# Outcome Based Education (OBE) Tools: Learning Management Systems

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***Abstract:*** The advancement of ICT has resulted in paradigm shift in educational learning concepts resulting in change of role of teacher and learner. Technology enabled learning is fast replacing the traditional classroom learning. Learning Management System (LMS) is one of these technologies that offers teachers to organize, manage and deliver course materials. The LMS provide a wide variety of tools and services for teachers and students to enhance teaching and learning. LMSs like Blackboard, Moodle, EvalTool etc., have made great impact on teaching, learning and assessment by providing flexible schedules, superior content, secure access, delivery of content, discussions, chat, assignments, quiz, etc. Universities worldwide are now adopting these tools to support and deliver their courses which have resulted in improved and effective learning. Keeping in view the importance of this emerging technology, this paper discusses the general framework of a LMS, criteria for choosing the appropriate LMS and its benefits.

***Index Terms*** **- Content Management, Blackboard, Education, eLearning, Learning Management System (LMS)**

### I. INTRODUCTION

In this rapidly changing world driven by globalization, knowledge economy and advancement of ICT, there is need to produce qualified and skilled professionals. Nowadays, companies hire those university graduates who not only have knowledge, but also have skills to be productive as well as effective in the workplace. To meet these challenges, higher education institutions worldwide started redesigning their academic strategies with the focus on the continuous improvement in the course curriculum and delivery of essential knowledge and skills to the students so that they are successful in this fast changing world. This academic strategy requires the involvement of teachers and students in the process of understanding, implementing and teaching. To support and coordinate these activities there is need for an organized computerized system to link all the course related activities including teaching, assessment and performance measurement. In order to meet this challenge, most of the higher education institutions around the world are investing in new eLearning tools like Learning Management System (LMS) for efficient and effective management of their teaching, learning and assessment.

There are more than five hundred LMS softwares available in the market and the size of this market is expected to grow from USD 5.22 Billion in 2016 to USD 15.72 Billion by 2021 [1]. These LMS have produced remarkable results for teachers, students and higher education institutions as they support the teachers in delivery of course material to the students, manage assignments and assessment, keep track of student performance, and manage all the records. Keeping in view the importance of these tools, this paper discusses the concept of LMS and its general framework which discusses its various components. It also identifies the various important criteria for choosing LMS and also discusses the various benefits of LMS.

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## I. LEARNING MANAGEMENT SYSTEM (LMS)

With advancement of ICT, most of the higher educational institutions around the world are now using the LMS to manage the requirements of teaching and learning [2]. LMS evolved from the Course Management Systems (CMS) that were introduced in the 1990s, with the focus on the delivery and contents of the courses while as focus of the LMS is on the requirements of the student as well as that of the e-learning regarding tasks [3]. The LMS supports the eLearning through the development and access of course content to the users [4] [5].

According to Gilhooly, LMS are the web based applications that facilitate the capture and storage of all course activities like, quizzes, exams, assignments, projects etc. along with the scores and evaluation of each of these activities [6]. While as Wang argues that these systems must support the cooperation and collaboration among learners by using active learning techniques, time on task, providing prompt feedback, high interactive capabilities, and offering different ways of learning [7]. According to Cigdemoglu et al., they facilitate the novel and innovative methods in teaching and learning by providing various tools for interactive learning for instance quizzes, assignment, online assessment, discussions, surveys, chat rooms, blogs, and wikis [8] [4].

Nowadays, LMS are commonly used in education sector to create, access, manage, distribute, and retrieve the course related materials. Majority of students pursuing their degrees through fulltime on-campus or distance mode have found these collaborative tools of LMS such as chats, wikis and discussion boards as valuable in sharing their learning experiences especially during group tasks [9]. It provides the course materials at any time and from any location on or off campus, lectures or difficult topics can be re-watched multiple times for

optimal understanding, and the combination of audio/visual slides and notes serves students of differing learning styles [10] and students appreciate these abilities of LMS. Ease of access allows them to meet deadlines and increases their efficiency.

## II. LMS- A FRAMEWORK

LMS offers educational institutions with the facilities to manage the courses including content, assessment, roster and reporting. The general framework of LMS for understanding and guidance of practitioners, academicians and researchers is presented here.

The concept of LMS can be decomposed into five parts as discussed below:

**Course Content:** This component of LMS offers the complete and up-to-date description of the courses. It also provides the lessons/lectures slides and material, details of teachers, schedule of topics and other activities, information about home works and their submission, course assessment methods and criteria for grading [11].

**Assessment:** The assessment component allows teachers to organize the various assessment tasks like homework, quizzes, midterm and final exam. These assessments used to evaluate the level of knowledge of students can be uploaded to the LMS. The grades of these assessments are input into the gradebook utility of LMS which provided the overall evaluation of the students.

**Roster/Timetable:** This component offers the facility of recording and tracking the student attendance. It also provides the full timetable information of the courses.

**Collaboration:** LMS must include the collaboration component which can facilitate collaborative learning through discussion and interaction between students as well as among students and teachers. Collaborative learning is necessary in group projects and group assignments. Various tools of collaboration like document sharing, discussion boards, email, chat, messages and announcements are provided in the LMS.

**Reporting:** The reporting component of LMS is the most valuable feature which provides the reports and analytics. Various data provided by this component are valuable for continues improvement of teaching and learning. It can generate the progress reports of students, group of students and whole class for a single assessment module or a single course or across all assessment modules.

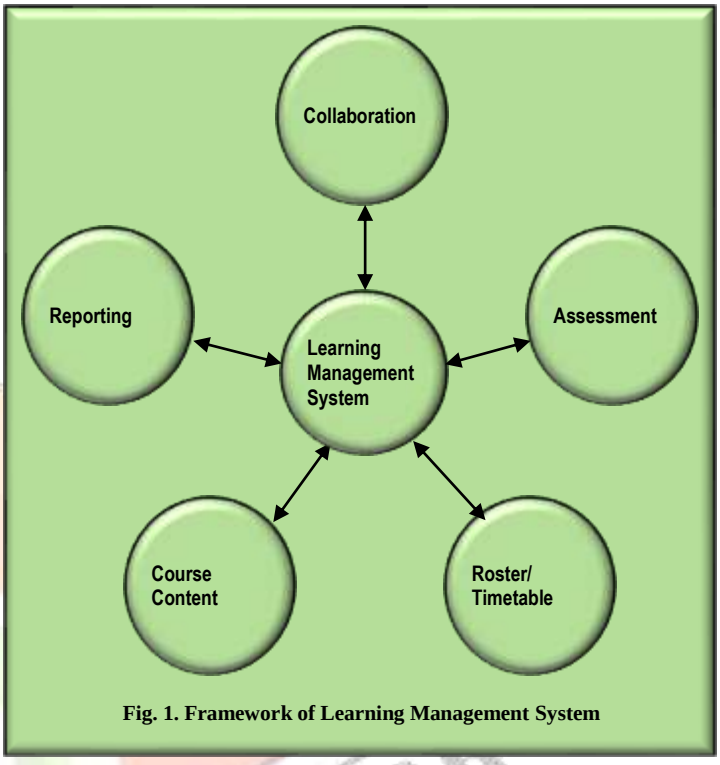


**Fig. 1. Framework of Learning Management System**

Through analytics reporting teachers get a chance to evaluate their teaching performance at the end of the semester. It compiles various performance vectors for of the key assignments. Teachers can even review and analyse the performance vectors during teaching to get feedback from the class to help improve teaching their teaching [12].

## III. CRITERIA FOR CHOOSING THE RIGHT LMS

There are many LMS available in market that are either commercial or open source such as Blackboard, MOODLE, EvalTool, WebCT, Sakai, Claroline, etc. that have made serious impression on teaching, learning and assessment by providing flexible schedules, superior content, secure access, delivery of content, discussions, chat, assignments, quiz, etc. It is very important that the users of LMS including teachers, students and administrators have a positive experience in this environment. Therefore, educational institutions must decide what exactly they want to achieve through the LMS before they adopt such tools. Iqbal & Qureshi have suggested that organizational goals and objectives, technical specification and support, design specifications, clear and user friendly graphical interface, well designed course repository, course administration capability, capability of interaction among users, evaluation and feedback, student's profile, and pedagogy are the important factors that must be considered when selecting a LMS [3]. Other researchers have identified usability and learning outcome [13], support for learners' behaviours and actions [14], design parameters like learning design and instructional design [15] as important criteria for selecting the LMS.

However, this paper recommends the examination of the following important criteria's to be considered by the higher education institutions while selecting the LMS.

**Future Teaching Requirements:** LMS should not only meet the current teaching and training needs of the institution but it should also meet such needs in the future.

**Online Training Content Types:** Online teaching and training content can be in the form of text, audio, video or combination of these and is provided in a wide variety of formats like Flash files, Audio/Video files, PDFs, Doc, Spreadsheets, PowerPoint presentations etc.

**Management and administration of users:** LMS must have the facility to admins, create users and their roles, uploading courses and their content, student assignments, assessments, instructors, and generation of various reports.

**Creation of course schedule:** This is a feature that enables LMS users to view all the available courses so that they can easily choose those courses that they are interested in.

**Communication with users:** It can be used to send notifications/ reminders to users on related to courses like eContent, assignments, assessments or deadlines.

**Evaluation and Assessments:** Assessments can be uploaded to LMS which can assist as a follow up to classroom teaching. Various assessments like homework, quizzes, midterm and final exam which are used to measure the level of knowledge of students can be uploaded to the LMS.

**Scores and Transcripts:** Users are able to access student scores in the courses as well as their transcripts. It keeps the continuous record of the performance of the students.

**Reporting:** LMS have various types of reports which can help the instructors in tracking the performance of the students as well as the effectiveness of teaching.

**Course Creation Tools**: Users can create, edit, update, distribute, and manage the complete courses from the start to the end. These tools should have easy to use interfaces so that the users who are not well versed with computers can also use them. The instructors start with the creation of course content and then threads the related material together into a complete course [16].

**Security:** LMS must have the robust security of data as it stores the personal data of students as well as the course content which is commonly copyrighted material having the commercial value [17].

## IV. BENEFITS

The Educational Institutions can immensely benefit by adopting the LMS for effective learning and teaching. Following are some of the benefits that LMS provides to these institutions.

**Stream lined teaching process:** Using a LMS makes things easier, as it helps to plan the teaching activities calendar which can be shared with learners, teachers, and administrators. This results in improvement of teaching activities.

**Ability to deliver engaging and motivating teaching:** This is a fact that each individual learns in a distinctive manner and if the teacher applies diverse learning methods, there is increase in the success rate of students. LMS gives students flexibility of selecting the content, place, time which results in better engaging and motivation.

**Technology Leverage:** Advancement in ICT has changed the whole working environment in all organizations as employees are more engaged with computers. Teaching and learning has also got effected by this change especially the use of LMS has resulted in future ready teaching and training. LMS tools have made teaching and learning more interesting and exciting for students.

**Centralized Learning:** LMS offers centralized learning where multiple learners can be taught and these learners access the content from the same source.

**Reporting Tools:** LMS improve the performance of teaching and training through performance analysis and reporting tools. Learner progress can be evaluated in different courses to find the areas that need improvement. This makes teachers as well as learners aware of the areas that require improvement and extra efforts.

**Evaluation capabilities:** Users can evaluate courses before joining, and teachers can keep a track of the retention levels and real time performance by periodically scheduling assignments.

**Easy updates:** Techers can easily update the course content and other related information. Since LMSs is centralized which makes it easy to implement the changes and learners also get the updated information at the same time.

**Simplified learning process:** An LMS improves the learning process as it is easy to use and even a naive user can learn to use it in a short period of time.

**Cost Effective:** In traditional teaching and training environment, the teacher would travel to different location for delivering lectures and it involved travel expenses, boarding and lodging charges. But the LMS has eliminated the need for travel and the teacher can deliver the lecture and content through this systems resulting in saving of valuable time of teachers and cost on travel related teaching.

**Interactive environment:** LMS has tools for collaboration and communication for teachers and students. Now the learners get the response to their queries in real time interactive environment.

**Anywhere anytime, learning:** LMS offers centralized uploading and access of course related content and learners have flexibility to learn at their convenient location and time.

## V. CONCLUSION:

The advancement in ICT has resulted in the paradigm shifts in education with new learning strategies that have also changed the role of teachers and learners. ICT based learning is fast replacing the traditional learning and LMS has emerged as a vital tool for this new teaching strategy. It assists the teachers to organize and manage course materials, assignments, assessments and provides the performance measurement reports of the students. Teachers are now able to offer students more and wide variety of learning resources. It also supports teachers and students to share their knowledge and ideas via discussion boards, chats and mails. These tools and activities offered by the LMS have resulted in increase the interest of students in their studies. Therefore, it is important for the educational institutions to choose the right kind of LMS and this paper has suggested me of the criteria's for choosing the LMS.

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