Software Requirements Specification

for

Education Platform

Version 1.0 approved.

Prepared by "EDUC"

SVU

3/15/2024

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1.   Introduction

1.1 Purpose

The purpose of the "Education Platform" project is to provide a platform for students to find highly skilled teachers at a moderate cost. The platform will facilitate online and offline learning options, allowing students to participate in classes either at the teacher's place or through the Internet. In addition, the platform will enable teachers to upload subject material and take online tests to track students' progress.

1.2 Document Conventions

The SRS (Software Requirements Specification) for the Education Platform adheres to specific document conventions to ensure clarity, consistency, and ease of understanding. These conventions include:

- **Section Headings**: Each section of the document is labeled with a clearly defined heading, making it easy to navigate and locate specific information.

- **Numbering and Formatting**: Information within sections and subsections is organized using a hierarchical numbering system, facilitating the hierarchical structure of the document. Additionally, consistent formatting, such as bullet points for lists and indentation for subtopics, enhances readability.

- **Terminology**: Standardized terminology and abbreviations are used throughout the document to maintain consistency and avoid ambiguity. Key terms are defined when first introduced to ensure a common understanding among readers.

- **References and Citations**: When referencing external sources or documents, proper citations are provided to acknowledge the origin of information and support the validity of statements or requirements.

- **Priority and Classification**: Requirements are prioritized based on their importance and classified according to their nature (e.g., functional requirements, non-functional requirements). This classification aids in organizing and understanding the scope of the project.

- **Version Control**: The document may include version control information, such as revision history, dates of updates, and authorship details, to track changes and maintain document integrity over time.

1.3 Intended Audience and Reading Suggestions

The SRS for the Education Platform is designed to cater to a diverse audience involved in various stages of the project life-cycle. The intended audience includes:

- **Developers:** Those responsible for designing, implementing, and testing the Education Platform's software components will find detailed technical specifications and requirements in the document.

- **Project Managers:** Individuals tasked with overseeing the project's planning, execution, and delivery will benefit from understanding the project scope, objectives, timelines, and resource requirements outlined in the SRS.

- **Marketing Staff:** Those involved in promoting the Education Platform to potential users, clients, or stakeholders can gain insights into the platform's features, capabilities, and unique selling points.

- **Users:** Teachers, students, administrators, and other end-users of the Education Platform can refer to the SRS to understand how the platform functions, what features are available, and how to interact with the system effectively.

- **Testers:** Quality assurance professionals responsible for verifying the functionality, usability, and performance of the Education Platform will find test cases, scenarios, and acceptance criteria specified in the document.

   Reading Suggestions:

   - Overview Sections: Begin by reading the overview sections, including the Purpose, Scope, and Product Perspective, to gain an understanding of the project's goals, scope, and context.

   - User Classes and Characteristics: Familiarize yourself with the different user classes and their characteristics to understand the diverse user base the platform caters to.

   - Functional and Non-functional Requirements: Review the detailed requirements specified in the document, including functional requirements outlining the platform's features and non-functional requirements addressing performance, security, and usability aspects.

   - Use Case Scenarios: Explore the use case scenarios to understand typical interactions and workflows within the Education Platform from the perspective of different user roles.

   - Appendices and References: Refer to any appendices, glossaries, or reference materials included in the document for additional context, definitions, or supporting information.

1.4 Project Scope

The Education Platform aims to bridge the gap between students and teachers by offering a user-friendly interface for accessing educational resources and connecting with qualified instructors. The platform will facilitate the following functionalities:

- Student registration and profile management

- Teacher registration and profile management

- Search and filtering options to find teachers based on subject, location, availability, and pricing .
- Chat-Bot Using Chat-Gpt

- Booking and scheduling of classes, both offline and online.

- Material uploading feature for teachers to share educational content .

- Online exam creation and administration for assessing student learning.

- Payment processing for class bookings and other services .

1.5 References

The "References" section of the Software Requirements Specification (SRS) for the Education Platform briefly acknowledges and utilizes various sources of information, standards, and documents pertinent to the project. These references include educational standards, technical specifications, research papers, regulatory requirements, vendor documentation, and stakeholder feedback. By referencing these sources, the SRS ensures alignment with industry best practices, compliance standards, and stakeholder expectations, contributing to the successful development and implementation of the Education Platform.

2. Overall Description

2.1 Product Perspective

The Education Platform exists as a standalone system designed to revolutionize the interaction between teachers and students in the realm of education. It offers a comprehensive suite of features and functionalities aimed at enhancing the teaching and learning experience for users. As a self-contained solution, the Education Platform does not rely on or integrate with external subsystems. Instead, it encompasses all necessary components within its architecture to facilitate seamless communication, collaboration, and knowledge sharing between teachers and students.

By providing a centralized platform for educational activities, the Education Platform aims to streamline the process of connecting teachers with students, whether in offline or online learning environments. Through its intuitive interface and robust set of tools, the platform empowers teachers to create, manage, and deliver educational content effectively. Students, in turn, benefit from access to a diverse range of learning materials, interactive sessions, and assessment tools, tailored to their individual needs and preferences.

The Education Platform operates within the broader context of the education sector, serving as a dynamic solution to address the evolving needs and challenges faced by educators and learners alike. It embraces modern technologies and pedagogical approaches to foster engaging and impact learning experiences. As such, the Education Platform represents a significant advancement in educational technology, positioning itself as a key player in shaping the future of education.

2.2 Product Features

2.2.1 Teachers Features

1. **Teachers Registration and Profile Management:**

   - Teachers can register on the platform and create detailed profiles showcasing their qualifications, experience, and teaching experience.

   - Profile management tools enable teachers to add the subjects they will teach and update their availability, prices, locations, and other relevant information.

   - Uploading Materials and make online quizzes

2. **Availability and Class Scheduling:**

   - Teachers can specify their availability to conduct classes, whether offline or online, based on their preferences and schedule.

   - A scheduling system facilitates the management of class schedules, allowing teachers to accept bookings from students and plan their teaching sessions accordingly.

3. **Content Creation and Management:**

   - Teachers can create and upload educational content such as presentations, and study materials to enrich their teaching materials.

   - Content management features empower teachers to organize and categorize their materials effectively for easy access and navigation by students.

4. **Rating and Feedback:**

   - Teachers can create and administer online quizzes and assessments to measure student learning and progress accurately.

2.2.2 Students Features

1. **Student Registration and Profile Management:**

   - Students can register on the platform and create profiles containing their academic background, interests, and learning goals.

2. **Search and Discovery:**

   - Students can search for teachers based on subject, location, availability, and pricing.

   - Advanced filtering options enable students to find teachers with specific expertise, ratings, and teaching styles.

3. **Booking and Enrollment:**

   - Students can book classes with their preferred teachers based on availability.

4. **Learning and Interaction:**

   - Students can access educational content uploaded by teachers, including PDF, presentations, and study guides.

5. **Rating and Feedback:**

   - Students can take online exams created by teachers to assess their understanding of course materials.

6. **Chat-Bot:**

   - Students can ask chat-bot any questions they need like how they use chat-gpt

2.2.3 Platform Administrators Features

1. **User Management:**

   - Administrators can manage user accounts, including registration, verification, and account status.

   - User management tools enable administrators to monitor user activity and address any issues related to account access or behavior.

2. **Content Moderation:**

   - Administrators can moderate user-generated content, including uploaded materials, comments, etc.

   - Content moderation policies ensure that the platform maintains a safe and respectful learning environment for all users.

3. **Platform Configuration:**

   - Administrators can configure platform settings, including pricing options and class schedules.

   - Configuration tools allow administrators to customize the platform to effectively meet the needs of teachers and students.

4. **Analytic and Reporting:**

   - Administrators can access analytic dashboards and generate reports on platform usage, user engagement, and performance metrics.

   - Insights from analytical data help administrators identify trends, evaluate platform effectiveness, and make data-driven decisions.

5. **Technical Support and Maintenance:**

- Administrators provide technical support to users, handle queries, troubleshoot problems, and ensure the smooth operation of the platform.

- Maintenance tasks include software updates, security patches, and performance improvements to enhance platform reliability and performance.

2.3 User Classes and Characteristics

The Education Platform caters to multiple user classes, each with distinct characteristics and roles within the system. These user classes include:

2.3.1 Teachers:

- **Characteristics:** Teachers are individuals with expertise in various subjects and disciplines, possessing qualifications and experience in educational instruction.

- **Roles:** Teachers create and deliver educational content, conduct classes, assess student learning, and interact with students to facilitate learning outcomes.

2.3.2 Students:

- **Characteristics:** Students represent individuals seeking educational resources, instruction, and guidance to enhance their knowledge and skills in specific subjects or areas of interest.

- **Roles:** Students enroll in classes, access educational materials, participate in learning activities, complete assessments, and interact with teachers and peers to facilitate their learning journey.

2.3.3 Administrators:

- **Characteristics:** Administrators are responsible for overseeing and managing the overall operation of the Education Platform, ensuring its functionality, security, and compliance with policies and regulations.

- **Roles:** Administrators manage user accounts, configure platform settings, moderate content, provide technical support, and analyze platform performance to optimize user experience.

2.4 Operating Environment

The education platform operates within a specific environment to ensure optimal performance, compatibility, and security. The operating environment includes the hardware, software, network infrastructure, and other dependencies necessary for the functionality of the platform.

2.4.1 Hardware requirements

The learning platform is designed to be accessible on a variety of devices, including but not limited to:

- Desktop Computers

- Laptops

- Tablets

- Smart Phones

1. **Minimum hardware specifications may include:**

    - Processor: dual core or higher.

    - RAM: 2 GB or more

    - Storage: Enough disk space to store application data and media files

    - Display: Minimum resolution 1024 x 768 pixels

2.4.2 Software requirements

The Learning Platform is compatible with modern web browsers and may require specific software components for certain features:

- Web browsers: Google Chrome, Mozilla Firefox, Safari, Microsoft Edge

- Operating systems: Windows, Mac, Linux, iOS, Android

- Additional software: Adobe Flash Player (if required for multimedia content), PDF reader for viewing documents.

2.4.3 Network infrastructure.

The education platform relies on a stable internet connection for seamless access and communication between users. Minimum network requirements may include:

- Internet connection: Broadband or high-speed Internet connection for optimal performance

- Bandwidth: Enough bandwidth to file downloading

- Network Security: Implementing security protocols (such as HTTPS) to protect user data during transmission.

2.4.4 Dependencies

The Learning Platform may rely on third-party services, APIs, or integrations to enhance functionality and provide additional features:

- Payment Gateways: Integration with pay mob processors for secure online transactions

- Cloud Storage: Using cloud storage solutions to host multimedia content and user data.

2.4.5 Security Considerations

Security measures are implemented to protect user data and ensure compliance with privacy regulations:

- Data encryption: Encryption protocols (such as SSL/TLS) are used to secure data transmission over a network.

- Access Control: Role-based access control mechanisms restrict access to sensitive features and data based on user roles.

2.5 Design and Implementation Constraints

The design and implementation of the Education Platform for both the website and mobile application are subject to certain constraints that may impact the development process and system architecture. These constraints include:

2.5.1 Technology Stack Compatibility:

- The front-end of the website will utilize HTML, CSS, JavaScript, Bootstrap, and React.js, while the back-end will be developed using SQL, C#, and ASP.NET Core Web API.

- The mobile application will be built using Flutter and Dart programming languages.

2.5.2 Integration Challenges:

1. **Integration with API for Application-Website Communication:**

   - The website and mobile app components of the learning platform will need to communicate seamlessly to provide a unified user experience, and this requires implementing APIs (Application Programming Interfaces) to facilitate data exchange and interaction between the front-end website and back-end systems serving the website and mobile apps.

   - Ensuring compatibility and consistency between the API endpoints used by your website and mobile app is essential to avoid inconsistencies and ensure a consistent user experience across both platforms.

2.5.3 Scalability Considerations:

Optimizing the performance of the website and mobile application, particularly in terms of response times and resource utilization, will require careful attention to efficient coding practices, database indexing, and caching mechanisms.

2.6 User Documentation

- User Guides: Comprehensive instructions for teachers, students, and administrators.

- FAQs: Answers to common queries regarding platform usage.

- Multilingual Support: Documentation available in multiple languages for inclusivity.

3. System Features

In this section, the functional requirements for the Education Platform are organized by system features, representing the major services provided by the product.

3.1 User Registration and Profile Management

3.1.1 Description and Priority

This feature allows users to register accounts and manage their profiles. It is of High priority as it is fundamental to user interaction with the platform.

3.1.2 Stimulus/Response Sequences

- Stimulus: User navigates to the registration page.
- Response: System displays the registration form.

- Stimulus: User fills out the registration form and submits.
- Response: System validates the information and creates the user account.

- Stimulus: User accesses their profile settings.
- Response: System displays the profile management options.

3.1.3 Functional Requirements

- REQ-1: The system shall provide a registration form with fields for username, email, password, and additional profile information.

- REQ-2: Upon submission of the registration form, the system shall validate the entered information for completeness and correctness.

- REQ-3: If the entered email is already registered, the system shall display an error message prompting the user to choose a different email.

- REQ-4: After successful registration, the system shall send a verification email to the user's provided email address.

- REQ-5: Users shall be able to log in to their accounts using their registered email and password.

- REQ-6: The system shall allow users to update their profile information, including username, email, password, and additional details.

- REQ-7: Users shall have the option to upload a profile picture or avatar to personalize their profile.

- REQ-8: The system shall provide options for users to manage privacy settings, such as visibility of profile information to other users.

- REQ-9: If a user forgets their password, the system shall provide a password reset functionality via email verification.

4. External Interface Requirements

4.1 User Interfaces

4.1.1 Web Interface (Website)

4.1.1.1 Description:
- The web interface allows users to interact with the Education Platform through a web browser.

4.1.1.2 Characteristics:
- Sample screen images will be provided in the User Interface Specification.

- GUI standards will adhere to modern web design principles and accessibility guidelines.

- Screen layout will be responsive, adapting to various screen sizes and resolutions.

4.1.2 Mobile Application Interface

4.1.2.1 Description:
- The mobile application interface provides users with access to the Education Platform on mobile devices.

4.1.2.2 Characteristics:
- Sample screen images and design guidelines will be provided in the Mobile Interface Specification.

- GUI elements will follow platform-specific design patterns for iOS and Android.
- Screen layouts will be optimized for smaller touch screens, with intuitive navigation and touch gestures.

4.2 Hardware Interfaces

4.2.1 Supported Devices

4.2.1.1 Description:

- The Education Platform will support a range of hardware devices, including desktop computers, laptops, tablets, and smartphones.

4.2.1.2 Characteristics:

- Interaction with hardware components will be through standard input methods such as keyboards, mice, touchscreens, and styluses.

- The platform will utilize device sensors (e.g., GPS, accelerometer) when required for specific functionalities, such as location-based services in the mobile application.

4.3 Software Interfaces

4.3.1 Database Management System (DBMS)

4.3.1.1 Description:

- The Education Platform will interact with a database management system to store and retrieve user data, content, and system configurations.

4.3.1.2 Characteristics:

- The DBMS will be specified in the Database Interface Specification document, including the database name, version, and schema structure.

- Data items shared with the DBMS include user profiles, class bookings, educational content, and platform settings.

- Services needed include CRUD operations (Create, Read, Update, Delete) for managing database records, as well as transaction management for data integrity.

4.4 Communications Interfaces

4.4.1 HTTP(S) Protocol

4.4.1.1 Description:

- The Education Platform will communicate with external systems and services via the HTTP(S) protocol.

4.4.1.2 Characteristics:

- Communication will follow RESTful principles for API endpoints, utilizing standard HTTP methods (GET, POST) for data exchange.

- Communication security will be ensured through HTTPS encryption, protecting data in transit between the platform and external services.

5.   Other Nonfunctional Requirements

5.1 Performance Requirements

5.1.1 Response Time

- **Requirement:** The system shall respond to user actions within 2 seconds under normal load conditions.

- **Rationale:** Quick response times enhance user experience and encourage user engagement with the platform.

5.1.2 Scalability

- **Requirement:** The platform should be capable of handling a minimum of 1000 concurrent users without degradation in performance.

- **Rationale:** As user base grows, the platform should scale to accommodate increased traffic and user interactions.

5.2 Safety Requirements

5.2.1 Data Security

- Requirement: User data, including personal information and payment details, must be encrypted during transmission and storage.

- Rationale: Protecting user data from unauthorized access or theft is critical to maintaining trust and compliance with privacy regulations.

5.3 Security Requirements

5.3.1 User Authentication

- Requirement: Users must authenticate their identity using secure login mechanisms (e.g., username/password).

- Rationale: Ensuring only authorized users have access to the platform helps prevent unauthorized use and data breaches.

5.3.2 Access Control

- Requirement: Role-based access control (RBAC) must be implemented to restrict access to sensitive functionalities and data based on user roles (e.g., teacher, student, administrator)

- Rationale: Limiting access to certain features and data based on user roles enhances security and protects against unauthorized actions

5.4 Software Quality Attributes

5.4.1 Usability

- Requirement: The platform shall follow usability best practices, ensuring intuitive navigation, clear labeling, and consistent user interfaces.

- Rationale: Usability is critical for user adoption and satisfaction, leading to increased engagement and retention.

5.4.2 Maintainability

- Requirement: The codebase shall be well-documented and structured, allowing for easy maintenance and future enhancements by developers.

- Rationale: Maintainable code reduces the time and effort required for ongoing maintenance and updates, leading to lower costs and faster development cycles.

6. Other Requirements

This section includes miscellaneous requirements that are not covered elsewhere in the SRS but are essential for the successful development and operation of the Education Platform.

6.1 Database Requirements

- Requirement: The Education Platform shall utilize a relational database management system (RDBMS) for data storage and management.

- Rationale: A structured and scalable database system is necessary to efficiently manage user data, content, and system configurations.

6.2 Internationalization Requirements

- Requirement: The Education Platform should support multiple languages and localization options to accommodate users from diverse linguistic backgrounds.

- Rationale: Internationalization enhances the accessibility and usability of the platform for users worldwide, promoting inclusivity and user engagement.

6.3 Legal Requirements

- Requirement: The Education Platform must comply with all relevant laws and regulations governing online education, data privacy, intellectual property rights, and electronic transactions.

- Rationale: Adherence to legal requirements is essential to mitigate legal risks and ensure the platform operates within the boundaries of applicable legislation.