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# Comparing Moodle and eFront Software for Learning Management System

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**ABSTRACT**

In the last decade, the effect of internet usage in education has increased gradually and new technologies have improved student's learning. By using e-learning tools, the student education can be more flexible with respect to place and time constraints. Learning Management System is one of the e-learning that can be used either in education or organization. In order to develop LMS, the usage of open source software could contribute in developing and implementing the LMS. Generalizing the usage of open source software will provide development of learning tools and increases the educational quality. In this paper, the review of literature was done to identify suitable tools of open source software such as Moodle and efront suitable to use in the development of LMS. As far as the literature is reviewed, there are many e-learning platforms available to support learning process. However, there has been limited attention given for the appropriate e-learning platform that suitable for some institutions and organizations. The consideration in developing LMS should start by understanding the tools that will be used so the contents that will be delivered can be access by the students or staffs easily and could save the time constraints. Thus, the purpose of this paper is to identify how e-learning can be implemented by using open source software especially in developing Learning Management System (LMS). Since there are various types of tools in open source software, Moodle and eFront was chosen to discuss in this paper. The study is discussing over the literature review related to open source software that is referring to Moodle and eFront. The open source software related is discussed on comparison of requirements supported regarding the capabilities of software. It is hoped that this study will contribute to a better knowledge about open source software for LMS especially requirements for Moodle and eFront software.



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## INTRODUCTION

No doubt that the network and internet technology have become more important and produce a lot of application that rapidly developed and spread especially in education system. E-learning is one of applications that become a new medium in the education area. E-learning technologies represent a good opportunity to reduce the digital divide and to ensure faster and higher development trends (Toth, A., Pentelenyi, P and Toth, P., 2006). Several universities and companies are currently involved in using e-learning systems to provide a solution for teaching and learning process.

E-learning provides the opportunity for student to interact electronically with each other. This interaction can be via e-mail or on discussion board or in chat rooms (Tortora, G, *et al*., 2002). Though recognizing that the world at large will persist to use language and terminology in different ways, so the term of Virtual Learning Environments (VLE) is used to refer the on-line interactions for a variety of kinds activities that take place between students and teachers (Sugi, Y, *et al*., 2006).

There are many software systems available that provide VLE systems. This software is in both forms, commercial and open source software (OSS). One of the famous e-learning systems is Learning Management System (LMS) which being developed using open source software (Zenha-Rela, M and Carvalho, R., 2006; Crowston, K and Howison, J., 2006; Feller, J and Fitzgerald, B., 2002).

LMS provide university or college faculty and students centralized a set of tools to help student succeed with various aspects of curricular such manage course catalogues, record data from learners and provide reports to management. Today, most LMS make extensive use of the web and include features such as discussion forums, chats, journals, automated testing and grading tools and student tracking. LMS also use to supply regular face-to-face courses and to deliver corporate training. Many organizations are using LMS to support and to improve learning within their institutions. There are many open source LMS platforms available such as Moodle,

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Claroline, ATutor, Efront, Blackboard and WebCT (Nadire, C, *et al*., 2005). However, the question is how to choose the appropriate LMS platform from available platforms or make it suitable to institutions in Malaysia.

Therefore the purpose of this paper is to understand the usage of open source software in develop learning management system that concentrated to Moodle and eFront software. The discussion will refer to the capability of both of the template available in a process of developing learning management system.

### *2. Open Source Software Tools:*

Open source definition was originally written by Bruce Perens for Debian Linux and was completed in 1997. It is an established definition of open source that is simple without being too simple, and it includes several licenses that are acceptable. Some people call software that distributed under licenses such as the GPL, Apache, or Mozilla licenses is "Open Source Software". Others call it "Free Software." Yet others, particularly in Europe, call it "Free/Libre or Open Source Software" (FLOSS) (Dougiamas, M and Taylor, P., 2002). There are other expressions in use also, but the most widely used term seems to be open source.

A typical open source project starts when an individual (or group) feels the need for a new feature or entirely new software, and someone in that group, eventually writes one. In order to share it with others who have similar needs, the software is released under a license that allows the community not only to use it but also to see the source code and modify it to meet local needs and improve the product by fixing bugs (Evrim, A, *et al*., 2010; Antonenko, P, *et al*., 2004; Dougimas, M and Taylor., 2003; Brandl, K., 2005).

Making software available widely on an open network, e.g., the Internet, allows developers around the world to contribute code, add new features, improve the present code, report bugs, and submit fixes to the current version. The developers of the project incorporate the features and fixes into the main source code and a new version of the software is made available to the public. This process of improvement and customization through code contribution and bug fixing is continued in an iterative manner (Betty, B, and Ulasewicz, C., 2006).

In e-learning process, open source software can be used in many different phases such as application software that performs learning content preparation and in LMS which provide learning content presentation in a web based environment and web server software.

According in (Tor Faxen, 2011), advantages of using open source software can be summarized as follows: i) Open source software is examined by developers and software experts. So, the software is filtered and cleaned of errors. Thus, increase the user confidence in the open sources software usage. ii) Open source software is often updated more frequently than propriety software. These changes reflect the needs of the user requirements. iii) Open source software provides security mechanism according to the level of user requirements but usually not at the level commercial software. This mechanism provides users with the access to the contents of the code and gives their knowledge of their security software.

Due to the advantages of using open source software, many organizations are adopting this technology and increasing their investments. However, along with the advantages, installation and maintenance cost for this software appear to be disadvantages compared to a traditional learning method.

### *3. Evaluation of Open Source E-Learning Platforms:*

Evaluation of the system is required to compare available systems to choose the best, even if there are no numbers of alternatives, evaluation of the system will help in making decisions on its quality, and the needs for improvement.

Generally, the steps of evaluation of a system are selecting the evaluation criteria based on the review of the previous work in the field of open source platforms for learning management systems. According in (Techworld, 2013), we used the following Steps to compare and evaluate the E-learning Platform in this study:

#### *a) Putting the Evaluation and Comparison Criteria:*

A learning management system is defined as software that has been used in a learning content presentation which has a significant role and complexity in e-learning environment. According to (Tor Faxen, 2011), twelve requirements were chosen to evaluate the open source software. The selected requirements were chosen based on basic academic purpose on distance learning process especially for learning management systems.

The open source software has to comply with the following requirements; (1) Assignment Upload, (2) Personal File Storage, (3) Course Object Reuse, (4) Digital Library, (5) Course Evaluation Capacity, (6) Results Page, (7) Results Analysis, (8) Chat, (9) Forum, (10) Wiki, (11) Message, (12) Collaboration System.

#### *b) Listing Available Platforms:*

There are many open source LMS platforms available such as Moodle, Claroline, ATutor, Efront, Blackboard and WebCT (Nadire Cavus, Huseyin Uzunboylu, Dogan Ibrahim, 2005). In this study, the mostly preferred two LMS are selected among from fifty free and open source LMSs on the web site of UNESCO (SCORM, 2004). According in (SCORM, 2004), the LMS software that supports the largest number of requirements among the open source software for academic environment is Moodle and eFront. This software fulfils almost all of the

requirements for the academic purposes.

### *c) The Result of the Evaluation and Selection Platforms:*

### *Moodle Software:*

Moodle was developing by martin Dougiamas at Curtin University in Western Australia (Dougimas, M and Taylor, P.C, 2003). Moodle is an open source course management system for online teaching and learning. The acronym Moodle stands for 'Modular Object Oriented Dynamic Learning Environment'.

Moodle is an open source web based software package to create, update and deliver online courses and other instructional communication tools. Since it has a modular structure, programmers can also script additional modules for different educational purpose (Brandl, K, 2005).

Table 1 show the requirements supported in Moodle for academic purposes. As can see in this table, Moodle software supports all requirements exclude Digital Library features. This all features allow instructors to set up an effective learning process that allow students to work individually or in groups in order to maximize student's participation and engagement with Moodle software.

**Table 1:** Moodle Requirements Supported

| No. | Requirement | Supported |
|---|---|---|
| 1. | Assignment Upload | Yes |
| 2. | Personal File Storage | Yes |
| 3. | Course Object Reuse | Yes |
| 4. | Digital Library | No |
| 5. | Course Evaluation Capacity | Yes |
| 6. | Results Page | Yes |
| 7. | Results Analysis | Yes |
| 8. | Chat | Yes |
| 9. | Forum | Yes |
| 10. | Wiki | Yes |
| 11. | Message | Yes |
| 12. | Collaboration System | Yes |

Moodle have explicitly stated that the design of the software is grounded in constructivist instructional principles. They focus on the experiences that are best for teaching and assessing the information teacher think that students required to know. Also, they can help each participant in a course to be a teacher as well as the learner in a socially cooperative learning community (Betty, B and Ulasewicz, C., 2006).

Recently Moodle has become one of the most popular open source software applications in education. It supports the socio constructivist approach to teaching and learning epistemologies within internet based communities of reflective inquiry (Tor Faxen, 2011). Moreover, it featured in studies conducted by (SCORM, 2004) which indicate that as a course management system, Moodle enables the teacher to conveniently improve classroom communication by posting assignments, lesson plans, announcements and course documents. They described how in their experience Moodle improved student's performance by promoting and organizing communication among them, their parents, teachers, administrators and the community.

### *5. Efront Software:*

eFront is an open source e-Learning platform (also known as a Course Management System (CMS), or Learning Management Systems (LMS), or Virtual Learning Environment (VLE). eFront is written from scratch, making essential changes to the core structure of the system and released under an open-source license in September 2007, (Language Packs, 2013).

eFront is designed to assist with the creation of online learning communities while offering various opportunities for collaboration and interaction through an icon-based user interface. The platform offers tools for content creation, tests building, assignments management, reporting, internal messaging, forum, chat, surveys, calendar and others. It is a Sharable Content Object Reference Model (SCORM1.2) certified and SCORM 2004 / 4th edition compliant system translated in 40 languages.

Table 2 shows the requirements supported in eFront for academic purposes. As can be seen in this table, eFront software support all requirements exclude Course Evaluation Capacity and Collaboration System features.

**Table 2:** eFront Requirements Supported

| No. | Requirement | Supported |
|---|---|---|
| 1. | Assignment Upload | Yes |
| 2. | Personal File Storage | Yes |
| 3. | Course Object Reuse | Yes |
| 4. | Digital Library | Yes |
| 5. | Course Evaluation Capacity | Yes |
| 6. | Results Page | Yes |
| 7. | Results Analysis | No |
| 8. | Chat | Yes |
| 9. | Forum | Yes |
| 10. | Wiki | Yes |
| 11. | Message | Yes |
| 12. | Collaboration System | No |

eFront is commonly included in lists of well known open-source learning systems or is referred to as a Moodle alternative. Independent comparison matrices between learning management systems often favor eFront, especially under usability characteristics. Several research papers and technology portals describe the system under functionality, usability and standards perspectives.

Apart from the community edition that is distributed as open source software, there are three commercial editions with a modified features set, targeted at learning professionals, educational institutions and enterprises. All versions are provided with their source code but only the community edition uses an Open Source Initiative (OSI) accepted license. The commercial versions of eFront are distributed via a partner's network.

***Discussion:***

In this study, open source LMSs were analyzed and it was observed between Moodle and eFront software using basic requirements supported for academic purposes. By concentrating two open source platforms, Moodle are favorable for developing LMS, meanwhile eFront is supporters besides Moodle. Moodle is primarily marketed to the academic area, but eFront is marketed to both academic organizations and corporations.

Table 3 is a summary of the results based on the requirements supported from Moodle and eFront. From this comparison table, there is not much different between this two platforms. But, since features of Moodle software has wider options as a learning communication tool, Moodle is more chosen for academic purposes.

Comparison results show Moodle and eFront software can provide almost all requirements needed. These requirements are the most basic functions needed for an LMS system. However, there are three functions that are not included in template of open source software. Moodle not provided the digital library features, meanwhile eFront not provided result analysis and collaboration system features.

The purpose of digital library in LMS systems is to allow the different organizations that use the system to share information and for the developer to provide access to other sources of information and were provided their own course content. The number of systems with digital libraries was few and eFront is one of the software supported this function. However, this function is not important for academic area because of involvement with the developer's expert area and development process.

Requirements related to the evaluation are results analysis functions. This functions supports by many LMS software. The reason for lack of support for these requirements is that it is not necessary and it takes a lot time to implement the analysis of results. These functions can be interest for the LMS because it can help to assist teachers to evaluate students' results.

Techworld show that the use of collaboration systems improves the students learning experience and improves e-learning course that uses the technology (Techworld, 2013). These functions have the ability to make students feel more involved when using LMS system. Furthermore, this function is also important to the teachers and the organization for improving the social aspect of e-learning.

**Table 3:** Comparing Moodle and eFront Software

| *Open Source* | Moodle | eFront |
|---|---|---|
| *Requirements* | | |
| Assignment Upload | ⁄ | ⁄ |
| Personal File Storage | ⁄ | ⁄ |
| Course Object Reuse | ⁄ | ⁄ |
| Digital Library | x | ⁄ |
| Course Evaluation Capacity | ⁄ | ⁄ |
| Results Page | ⁄ | ⁄ |
| Results Analysis | ⁄ | x |
| Chat | ⁄ | ⁄ |
| Forum | ⁄ | ⁄ |
| Wiki | ⁄ | ⁄ |
| Message | ⁄ | ⁄ |
| Collaboration System | ⁄ | x |

***Conclusion:***

This paper is highly motivated by the lack of research in open source software specifically in the education domain which leads to the comparing Moodle and eFront software for learning management system. As for the conclusion, using open source software could helps in teaching and learning. There are many selection of open source software besides Moodle and eFront. Some of the software's known as Sakai, Atutor, Decebo and etc. Moodle and eFront have its own strength in contributing to the development of LMS. Lately, Moodle are favorable for developing LMS. Meanwhile eFront is supporters besides Moodle.

As in Malaysia the usage of open source software is encouraging by the Education of Malaysian government. The supporting has helps in exploring a new knowledge in implementing learning management system either in education or in organization. The successful in using the open source is supporting by the ongoing project among its current and potential users.

E-learning has a very bright future and has the potential to become the dominant form of education in the world. The Faculty of Computer, Media and technology Management at TATI University College is actively carrying out studies in this area, identifying suitable open source software for higher learning institutions in Malaysia and investigating the requirements for learning management systems.

Further studies within the field of e-learning including developments of tools for evaluate Moodle and eFront platform; and empirical assessment of students/teachers satisfaction. It is hoped that this work will pave new research directions and spark interest in the area.

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