**TEAM-03**

**Software requirements specification (SRS)**

WIKI PAGE LINK

<https://github.com/s566466div/GDP-Project-EduLearn-03/wiki/Software-requirements-specification-(SRS)>

1. **Project Information**

* **project charter**

**Problem**

Online education platforms face several challenges that affect their efficiency and user satisfaction. Some include difficulties in finding courses, accessing class materials, consistent and optimal assessment methods, streaming videos of the classes, navigating interfaces, storing and retrieving data efficiently, ensuring portability, tracking progress in a timely manner, and providing security ,privacy to the student data.

**Motivation**

EduLearn's ability to address the problems encountered by online learning platforms directly improves the client's workflow in a number of significant ways, which eventually raises productivity, effectiveness, and user satisfaction:

1. Streamlined Course Discovery: EduLearn helps customers save time and money by streamlining the course search process with an extensive catalog and powerful search tools. Clients can concentrate more on their primary responsibilities instead of sifting through long lists of courses when they have faster access to pertinent content.

2. Effective Access to Course Materials: Students may quickly obtain lecture videos, reading materials, and assignments thanks to EduLearn's easy access to course resources. This effectiveness reduces waiting times for clients to obtain essential materials, enabling them to continue pursuing their learning goals uninterrupted.

3. Improved Assessment Procedures: EduLearn's consistent and best-practice assessment techniques enable clients to assess student growth and comprehension more skillfully. This facilitates the grading procedure and offers useful information about student performance, allowing teachers to modify their methods of instruction.

4. Reliable Video Streaming: Clients are guaranteed uninterrupted delivery of high-quality lecture content via EduLearn's performance optimization for video streaming. This dependability removes worries about buffering delays or technical problems, freeing up teachers to concentrate on teaching interesting and educational classes.

5. Assurance of Data Security and Privacy: EduLearn's strong security protocols give customers confidence that private information and sensitive data are protected. EduLearn maintains regulatory compliance and fosters user confidence by protecting user information and academic records, which improves platform satisfaction overall.

* **your developer about pages**

Developer Name : Divya Bathala

- Username: Divya Bathala

- Strengths and Interests:

- strengths : The ability to plan, organise, and coordinate project operations in order to guarantee effective outcomes and on-time delivery is known as project planning and coordination. Understanding of DevOps concepts and procedures, such as infrastructure as code, continuous integration, and continuous deployment, to promote cooperation between development and operations teams

- Interests : Interested to learn about several approaches to improve project workflows, such as Agile, Lean, or Waterfall. An interest in improving application security posture by automating and utilising tools to incorporate security controls and best practices into the software development lifecycle

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Developer Name : Partha Sarathy Boda

- Username: Partha Sarathy Boda

- Strengths and Interests:

- strengths : Expertise in both automated and manual testing to guarantee the dependability and quality of software.

- Interests : Intrested to automate various test cases in order to boost the productivity and dependability of testing operations.

Developer Name : Srilatha Yadala

- Username: Srilatha Yadala

- Strengths and Interests:

- Strengths: Comprehensive Azure knowledge, problem-solving skills, and proficiency in automation and security practices.

- Interests: Passionate about staying updated with the latest Azure technologies and certifications, and collaborating with cross-functional teams to deliver innovative cloud solutions. Interested in DevOps practices, data management, hybrid cloud solutions, and Azure governance and compliance.

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Developer Name : Vani Battu

- Username: Vani Battu

- Strengths and Interests:

- strengths : Frontend Development: Proficient in HTML, CSS, and JavaScript for building user interfaces.

User Experience Design: Skilled in creating intuitive and engaging UI designs for user interaction.

Responsive, designing websites that adapt seamlessly to various screen sizes and devices.

- Interests : Passionate about leveraging technology to enhance learning outcomes and experiences.

Commitment to continuous learning and self-improvement, both personally and professionally.

Enthusiasm for contributing to open-source projects and collaborating with the developer community.

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Developer Name : Gundala, Lakshmi Manasa

- Username: Lakshmi Manasa Gundala

- Strengths and Interests:

- strengths : Backend Development: Skill in Spring Boot and Java to create scalable and reliable backend systems that manage logic and data. The ability to store and retrieve course materials and user data efficiently requires knowledge of SQL databases like PostgreSQL or MySQL.

- Interests : Data Security: Interested in putting Spring Security's security capabilities into practice to safeguard user information and thwart unwanted access. Scalability and Performance Optimization: Interested in ensuring smooth learning experiences through the optimization of Spring Boot apps for scalability and performance.

* **problem statement**

**Introduction**

Online learning platforms are now essential resources for teachers and students in the age of digital education. As these platforms provide access to educational materials at any time and from any location, learning is now more accessible than ever. But while being widely used, a lot of online learning platforms have serious issues that limit both their efficacy and user satisfaction.

**Problem Statement**

Present generation online learning platforms exhibit numerous inefficiencies across functionalities, resulting in less effectiveness and user satisfaction. Especially when coming to the learning platforms it is important to focus on the drawbacks which effect the functioning and optimal output of the application. Identifying and providing the solutions for the encountered issues is the primary motive. Below are the brief explanation of issues encountering in today's digital era:

1. Limited Search and Filtering Options in Course Catalog: Due to insufficient search and filtering capabilities, users have difficulty finding and enrolling in courses, which discourages exploration and the discovery of new content.

2. Inconsistent Access to Course Materials: Irregular availability of essential resources such as reading materials and video lectures disrupts users' learning processes, affecting their overall study experience.

3. Inconsistent Assessment Results: User perceptions of their own performance and progress are impacted by inconsistent assessment outcomes, which make it difficult for users to complete quizzes and homework appropriately.

4. Problems with Video Streaming: Buffering issues and playback problems hinder the smooth streaming of lecture videos, causing frustration and interruptions during the learning process.

5. Delayed Access to Course Materials and Progress Data: Timely feedback and progress tracking are limited by poor data storage and retrieval technologies, which delay access to course materials and progress data.

6. Usability and Accessibility Concerns Across Devices: Due to restricted compatibility, users may have usability and accessibility challenges while using the platform from multiple devices, which could result in an uneven educational experience.

7. Absence of Comprehensive Course Dashboard and Progress Tracker: Users become confused and find it difficult to properly monitor learning activities and progress in the absence of a thorough course dashboard and progress tracker.

8. Risk of Unauthorized Access to Sensitive User Data: Unauthorised access to sensitive user data might harm user security and privacy due to inefficiencies in the server backend's user authentication and permission processes.

1. **Design**

* **Use cases**

**Use case 1:User Registration**

Goal: As a new user (Student or Instructor), I want to securely register for an account on the platform.

Input:

User navigates to the registration page.

User provides personal information such as name, email, and password.

System Interactions:

System validates the provided information.

If validation is successful, the system creates a new user account.

If validation fails or there are errors, the system displays appropriate error messages.

Expected Output: Confirmation of successful registration or error messages for unsuccessful registration attempts.

**Use Case 2: User Authentication**

Goal: As a registered user (Student or Instructor), I want to securely authenticate myself to access the platform.

Input:

User navigates to the login page.

User enters their username (email) and password.

System Interactions:

System validates the credentials.

If credentials are valid, system grants access to the user's account.

If credentials are invalid, system displays an error message.

Expected Output: Successful login, granting access to user's profile or error message for invalid credentials.

**Use Case 3: Course Catalog**

Goal: As a student, I want to browse available courses and view detailed information about courses.

Input:

Student navigates to the course catalog.

Student utilizes search and filtering options to find courses matching their interests or requirements.

Student clicks on a course to view detailed information.

System Interactions:

System presents a list of available courses with relevant details such as title and description.

Student can click on a course to view more detailed information.

System provides options for sorting and filtering courses based on criteria like subject or discipline.

Expected Output: Student interacts with the course catalog, viewing detailed information about available courses.

**Use Case 4: Browse and Enroll in Courses**

Goal: As a student, I want to browse available courses and enroll in courses that I am interested in.

Input:

Student navigates to the course catalog.

Student browses available courses or uses search and filtering options to find specific courses.

Students go through course information across various subjects and disciplines.

System Interactions:

If satisfied, Student enrolls in the course.

Student receives confirmation of successful enrollment.

Expected Output: Successful enrollment of courses.

**Use Case 5:Course Dashboard**

Goal: As a student, I want to interact with a user-friendly course dashboard that logically organizes course content for easy navigation.

Input:

Student accesses the course dashboard for the enrolled course.

Student navigates through different sections of the dashboard.

System Interactions:

System displays a organized course dashboard.

Student clicks on various sections to access course materials and track progress.

Expected Output: Student interacts with a logically organized course dashboard, facilitating easy navigation and access to course content.

**Use Case 6: Access Course Content**

Goal: As an enrolled student, I want to access course materials such as video lectures, reading materials, assignments, and quizzes.

Input:

Student selects the enrolled course they want to access.

Student selects a specific item (video lecture, reading material, assignment, quiz) to view.

System Interactions:

System presents the course dashboard with video lectures, reading materials, assignments, and quizzes.

System retrieves and displays the selected content.

Student interacts with the content as needed.

Expected Output: Student will be able able to access all the course content.

**Use Case 7: Complete quizzes and assignments.**

Goal: As a student, I want to complete quizzes and assignments to assess my learning progress.

Input:

Student navigates to the course dashboard.

Student selects the quiz or assignment they want to complete.

System Interactions:

Student completes the quiz or assignment.

System evaluates the user's responses and provides feedback.

System updates user progress based on completed quizzes and assignments.

Expected Output: Student will be able to complete Quizzes and Assignments.

**Use Case 8: Progress Tracker**

Goal: As a student, I want to track my overall learning progress, showing completed and pending tasks.

Input:

Student can click on a specific course to view detailed progress information.

System Interactions:

System displays a summary of completed tasks and pending tasks for each enrolled course.

System provides detailed progress information such as completed or pending lectures, assignments, and quizzes.

Expected Output: Progress tracker showing completed and pending tasks.

**Use case diagram**

A diagram of a system

Description automatically generated

* **Functional requirements**

The system MUST:

1.Provide user registration functionality allowing users(Students and Instructors) to create accounts securely.

2.Authenticate users(Students and Instructors) securely during login processes.

3.Offer a course catalog with search and filtering options.

4.Enable students to browse and enroll in courses across various subjects and disciplines with a simple enrollment process.

5.Grant enrolled students to access all course materials including video lectures, reading materials, assignments, and quizzes.

6.Design a user-friendly course dashboard that logically organizes course content for easy navigation.

7.Include a feature for students to track their overall learning progress showing completed and pending tasks.

The system SHOULD:

1.Integrate with video streaming services for hosting lecture videos.

2.Encrypt sensitive user information and academic records to ensure security.

3.Implement measures to protect against unauthorized access to course materials.

The system MAY:

1.Include additional features for enhanced user engagement, such as discussion forums or live chat support.

2.Provide offline access to course materials for users in areas with limited internet connectivity.

3.Provide password recovery functionality for users by limited access to the user's email IDs.

The system MUST NOT:

1.Share user's personal data with third parties without explicit consent.

2.Modify or alter course materials without proper authorization from course instructors or administrators.

* **Non-functional requirements**

**1. Security:**

Access to the system should be controlled based on user roles, with strong authentication and permission processes.

Apply encryption to safeguard course materials and user data during transit and storage.

**2. Performance:**

Video streaming should be optimized to minimize buffering and provide smooth playback across various network speeds.

Reading materials and other content should be delivered efficiently to reduce load times, especially for users with slower internet connections.

**3.Device Compatibility:**

The platform's user interface should be designed using responsive web design principles to ensure compatibility with different devices and screen sizes.

Users should be able to access and interact with course content seamlessly regardless of the device they are using.

**4.Scalability:**

The system should be designed to accommodate a growing user base and increasing volumes of course content.

**5.Regulatory Compliance:**

The platform should comply with relevant data protection regulations to ensure the privacy and security of user data.

Copyright laws and intellectual property rights should be respected, with proper permissions obtained for hosting and distributing course materials.

**6.Usability:**

Employ clear and simple instructions to enable users to navigate the system successfully.

**7.Availability:**

Ensure continuous access to learning resources through redundant storage systems, reducing the risk of data loss and maintaining consistent availability.

Strive for high availability and uptime to deliver uninterrupted learning experiences for users, minimizing downtime and ensuring seamless access to course materials.

**8.Reliability:**

Strive to maintain high availability by minimizing disruptions caused by maintenance or unexpected faults.

Utilize real-time monitoring systems to identify and reduce potential concerns before they develop into critical issues.

* **Data management plan**

## Summary of Data to Store:

1. **User Data:**
   * User ID (VARCHAR) (P.K)
   * Email (VARCHAR)
   * Password (VARCHAR)
   * User type (student or instructor)(String)
   * Name (String)
2. **Course Data:**
   * Course ID (Integer) (P.K)
   * User ID (VARCHAR) (F.K)
   * Course name (String)
   * Course description (String)
   * Enrollment status(String or Boolean)
3. **Course Content:**
   * Content ID (Integer) (P.K)
   * Course ID (Integer) (F.K)
   * Content type (String: "video lectures", "reading materials", "quizzes", "assignments")
   * Content title (String)
   * Content file path (String)
4. **Quizzes**
   * Quiz ID (Integer) (P.K)
   * Course ID (Integer) (F.K)
   * Quiz Title (String)
   * Description (String)
   * Due Date (Date or Date Time)
   * Maximum Score (Float or Integer)
   * Grade (char)
5. **Assignments**
   * Assignment ID (Integer) (P.K)
   * Course ID (Integer) (F.K)
   * Assignment Title (String)
   * Description (String)
   * Due Date (Date or Date Time)
   * Maximum Score (Float or Integer)
   * Grade (char)
6. **User Progress:**
   * User ID (VARCHAR) (P.K,F.K1)
   * Course ID (Integer) (P.K,F.K2)
   * Completed tasks (Integer)
   * Pending tasks (Integer)
   * Progress percentage (Float or Integer, representing percentage)

**ER diagram**

A diagram of a company

Description automatically generated

### **Initial Plans for Data Security:**

**1. User Authentication:**

* Securely store user's passwords using encryption techniques.

**2. Role-Based Access Control (RBAC):**

* Assign roles (student, instructor) to users to control access to specific features. Ensure that only authorized users can access restricted functionalities.

**3. Encryption:**

* Encrypt sensitive data (e.g., passwords, user progress) using strong encryption methods. Use HTTPS to secure data transmission between clients and the server.

**4. Database Security:**

* Control access to the database to limit who can interact with it directly. Keep the database software up to date with regular updates and patches.

**5. Data Backups:**

* Regularly backup data to prevent loss due to accidents or security breaches.
* **Proposed Prototypes**

**Prototype 1: User Registration**

Features:

1.Develop a user registration form allowing students and instructors to create accounts securely.

2.Implement validation for user registration data.

3.Enable user profile creation.

4.Store user profile data securely in the database.

**Prototype 2: User Login**

Features:

1.Design a login page with username (email) and password fields.

2.Implement authentication and authorization mechanisms.

3.Provide password recovery options for users.

4.Ensure secure storage and handling of user credentials in the database.

**Prototype 3: Course Catalog and Enrollment**

Features:

1.Design a catalog interface displaying available courses with search and filtering options based on subjects and disciplines.

2.Develop a page for each course, showcasing course description, instructor details, and enrollment options.

3.Create a page for the enrollment process, allowing users to easily enroll in courses of their choice.

4.Showcase confirmation messages for successful course enrollment.

5.Implement storage for course information and enrollment data in the database.

**Prototype 4: Course Dashboard**

Features:

1.Create a course dashboard interface displaying course content such as video lectures, reading materials, assignments, and quizzes.

2.Enable easy navigation for users to access different course components.

3.Enable students to interact with course materials, submit assignments, and complete quizzes within the platform.

4.Implement storage for course content in the database.

**Prototype 5: Access Course Content**

Features:

1.Create visualization of video lectures, reading materials, assignments, and quizzes.

2.Interaction options for users to engage with the content.

**Prototype 6: Quizzes and Assignments**

Features:

1.Design a layout for quizzes and assignments presenting questions and tasks.

2.Provide a Submission process for completed quizzes and assignments.

3.Provide a grade after evaluating student responses.

**Prototype 7: Progress Tracker**

Features:

1.Create a progress tracker feature showing students' overall learning progress, completed and pending tasks for each enrolled course.

2.Implement storage for completed and pending tasks.

**3. Meeting Minutes**

* **Client Meeting Minutes**

1. Who was present?

Client: Dr. Mark Chai

Team Members:

Divya Bathala

Srilatha Yadala

Vani Battu

Lakshmi Manasa Gundala

Partha Sarathy Boda

2. Meeting agenda

To discuss the Problem Statement for Edulearn, as well as the Project requirements, Interface, Server Backend, and Security

requirements along with database.

3. Specific questions asked (and who asked them)

-What is the need for this project, or what problems do you think are being faced?(asked by Client)

-What database are you going to use for your project?(asked by Client)

-Any other ideas for the Project?(asked by Client)

-Can we add extra functionalities for the project other than the given requirements?(asked by Srilatha Yadala)

4. Specific answers given (and who gave them)

-To be aware of unauthorized user logins .(answer given by parthasarathy Boda)

Browsing and filtering functionalities for courses. (answer given by Lakshmi Manasa Gundala)

To display ongoing social or cultural events on our website. (answer given by Vani Battu)

Accessing course content without any interruptions .(answer given by Srilatha Yadala)

Seamless video streaming of course content and can add summary for the video. (answer given by Divya Bathala)

-Firebase (answer given by Lakshmi Manasa Gundala)

SQL (answer given by parthasarathy Boda)

-To give access to different content based on their student and faculty roles. (answer given by Lakshmi Manasa Gundala)

To add Accommodation and event features.(answer given by Srilatha Yadala)

-You can add extra functionalities but you will not be graded or given budget for those functionalities. You should mainly

focus on given requirements. (answer given by Client)

Action items: what have you decided you will show the client in your next meeting

-We have decided to show the problem statement for Edulearn Project by next meeting.

When is the next meeting (no more than two weeks away)

-Next meeting will be on next Wednesday (05/08/2024)