

# EFFICIENT EVALUATION SYSTEM FOR LEARNING MANAGEMENT SYSTEMS

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## ABSTRACT

A learning management system (LMS) provides the platform for web-based learning environment by enabling the management, delivery, tracking of learning, testing, communication, registration process and scheduling. There are many LMS systems on the market that can be obtained for free or through payment. It has now become an important task to choose the correct LMS for a web-based education course. This paper has described a computer aided system developed by the author that can be used to evaluate LMSs and choose the best one satisfying the requirements. The system demands using artificial intelligence methods and decision making procedures to help users in evaluating LMS. The system is designed and programmed using the MS-Visual Studio .NET and its database is designed using MS-SQL Server. The system developed by the author can carry out the evaluation process easily, efficiently, with little effort, instantly, and with no errors.

## Keywords

Evaluation system, choose of LMS, Evaluation of learning management systems, web-based learning

## INTRODUCTION

Cavus, Uzunboyulu and Ibrahim [2] were underlined that a learning management system (LMS) provides the platform for web-based learning environment by enabling the management, delivery, tracking of learning, testing, communication, registration process and scheduling (Figure 1). LMSs offer their greatest value to educational institution by providing a means to sequence content and create a manageable structure for teachers.

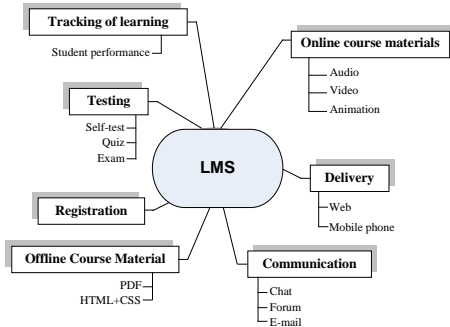


Figure 1. Structure of an LMS [3]

There are many LMS systems on the market that can be obtained for free (i.e. Moodle, Claroline, ATutor, etc.) or through payment (i.e. Blackboard, WebCT, and many others). How would a teacher using a LMS system know how to select the best system?. Thinking this point, the author has developed the computer package called Easy Way to Evaluate LMSs (EW-LMS) just to help the teachers who want to use a LMS but who do not have any technical computer knowledge.

## Related Research

Bednarik [1] aimed to develop a model to evaluate educational software using non-professional evaluators. He emphasized the importance of the role of peer review in the selection of educational software. The author defined the usability and human-computer interaction as the satisfaction and the effective interaction whereby users can achieve their goals as specified. 3Waynet Inc. [4] is a guide created and designed by 3Waynet Inc. and licenced to Commonwealth of Learning (COL) to help users use a software tool for evaluating LMSs. This evaluation tool is in a spreadsheet format and is run by Microsoft Excel. Graf and List [5] presented an evaluation of open source e-learning platforms. They focused on the adaptation capabilities of the system. The evaluation process used the Qualitative Weight and Sum (QWS) approach to the evaluation of LMSs. In recent years researchers have been proposing new models for the evaluation of LMS systems. Arh and Blažič [6] proposed a complex decision making solution for the evaluation of LMSs and multi-attribute decision making. Kavcic et al.'s [7] study aimed to help the people who are involved in e-learning to find the best LMS to suit them.

EW-LMS makes an intelligent selection and finds the most suitable LMS for a given set of criteria.

## THE EW-LMS SYSTEM

The EW-LMS system developed by the author makes use of up to fifty-two comprehensive features that may be contained in an LMS system. The system can then find the LMS that best matches the selected criteria.

The system's database contains a full description and the features of the most popular LMSs that are widely-used throughout the world, and more can be added if desired. Currently, the LMSs used are: Moodle, ATutor, Blackboard, WebCT, and Claroline. Each of these is analyzed as stated in the list of features and these features are classified in terms of six main factors:

- Pedagogical Factors
- Learner Environment
- Instructor Tools
- Course and Curriculum Design
- Administrator Tools
- Technical Specifications

The system was based on Microsoft Visual Studio .NET 2005 (Visual Basic .NET, ADO .NET, ASP .NET), Hyper Text Markup Language (HTML), Dynamic HTML, XML, and VB Script. The following application programs were used: Rational Rose Enterprise Edition, Adobe PhotoShop, Microsoft FrontPage 2003, Microsoft PowerPoint 2003, and Microsoft Visio 2003. The system contains a database to store all LMSs' information and the data related to the evaluation and comparison operations. Microsoft SQL Server 2005 is used to build this database.

### The Evaluation Process

The system demands using artificial intelligence methods and decision making procedures to help users in evaluating LMS. The developed system goes through the following steps in order to select the best LMS system:

- Step 1: Selecting user needs
- Step 2: Choosing the group of products user want to include in the evaluation process
- Step 3: Weighing user group of features
- Step 4: Ranking each feature for each product
- Step 5: The results

There are 6 main processes within the system. Administrating, managing LMSs, managing features, opinions/discussions, LMS evaluation and comparing between LMSs (Figure 2). In administration process add, delete and update of the administrator sub-processes can be done only by the system administrator. The LMS data to be used in the system are transferred to the database. The LMS features to be used in the system are in the third process. In the 4<sup>th</sup> process information is given to use users on their requirements. The most important part of the developed system is in process 5. This is the process where the user requirements are evaluated. The last

process helps the user to select the best LMS system that satisfies his or her requirements.

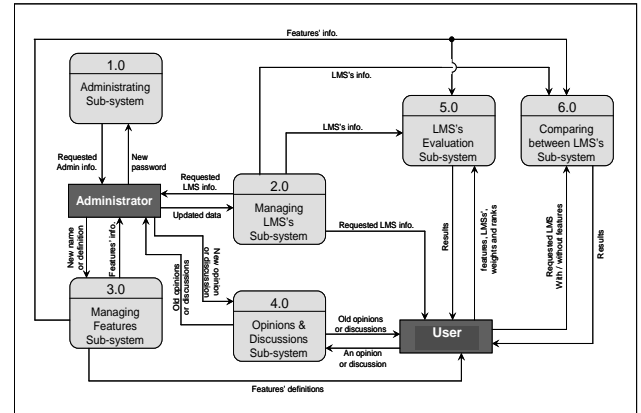


Figure 2. Structure of the developed system

The EW-LMS system supports two types of users:

- **Administrator:** The administration team is responsible to administrate and manage the whole system tasks and processes. As can be seen from Figure 3, the system administrator is the most authorized person using the system. The administrator loads the system with the important data such as the features that can be used in LMS selection, gives authorization to all users, and also provides opinions on the LMS selected by the system.

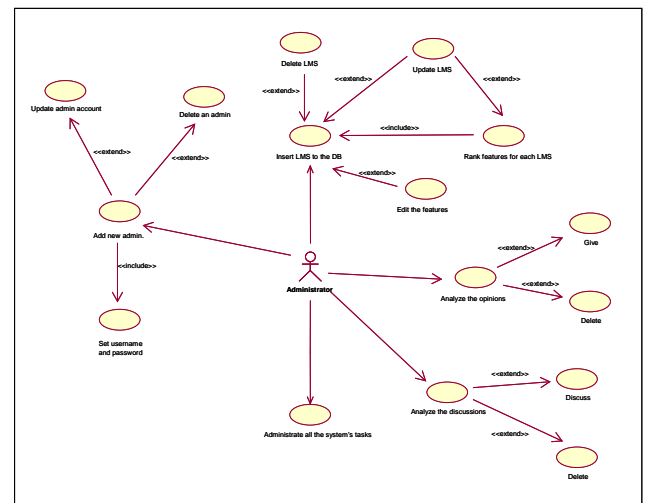


Figure 3: The Use-Case Diagram for Administrator

- **Users:** Users of the system can get benefits from the system through evaluating and making comparisons among the LMSs offered in the program. The user enters his or her requirements to the system. The system selects the best LMS based on the features selected earlier by the user. In addition, users can see

the opinions of other users who have used the system before in their selection of a LMS.

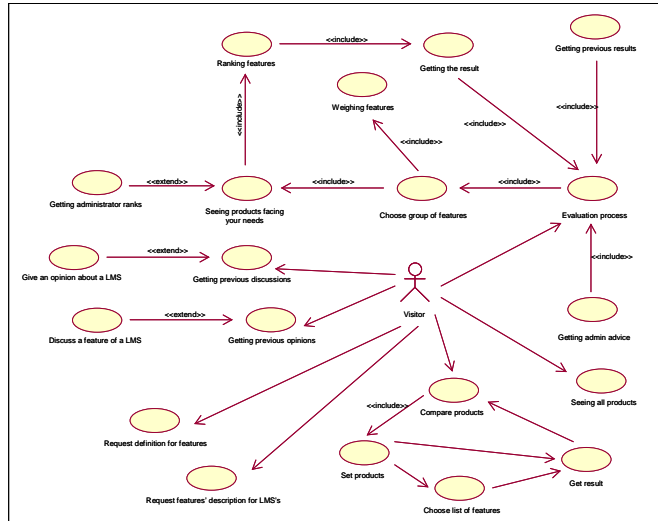


Figure 4. The Use-Case Diagram for users

## CONCLUSION

The developed system helps teachers who want to use a LMS to deliver their lectures but who do not have any technical computer knowledge to make a selection of a LMS in the shortest possible time and with little effort, with user-friendly steps. The artificial intelligence algorithm depends on fuzzy logic comparisons and structural conditions used in the system to find the most suitable LMS from a group of choices as a suitable choice for the user.

The system is oriented to any one interested in evaluating and using an LMS system in web-based education. The individuals who may be interested in using this software are teachers, students, and any educational organizations such as: universities, schools, institutes, or anyone else who may have an interest in LMS systems.

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