

A SURVEY OF OPEN SOURCE LEARNING MANAGEMENT SYSTEMS

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ABSTRACT: Learning Management System (LMS) is an Internet based software system for educational or learning environment. Most Learning Management System not only has features for creation and distribution of content but also has features to track the level of learning or training. Being internet based, it becomes imperative to offer the learning environment in any such smart device like mobile phone, computer etc. LMS can be a learning environment for any setup be it formal academic educational institutions like schools, colleges and universities or informal coaching/training institutions/organizations. LMS provides interactive and evaluative environment for learning. Without doubt LMS is a cost effective and convenient learning platform. This paper presents a survey of various popular LMS and brings out the comparison of the identified and important features.

KEYWORDS: Survey, Learning Management System, LMS, MOODLE, BlackBoard, Cloud LMS, Opensource LMS.

1. INTRODUCTION

Learning Management system is software for learning environment that can be hosted on cloud or on server. The components of any LMS are Course Instructor (Teacher), Courses, Course Content, Student (Learners), Evaluation, Assessment and Interaction. Thus an LMS is a Internet based platform to teach and learn. Learning management systems are also known as Course Management Systems (CMS), Personal Learning Environment (PLE), e-learning courseware and Virtual learning Environments (VLE) [SV13].

It provides an avenue for classroom materials or activities to be shared easily. It is also a portal that enables lecturers and students to interact out of the classroom, having discussions through groups that could otherwise take up much of the time supposed to be spent learning in the class. The learning process in a traditional class room environment is a two-way process, where teachers share their knowledge and take response from students.

Florence Martin had carried out a study on 145 undergraduate students to bring out the effect of Blackboard as LMS for Computer Literacy course in 2008. The outcome is enthusiastic response from both students and teachers and the opinion that LMS

will enhance course outcomes [Mar08]. The study was carried out with reference to Blackboard because then in US it was the popular LMS.

In 2009, University of California conducted a survey with 1750+ students about online learning. The students from various courses junior, subjunior, graduates, senior participated. It concludes student preferred blended learning i.e. meeting in classroom and complete coursework online [www04].

2. LICENSED VS OPEN SOURCE LMS

The factors to be considered while making choice for an LMS are (i) Cost, (ii) Configuration requirement and (iii) Integration issues. Commercial LMS generally impose seat licensing fee in addition to the Software and Hardware Costs. This warrants huge investment cost, while the return on investment depends on the patronage for online learning than about looking online learning content as facilitation. In this scenario, marketing efforts are additionally needed to popularize the Online learning platform. Lack of established practices amongst teachers in using online tools restricted the actual use of the LMS. Thus these kind of Commercial LMS are affordable only in Professional environment and unviable in academic environment.

Making choice with Open Source (OS) LMS solution mitigated the above issues like licensing, software cost incurred in the case of commercial LMS. The evaluation of LMS with reference to Configuration and Integration is a common practice to be undertaken. Since the cost Open Source LMS is almost nil or minimal, even a failure after implementation would have a reduced impact on the overall loss, and would not have prevented moving to another Open Source or even commercial solution later [Mar08].

Botturi et al have described how Moodle as a platform for supporting educational activities was carried out at both The University of Lugano (USI) and the University of Applied Sciences Of Italian Switzerland (SUPSI) [BCT12]. They have brought the issues of concern in academic environment while integrating LMS solution with the existing

and in practice standard procedures like class scheduling, registration, evaluation, assessment, Progress report, Feedback, etc. Therefore the need for tailor made integration with the prevailing system of the Institution is essential. This is better done in coordination with the IT system professionals of the beneficiary institution.

Polytechnic Institute at Portugal have made a study to evaluate the challenges in implementing LMS in the Institution and finally identified Moodle as a platform [Lop14]. LMS tools provide interesting alternatives to promote learning and customize evaluation [MA12]. Tools for Distribution, communication, interaction and course administration are important features expected from any LMS. Further LMS needs to be popularized and incentivized in higher education system [J+14]. Chirag Patel et al have a finding that 87% students prefer online assignment evaluation [PGP13].

3. CLOUD-BASED LEARNING MANAGEMENT SYSTEMS

Before the features are listed, the purpose and ownership of LMS is to be identified. Because in the corporate training or Small business training the training needs and pace are different from the university academic environment. There are cloud based COTS (commercially off the shelf) LMS with plug and paly features for creation and learning are available. To name a few, these Cloud based ready to use LMS are Adobe Captivate Prime, TalentLMS, Docebo, Litmos and Coursemill are the top5 rated according to the study conducted by [www03]. These are all priced in some form or the other. The 4 important characteristics to be considered while choosing LMS for corporate use are:

- The data format in which LMS takes data and handles.
- Profiling of users with relevant access rights
- Portability of LMS data and access .i.e. access on any smart device , online and offline
- Plan charges (Cost)

A. Adobe Captive Prime

Tops the list of most favorite Cloud based LMS. Provides all the features that required setup LMS and tracking the learning in a friendly way. It uses Fluidic Player and Intuitive Dashboard which supports most formats for content exchange and upload. Also Adobe Captive Prime can be used online and offline by learner. Allows Desktop, Laptop and Mobile formats. Setting up of LMS and access rights, content uploading scheduling etc are seamlessly easy. Gamification for fun learning is possible.

B. TalentLMS

TalentLMS almost supports all the features of Adobe Captive Prime specially with refernce to Portabilty. But the resource integration follows SCORM (Sharable Content Object Reference Model). The setup and building up of courses is very easy and can be done in minutes. Course management is TINCAN certified. Very reasonably priced and bundled pricing available. Gamification supported.

C. Docebo

Docebo is used as LMS by many reputed large content management players like Thompson Reuters, Bloomberg etc. Web conferencing and Third party integration are additional features. Rebranding the LMS to reflect the Organisation image is feasible. Supports more than 30 languages. Pricing front it is comparatively costly.

D. Litmos

The course organization is customizable and hence learning path with choice of courses can be defined individually by learners. Hence useful for very large organizations where variety is important. Feedback survey is a feature. Reports can be customized. Certainly one of the favorite Cloud based LMS.

E. Coursemill

Drag and drop for customized report generation with charts and tables of choice is a useful feature. Interactive Bulletin Board and instant messaging service (chat) enables communication and interaction with peer learners. Courses can be accessed in Mobile. Creation and scheduling of courses is a standard and mandatory feature

4. OPEN SOURCE LMS FOR ACADEMIC INSTITUTIONS TEACHING

The primary features that are required in the LMS for education sector are:

- Course Management (Seamless Content Integration, Course Announcement, Enrollment for Courses)
- Video Conferencing
- Content Repository
- Performance Management (Progress report, Assessment and Evaluation)
- Productivity Tools (Bulletin Board and Chat)
- Extended Enterprise (integration with academic administration)
- Blended Learning
- Scalability of Courses, students, delivery and schedule

Generally Open Source LMS is preferred in education sector, because of the cost factor. Second,

courses and features can be added as per the department requirement. In education sector different courses require different content type and also performance management. Most important are the blended learning and integration with academic administration. Many institutions have undertaken study of the various publications in e-learning and LMS before decision making to implement in their institute. Most popular Open Source LMS are MOODLE, CANVAS, Blackboard and Electronic Educational Environment (EEE) LMS. These will be compared here.

A. Moodle

Moodle is a acronym and stands for modular object-oriented dynamic learning environment. Moodle is a FOSS (Free and Open Source Software) online LMS. E-learning courses can be developed with Moodle and hosted on a web server. Moodle is Open and community driven. Also supports third party plug-ins. Allows customized installation to trim the requirements. However Moodle is a little complex for novice person to setup.

Moodle provides three roles and relevant features that are required in each role in a LMS [www01]. The three roles are Administrator, Teacher and Student. General features of importance are Personalized Dashboard, Collaborative tools like Wiki for interactive learning, Performance Management tools, Convenient file management for content creation and repository, Calendar for scheduling courses etc. Few administrator features of importance are customizable website themes, Bulk course creation, Security and authentication, Multilingual, logs creation etc. For course instructors, Moodle provides facility for Group Management, workflow definition, Badges definition for assessment, easy multimedia integration and external source embedding for contents.

These crisp features and the Comprehensive online help make it the most used in the Open Source LMS category. No doubt MOODLE caters to the Academic environment and integration of outcomes to Academic administration.

B. CourseSites by Blackboard

Blackboard is also a Open Source LMS. Free version of their Blackboard Learn software is called Course Sites. CourseSites is aimed at individual instructors [www02]. Blackboard caters to the academic rather than the corporate market. The software is web-based and free, and allows the

creation of up to five active “course sites” (each representing one discrete class). Easy file management (drop box), Switching views between roles, customizable course navigation menu are some of the favoured features. However the control panel is not customizable and hence seeking options requires familiarity of the panel.

C. Electronic Educational Environment (EEE) LMS

Electronic Educational Environment (EEE) LMS system is a software tools that can be used to improve classroom teaching and provide a course information via online across the university. The Electronic Educational Environment is University of California’s home-grown course management system [www04]. EEE has provisions to communicate courses, course materials, assignments, collaborative learning, etc. It was more students centric. Hence even trainees and students can easily access and manage their course resources through unique, customizable page.

5. COMPARISON (SYNOPSIS)

In this millennial learner’s era, e-learning and hence LMS plays important role not only in corporate learning environment but also in academic learning environment. Academic learning has become blended learning of both classroom learning and e-learning. University of California presents a comparison [www04] of the four Open Source LMS and as in Table 1.

A survey conducted in 2016 involving 1604 Educational Institutions in Europe, with reference to the use of LMS tools [HF16]. Moodle is the favourite as 63% of the institutions are using Moodle as LMS Tool. Next is Blackboard with 12% and many others with least patronage. These details are shown in Figure1.

6. CONCLUSION

A study and comparison of features and market of the Cloud based and Open source LMS was carried out. In each case most popular five LMS were considered and the details were brought out. It is found MOODLE, a FOSS LMS is way ahead and strong for using as LMS software for e-learning while many others are catching up to the need of the industry. E-learning industry has exponential growth due to the fact that internet and the smarty devices have changed the millennial learners.

Table 1. Comparison of Open Source LMS Tools Features [www04]

Function	EEE	Moodle	Blackboard	Canvas
Enrolment information automatically synced with the UCI University Registrar	✓	✗	✗	✗
Configure course access for teaching assistants, colleagues and staff	✓	✓	✓	✓
Setup a custom course website	✓	✓	✓	✓
Communication Tools: Email, Message or Discussion Board	✓	✓	✓	✓
Facilitates the formation of groups and collaborative work	✗	✓	✗	✓
Allows instructor to provide files that are shared with all students in the course	✓	✓	✗	✗
e-Portfolios	✗	✓	✓	✓
Collect information in a web form (graded or ungraded)	✓	✓	✓	✓
Grade book	✓	✓	✓	✓

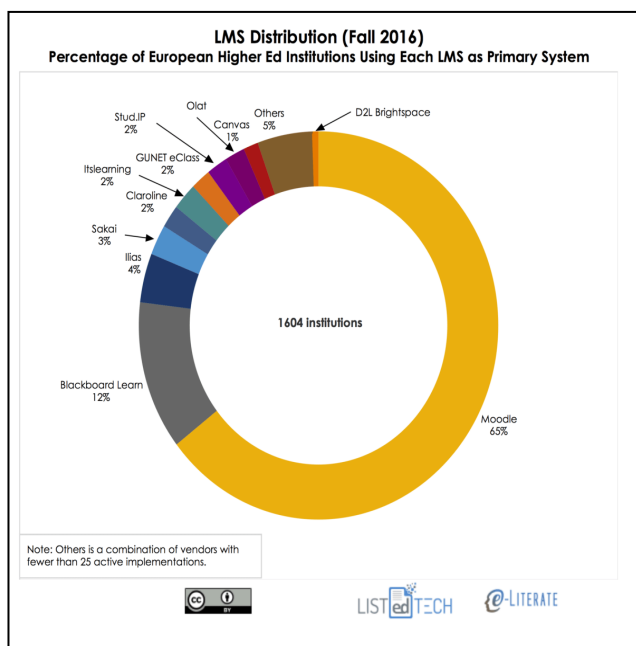


Figure 1. LMS Distribution in Europe [HF13]

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