functionality	Requirement	Range	Score
General	Overview Content repository Data export/import	Low = 1 High = 5	ILIAS – 4 OOS* - 4 COTS** - 4
SCORM compliant	SCORM 1.2 SCORM 2004	Full both=5 Only one = 3 No one =0	ILIAS – 3 OOS* - 3 COTS** - 3
Learning tracking progress	Per student Per course Per item	Low = 1 High = 5	ILIAS – 5 OOS* - 3 COTS** - 4
Content formats	Text Images Video	Low = 1 High = 5	ILIAS – 4 OOS* - 4 COTS** - 4
User interface	Friendly Intuitive Help support	Low = 1 High = 5	ILIAS – 3 OOS* - 3 COTS** - 4
Customization	Personalize Integration in the portal Course management	Low = 1 High = 5	ILIAS – 4 OOS* - 3 COTS** - 2

Collaborative tools	Chat, Forum Sync collaborative Mail	Low = 1 High = 5	ILIAS - 4 OOS* - 4 COTS** - 5
Technical administration	Different OS Security Backup auto	Low = 1 High = 5	ILIAS - 4 OOS* - 4 COTS** - 3
Maintenance and cost	On-line support Experience Others military institution	Low = 1 High = 5	ILIAS - 4 OOS* - 4 COTS** - 2
Average			ILIAS - 3,88 OOS* - 3,66 COTS** - 3,44

* OOS – Other Open Source LMS ** - Commercial On The Shelf

Form our perspective there are some strengths and weaknesses of ILIAS:

Good points:

1. The ILIAS is a scalable, highly configurable platform for creating and managing classroom-based and e-learning activities, curriculum, and courseware.
2. Very good course, content, students and learning tracking progress management tools.
3. Customizable interface (multilanguage and presentations) and course domains
4. Content multi-format supported
5. Multilingual

Need to be improved or added:

1. Context-senistive user help provided by the LMS
2. Synchronous module for collaborative space
3. SCORM sequencing capabilities
4. Virtual classroom is missing

3. ILIAS at the Romanian National Defence University

It is installed on LINUX machine and it is integrated in the eLearnig portal such as the learner has a single gate of access to any kind of learning resources: courses, virtual library, conference and so on, figure no1.

Using the course and content repository we provide varied curricula and courses together with on-line educational services support: full on-line courses, military professional courses, long-term curricula, doctoral and master studies, figure no.2.

Below, figure no.3, is presented the SCORM content managed by this LMS in order to support full on-line course "Conflict Management and Negotiation". The course has 13 items, each of them are divided in other small learning objects accompanied by specific educational objectives.

As was mentioned in the selection criteria, the learning tracking progress tools offered by the LMS were of utmost importance for us. In this sense, the ILIAS offers several tools providing us with the possibility to the status of the learning progress for each student, figure no. 4. Also, we have the possibility to have a number of other data considered very important by our tutors: time spent for each learning objects, links followed, how many collaborative tools used and so on. Based on this information, the tutor can coordinate the learning activity of each student in a very personalized way.



Figure no.1 – User registration



Figure no. 2 – Course and content repository

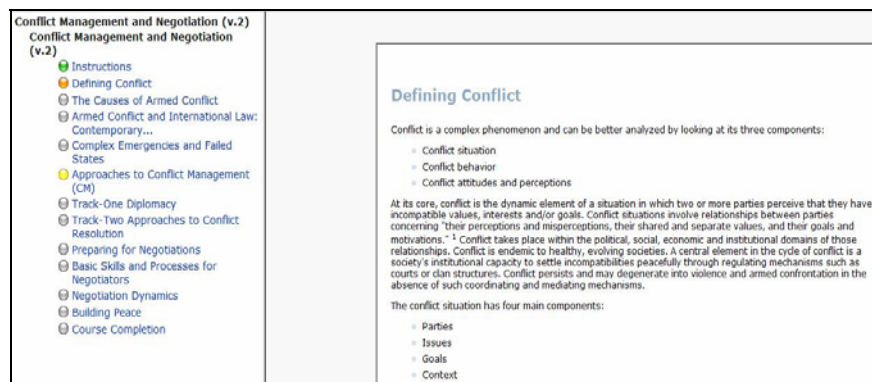


Figure no.3 – SCORM content on the ILIAS

The screenshot displays the 'Learning Progress of Course Participants' settings page. It includes a 'Details' section with course information: Title 'Conflict Management and Negotiation', Description 'The objectives of this course are to provide an overview of theories of violent conflict, to deal with international negoti...', and Mode 'Manual by Tutor'. Below this is a 'Login' section with 'Filter First Name' and 'Last Name' input fields and a 'Refresh' button. The main section is 'Users', showing a table of participants. The first user is '[bogdan_78] cpt David Bogdan', with a status of 'In Progress' and a yellow progress indicator. Below the user name, a list of course components is shown with their respective statuses and progress indicators: 'Conflict Management and Negotiation (v.2)' (In Progress, 61.54%), 'Instructions' (Completed), 'Defining Conflict' (Completed), 'The Causes of Armed Conflict' (Completed), and 'Armed Conflict and International Law: Contemporary Challenges' (Completed).

Users	Status	Mark	Actions
[bogdan_78] cpt David Bogdan Status: In Progress	●		[Edit] [Hide Details]
<input checked="" type="checkbox"/> Conflict Management and Negotiation (v.2) Status: In Progress Processed Content: 61.54%	●		[Edit] [Hide Details]
<input checked="" type="checkbox"/> Instructions Status: Completed	●		
<input checked="" type="checkbox"/> Defining Conflict Status: Completed	●		
<input checked="" type="checkbox"/> The Causes of Armed Conflict Status: Completed	●		
<input checked="" type="checkbox"/> Armed Conflict and International Law: Contemporary Challenges Status: Completed	●		

Figure no.4 – Learning tracking tools

Conclusions

We do not want to say that the LMS chosen by us is perfect but at this moment it offers us the best solution for our needs. In the same time, for synchronous didactical activity delivered inside our eLearning laboratory or on-line by Internet we use another LMS, commercial one produced in Romania. It is AeL from SIVECO Romania. It is very difficult to find a solution which covers at high parameters all educational on-line activity and in many cases is recommended to use two or three LMSs.

As we mentioned, at the beginning of our eLearning project, we tested more LMSs, both open source and commercial, but we cannot give a recommendation that one is better than another. Open source comes with some positive aspects, such as: costs, flexibility, community support and so on, but brings others negative points: requires more technical skills from the stakeholders, no warranty about bugs or updates and so on. The commercial LMS could be expensive or very expensive if some personalized features are desired but in the same time offers technical support and assistance.

In according with those written above, and taking in consideration that the eLearning market is very dynamic, we decided that is better for us to make permanent tests on different LMS and probably in one or two years we will take a long term decision.

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