**Software Requirements Specification**

**for**

**eLearning Management System**

**Version 2.0 approved**

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**Table of Contents**

**Table of Contents** [**ii**](#_gjdgxs)

[**Revision History**](#_gjdgxs) [**ii**](#_30j0zll)

[**1. Introduction**](#_30j0zll) [**1**](#_1fob9te)

[1.1 Purpose](#_1fob9te) [1](#_3znysh7)

[1.2 Document Conventions](#_3znysh7) [1](#_2et92p0)

[1.3 Intended Audience and Reading Suggestions](#_2et92p0) [1](#_tyjcwt)

[1.4 Product Scope](#_tyjcwt) [1](#_3dy6vkm)

[1.5 References](#_3dy6vkm) [1](#_1t3h5sf)

[**2. Overall Description**](#_1t3h5sf) [**2**](#_4d34og8)

[2.1 Product Perspective](#_4d34og8) [2](#_2s8eyo1)

[2.2 Product Functions](#_2s8eyo1) [2](#_17dp8vu)

[2.3 User Classes and Characteristics](#_17dp8vu) [2](#_3rdcrjn)

[2.4 Operating Environment](#_3rdcrjn) [2](#_lnxbz9)

[2.5 Design and Implementation Constraints](#_lnxbz9) [2](#_35nkun2)

[2.6 User Documentation](#_35nkun2) [2](#_1ksv4uv)

[2.7 Assumptions and Dependencies](#_1ksv4uv) [3](#_44sinio)

[**3. External Interface Requirements**](#_44sinio) [**3**](#_2jxsxqh)

[3.1 User Interfaces](#_2jxsxqh) [3](#_z337ya)

[3.2 Hardware Interfaces](#_z337ya) [3](#_3j2qqm3)

[3.3 Software Interfaces](#_3j2qqm3) [3](#_1y810tw)

[3.4 Communications Interfaces](#_1y810tw) [3](#_4i7ojhp)

[**4. System Features**](#_4i7ojhp) [**4**](#_2xcytpi)

[4.1 System Feature 1](#_2xcytpi) [4](#_1ci93xb)

[4.2 System Feature 2 (and so on)](#_1ci93xb) [4](#_3whwml4)

[**5. Other Nonfunctional Requirements**](#_3whwml4) [**4**](#_2bn6wsx)

[5.1 Performance Requirements](#_2bn6wsx) [4](#_qsh70q)

[5.2 Safety Requirements](#_qsh70q) [5](#_3as4poj)

[5.3 Security Requirements](#_3as4poj) [5](#_1pxezwc)

[5.4 Software Quality Attributes](#_1pxezwc) [5](#_49x2ik5)

[5.5 Business Rules](#_49x2ik5) [5](#_2p2csry)

[**6. Other Requirements**](#_2p2csry) [**5**](#_147n2zr)

[**Appendix A: Glossary**](#_147n2zr) [**5**](#_3o7alnk)

[**Appendix B: Analysis Models**](#_3o7alnk) [**5**](#_23ckvvd)

[**Appendix C: To Be Determined List**](#_23ckvvd) [**6**](#_ihv636)

**Revision History**

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
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# Introduction

## Purpose

The purpose of this document is to present a detailed description of the Learning Management System. It will explain the purpose and features of the system, the interfaces and what the system can do. It also explains about the constraints under which it must operate and how the system would react to the external factors.

## Document Conventions

1. Admin - Refers to the super user who owns the website.

2. Student - Student who enrolls himself in a course.

3. Mentor - Employed by admin to teach students

4. LMS - Learning Management System

## Intended Audience and Reading Suggestions

1. Project team - The developers in the project team would use this document to implement the functionalities of the system and to ensure the traceability of the software.

2. Testing team - The testers in the testing team would use this document to know the interface design and functionalities which would help them in testing the software accordingly.

3. Client - The client would use this document to verify if the requirements specified in the document satisfy their needs.

4. Project Supervisor-The project supervisor would use this document to monitor the project proceedings and to check if the project considers all the requirements that are specified by the client.

## Product Scope

The project aims at improving the efficiency in the online education and reduces the complexities involved to the maximum possible extent.

Home-schooled students, part-time workers, college/school going students, people who want to restart their career, if they want to do some courses outside their daily routine or curriculum, they need flexible hours to study. Online education is receiving a lot of attention these days due to flexibility of learning hours and the huge content of information available. This website can be used by students and mentors. It aims at making online education flexible. So this system uses several programming and database techniques to elucidate the work involved in this process. As this is a matter of Security, the system has been carefully verified and validated in order to satisfy it.

The System provides an online interface to the teacher where they can view Information about student’s performance. It provides a communication platform between the teacher, student and the administrator.

## References

IEEE. *IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.* IEEE Computer Society, 1998.

# Overall Description

## Product Perspective

eLMS is an online learning management system. The eLMS software is designed to help educators create online courses and to facilitate e-learning in the course. The system helps the learners to create a personalised learning environment.

The software acts as an interface between the admin, mentor and Student. This system tries to make the interface as simple as possible and at the same time not risking the security of data stored in the database. This minimizes the time duration in which the learning management is done.

## Product Functions

The admin should be able to

* Login to his session
* View the statistics about the courses available
* Review the performance of registered students
* View reports about the payments for the courses
* View the feedback given by the students
* Add or remove students
* Logout from his session

The mentor should be able to

* Login to his session
* Add lecture videos, study material and notes
* Add assignments
* View submitted assignments and evaluate them
* View the progress of each student
* Interact with students to solve their queries
* Submit feedback
* Logout from his session

The student should be able to

* Login to his session
* View his profile
* Register for courses
* Opt out from courses
* Contact mentor to resolve queries
* Solve and submit assignments
* Engage in the discussion forums
* Submit feedback
* Logout from his session

## User Classes and Characteristics

The main users of the eLMS will be the admin, mentor and the student .

Admin will have a higher level of access to the system. He will have certain administrative functions available which the other user classes are not allowed to access. He can even control the users of the system that is add or remove students.

Mentor will have a different level of access to the system when compared to the admin. The mentor functionalities would be basically towards improving the students performance in a particular course.

Students will have a standard level of access that will not differ between individuals.

## Operating Environment

Processor - Intel processor or any other of better performance

Operating System - Windows, Unix, Linux, Mac OS X

Memory - 1GB RAM or more

Hard Disk space - Minimum 3GB for database usage in future

Database - MySQL

## Design and Implementation Constraints

* Hardware limitations: Some of the users of this system will not have high end computers with which to access the software. Therefore, we must take into account processing and internet speed limitations when designing the system.
* Data security limitations: Although the security of the users data is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring.

## User Documentation

The user documentation components that will be delivered along with the software would be:

* A user manual describing the features of the system and the functions that can be performed by different user classes. It would also state about the navigations used by different user classes in order to help them understand the system structure.
* A basic tutorial on how to use the software would also be provided for novice users.

## Assumptions and Dependencies

* The admin and other users of the system must have a basic knowledge of computers and must understand the english language.
* The user must have some prior knowledge of using similar software.
* The system needs strong internet connectivity in order to keep connections with the server for proper functioning.
* The computer system must have an installed web browser in order to gain access to the software.

# External Interface Requirements

## User Interfaces

The user interface is an important part of this software and will make the software very user friendly and will justify its usability.

* *Input interface*-The interface for creating,editing and entering the context has some interactive tools which is used to build this software,which can also be used for opening the browse window and importing the input files. The pages shall permit complete navigation and item selection and the system shall provide all functionalities and activities supported by LMS. This also will provide security using the login pages which verifies authenticated users over intruders.
* *Preview Interface*: With the help of the preview screens we would be able to show the presentation slides, video and the table of contents as a complete multimedia presentation will have complete navigation and can be achieved using both artificial and natural constraints.
* *Publish Interface*: With the help of publish screens we can get the input from the user about where to store the presentation for the later use of the course materials,videos,assignments etc.

## Hardware Interfaces

* E-learning systems inculcates students with the help of rich multimedia presentation/videos and so a microphone or speaker is needed on the hardware side for listening to the audio output.
* Considerably a monitor with decent screen resolution of at least 8\*6(cms )or above will be preferable for viewing the presentations and videos.
* A webcam on the faculties’ computer captures live video which then is broadcasted to the students’ computer screen.
* Along with these,: Processor 1GHz or faster , RAM 1GB (64 bit) Hard disk space 20GB (64 bit) is also expected to be present in the systems.

## Software Interfaces

Apache Server , MySQL and PHP of corresponding versions need to be installed .Apart from this,it should be possible for e Learning system to be implemented in both Windows and Linux Operating System environments. It should also embed a player within itself for presentation. The output of this software will need a web browser for viewing it.

## Communications Interfaces

* eLMS uses MySQL database named “eLMS” here, with the help of queries there will be exchange of data using query processing and displaying the results will be done.
* eLMS uses PHP to generate eLMS pages according to the interactions that take places among actors and the system.
* Along with these, eLMS works under live-streaming and hence require RTP for transmission of data. More over this allows easy interaction between the teachers and the students.

# System Features

**4.1 Authentication**

4.1.1 Description and Priority

The system offers access to the Moodle core functions and access to server resources

at server level only by validating the user with the unique username and password.

4.1.2 Stimulus/Response Sequences

a) Students: Login, post queries and submit homework, logout.

b) Mentor: Login, logout

c) Admin: Adding new accounts, removing the students.

4.1.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.2 Broadcasting**

4.2.1 Description and Priority

This utility is used to send live stream of class lectures from teachers to students in real time.

4.2.2 Stimulus/Response Sequences

a) Teacher: Broadcast his lectures.

b) Student: Capture and view the lectures.

4.2.3 Functional Requirements

All students should have the client application program running. Teacher with his server application will broadcast his lectures.

**4.3 Accountability**

4.3.1 Description and Priority

This module is designed to support the user accounts in the eLMS software. Only the administrators could access this.

4.3.2 Stimulus/Response Sequences

a)Admin: Login, add students, broadcast real time lectures

b) Mentor: Login and add lecture videos ,study materials

c) Student: login and access the lectures.

4.3.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.4 Assessments**

4.4.1 Description and Priority

In this features of eLMS enables the teachers to send assignment and to assess them based on their performances.

4.4.2 Stimulus/Response Sequences

a)Mentor: Add and view assignments,

b) Student: Submit the assignment.

4.4.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.5 Content Repository**

4.5.1 Description and Priority

This feature of eLMS enables the Mentors to add notes, upload lecture videos.

4.5.2 Stimulus/Response Sequences

a) Mentor: Adds Study materials and upload videos.

b) Student: Capture and view the contents

4.5.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.6 Accessibility**

4.6.1 Description and Priority

eLMS goal is to be fully accessible and usable for all users regardless of ability. Some modules are fully accessible and some are not accessible. Instructors are individually responsible for ensuring that their content is accessible, such as PDFs and other documents.

4.6.2 Stimulus/Response Sequences

a)Mentor: The assessments submitted by the student should be accessible to the Mentor.

b)Student: The Contents added by the Mentors should be visible to the Students

c)Admin: Admins can access the performance reports,Course reports, payment reports, feedbacks, student lists .

4.6.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.7 Analytics**

4.7.1 Description and Priority

eLMS has a wide variety of reports and logs that allow instructors to track student progress and successes. These are generated at the course level, and instructors will need the training to use them well.

4.7.2 Stimulus/Response Sequences

a)Mentor: View Students progress report

b)Admin: Admin can access the performance reports, Course reports, payment reports.

4.7.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.8 Course Management**

4.8.1 Description and Priority

This feature enables the students to register for a particular course based on their interest. Instructors can use eLMS as a simple file repository. Admins can manage course registration and payment processes.

4.8.2 Stimulus/Response Sequences

a)Mentor: Get the list of students registered for the course.

b)Student: Pay and register for the course of interest.

c) Admin: Manage Course registration and payment process.

4.8.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.9 Feedback system**

4.9.1 Description and Priority

This feature enables the students to clarify their doubts and to give feedback about the instructor or the interface. It also provides the solution to some technical problems .

4.9.2 Stimulus/Response Sequences

a)Mentor: View the feedback and the queries and solve student’s doubts.

b)Student: Provide feedback about the mentor and the interface also their queries and doubts regarding their course.

c)Admin: View the feedback and the queries of students .

4.9.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

**4.10 Communication management**

4.10.1 Description and Priority

This feature enables the mentors to communicate each other and the Help desk for any technical support.

4.10.2 Stimulus/Response Sequences

a)Mentor: Contact the Help desk.

b)Student : Contact Help desk.

4.10.3 Functional Requirements

All system should have the internet connection and eLMS application (client/server) running.

# Other Nonfunctional Requirements

## Performance Requirements

* This software should perform the same way irrespective to its Operating System environments.
* Time taken for importing files and publishing the multimedia presentation should be minimum.
* The video quality should be clear and good .The audio could be heard well. The video and audio of lectures should be synchronized well.
* Responses to queries shall take no longer than 3 milliseconds to load onto the screen after the user submits the query for any user.
* The system shall display confirmation messages to users within 4 milliseconds after the user submits information to the system.
* The system should generate policy with an accuracy of 99%.

## Safety Requirements

* This requirement does not apply for our software as this system cannot pose a threat in any way.But again,reliable Internet is the backbone of the software so for the broadcasting of the video needs sufficient and uninterrupted internet connection.
* Also,power is a significant feature and the power supply should be always taken care of. An uninterrupted power supply is always recommended.

## Security Requirements

* As all the operations are to be done within a single system security is not an issue for this software.
* The files generated by the user are only accessible by the admin and application should store these files in MySQL database and must not share them. The policy framework should be accessible only by teachers.
* HTTPS enables access to web application to secure access of confidential data (student information). There will be no external access to the database, except through the XML protocol.
* Administrators of the system will have full database administration rights and tutors/faculties may have access to a copy of parts of the VCS database, for editing purposes.
* Also this can be taken care by the login credentials provided to the user,admin and faculties through which the intruders can not easily cause a threat to the system.

## Software Quality Attributes

Quality has a number of attributes some of the important attributes for this software are

* Portability: As this software is to work on multiple platforms and shall be available to users all the time,portability is an essential attribute.
* Reliability:The system always has something to function and always pop up error messages in case of component failures if any.
* User Training: We assume that the users already have some previous experience in working with similar software. So the users will not need any specific training for using this software.
* Testability: As a basic characteristic the software needs to be testable to ensure correctness.

## Business Rules

* The LMS operations management team is responsible for ensuring that the LMS operates reliably, is managed in conformance with standards, and meets the needs of the organization. The operations management team works closely with the working groups and steering team, helping to surface issues that need attention.
* LMS administrators are responsible for the accuracy and thoroughness of content configuration in the LMS. They must provide timely response to requests from content owners. LMS administrators must consistently implement LMS standards, conventions, policies, and processes.
* And also,illegal duplication of the course materials(presentations,videos,etc,.) will be strictly dealt with. This is not an open source software hence source code of the product won’t be open. Further modifications and improvements rights will be with the developer team.

# Other Requirements

*<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>*

**Appendix A: Glossary**

*eLMS*:Online learning management system

*RAM*:Random Access Memory

*SQL*:Structured Query Language

*User ID*: Unique username issued to each user on login

*Password*: Unique word given to each user as a secret code.

*User*: The person who will use the software system(student,faculty,admin)

*Multimedia presentation*: Presentations containing multimedia elements like video, images, etc.. *Apache*:A free and open-source cross-platform web server software.

*intrusion*:The act of going into a place or becoming involved in a situation where you are not wanted or do not belong

**Appendix B: Analysis Models**

*<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams*.>

**Appendix C: To Be Determined List**

*<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>*