Software Requirements Specification

for

CU-Learning Management System

Prepared by

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1 Introduction

Aimed at Developing a Learning Management System to promote self paced learning and reduce the absence of resources for students . It integrates the features of a physical classroom with the convenience of digital notes , minus the fixed expenses. It adds sophistication in the existing learning experience of students, with the perfect blend of synchronous and asynchronous interaction. It provides a means of collaborative learning for the students.

There are basically 4 types of users:

- Student
- Faculty
- Administrator

1.1 Document Purpose

The document specifies the software requirement specification for Learning Management System. The software requirement specification document is prepared for certain class of audiences which is comprised of professional and experts. It is prepared in a manner which professionals, managers and experts to build an effective Learning Management System.

1.2 Product Scope

Learning Management System (LMS) aims to improve accessibility for the students of University. The benefits of having LMS is that student can view course content as per their requirements. They can appear for assessments, view grades and participate in quizzes online. Faculties can evaluate assignments, schedule quiz and perform related activities online. The system will provide easy-to-access web based service which can give management an effective means of managing all resources.

1.3 Intended Audience and Document Overview

The document is intended for the people of following profession:-

- **Project managers**- Project managers are those who supervise the entire project.
- **Implementers or coding expertise-** This category of professionals implements the design stated by the developers using programming languages. They are responsible for all the application modules and graphical user interfaces.
- **Tester-** This class of people test the developed system with the help of certain test cases and determine the efficiency and estimates the performance of the system.
- **Documentation writers-** Documentation writers prepare the user manuals and other necessary documents for proper setting of the system in a certain operating environment.
- **LMS Users-** The people from university as stakeholders. They are responsible for quality of software requirement specification document through their valuable comments on the initial requirement documents.

1.4 Definitions, Acronyms and Abbreviations

Definitions:

Users: Student, Faculty, Admin
Admin: Application administrator responsible for application management and Database Admin.
Faculty: Registered teachers of LMS.
Students: Registered users of LMS as the students of the classroom.
Lecture: A Video/PowerPoint Presentation/Notes on any subject/topic related to any course.
Quiz: Added by faculty for evaluation purpose.
Assignment: These are to be submitted within a given a deadline.
Surprise Test: Test conducted to evaluate the performance of a student in a particular subject/course in each Unit.

1.5 Document Conventions

Acronyms & Abbreviations:

HTTPS: Secure Hypertext Transfer Protocol

LMS: Learning Management System

HTML: Hypertext Markup Language

HTTP: Hypertext Transfer Protocol

1.6 References and Acknowledgments

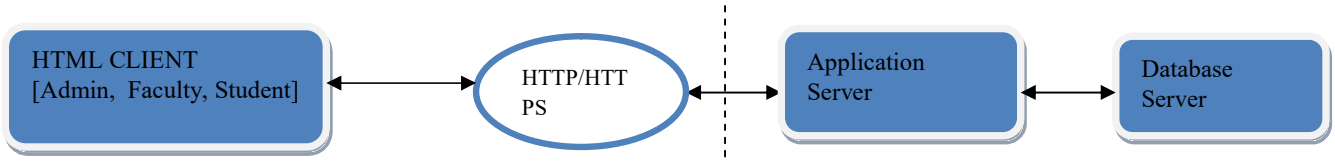
[1] UML Diagram [pdf] by Prof Kumar K., VIT University

[2] Software Engineering A Practioner's Approach, Roger S Pressmen

[3] VIT Academics, http://academics.vit.ac.in/

2 Overall Description

2.1 Product Perspective



- The web pages (XHTML/JSP) are present to provide the user interface on customer client side.
- Communication between customer and server is provided through HTTP/HTTPS protocols.
- The Client Software is to provide the user interface on system user client side and for this TCP/IP protocols are used.

2.2 Product Functionality

Learning Management System is a product that support digital learning process of teaching and learning in the class room and can be divided virtually. Students can view course content, syllabus, take assessment, view PDFs etc as per their convenience, also faculty can upload documents, videos and other teaching related materials. Administrator can manage the system from a dashboard and assign the subjects to students.

2.3 Users and Characteristics

Users of the VCS can be any person who is interested in having online lectures, meeting or even a conversation. Mainly we can categories the users as lecturers, students, management and administrator

Users: Student, Faculty, HOD, Admin

Student: Each student can participate in the assessments assigned by the faculty. They can also do view course content and syllabus. They can view the references by the added by the teacher for notes.

Faculty: As faculties, they can syllabus into units & their lectures , real-time assignments and quizzes. The documentations/presentations can be distributed prior to the physical lecture. Lecturer can also conduct a surprise test by storing a set of questions. According to the instructions given by the lecturer, the system will generate an exam paper.

HOD: Head of Departments & Principals are responsible for maintaining the academic details of the students registered for various courses, they have the responsibility of introducing new courses, maintaining the existing courses, address any problems which the users are facing regarding any faculty or course. They can also provide the privileges to the faculty.

Admin: As admin, they have the task of maintaining the system such as maintaining the database, performing regular backups, keeping the system running and handling any failure of the system by addressing the requests coming from users , which are HODs , faculties and students.

2.4 Operating Environment

Software Interface

Client: Web Browser, Operating System (any)

Web Server: WAS, Operating System (any)

Data Base Server: DB2, Operating System (any)

Development End: WSAD, DB2, PHP

Hardware Interface

CLIENT SIDE

	PROCESSOR	**RAM**	**DISK SPACE**
Mozilla Firefox, Chromium Based Browsers	PENTIUM III 1 GHz AND ABOVE	256 MB	1 GB

SERVER SIDE

WEB SPHERE APPLICATION SERVER	PENTIUM III at 1 GHz	512 MB	2 GB
DB2 V9.1	PENTIUM III at 1 GHz	512 MB	1 GB(Excluding data size)

Communication Interface

- Client on Internet will be using HTTP/HTTPS protocol.
- Client on Intranet will be using TCP/IP protocol.

2.5 Design and Implementation Constraints

- For ensuring platform independence of the software the implementation will be JAVA so the end user system must have a JAVA run time environment.
- User must have flash player to view videos and animations.
- The browsers must have plug-ins to view presentation slides.
- Good internet connection speed for uninterrupted service.

2.6 User Documentation

- A readme file to help the user with the installation of the software.
- A well documented user manual.

2.7 Assumptions and Dependencies

- A student can register for only one course at a time.
- One Course may have multiple subjects which are to be taught by different faculties.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

- LoginUI

  The login interface enables you to integrate user login with the content of our website. The system offers protection by storing passwords in encrypted form.

- HomeUI

  Home Page UI or the Landing Page is the first page which user sees after logging into the LMS.

- SubjectsUI

  The home UI has the CONT folders, where content uploading is done and Formal folders where the teacher takes assessments, quizzes and ST. It is divided into course overview, Three units , Surprise test and quizzes sections.

- ExaminationUI

  This is similar for Quizzes , Surprise tests and online assignments. The faculty can customize it by defining timer for each kind, submission deadlines and upload questions for that.

- SubmissionUI

  The Submission interface displays file uploading options in the format defined by the faculty. It contains Option to upload files and view them after uploading.

- NotificationUI

  It shall notify the user of pending submissions and successful submissions. Option to mark all notifications as read will also be made available.

- GradesUI

  It shows the subject list along with grades to student.

- CalendarUI

  It shows the pending submission of assignments, timeline of quizzes and surprise test to student.

3.1.2 Hardware Interfaces

No exceptional hardware requirements except those specified under system requirements of this SRS in 2.4.

3.1.3 Software Interfaces

DB2 is used as the database server. All the user's data and system data will be stored in the DB2 Database. To access the DB2 database we have to implement software interfaces using java. As the web server we use WebSphere HTTP server along with. It contains the server side database handling and the client implementation to view the html and Flash content. HTML is produced by the execution of the codes deployed in the WebSphere server. As Java server we use WebSphere server. Server which runs as an application deployed in the. WebSphere HTTP servers are directly interfaced with the Java server. And also there is a special java interface to communicate with DB2 database server.

3.1.4 Communications Interfaces

Client on Internet will be using HTTP/HTTPS protocol.
Client on Intranet will be using TCP/IP protocol.

3.2 Functional Requirements

- Students can view courses, access content, take quizzes as per their convenience.
- Students can also submit worksheets through inbuilt portal.
- Faculties can upload content, upload assignments, announcements, evaluate worksheet and also can upload lectures in various formats as in videos, power point presentation etc.
- There can be forums, blogs etc to discuss various queries and to put up suggestions posted both by students and teachers.
- There is dedicated calendar UI to facilitate time management for faculty and students.
- Administrators can generate reports, log files, backup/recovery of data at any time.
- Shared documents and media library that can help in active learning of a student.

- Provisions of resources to arouse the interest of students in extra-curricular activities like public speaking and grasp the chance to enhance their personalities.
- Students can take up various quizzes which can help them realize their inbuilt talents in various fields.

3.3 Non-functional Requirements

1. Accessibility: Learners can access their learning materials anytime, anywhere, as long as they have an internet connection.

2. Responsiveness: Less response time should be there so that student and faculty should feel empowered while using this LMS.

3. Availability: 24 x 7 availability should be there so that student can use it at any time according to his convenience. It will also be beneficial for the faculty as they could work outside their professional hours to work better for the organisation.

4. Scalability: Number of users will mainly depend on the server load, server processing capacity and its memory. It should scale maximum number of users which should be estimated through number of faculties and students.

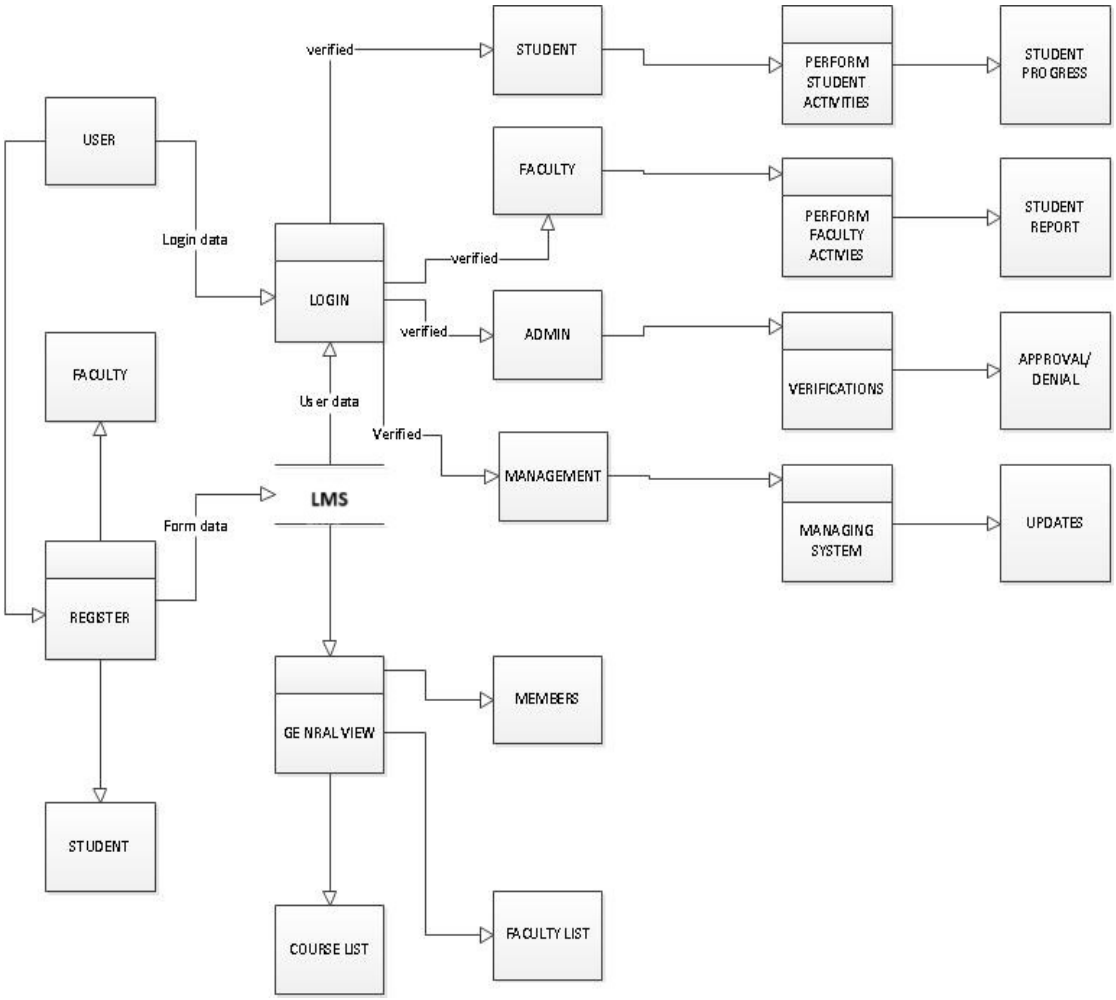
5. Security: HTTPS enables access to web application to secure access of confidential data (student information). Database Access There will be no external access to the database, except through the XML protocol. Administrators of the system will have full database administration rights and Lecturers may have access to a copy of parts of the LMS database, for editing purposes.

4 SYSTEM DESIGN

In software development, design acts as a bridge between the initial idea (customer requirements) and the final product (finished software). It's like creating a detailed blueprint that translates what the customer wants into a clear picture of how the software will be built. This blueprint considers important aspects like data organization, overall structure, user interaction points, and individual software components. This chapter dives into this crucial design phase of the project, where the foundation for a high-quality software product is laid.

There is a diagram represent the implementation of system.

4.1 Data Flow Diagram



4.2 Role Overview

Administrator:

- **Grant / Revoke Rights:** Manage rights granted.
- **Update Generic UI:** Manage the Common UI like login screen which are common for all.
- **View Requests:** View requests of all the registered users including Management, Faculty, and Student.
- **Backup Database:** Take backup of the database as and when needed.
- **View User Activity Logs:** Check and download User Activity Logs.
- **Generate Reports:** Generate reports on ad-hoc basis.

Management/HOD/Principals:

- **Grant/ Revoke rights:** Provide rights to faculties for their respective sections.
- **Register subjects to students:** Register subjects to student profiles according to his her section and stream.
- **Calendar maintenance:** Maintain the Calendar by punching all the deadlines,
- **View/Manage Faculties:** View the profiles of all the recruited faculties and can even appoint new or can replace the older faculties.
- **View Courses:** View all the available courses.
- **Add Courses:** Has the privilege to Add courses as per the need.
- **Manage Courses:** Can add or remove courses and manage the syllabus of each courses.

Faculty:

- **Manage Course content:** Update and overview the syllabus as per instructions from authority and plan the course content delivery. Upload sufficient resources and references for student to engage with.
- **Upload/Evaluate Tests:** Upload the Assignments, quiz, surprise tests for the students to evaluate their performance and evaluate the solution submitted by the student.
- **View Student Report:** Fetch grades of the student for preparing result.

- **Maintain CONT and Formal folders:** Content folders of all the sections assigned to the teacher must be updated. Formal folders should contain enough course content and references so that student can excel throughout the teaching learning journey.

Student:

- **View Test Schedule:** Registered students can view their test schedules via calendar.
- **View notifications:** Student should be notified for assignments etc and for successful submissions.
- **Appear for test:** Registered students who completes his part of the syllabus of a particular subject/course can appear for the quiz, ST, as and when faculty makes it accessible to student..
- **View Syllabus:** Can view the syllabus pertaining to the registered course.

5 SCOPE OF EXTENSION

- The Learning Management System can be extended to be used by Local Area Network of the institute.
- The LMS can be extended to include various extra-curricular activities that will simulate in the overall development of a child.