Software Requirements Specification

For

An Interactive e-learning Platform for Learners

Version 1.0 approved

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Table of Contents

2

Revision History

Name	Date	Reason For Changes	Version
Nikitha Rao Jakati	**10/10/2022**	**Initial Copy**	**1**

1 Introduction

1.1 Purpose

The main motive of our system is to create a platform for sharing educational content and resources that provide students everything in one place. It also enables you to use any device at any location while participating. Our project benefits are that both student and teacher can track the student's progress. Additionally, students have an option for reporting and can also interact with each other on this platform.

1.2 Document Conventions

Whole document is written in times new roman with sizes:
Size of title:12
Size of other headings:12
Size of content:12

1.3 Intended Audience and Reading Suggestions

This document is designed by whole team participating in the project's development. Here, we've Introduction, Overall Description, System Features, External interface requirements, Other Non-Functional Requirements and the other requirements are six sections. Here, each section has been divided into other subsections. This document can also be used as reference in future for the project enhancement.

1.4 Project Scope

By designing an online web application, we want to make the learning process easy and available for everyone. Our online application allows instructors, students, and administrators to accomplish a variety of functions such as enrolling in courses, tracking, grading, reporting, alerting, and collecting and analyzing data.

- For Instructors, we provide access to view the students who enrolled in the course, upload course-related materials, conduct assessments, grade them accordingly and notify them about related announcements.
- For Students, we permit them to enroll in their choice course, view the course, access the instructor, take their exams, view their grades, access the uploaded course materials, and report their feedback and there is an option of a chat box to interact with their instructors and students for any queries.
- For Admins, have a complete allowance on this website where they can add instructors and students and can make any changes if necessary.

4

1.5 Reference

2 Overall Description

2.1 Product Perspective:

Our product is an e-Learning platform which allows end users to enhance their learning. It has both Student account and Faculty account login. From Student perspective, it allows the end user to read the materials, study them and write the assessments. From the faculty perspective, it allows them to upload the materials, assess the students, etc.

2.2. Product Features:

This product has very user interactive and quality content features which helps the end user grow in a wise manner. They include
1)Attractive and user-friendly UI
2)Easy Login for both Faculty and Student
3)Quality content and recorded lecture videos
4)Assessments for students
5)Discussions available for student with faculty

2.3 User Classes and Characteristics:

Here, in our system we have three different types of users. They are

Admin:
The admin is sole creator of the product and has all the required access to perform any operations. Admin can access both instructor and student files. Admin has access to the database and all the security controls.

Instructor/Faculty:

5

These people will provide and post all the required content on the website and will assess the quizzes done by the students. They also have the visibility of each student's progress.

Student:
Students will be another kind of users where they'll be able to login to the platform and learn the materials which helps them to perform in quizzes.

2.4 Operating Environment:

2.4.1 Hardware Requirements:

Intel i3 processor
100 GB hard disk space
8 GB of Ram
Active and stable internet connection

2.4.2 Software Requirements:

The backend and logic processing of the program will mostly be handled by django, while client-side processing will be handled by HTML and JavaScript. The following Python libraries will be utilized in the creation of the application:
1)   Django - The python framework to help serve web pages and connect to databases.
2)   It also provides ORM (Object Relational Mapper) to help query databases.
3)   Sqlite3 - Database to be used
4)   django-bootstrap4: for styling forms and pages.

2.5 Design and Implementation Constraints:

First when the webpage is loaded, the login page comes into picture where students can login or sign up. After the login, they can see the list of courses that are present in the platform. After they enroll into a course, the structure appears on the screen. The students' performance and the scores of the assessment during the curriculum can be viewed by the course creator.

Implementation Constraints:
- To view the files, present in course certain applications like pdf viewer, doc viewer etc.
- The data of course progress of the student is stored in the database and he or she should be careful with the course as if there is any mistake occurred during assessments, it cannot be undone until course creator changes it.

- User interface will be easy when used in desktop or PCs as it is a web application.

2.6 User Documentation:

The documentation is provided at the bottom of the web page which includes the details of the management and their contact information like email-id to get in contact with them. The main cause of the website is also mentioned so that users can know about it.

2.7 Assumptions and Dependencies:

The whole webpage will be user friendly and easy to navigate throughout the project. The other thing is the timely update of each course and addition of courses. To ensure this the management team needs to work on it continuously by monitoring in a timely manner. After the deployment of the project also all should look after it to maintain the quality of courses present.
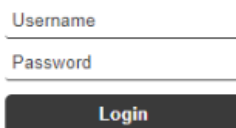
3. System Features

3.1 Registration:

The user needs to register to the product where he/she must sign-up for it. Here, we've two types of users. They are
  1) Instructor
  2) Student

3.2 Profile

Here, the user can complete their profile by filling up their information. The basic details like preferred name, contact details, etc. must be completed.

3.3 Enrollment for course

In this, students can enroll in their classes where they will choose their area of interest. In terms of the instructor, they'll upload the relevant content from their end.

3.4 Assessments

Students will need to complete their assessment for a better understanding of their course. It'll be in the form of a quiz where they need to choose an option from a multiple-choice question.
They can find their performance after the test so that they can assess themselves which helps them grow better in the further classes.

4 External Interface Requirements:

4.1 User interfaces:

The design of the webpage is to achieve good UI experience and the convenience to user, so anyone can use it even if it is new environment where navigating through the pages and to complete given tasks is priority.

1. The sign-up and login features are located on the home page, which is the initial page.
2. After the person signup into the page, then he will be able to see the registration page of the courses that are present.
3. There are two types of logins available: one is for instructors and the other one is for students. In that section, the instructor can post recorded lectures, assignments, and announcements, among other things.
4. In the student login, they can enroll in classes from their registered accounts, submit their assignments, and post doubts.
5. Home page, which contains brief information about the course being offered in the system.
6. Course page with all courses posted.
7. Student Profile allows him/her to see courses he/she enrolled and other things that students do as mention previously.

Registration_AND_Login_FLOWCHART
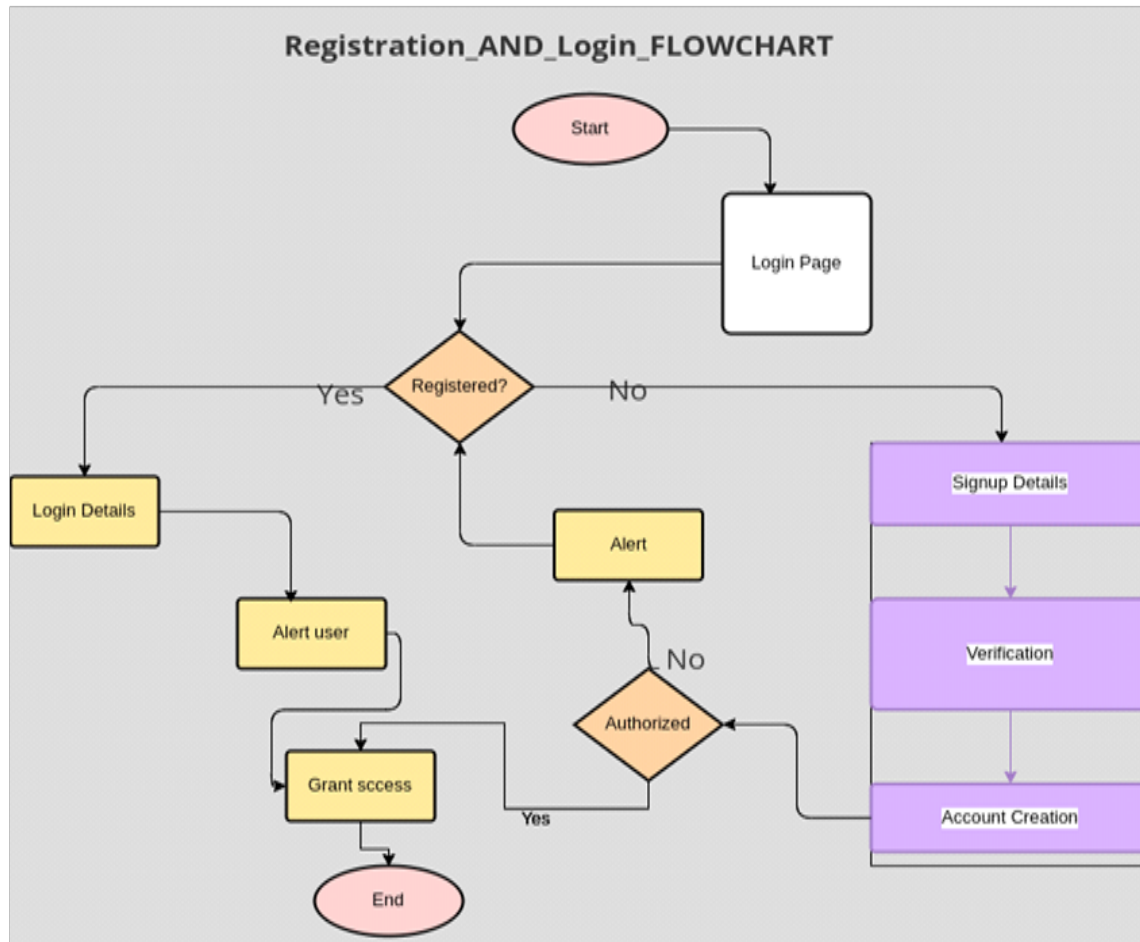
4.2 Hardware Interfaces:

Monitor: 1024*768

Processor: Intel i3

RAM: 8GB

Space on disk: 100

4.3 Software Interfaces:

Development Languages: HTML, CSS, JavaScript, PHP

4.4 Communication Interfaces:

      The system uses TCP/IP protocols for network correspondence and HTTP/HTTPS for internet connectivity.

5. Functional Requirements:

1. It should prevent students with an amount due from enrolling in learning units for that semester, but it should allow them to access materials and recorded sessions from past semesters.
2. In order to enroll in a course or access it, a student must be registered. should permit lifelong learning once subscribed.
3. It should have chat functionality. So that the students can chat publicly- group chat or privately, with the lecturer during a session or after the session to clear their doubts and for better understanding.
4. All sessions should be recorded, and they should be made available to students. If the recorded videos are available, then the students who fail to attend the classes can easily access the resources, and these videos are also useful for those who want to revise.
5. It should be possible for a lecturer to type code on an interface so that the students can copy it for coding-related subjects. It will be useful for students to maintain proper concentration in class.
6. A student should be enrolled in the appropriate units for each semester automatically according to their preference.
7. Should permit instructors to upload both text-based and multiple-choice questions
8. It should keep track of a student's attendance in class and generate a report on which pupils are not eligible to take the final exams. Here, attendance can be considered in the form of a module. I.e., the students must complete all the modules without skipping any. Then and only then will they be able to take a test for that course.
9. Finally, it should grade students according to the results of their assignments.

6 Non-Functional Requirements:

Expectations of Clients/users come under NFR (Non-functional Requirements). The quality of the software depends on how well the NFRs are met.

6.1 Fast Loading Web Pages (Performance):

The time taken for loading all the pages should be minimum. The time is taken for loading pages with live broadcast and video, and normal text pages should be the same to give a better experience for the user. This can be achieved by expanding the hardware(memory) capabilities of the website hosting facilities.

6.2 Search Engine Optimization:

To make all our pages found quickly on any browser by implementing our text in HTML format. By following HTML guidelines all the text should be within the HTML tags only. By following SEO guidelines, we can achieve this.

6.3 Good User Interface:

The system should be in such a way that users should understand navigation between pages easily and should be able to track back easily. Colors, and fonts used should be pleasing to the user's eye. New users should also be able to use this system without prior training.

6.4 Security:

Username and password should be used to allow only authorized individuals. Passwords should not be similar to usernames. Data integrity should be maintained in the database.

6.5 Compatibility:

Our system should function on the most popular Operating System and on all modern browsers (Google, Edge, etc.). In the future also it should be able to work on different kinds of devices (smartphones, laptops, desktops)

6.6 Availability:

The system should be available around the clock(24x7). If there is any maintenance, then that can be an exception, but it should not affect the system's standard.

6.7 Interactive Content:

Developers and lecturers should work together to bring modern techniques and information to the users.

7 Development Phases:

Phase-1:

Login page for students

A login page is provided for the students where they enter their login credentials to login into the e-learning platform. Each student will create a username and password and the password should be unique and strong. Once when the student enters his/her password it directs to the website where the courses are displayed.

When the user wants to create an account, it asks for the student's last name, first name and phone number. When all the details are provided and verified an account is created with username and password given by the student.

Registration Page

Registration page is provided where the website permits students to enroll for the course. All the courses which are available for the students are provided and students can choose the course in which they are interested in. Students can also view the professor's name and their ratings before they are enrolled. When the student is enrolled, the professor will know that a new student is enrolled in his course.

Data Model Design

The process of database design begins with data modeling. This phase is also known as the high-level or abstract design phase. Organize data components and their relationships using an abstract model. It has nothing to do with the execution. There are various ways to express a data model, such as using entity relationship diagrams and UML class diagrams. The main theme of the data model design (DMD) phase can be described as the information in the database, the relations between data items, constraints on data. The next will be database design, in that two more steps are database logical design (DLD), which describes the database in a data model of a specific DBMS (Database Management System) and another one is database physical design (DPD), which describes the internal database storage structures.

Phase-2:

System design

The process of implementing the functionalities in a product where we design architectural components, interface creation, database establishment to meet the end user requirements is coined as system design.

It's a high-level process where we've come across and planned our final design of the UI, which includes the Login page where the student and instructor will be logged in. Then, we also designed the logic for our project and moved to the next iteration where we'll be implementing it. This includes all the functional and non-functional requirements of the system.

Database Creation

The database needs to be created to store the student data and their progress. It can be accessed by the admin to check out the progress of the user. The whole web page needs a database so that any data related to the courses, students and instructors can be stored.

Phase-3:

Assessment

  Assessment will be taken by the students when they complete all the modules in the course and this assessment is specific to all the courses and the type of assessment fully depends on the instructors. Through assessment, teachers can use data about student's knowledge and skills to inform their instruction. Instructors will provide feedback to students about their learning and how to improve.

Testing

 For testing, first we will consider the application requirements; based on those requirements we are going to design test cases for that application. If the application is ready, then we are going to perform those test cases. Initially, we'd perform unit testing after developing the code and lookup on any issues. Then, we'll proceed with the relevant test scenarios.

Maintenance

Software maintenance is the process of modifying and updating software to meet the needs.using the right software maintenance techniques is a crucial part of keeping the software running for a long period of time. The costs involved in software maintenance are due to many factors and various situations. Without maintenance any software will be useless over time.

Evaluation

The process of accessing or measuring the performance of the complete system or model created, in comparison to the standards of the live market, is called system evaluation. This evaluation process is done in order to check if our system can reach the desired performance levels set initially. This can be done in each area of the system like feature evaluation, design evaluation, computational evaluation etc. separately to check if the performance goals are up to the mark. It provides us with the information regarding the areas where we can improve the system to meet the goals set.

Team Member Contribution Table

Name	Contributions
Nikitha Rao Jakati	Project scope and documentation / Development Phase 3
Umarani Vemula	Non-Functional Requirements / Development Phase 1
Sivani Akkem	User Interface / Development Phase 3
Haritha Talupula	Functional Requirements / Development Phase 3
Jyothirmayee Manne	System Features / Development Phase 1
Sai Rukma Reddy Gade	Overall Description / System Features / Development Phase 2
Lakshmi Dheeraj Oruganti	System Features / Development Phase 3
Sai Krupanand Reddy Bakaram	Overall Description / System Features / Development Phase 2