Software Requirements Specification

for

TriviaTrack

Version 1.0 approved

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1.   Introduction

1.1   Purpose

To develop **TRIVIATRACK**, a gamified testing and learning platform that increases efficiency and knowledge retention with the help of delivering education content VIA interactive assessments and games, while motivating the end users with a satisfaction of virtual coin (TRIVIA COIN) which can unlock courses, medals and upgrade your public profile.

1.2   Document Conventions

The Software Requirement Specification will follow the conventions stated below:

Font Style	Times New Roman, **Bold Text** will be used for Headings, Subheadings
Font-Size	18pt for Headings, 14pt for subheadings, 12pt for paragraphs
References	Documenting reference is IEEE citation format.
Formatting	Numbering will be done sequentially according to headings.
Priority	Priority will be mentioned for specific features according to requirement

1.3   Intended Audience and Reading Suggestions

This SRS document is intended for the following audience

Developers: They will use the documentation to get the idea and understanding of functionality, system features and the development phases. It is recommended to get clear advice on system specification
Testers: They will use this documentation to design test cases and test the feature is performing the dedicated task.
End User: End users are not the primary audience, but end users might be needing this document to get an idea of the mission,scope,feature and functionality of this software.

1.4   Product Scope

The purpose of this software is to provide a platform which is efficient for knowledge retention for both students as well as working people so they could learn better and perform better while keeping them motivated.
Benefits Included:
- Development of the gamified learning and testing platform.
- Implementation of AI recommendation System.
- Implementation of weakness improvement AI system.
- Features like peer competitions, leaderboards and live Q&A sessions.

This Project will have corporate training programs as well as student learning materials. This is a great way to pitch software in Corporate and business sectors where such revolution in training are required for the employees to learn quickly and perform more efficiently.

1.5   References

Not Applicable.

2.   Overall Description

2.1   Product Perspective

TriviaTrack is an innovative learning platform that integrates gamification and interactive elements to enhance the learning experience. This is not a follow-on product from an existing family but rather a new solution to eradicate the challenges of the traditional learning environment.
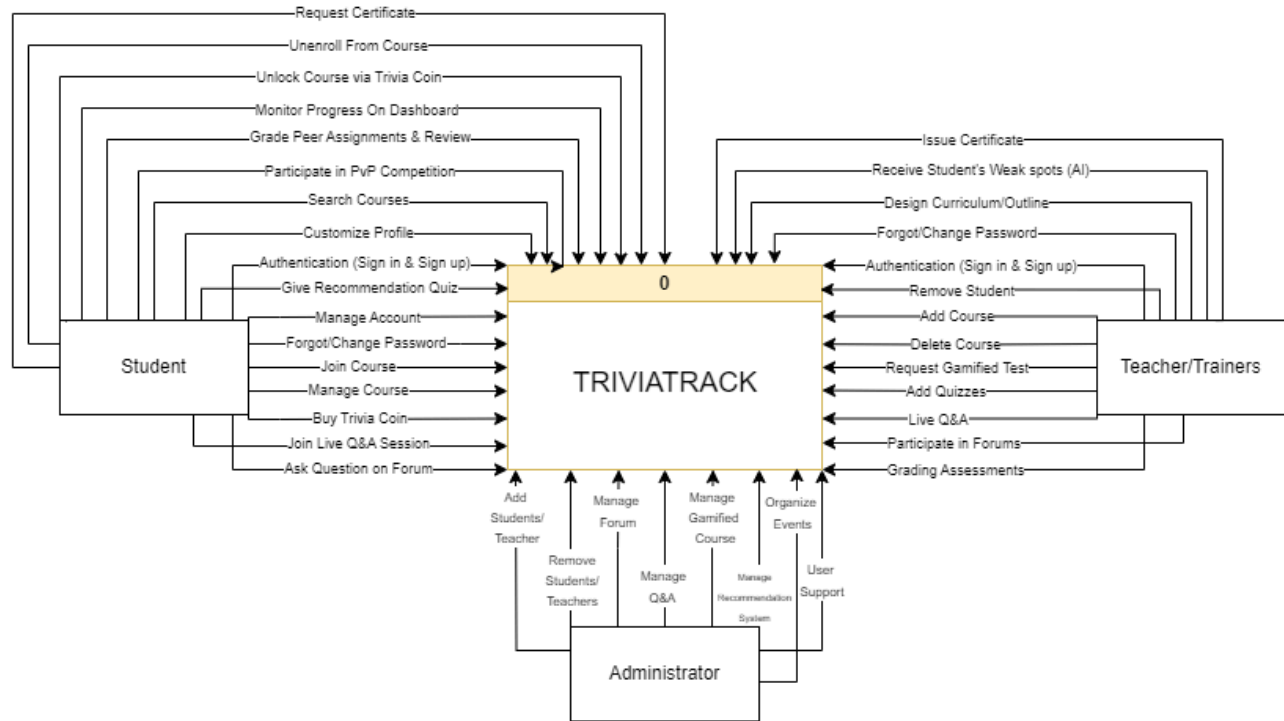
2.2 Product Functions

The software must perform or the let the user perform are as follows:

User Account Management
- Allow new users to register and existing users to log in.
- Users can create and update/customize their profiles.
- Users are assigned roles (student, teacher, admin) based on their activities and permissions.

Educational Content Interaction
- Students can enroll in various educational courses.
- Access lessons, videos, and supplementary materials.
- Engage in quizzes to test knowledge and earn rewards.

Social and Collaborative Features
- A platform for students and teachers to interact, discuss course materials, and share insights.
- Students can participate in peer review sessions to provide and receive feedback on assignments.

Performance and Progress Tracking
- Teachers can view student progress, quiz results, and overall course engagement.
- Provide analytics on course effectiveness and student engagement metrics for teachers.

Virtual Currency Management
- Mechanisms for students to earn TriviaCoin through course activities and spend them on accessing additional content or courses.

Administrative Functions
- Admins can manage user accounts and control access levels.

- Admins and teachers (only their own course) can add, modify, or remove course content.
- Regular updates and maintenance tasks to ensure platform integrity and security.

2.3   User Classes and Characteristics

2.3.1. Students:
- **Frequency of Use**: High.
- **Product functions**: Assessments, quiz, participation in gamified learning activity, earn and use Trivia coin and monitor progress report.
- **Technical Expertise**: Basic expertise required of web interface and how to navigate.
- **Security or Privilege**: Limited Access, Students can only access their progress,quiz and claim rewards.
- **Educational level**: Educational institutes (Schools, Universities, or any Educational organizations).
- **Importance:** Students are the primary user base. Importance is High.

2.3.2. Teacher:
- **Frequency of Use**: Moderate.
- **Product functions**: Creating and managing assessments and quizzes, monitoring progress, Live Q&A sessions, and managing students enrolled in the course.
- **Technical Expertise**: High,Teachers should have a high grasp of the software in order to efficiently utilize the potential of the software and understand the basics of the creation of tools and analytics.
- **Security or Privilege**: Moderate. Teachers will have access to student's grades, creating content and managing course material.
- **Educational level**: Corporate trainers, school teachers, Professors.
- **Importance:** High. Teachers play a vital role in building the course content for the students.

2.3.3. Administrators:
- **Frequency of Use**: Low.
- **Product functions**: Manage Platform settings through the dashboard and monitor user roles and permissions making this a secure platform.
- **Technical Expertise**: High. Admins will have a solid grasp on the technical background to provide facilities to users in crisis. Technical experience in database and system maintenance is also important.
- **Security or Privilege**: Full access. Admins will have full control over teachers and users. including managing users (Adding or removing) and access to the software.
- **Educational level**: IT professionals
- **Importance:** Medium. Admin will not directly communicate with the users.

2.4   Operating Environment

Hardware Platform:

- Compatible with desktop, laptop, tablet, and smartphone devices.
- Minimum hardware requirements:
    - CPU: 1 GHz or higher.
    - RAM: 2 GB or higher.
    - Screen resolution: 1024x768 pixels or higher.

Operating Systems:

- **Windows** (Windows 10 and above).
- **macOS** (Catalina 10.15 and above).
- **Linux** (Ubuntu 18.04 and above).

Web Browsers:

- Compatible with modern web browsers, including:
    - Google Chrome.
    - Mozilla Firefox.
    - Safari.
    - Microsoft Edge.

Software Components:

- **Frontend**: Developed using React.js for user interaction.
- **Backend**: Node.js and Express.js to manage server-side logic.
- **Database**: MongoDB for data storage and management.
- **AI Components**: TensorFlow.js or Brain.js for machine learning and recommendation systems.

Other Software Dependencies:

- **OAuth 2.0** for user authentication and authorization.
- **Stripe** for payment processing (optional for premium features).
- **WebSockets** for real-time communication during peer competitions and live Q&A sessions.

2.5   Design and Implementation Constraints

TriviaTrack Implementations can have several constraints that might limit the options available to developer

- **Hardware Requirements**: TriviaTrack should perform efficiently and be optimized for low end devices. The processing power should include a minimum of 2gb ram and can have

heavy computations for eg AI recommendation systems. This system should be offloaded and integrated accurately with the backend services to perform smoothly on low end devices as well.
- **Tech Stack:** The Software will be built on **MERN stack (MongoDB, Express.js, React.js,Node.js)** and it will include softwares like **Unity, Phaser** for game integration, This can limit the flexibility in choosing any other alternative framework or language for integration.
- **AI Integration:** The AI Recommendation system should be built on Brain.js and TensorFlow, limiting the flexibility of developer to experiment around by developing on these libraries make the developer depended on Javascript

2.6   User Documentation

The following Documents will be provided with the release of TriviaTrack:
- **User Manual(Documentations):** A complete walkthrough will be delivered covering all the platform features that includes Account Handling, Earning and buying TriviaCoins, Using Live Q&A, making productive use of Chat forum.
- **Video Tutorial:** A comprehensive video tutorial about features and how to use them make the software for the users seamless.
- **Help Forum**: To Assist on any queries and resolving them.
- **Delivery Formats:** Downloadable PDF, Documentation Page(Website),Video Tutorials.

2.7   Assumptions and Dependencies

Assumptions:
- **Supported Browsers:** The expectation is that users will access the software using a Browser with modern functionalities and features which support HTML and JavaScript like Chrome, Firefox,Edge.
- **Third Party APIs:** Many third party APIs will be integrated in the Software like OAuth 2.0 or Stripe and it is assumed that the APIs remain functional and provide their services.
- **Technical Skills:** It is assumed that the user will have some Basic skills to navigate the website like managing their account, browse courses and enroll in them. To mitigate this risk an comprehensive document will be provided while launching this website.
- **Connection to Internet:** This is the most important thing to assume that the users will be connected to stable internet inorder to access the heavy features of the software (Quiz, competitions)
- **Regular Software updates:** It is expected for the user to regularly update their browser so it can be compatible with the software

Dependencies:
- **AI Frameworks:** The software will be using Brain.js and TensorFlow for AI systems. If any framework gets updated or declares any functionality deprecated the software feature might fail and could result in affecting its functionality.

- **Payment Gateway:** If the gateway goes down or changes it policies/conditions could hinder the software functionality to go down resulting in users not able to process their credit/debit cards and get access to premium features.
- **Database optimization:** The Software will be deeply integrated with MongoDB for data storage. Bottlenecks can result in slow query processing resulting in bad user experience.

3. External Interface Requirements

3.1 User Interfaces

The user interface will be intuitive and gamified, featuring dashboards for quiz performance, leaderboards, and a virtual wallet for managing TriviaCoin.

Authentication Page:
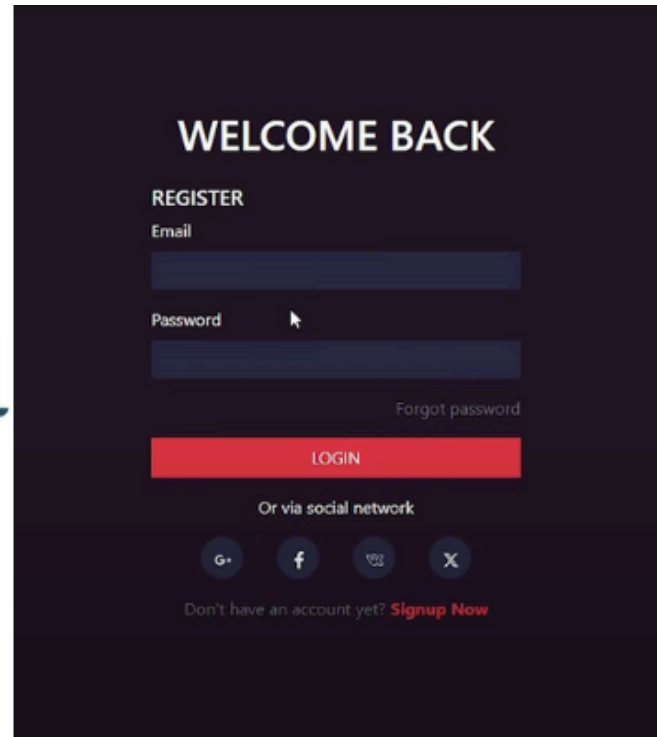
3.2   Hardware Interfaces

3.2.1 Supported Device Types:
- Desktop computers
- Laptops
- Tablets
- Smartphones
- Web Browser (Chrome, Opera)
- WebGL

No device specification requirements to access the website.

3.2.2 Interaction Nature:
TriviaTrack can be accessed on Desktop, Laptops, Mobiles, Tablets through a standard web browser such as Chrome, or Explorer.

3.2.3 Communication Protocols:
The communication between device and server is handled through Internet Protocols. The devices need a working Internet Connection to access the website.

3.3   Software Interfaces

TriviaTrack integrates the use of multiple software interfaces and IDEs:

- Stripe API to handle payments securely and for authentication, using OAuth 2.0.
- TensorFlow.js to improve learning through weakness detection with AI.
- To create gamified learning modules that enhance the learning process, Unity & Phaser are utilized.
- The IDE used is Visual Studio Code, which makes code management and feature integration easier for the entire project.

3.4   Communications Interfaces

- Email will be used to report statistics and for announcements regarding TriviaTrack.
- Any web browser will be able to access 2D games, WebGL might be required for some 3D games.
- Secure HTTPS protocols protect all data exchanges on TriviaTrack.
- WebSockets enable real-time interaction for features such as live Q&A and interactive quizzes. This combination guarantees both security & communication during user activities on the platform.

4.   System Features

4.1. Course Management Features

4.1.1. Description: Enables teachers to create, update, delete, and manage courses, including uploading materials and setting quizzes.

4.1.2.   Stimulus/Response Sequence

Use Case Name: Manage Courses
Description: Enables teachers to create, update, delete, and manage courses, including uploading materials and setting quizzes.
Actors: Teachers, Admins.
Goal: Streamline the management and accessibility of course materials.
Pre-Conditions: Users must be logged in as a teacher or admin.
Basic Course of Events / Main Flow: ● **User Action:** The teacher accesses the course management area of the dashboard after logging in.. ● **System Response:** The interface shows the available courses along with the ability to add, edit, or delete them. **Alternate Flow (Invalid Data):** ● **User Action:** Teacher enters incomplete information for a course setup. ● **System Response:** The system prompts the teacher to fill all required fields. **Exception Flow (System Errors):** ● **System Failure:** Database access issue when updating course information. ● **System Response:** "Course update failed due to a system error. Please try again."
Post Conditions: The course information is updated or created in the system.

4.1.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall allow teachers to upload and manage course materials.	High	Pending
Req 2	The system shall validate course information before saving.	Medium	Pending
Req 3	The system shall provide options to delete or archive courses.	Medium	Pending

4.2. User Management Features (Teacher/Student)

4.2.1. Description: Allows admins to manage user accounts, including creating, updating, and deactivating accounts for teachers and students.

4.2.2. Stimulus/Response Sequence

Use Case Name: Manage Users
Description: Allows admins to manage user accounts, including creating, updating, and deactivating accounts for teachers and students.
Actors: Admins.
Goal: Ensure user accounts are up to date and secure.
Pre-Conditions: User must be logged in as an admin..
Basic Course of Events / Main Flow: ● **User Action:** Admin accesses the user management panel and selects an account to update. ● **System Response:** The system provides the interface to edit user details or deactivate accounts. **Alternate Flow (Invalid Input):** ● **User Action:** Admin enters invalid data for a user's account. ● **System Response:** The system displays an error message and requests correct information. **Exception Flow (System Errors):** ● **System Failure:** If the system cannot update user information due to a technical issue. ● **System Response:** "Update failed. Please check the system connectivity."
Post Conditions: User accounts are modified according to the admin's changes.

4.2.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall provide a secure interface for user account management.	High	Pending
Req 2	The system shall allow admins to activate or deactivate user accounts.	High	Pending
Req 3	The system shall log all user account modifications for auditing purposes.	Medium	Pending

4.3. Dashboard Setup

4.3.1. Description: Provides a personalized dashboard for users to view their progress, notifications, and access various features like courses, tests, and forums.

4.3.2. Stimulus/Response Sequence

Use Case Name: User Dashboard
Description: Provides a personalized dashboard for users to view their progress, notifications, and access various features like courses, tests, and forums.
Actors: Teachers, Admins.
Goal: Offer a centralized and personalized user interface for better navigation and usability.
Pre-Conditions: User must be logged in.
Basic Course of Events / Main Flow: **User Action:** User logs in and is redirected to their personalized dashboard. ● **System Response:** The system displays relevant information such as upcoming courses, scores, and notifications. **Alternate Flow (Invalid Data):** ● **User Action:** New user accesses the dashboard with no current courses or history. ● **System Response:** The system displays a welcome message and suggestions to enroll in courses. **Exception Flow (System Errors):** ● **System Failure:** If the dashboard fails to load due to a server issue. ● **System Response:** "Dashboard unavailable. Please try reloading the page."
● **Post Conditions:** User interacts with the platform through the dashboard.

4.3.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall customize the dashboard based on the user's role and preferences.	High	Pending
Req 2	The system shall update the dashboard in real-time to reflect the latest information.	Medium	Pending
Req 3	The system shall provide quick access links to frequently used features.	Medium	Pending

4.4. Peer Grading/Competitions

4.4.1. Description:Facilitates peer assessments and competitive events among users, allowing for collaborative and competitive learning environments.

4.4.2. Stimulus/Response Sequence

Use Case Name: Peer Grading/Competitions
Description: Facilitates peer assessments and competitive events among users, allowing for collaborative and competitive learning environments.
Actors: Students, Teachers.
Goal: Enhance learning through peer feedback and competitive challenges.
Pre-Conditions: Users must be enrolled in relevant courses or events.
Basic Course of Events / Main Flow: ● **User Action:** Student submits an assignment for peer grading or participates in a competition. ● **System Response:** The system distributes the assignments to peers for grading or logs competition results. **Alternate Flow (Invalid Participants):** ● **User Action:** Not enough participants for a peer grading session or competition. ● **System Response:** The system notifies the user of the delay and attempts to recruit more participants. **Exception Flow (Submission Error):** ● **System Failure:** If there's a failure in submitting assignments or recording competition results. ● **System Response:** "Unable to submit your entry. Please try again."
● **Post Conditions:** Peer grades are recorded, and competition results are updated.

4.4.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall facilitate the assignment of works for peer grading.	High	Pending
Req 2	The system shall record and display results of competitions accurately.	Medium	Pending
Req 3	The system shall notify participants of upcoming grading tasks or competitions.	Medium	Pending

4.5. Certifications

4.5.1. Description: Manages the generation and issuance of certificates for users who have successfully completed courses or passed certain benchmarks.

4.5.2. Stimulus/Response Sequence

Use Case Name: Certification Issuance
Description: Manages the generation and issuance of certificates for users who have successfully completed courses or passed certain benchmarks.
Actors: Students, Teacher, Admin
Goal: Provide formal recognition of achievements within the platform.
Pre-Conditions: User must have met the criteria for certification.
Basic Course of Events / Main Flow: ● **User Action:** User completes a course with passing marks. ● **System Response:** The system generates a certificate and notifies the user. **Alternate Flow (Invalid Criteria):** ● **User Action:** User completes a course but fails to meet the certification criteria. ● **System Response:** The system notifies the user of the requirements not met and provides options to retake assessments. **Exception Flow (Generation Error):** ● **System Failure:** Certificate generation fails due to a technical issue. ● **System Response:** "Certificate generation failed. Please contact support."
● **Post Conditions:** Certificate is available for the user to download or share.

4.5.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall automatically generate certificates for eligible users.	High	Pending
Req 2	The system shall allow users to access and download their certificates.	Medium	Pending
Req 3	The system shall notify users upon successful completion of certification criteria.	Medium	Pending

4.6. Live Q&A Sessions

4.6.1. Description: Enables real-time Q&A sessions between users and instructors to enhance learning through direct interactions.

4.6.2. Stimulus/Response Sequence

Use Case Name: Live Question and Answer Sessions
Description: Enables real-time Q&A sessions between users and instructors to enhance learning through direct interaction.
Actors: Students, Teachers.
Goal: Facilitate real-time educational interactions and address user queries instantly.
Pre-Conditions: Scheduled Q&A sessions must be in place, and participants need to be logged in.
Basic Course of Events / Main Flow: ● **User Action:** User joins a scheduled live Q&A session. ● **System Response:** The system enables interaction between users and the instructor. **Alternate Flow (Invalid Hardware):** ● **User Action:** User experiences issues with video during the session. ● **System Response:** The system attempts to resolve the issue or provides alternatives for joining the session. **Exception Flow (Session Cancellation):** ● **System Failure:** If the instructor is unable to host the session as scheduled. ● **System Response:** "Session has been canceled. Please check the schedule for the next session."
● **Post Conditions:** Users have participated in the Q&A session, and their queries have been addressed.

4.6.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall facilitate the scheduling and conducting of live Q&A sessions.	High	Pending
Req 2	The system shall provide tools for audio and video communication.	High	Pending
Req 3	The system shall archive sessions for later viewing by users.	Medium	Pending

4.7. Ranking System

4.7.1. Description: Manages and displays rankings of users based on their performance and achievements within the platform.

4.7.2. Stimulus/Response Sequence

Use Case Name: User Ranking
Description: Manages and displays rankings of users based on their performance and achievements within the platform.
Actors: Students.
Goal: Motivate users through a competitive ranking system that highlights top performers.
Pre-Conditions: Users must have completed accessible activities.
Basic Course of Events / Main Flow: • **User Action:** User completes a test or activity that contributes to their ranking. • **System Response:** The system updates the user's ranking based on the latest results. **Alternate Flow (Invalid Result):** • **User Action:** User fails to complete an activity. • **System Response:** The system does not update the ranking based on the results. **Exception Flow (Calculation Error):** • **System Failure:** If there's an error in calculating the rankings. • **System Response:** "Ranking update error. Please try again later."
• **Post Conditions:** User rankings are updated and displayed on leaderboards.

4.7.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall calculate user rankings based on predefined criteria.	High	Pending
Req 2	The system shall display updated rankings on user dashboards and leaderboards.	High	Pending
Req 3	The system shall allow users to view their ranking history.	Medium	Pending

4.8. Gamified Tests

4.8.1. Description: Offers an interactive and engaging testing environment where users can participate in gamified assessments.

4.8.2. Stimulus/Response Sequence

Use Case Name: Conduct Gamified Tests
Description: Offers an interactive and engaging testing environment where users can participate in gamified assessments.
Actors: Students, Teachers.
Goal: Enhance learning and assessment through gamification elements such as points, badges, and timed challenges.
Pre-Conditions: Tests must be created and assigned to relevant users..
Basic Course of Events / Main Flow: ● **User Action:** User starts a gamified test. ● **System Response:** The system presents the test with gamification elements and tracks user responses. **Alternate Flow (Time Out):** ● **User Action:** User fails to complete the test in the allotted time. ● **System Response:** The system ends the test and records the answers provided up to that point. ● **Exception Flow (Technical Interruption):** ● **System Failure:** If the test is interrupted due to a technical issue. ● **System Response:** "Test interrupted. Please restart the test."
● **Post Conditions:** Test results are recorded and feedback is provided to the user

4.8.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall provide interactive testing interfaces with gamification elements.	High	Pending
Req 2	The system shall record test results and provide instant feedback.	High	Pending
Req 3	The system shall allow users to retake tests under certain conditions.	Medium	Pending

4.9. Virtual Currency (TriviaCoin)

4.9.1. Description: Manages the virtual currency system, allowing users to earn and spend TriviaCoins based on their learning activities and achievements.

4.9.2.   Stimulus/Response Sequence

Use Case Name: TriviaCoin Transactions
Description: Manages the virtual currency system, allowing users to earn and spend TriviaCoins based on their learning activities and achievements..
Actors: Students, Admins.
Goal: Encourage continuous learning and interaction within the platform through a reward-based system.
Pre-Conditions: Users must engage in activities eligible for earning TriviaCoins..
Basic Course of Events / Main Flow: ● **User Action:** User completes an activity that rewards TriviaCoins. ● **System Response:** The system credits TriviaCoins to the user's account. **Alternate Flow (Insufficient Balance):** ● **User Action:** User attempts to redeem TriviaCoins for rewards but has insufficient balance. ● **System Response:** The system informs the user of the insufficient balance and suggests ways to earn more TriviaCoins. **Exception Flow (Transaction Error):** ● **System Failure:** If there's a failure in processing TriviaCoin transactions. ● **System Response:** "Transaction failed. Please try again."
● **Post Conditions:** TriviaCoins are updated in the user's account

4.9.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall accurately track the earning and spending of TriviaCoins.	High	Pending
Req 2	The system shall provide a secure and transparent transaction process.	High	Pending
Req 3	The system shall offer rewards and incentives for spending TriviaCoins.	Medium	Pending

4.10. Payment Gateways

4.10.1. Description: Integrates payment gateways to handle transactions for services that require payment, such as premium courses or special certifications.

4.10.2. Stimulus/Response Sequence

Use Case Name: Payment Gateways
Description: Integrates payment gateways to handle transactions for services that require payment, such as premium courses or special certifications..
Actors: Students, Teachers, External Payment Services.
Goal: Provide a secure and efficient means for processing financial transactions within the platform.
Pre-Conditions: Users must select a service or product that requires payment.
Basic Course of Events / Main Flow: ● **User Action:** User selects a payable service and proceeds to checkout. ● **System Response:** The system facilitates the payment through integrated gateways like Stripe. **Alternate Flow (Payment Declined):** ● **User Action:** Payment is declined by the payment gateway. ● **System Response:** The system notifies the user of the declined payment and suggests alternative payment methods. **Exception Flow (Gateway Error):** ● **System Failure:** If the payment gateway experiences an error. ● **System Response:** "Payment processing error. Please try a different method or check back later."
● **Post Conditions:** Payment is processed, and access to the service is granted.

4.10.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall integrate with external payment gateways securely.	High	Pending
Req 2	The system shall handle different forms of payment (credit card, digital wallets, etc.).	High	Pending
Req 3	The system shall provide detailed receipts and transaction records to users.	Medium	Pending

4.11. Chat Feature

4.11.1. Description: Provides a chat feature for users to communicate in real-time within the platform, enhancing collaboration and support.

4.11.2. Stimulus/Response Sequence

Use Case Name: In-platform Messaging
Description: Provides a chat feature for users to communicate in real-time within the platform, enhancing collaboration and support.
Actors: All users.
Goal: Facilitate communication among users for educational collaboration and social interaction.
Pre-Conditions: Users must be logged in and have access to the chat feature.
Basic Course of Events / Main Flow: ● **User Action:** User accesses the chat feature and sends a message. ● **System Response:** The system delivers the message in real-time to the intended recipient. **Alternate Flow (Connectivity Issues):** ● **User Action:** User attempts to send a message during poor network conditions. ● **System Response:** The system temporarily stores the message and attempts to send it once connectivity is restored. **Exception Flow (Service Interruption):** ● **System Failure:** If the chat service is interrupted. ● **System Response:** "Chat service temporarily unavailable. Please try again later."
● **Post Conditions:** Messages are exchanged between users.

4.11.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall provide a user-friendly interface for messaging.	High	Pending
Req 2	The system shall ensure messages are delivered securely and promptly.	High	Pending
Req 3	The system shall maintain a history of conversations for user reference.	Medium	Pending

4.12. AI Recommendation System

4.12.1. Description: Provides a chat feature for users to communicate in real-time within the platform, enhancing collaboration and support.

4.12.2.   Stimulus/Response Sequence

Use Case Name: Personalized Learning Recommendations
Description: Utilizes machine learning algorithms to analyze user data and provide personalized course and content recommendations.
Actors: Students, System.
Goal: Enhance the learning experience by offering tailored educational content based on user preferences and performance.
Pre-Conditions: User must have interacted with the platform to generate sufficient data for analysis.
Basic Course of Events / Main Flow: ● **User Action:** User completes a course or test. ● **System Response:** The system analyzes the user's performance and preferences and suggests additional relevant content. **Alternate Flow (No Data for Analysis):** ● **User Action:** New user with insufficient data for a personalized recommendation. ● **System Response:** The system offers general recommendations until more personalized data is available. **Exception Flow (Analysis Error):** ● **System Failure:** If there's an error during the analysis process. ● **System Response:** "Unable to generate recommendations at this time. Please try again later."
● **Post Conditions:** Personalized recommendations are displayed to the user.

4.12.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall analyze user data using machine learning algorithms.	High	Pending
Req 2	The system shall update recommendations in real-time as new data is available.	High	Pending
Req 3	The system shall provide options for users to adjust their preferences for more accurate recommendations.	Medium	Pending

4.13. Sign Up

4.13.1. Description: Allow New users to Create accounts on the software and register using Email/Phone Number password

4.13.2. Stimulus/Response Sequence

Use Case Name: Sign Up
Description: Allow New users to Create accounts on the software and register using Email/Phone Number password.
Actors: Students, System,Teacher.
Goal: Users can register and access the website contents.
Pre-Conditions: Users must have stable internet with valid email Address / Phone number
Basic Course of Events / Main Flow: ● **User Action:** The User navigates to the Sign up page and enters the Email/Phone number and personal details asked. ● **System Response:** The system will validate credentials making sure the email is valid and password is strong. **Alternate Flow:** ● **User Action:** User submits incomplete fields or invalid email Address / Phone Number ● **System Response:** The system highlights the field as required and asks the user to fix them. **Exception Flow:** ● **System Failure:** Database service is down or error occurs. ● **System Response:** "Unable to Create Account, Please Try Again!"
● **Post Conditions:** The user can securely login and navigate through the website.

4.13.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall allow users to register by providing an email, password, and personal details.	High	Pending
Req 2	The system shall validate the email format and password strength before creating an account.	High	Pending
Req 3	The system shall handle and display errors for incomplete or invalid data during the registration process.	Medium	Pending

4.14. Scoring/Rewards System

4.14.1. Description: Manages the scoring and issuance of rewards like points, badges, and leaderboards to motivate and engage users.

4.14.2. Stimulus/Response Sequence

Use Case Name: Scoring and Rewards
Description: Manages the scoring and issuance of rewards like points, badges, and leaderboards to motivate and engage users.
Actors: Students, System.
Goal: Incentivize participation and achievement through a comprehensive reward system..
Pre-Conditions: Users must participate in activities eligible for scoring and rewards.
Basic Course of Events / Main Flow: ● **User Action:** User completes an activity that is part of the scoring system**.** ● **System Response:** The system calculates the scores and assigns rewards accordingly. **Alternate Flow (Scoring Issues):** ● **User Action:** User queries a score they believe is incorrect. ● **System Response:** The system reviews the scoring and corrects any issues. **Exception Flow (Scoring System Down):** ● **System Failure:** If the scoring system fails to update. ● **System Response:** "Scoring update is currently unavailable. Please check back later."
● **Post Conditions:** Scores and rewards are updated on the user's profile and leaderboards.

4.14.3. Functional Requirements

Req ID	Description	Priority	Status
Req 1	The system shall calculate and update scores based on user activities.	High	Pending
Req 2	The system shall display scores and rewards visibly to users.	High	Pending
Req 3	The system shall allow users to view their reward history.	Medium	Pending

5. Other Nonfunctional Requirements

5.1 Performance Requirements

● The platform is designed to support several users concurrently, guaranteeing that it functions smoothly and stays available even during periods of high usage.
● To ensure a smooth user experience, the platform will keep response times under 2-3 seconds in standard operating conditions.
● For live interactions, such Q&A sessions and competitive events, the system will be tuned to maintain the appropriate latency, guaranteeing no delays.

5.2 Safety Requirements

● Include error-handling and validation features in the platform to guarantee steady operation and prevent system crashes.
● Includes active monitoring and moderation of interactions on the platform to prevent any form of abuse.
● TriviaTrack will comply with all applicable educational and data protection laws, ensuring the things do not violate any laws.

5.3 Security Requirements

● To ensure transactions conducted related to TriviaCoin, there is a need to encrypt all user's data and financial transactions happening through stripe.
● Ensure data privacy, and secure authentication while they are accessing the site through OAuth 2.0 to protect user data and manage unauthorized access.
● Establish a system for user input to determine any safety concerns from the viewpoints of users and modify platform features accordingly.

5.4 Software Quality Attributes

● **Usability:** The platform is designed to be intuitive and user-friendly, ensuring easy navigation with minimal learning time required.
● **Reliability:** Targeting 99% uptime to ensure the platform is consistently available when users need it.
● **Maintainability:** Code will be well-documented and organized to make updates and troubleshooting straightforward.
● **Performance:** Ensure response times of under 2-3 seconds for processes during peak usage, continuously monitored using tools.
● **Scalability:** Support up to multiple concurrent users without compromising performance, and increase capabilities if required (vertically/horizontally).
● **Portability:** The platform will be accessible on several major operating systems (Windows, macOS, Linux) via web browsers, ensuring wide usability.
● **Security:** Ensure minimal breaches or data leaks due to any vulnerabilities.

- **Flexibility:** Ensuring multiple choices for courses, tests, and profile customization, and ensuring flexibility for features according to user requirements.
- **Adaptability:** Capacity to update the platform to meet new educational standards or user requirements with efficiency tracked.

5.5   Business Rules

Admins:
- Manage, add, and remove courses.
- Manage student profiles and remove students.
- Access and modify backend settings and user permissions.
- Oversee the usage of TriviaCoin within the platform.

Teachers:
- Add and manage self-posted courses.
- Enroll students in courses and manage their progress.
- Grade quizzes, and provide feedback to students.
- Modify course content for any updates.

Students:
- Enroll in courses and participate in quizzes.
- Earn TriviaCoin through course participation and achieving quiz milestones.
- Use TriviaCoin to unlock additional content within the platform.
- Participate in peer reviews as per the guidelines set within the courses.

Common for Teachers and Students:
- Students and teachers cannot sell TriviaCoin within or outside the platform; it is solely earned through quiz/course participation and only bought via given platform.

6.   Other Requirements

MoSCoW Analysis:

Could Have:

- The platform could explore options for users to access and sell TriviaCoin outside of the platform for educational/real-life resources.
- Enhanced reporting tools could be developed to provide teachers with additional insights into student/course statistics.
- The platform could include additional languages beyond English to cater to a broader user base, starting with widely spoken languages based on user statistics.

Won't Have:

- TriviaTrack will not incorporate non-educational content, maintaining a strict focus on education and learning.
- The platform won't allow for complex role management in its initial releases to keep the UI and UX straightforward and easy.
- The platform will not support comprehensive offline capabilities for accessing and interacting with content.

Appendix A: Glossary

Term	Definition
TriviaCoin	Virtual currency earned through quiz completion.
TBD	To be determined
OAuth 2.0	The industry-standard protocol for authorization

Appendix B: Analysis Models

TBD

Appendix C: To Be Determined List

Description	Section
Diagrams such as ERD, DFD, State-Transition will be created and updated as the work progresses.	Appendix B: Analysis Model
User Interface (UI) design for Dashboard, Forum and other interactive features will also be uploaded later.	Section 3.1: User Interfaces
Features Flow in detail is yet to be described.	Section 4: System Features