

Open Source Learning Management Systems in Higher Education

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ABSTRACT

Nowadays, with the use of technology and the Internet, education is undergoing major revolution; looking self-assured to new ways of education. One of the commonly used method of teaching used to promote knowledge, consists in the use of virtual environments, which are available online. Unlike orthodox models of software development, the open source model is based on the collaborative efforts of users. Interest in open source software has grown exponentially in recent years. A Google search for the phrase open source in early 2005 returned 28.8 million webpage hits, whereas today that number had jumped to 1,840,000,000 webpage hits. This paper discusses the origin of the term open source and the canon of the open source software development model. In addition, it analyses the virtues and shortcomings of Moodle and Sakai applying the model in higher education taking two main features Communication tools and Assistant tools. The paper concludes with a discussion of the potential for applying the open source software development model to higher education and pros and cons of both LMS.

Keywords:

Learning Management Software (LMS), Content management System (CMS), Open Source, Moodle, Sakai

1. INTRODUCTION

The learning process needs mechanism to present the knowledge, interact with it and share it with others. In this context, Online Learning is becoming an important tool to support the learning system to achieve its objective. However, the importance of Online Learning in the university's environment does not mean that it will replace the traditional Learning mode. In other words, "eLearning is not intended to replace face-to-face classroom training but it can be used to enhance the traditional training". [1].

With the benefits of using web technique and its different services, many of the educational institutes, especially higher education institutes, have adopted LMSs to organize many administrative and academic tasks. Online access to course materials, assignments, discussions, assessment and grade books, communication and collaboration, registration, records, transcripts, schedules, reports, etc.[2][3]. The learning tool of LMSs helps in managing course content, activities and making communication easier between learner and teacher and also among learners. In recent years interest in open source has grown exponentially. In mid-January, 2005 a Google search of the phrase open source returned approximately 28.8 million webpage hits [4]. That number jumped significantly to 1,840,000,000 webpage hits when a Google search Oct, 2012.

The higher education sector is quite unlike other industries. It has its specific processes and a diverse set of demands. Most viable exclusive application vendors develop their applications focused on a wider domain spread across industries. To overcome these shortcomings, the education industry started looking to "open source" as an alternate model. The success of community developed open source software is quite well established. Linux and Apache are examples of its success. A similar trend can be traced to the development of community projects in education like the Moodle and Sakai.

2. Open Source Software

Open Source software (OSS) is software that is available in source code form and is provided under an open-source license that permits users to study, change, improve and can also at times allow distributing the software free of charge.

Open Source Software is considered as the solution that appears from these needs. The most popular open-source solutions are Moodle and Sakai in the higher education market. Both Sakai and Moodle, have their roots in academia, and continue to be dominant players there.

3. The Educational Technology Revolution

Since the late 1990s, the utilization of CMSs for web-based instruction has steadily increased in higher education.

The implementation of CMSs in universities followed on the revolution of educational technology that promised better quality, learner-centred education and claimed that it would deliver more independent and active students [5]. E-Learning delivered electronic learning materials to distant learners and it was considered to be the new vehicle that would lead education to new learning methods. A recent study in the US shows that among the largest colleges and universities (institutions with a total enrolment of 15,000 or more), more than 96 percent have online course offerings[6]. The same study indicates that during fall 2005, about 3.2 million students were enrolled in at least one online course in the US, approximately a million more than in the previous year. These studies show that the educational technology revolution has resulted in an increasing use of CMSs and LMSs. As a result of this growing integration of LMSs in higher education, the instructors' initial fears that they would eventually be substituted by the LMS were soon replaced by a need for training in the effective use of LMSs. This paper scrutinizes whether this educational technology revolution has been able to fulfil its promise of learning benefits for instructors and students, and it takes a closer look into the challenges that are related to the implementation of e-learning and LMSs. In Figure 1 the scrutiny architecture is presented. The LMSs Moodle and Sakai are compared based on two main functionalities Communication and Assistant tools.

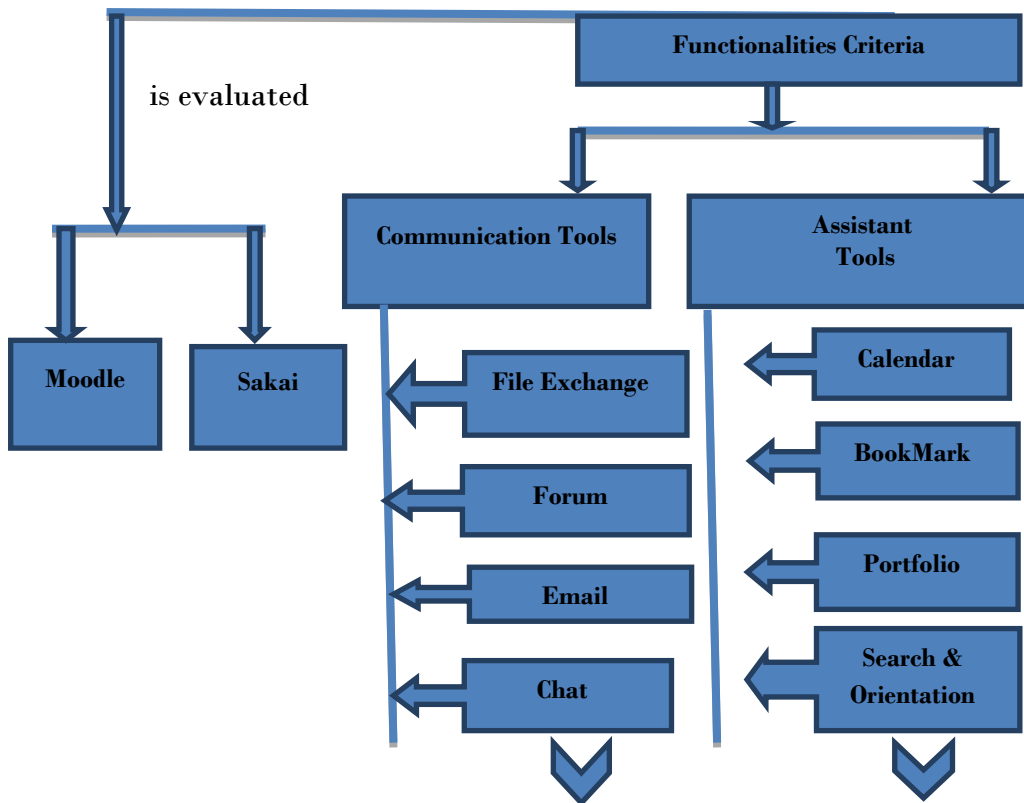


Figure 1: Scrutiny Architecture

4. Open Source in Higher Education

Higher education institutions, and in particular colleges and universities, are places wherein innovation and the free exchange of ideas are nurtured, where Universities play a central role.

Along with the massive use of IT in the classroom, higher education is facing severe financial restrictions because an institution's base budget is not only for licensing fees, but also for training and support required for application software. An option for an institution to achieve sustainable economics is to limit changes related to application software so as to reduce the institution's total spending on IT. Yet, colleges and universities are noted for extensive networks of widely spread and talented individuals who are motivated to develop innovative tools, resources, and academic methods, especially those online. As a result, software applications that are limiting or offer limited opportunities for experimentation or creativity are unlikely to be praised within higher education institutions.

The underutilization of CMS and LMS can be used for Admission or Registration of learners, Tracking participation in courses Testing, Conducting test, follow-up discussions, Transferring information like notes to other learners. It can also be used for Fee processing and fee transfer among departments, Scheduling courses, Managing skills, Managing blended learning. CMSs can provide online

access to course materials, assignments, discussions, assessment and grade books, communication and collaboration, registration, records, transcripts, schedules, reports, etc. [7]. Even though most CMSs have limitations [e.g., browser compatibility issues and template-driven structures [8][9], current CMSs are incorporating features and functionalities that can provide extensive scaffolding to learners. As promised by the educational technology revolution, CMSs can support learner-centred activities, system interactivity, and personalized and flexible training, and it can provide immediate feedback [9].

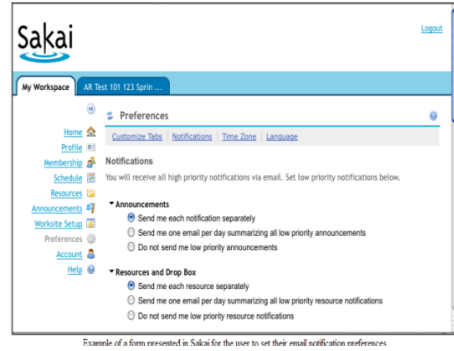
The integrated features and functionalities, such as the capabilities to present the learning material content in multimedia ways, are often under utilized. This under utilization may not impact the learning of in-class students but it may have a negative effect on the learning of distant students enrolled in fully online courses. As a result, the LMS neither supports the students' autonomy, nor does it encourage their initiative for managing their own learning processes [10].

5. Moodle vs. Sakai

Despite common origins as LMS solutions designed primarily for the education marketplace, there are significant differences in the underlying technologies and approaches of Moodle and Sakai.



Figure 2: Moodle vs. Sakai



Example of a form requested in Sakai for the user to set their email notification preferences

5.1 Moodle Glimpse

Moodle (Modular Object-Oriented Developmental Learning Environment) Moodle is an open-source course management learning system to help educators create effective online learning communities. It is also possible to modify the source code of any file of Moodle. Moodle's source code is written in PHP, a common, free scripting language that was originally developed for building dynamic Web pages. Moodle is thought to be the most popular of the open-source LMS systems in use today. It stores the record of every click that students make. We can use these logs to find courses in which student are interested. It stores the logs in relational database MYSQL. Moodle can be used in many types of environment such as in education, training and development. Its features are Emphasis on learning activities and interaction Strong support and development network Intuitive interface, easy to learn Flexible and simple to customise

Linking to resources and media Communication tools Assessment tools, including facilities for peer and self-assessment Tools which facilitate reflection Collaborative tools Differentiated learning activities Tracking and grading



5.2 Sakai Glimpse

In contrast to Moodle, Sakai was developed on a more centrally planned model. Funded by a Mellon Foundation grant, Sakai was built by a consortium of five large U.S. universities, including Michigan, Stanford, MIT, UC Berkeley, and Indiana. It was based on existing tools contributed by each of the founding institutions.

Sakai was released to the public in 2005 and is managed today by the Sakai Foundation, which oversees its development and project roadmap. The application is programmed in Java and designed to be a service-oriented application suite.

As a newer platform, Sakai has not yet achieved the large penetration outside the higher education marketplace that Moodle has gained. Its standing for higher-end features, scalability, and security, however, has made it popular with large universities that need a robust solution.

Table 1: LMS tools scrutiny based on communication tools.

Communication Tool		
Feature	Moodle	Sakai
Forum	P	P
White Board	P	P
Forum Management	P	P
Chat	P	P
Online Journals	P	P
File Transfer	P	P

Table 2: LMS tools scrutiny based on communication tools.

Assistance Tools		
Feature	Moodle	Sakai
Bookmarks	P	P
Calender	P	P
Search	P	P
Group Work	P	P
Community	P	P
Portfolio	A	P
Group work	P	P

6. FINDINGS

In Table 1 the Comparison of Moodle and Sakai is presented based on the Communication tools present in it. All the features are present in both the models where in Table 2 a comparison is shown based on Assistant Tool with its features where the Portfolio Features which is there in Sakai is not present in Moodle .In portfolio there are Portfolio Tools like Forms, Evaluations, Glossary, Matrices, Layouts, Templates Reports, and Wizards. The Portfolio tool can enhance the learning process through synthesis and reflection, provide a showcase for accomplishments or support assessment. Sakai's portfolio has the flexibility to meet these diverse needs. Example Faculty can provide guidance, Student can exhibit their work and also organization (college or university) can access student learning.

7. CONCLUSION

An open-source LMS solution isn't right for every situation or organization type. In this paper, we present an explorative data analysis of several Open source LMCs, in order to define some guidelines to help educational institutions to make a choice between them. We analysed two tools independently, and in comparison with others. The scrutiny was performed using two sets of Criteria: Functionality and Impact of Functionality. For the Functionality Criteria, we were able to determine the features available in each tool, assessing, in this sense, their relative characteristics. For the Impact Criteria, we analysed different and relevant statistics of each tool, showing the relevance and importance of the LMS. However, for higher education, either Sakai or Moodle can be a great solution. Both have the scalability and capacity to handle large-scale installations for more than 200,000 users. Both offer rich feature sets, outstanding administration and management tools, and enterprise-grade security. In the end, deciding which solution is better comes down to our academic need. If customization, reporting and analytics, and collaboration are high priorities, Sakai is probably better option. If ease of use, extensibility, and a wide base of other students — as well as support and service vendors — Moodle may be ideal.

8. REFERENCE

- [1] [APO03] ©APO, 2003. Multimedia and eLearning: a new direction for productivity promotion and enhancement. Asian
- [2] TorranoMontalvo, F., & Gonzalez Torres, M. C. (2004). Self-regulated learning: Current and future directions. *Electronic Journal of Research in Educational Psychology*, 2(1), 1–34.
- [3] Tortora, G., Sebillo, M., Vitiello, G., & D'ambrosio, P. (2002). Proceedings of the fourteenth international conference on software engineering and knowledge engineering 2002. A multilevel learning management system, 541–547.
- [4] Kapor, M. (2005). How is open source special? *EDUCAUSE Review*, 40(2), 72–73.
- [5] Swinney, L. A. (December 2004). Why faculty use a course management system (blackboard) to supplement their teaching of traditional undergraduate courses. Thesis submitted to the University of North Dakota for the degree of Doctor of Philosophy (2004).
- [6] Allen, E., & Seaman, J. (2006). Making the grade: Online education in the United States. Retrieved November 30, 2006 from http://www.sloanc.org/publications/survey/pdf/making_the_grade.pdf.
- [7] TorranoMontalvo, F., & Gonzalez Torres, M. C. (2004). Self-regulated learning: Current and future directions. *Electronic Journal of Research in Educational Psychology*, 2(1), 1–34.
- [8] Liu, Y. (2004). Faculty development and CMS. In Proceedings of society for information technology in teacher education international conference
- [9] Zhang, D., Zhao, J., Zhou, L., & Numamaker, J. (2004). Can e-learning replace classroom learning? *Communication of the ACM*, 47(5), 75–78.
- [10] Boekaerts, M. (1997). Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students. *Learning and Instruction*, 7(2), 161–186.
- [11] Moodle, <http://moodle.org/>, consulted on the 9th June 2012
- [12] http://www.monarchmedia.com/enewsletter_2010-3/open-source-lms-sakai-and-moodle.pdf