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Design of a Learning Management System (LMS) for Educational Sector

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Introduction:

The twenty-first century is characterized with people living on the fast lane. The daily struggle is to get much work done with little hassles. What is termed "new" becomes obsolete. The education sector hasn't been left out.

There is the constant need to keep up with varied forms of learning best suited to different categories of students that pass through the education system. LMS has its roots in the term, Integrated Learning System (ILS) which offers functionality beyond instructional content such as management and tracking, personalized instruction and integration across the system . The term ILS was thought up by Josten's Learning, and LMS was originally used to describe the management component system of the PLATO K-12 learning system. It was content-free and separate from courseware . LMS is a general term that is used for a wide range of systems that organize and provide access to online learning services for students, teachers, and administrators. These services usually include access control, provision of learning content, communication tools and organizations of user groups . In addition, observation has shown that students do not have access to course materials. They prefer to search online than spend countless hours at the library searching for related books. Students also experience missing grades and assignments due to absence of records for those who submitted. Lastly, students lack accessibility to lecturers and also have limited time for completion of coursework. This is due to the bulky course load and limited time to consult lecturers.

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Consequently, this study provides a glimpse of real-time access to lecturers/students and course materials through the use of online chats and forums. It also provides easy dissemination of information to students via announcements and posts online as well as ensure prompt submission of projects and assignments for effective grading and assessment. Our scope places emphasis on three end-users which are the students, lecturers and the administrator of the system. The students will have access to course materials which can be downloaded, viewed or read online. The lecturers are responsible for course management. This involves uploading course materials for students and grading for assignments or projects. The administrator manages the content of the whole system. He can add or remove courses, lecturers or students. He has access to the database.

Objectives of The Study:

- To think on the design of a LMS for educational sector, which may act as a support and a channel of communication for teachers and students.
- To think of a design by which the users can access the LMS from anywhere, through an internet connection from any device.
- To think of reducing the cost of education system.

Design specifications

Features of the proposed system are the home page, the administrator login page, lecturer login page, contact page, help page, register student page, register instructor page, update instructor/student page, view instructor page and view student page; also security, delivery, interaction, reporting and record keeping will be put into place. The system will require the user to login to have access to the website to do the following tasks: view and download course materials, upload files, projects and other materials for people to see and also interact through live chats and discussion forums. Also the LMS will allow instructors to upload videos that will be viewed and downloaded. All users will not be allowed to login simultaneously on multiple systems. The hardware and software requirements are that there must be good internet connection, minimum RAM of 512MB and 1.5GHz processor speed for any user to have access to the LMS. Also, it will work with any operating system with an installed web browser but the web browser must meet the following specifications, Java runtime environment 1.4, Java script pop-ups and cookies set to enable. The system will be designed and structured to cut down the level of disjointedness and ease the learning process. Most of the time, there is break in the flow of study and information gathering because the student has to leave his/her current study location to look for the lecturer or get to the library to retrieve extra needed information. A mailing and real-time support will

make it possible for a student to contact a lecturer or other students instantaneously from his/her very location, thus keeping the study session active and continuous. This will make the assimilation level higher since there are no breaks in communication. Course materials will also be made available for easy accessibility. The system design will be structured with a mass communication section. This is to ensure easy dissemination of information to the entire student body. Also, upcoming events can be posted on the LMS to effectively notify the university community of scheduled events. Online forums would also be made available for academic discussions.This LMS is indeed very feasible as it provides a larger avenue for learning in addition to rapid delivery of learning content on a scalable web-based platform. Once tested and implemented, the LMS would be updated and maintained at regular intervals.

Hardware and Software Requirements:

The LMS uses server resources in an efficient and intelligent manner so that it can support thousands of users.

Hardware Requirements:

i. An intranet connection through MODEM
ii. Processor 2.5 GHz
iii. 1014 MB RAM

Software Requirements:

i. Database Server with high capacity
ii. Windows Server 2008, Windows 2003 Server or Windows 2000 Server.
iii. SQL Server 2008, SQL Server 2005 or SQL Server 2000 - you can also use SQL Server Express
iv. Client and Browser
v. Operating system of any kind (Microsoft Windows, Mac OS, Linux)
vi. Web browser (Safari, Firefox, Google Chrome, Internet Explorer, and Opera) must include JavaRuntime Environment 1.4 or higher and also JavaScript Pop-ups are enabled Cookies are enabled, Java is installed, up-to-date and AJAX enabled; lastly Pop-Up blocking disabled.

Systems Design

We can visualize three *Use Case Diagrams* for the lecturer, administrator and the student. A *Use Case* is described in terms of a sequence of interactions between some actors and the system by which the system provide a service to the actors. Each Use Case then captures a piece of functional requirements for some users. All the *Use Cases* together describe the overall functional requirements of the system.

Presented below the visualized *Case Diagrams* of three parties of the LMS users - the lecturer, administrator and the student.

Figure 1: Lecturer USE Case diagram

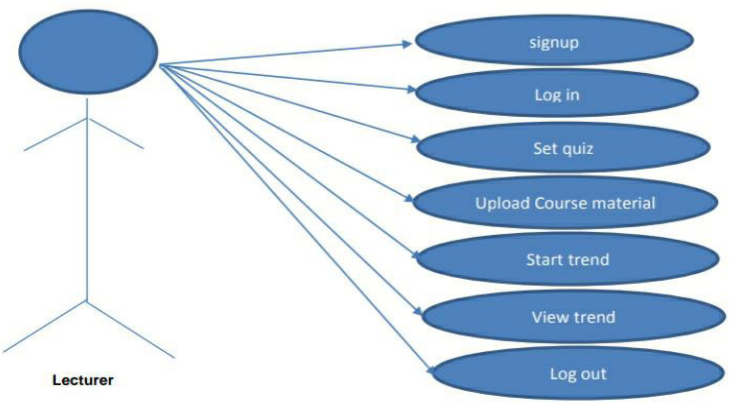


Figure 2: Student USE Case Diagram

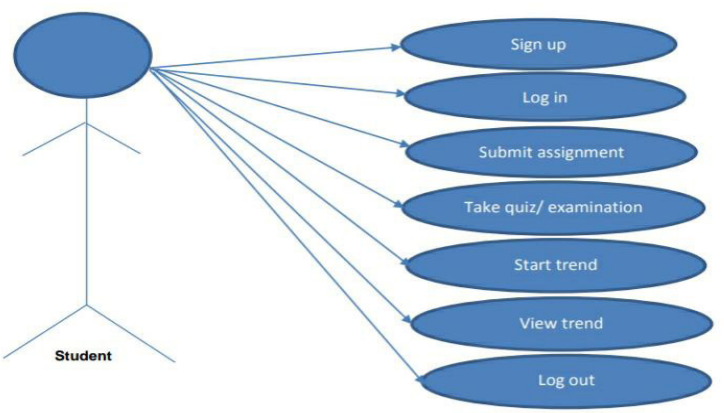
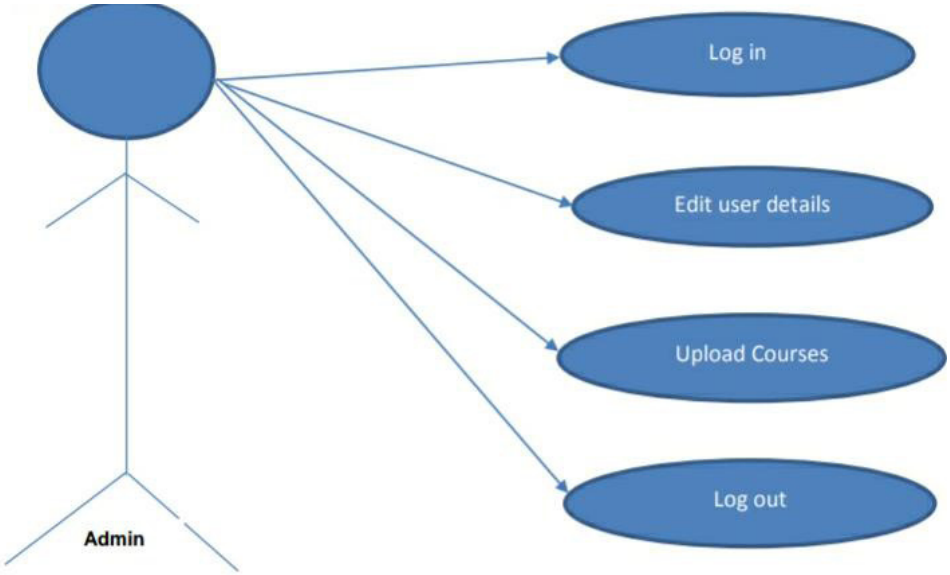


Figure 3: Admin USE Case Diagram



The Systems Development Schedule

- Our LMS database must be made up of relational tables, having specific containing entity relationships, the tables containing name of the fields, data types, sizes and other constraints that define the table.
- Design references may be collected from the creators of Moodle and Blackboard learning management systems.
- Programming tools that may be used are HTML (Hypertext Markup Language), PHP (Hypertext Preprocessor) and JavaScript.
- There must be ADMIN table which must contain the login details of all those authorized to access the admin section of the website. Such table may keep track of the admin_id, username and password of each system administrator.
- There must be assignment table which may record the *Assignment_Id*, Assignment_ Code and Lecturer_Id. Such table keeps each assignment unique and provides a link to the lecturer table, identifying the lecturer that posts an assignment, and it keep the track of the solution files that students upload for assignments given based on the assignment code.
- We may consider the administrator page that involves building a system from its components and testing the resultant system for problems that arise from

component's interaction. The administrator is responsible for: (i) Adding course code and course title, (ii) Adding levels and (iii) Editing student and lecturer pages. The administrator may enter new courses and assigns course codes to them as well. This newly added course is then stored in the LMS database.

Conclusion

In the course of the present project study, it is realized that building an LMS is a rigorous task. Consequently, a system that will provide real-time access to lecturers/students and course materials, announcement of information and dates relating to the learning process across to a larger percentage of the student population need to be developed. Furthermore, the study advocates the importance of simple and yet attractive design. The simple design allows users to easily navigate the site and carry out tasks with minimal hindrances. An attractive layout also ensures that the user does not get bored while using the system. In addition, the quiz component of the LMS provides a faster way of handling large classes with revision exercises. The system also eradicates the commotion that arises when it is time for submission of quizzes taken.

The LMS meets a lot of expectations but would perform better if the following recommendations and suggestions are considered;

I. System testing and maintenance should be performed regularly to avoid sudden system failures.
II. Updates and other modifications should be introduced with prior notice to users.
III. A course administrator should be employed who can manage the interactions between lecturers, students and administrators on one side and technicians on the other. This will aid ensure that proper support is provided for the system.

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