

Business Requirement Document

for

CompetiQuest

Version 1.0

Prepared by

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Date : 7th September 2025

Functional and Non- Functional Requirements

Functional requirements

1) User Authentication & Management

- The system must provide user authentication (signup and login).
- Authentication must be managed using JSON Web Tokens (JWT).
- Administrators must be able to perform simple user management tasks.

2) Quiz & Content

- The system must categorize questions by topic (e.g., Aptitude, Verbal, Programming).
- It must feature an interactive user interface for taking quizzes, specifically with Multiple-Choice Questions (MCQs).
- Users must receive instant scoring and per-question feedback with explanations after completing a quiz.
- A user should be able to select a category, choose a subject, and solve questions to get answers and explanations.

3) User Dashboard

- A user dashboard must be available to track performance over time.
- The dashboard must include a progress bar, a solving calendar, and a streak feature.

4) Administrator Panel

- A secure web admin portal must be available for administrators.
- Administrators must have the ability to Create, Read, Update, and Delete (CRUD) questions and topics.
- The system will use MongoDB for data persistence, including versioned question documents.

Non Functional requirements

1) Usability & Accessibility

- The primary application must be a responsive web application, accessible on both desktop and mobile devices.
- The application is intended to be fast and interactive.
- The admin interface must be desktop-friendly.

2) Performance

- The system should provide a data-driven environment for mastering competitive exam questions.
- The system is designed to be scalable and maintainable.

3) Security

- The platform as a whole must be secure.
- The admin portal must provide secure management of questions and analytics.

4) Extensibility

- The platform must be designed to be extendable, allowing for future enhancements.
- Future enhancements could include features for course instructors or ML-based recommendations.

Technology Stack

Frontend: Must be built with Next.js (React) and Tailwind CSS.

Backend: Must use Node.js with Express.js.

Database: Must use MongoDB.

Deployment: The target hosting platforms are Vercel and MongoDB Atlas.

User Stories

Taiga link: https://tree.taiga.io/project/mohsin_1352-competiquest/timeline

Github Link : <https://github.com/AArushi/CompetiQuest>

NAME	PROJECT	SPRINT	ASSIGNED	STATUS	PROGRESS
#7 As a new user, I want to sign up with my name, email, and a password so that I can create a secure account.				New	[Progress Bar]
#8 As a registered user, I want to log in using my email and password so that I can access my dashboard and take quizzes.				New	[Progress Bar]
#9 As a logged-in user, I want to log out so that I can securely end my session. (1 point)				New	[Progress Bar]
#10 As a user, I want to receive a JSON Web Token (JWT) upon login so that my session can be securely managed across the application.				New	[Progress Bar]
> #2 Quiz & Learner Experience				New	[Progress Bar]
> #3 User Dashboard				New	[Progress Bar]

NAME	PROJECT	SPRINT	ASSIGNED	STATUS	PROGRESS
> #1 User Authentication				New	[Progress Bar]
> #2 Quiz & Learner Experience				New	[Progress Bar]
#11 As a learner, I want to see all available topic categories (e.g., Aptitude, Verbal) so I can choose an area to practice.				New	[Progress Bar]
#12 As a learner, I want to select a specific quiz to start a practice session.				New	[Progress Bar]
#13 As a learner, I want an interactive and responsive UI to answer multiple-choice questions on both desktop and mobile.				New	[Progress Bar]
#14 As a learner, I want to submit my quiz and immediately see my score so I get instant feedback.				New	[Progress Bar]
#15 As a learner, I want to review the correct answers after the quiz so I can learn from my mistakes				New	[Progress Bar]
> #3 User Dashboard				New	[Progress Bar]
> #4 Admin Content Management				New	[Progress Bar]

The screenshot shows the CompetiQuest application interface. On the left is a dark sidebar with icons for CompetiQuest, Epics, Kanban, Search, Team, and Settings, and a 'collapse menu' button. The main area is titled 'Epics' and displays a table with columns: NAME, PROJECT, SPRINT, ASSIGNED, STATUS, and PROGRESS. There are two collapsed epics: '#1 User Authentication' (red dot) and '#2 Quiz & Learner Experience' (blue dot). Under '#3 User Dashboard' (orange dot), three user stories are listed: '#16 As a learner, I want to access a personal dashboard to see a summary of my performance.' (red dot), '#17 As a learner, I want to see a progress bar for different topics so I can identify my strengths and weaknesses.' (red dot), and '#18 As a learner, I want to see a "solving calendar" that shows the days I've practiced to track my consistency.' (red dot). Below these are two expanded epics: '#4 Admin Content Management' (green dot) and '#5 Project Deliverables & Documentation' (black dot). A green button '+ ADD EPIC' is at the top right, and a 'View options' dropdown is also present.

This screenshot shows the same CompetiQuest interface as the first one, but with more expanded epics under '#4 Admin Content Management'. The expanded items are: '#19 As an administrator, I want to log in to a secure, desktop-friendly admin page.' (green dot), '#20 As an administrator, I want to perform Create, Read, Update, and Delete (CRUD) operations on quiz topics.' (green dot), '#21 As an administrator, I want to add new questions, their multiple-choice options, the correct answer, and a detailed explanation to a topic.' (green dot), and '#22 As an administrator, I want to manage a simple list of users (e.g., view or delete users).' (green dot). The rest of the board structure is identical to the first screenshot.

The screenshot shows a project management interface for 'CompetiQuest'. On the left, there's a sidebar with icons for 'Epics', 'Kanban', 'Search', 'Team', and 'Settings', and a 'collapse menu' button. The main area displays a Kanban board. At the top, it says '#4 Admin Content Management'. Below that, under '#5 Project Deliverables & Documentation', there are 14 tasks, each with a small circular icon, a task ID, a brief description, and a status ('New') next to a button. The tasks are:

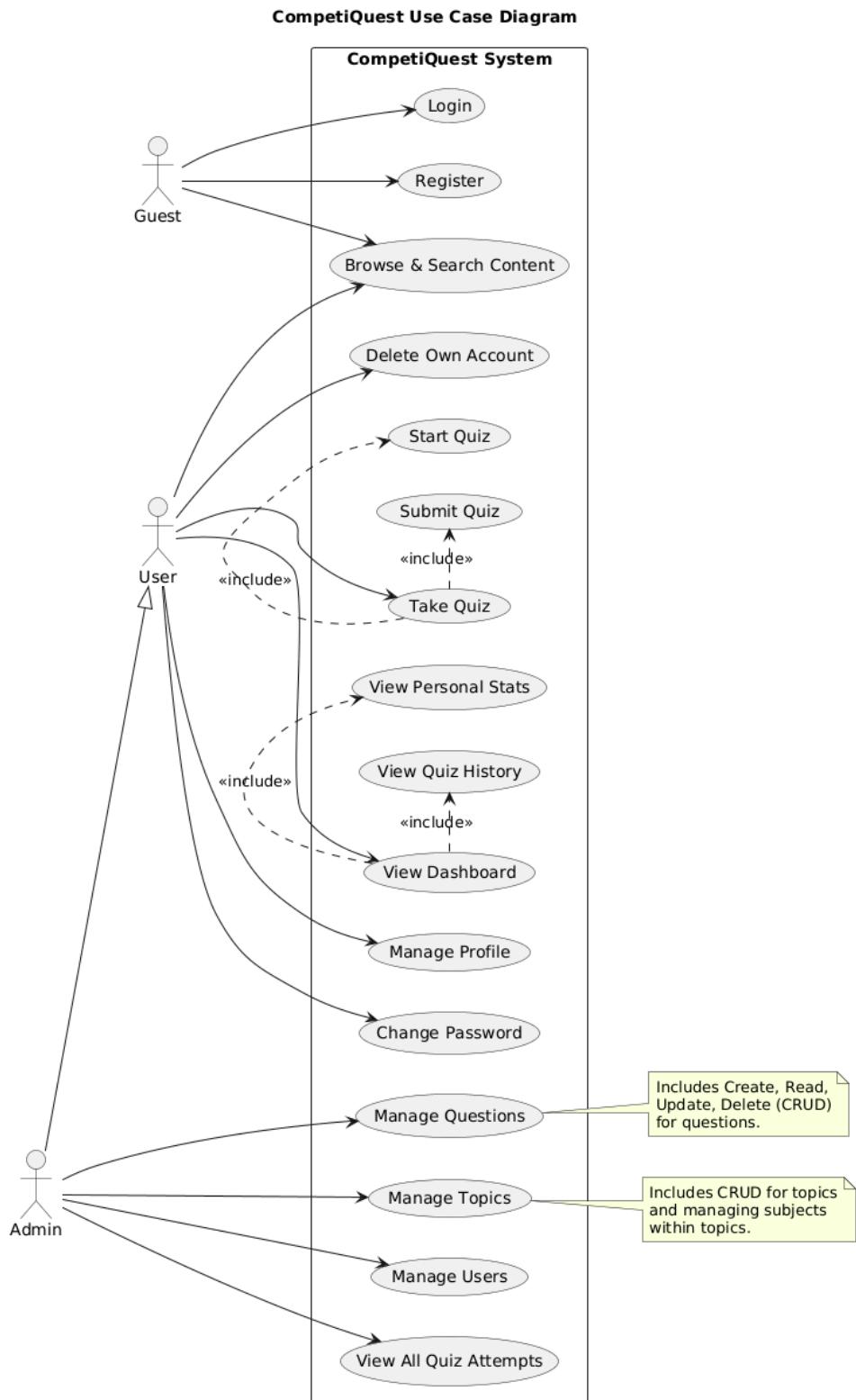
- #23 Create and submit Requirements Specification (BRD) with user stories and wireframes.
- #24 Create and submit System Design Document with architecture diagrams and API contracts.
- #25 Create and maintain the Project Gantt Plan.
- #26 Prepare and deliver the Mid-Semester Demo.
- #27 Create and submit the Test Plan & Test Cases.
- #28 Deploy the application to a live URL.
- #29 Write and submit the Final Project Report.
- #30 Create and deliver the Final Presentation & Demo.
- #31 Complete and submit the Peer Review & Contribution Report.
- #32 Complete and submit the Peer Review & Contribution Report.

Use Case Diagrams

Actors : Guest, admin, user

Use Cases:

- 1) Register
- 2) Login
- 3) Manage Profile
- 4) Change Password
- 5) Delete Own account
- 6) Take Quiz
- 7) View Dashboard
- 8) Browse and search content
- 9) Manage Questions
- 10) Manage topics
- 11) Manage users
- 12) View attempts
- 13) View quiz history
- 14) View personal stats



Interface Criteria

- **User Interface (UI/UX) Criteria:** These are non-functional requirements that describe how the user interacts with the application. They focus on usability, design consistency, and overall user experience.
- **API Interface Criteria:** These are technical specifications that define how the frontend and backend communicate. This is a contract that ensures both parts of the application work together seamlessly.

UI/UX Interface Criteria:

- **Responsiveness:** The application layout must adapt cleanly to different screen sizes, ensuring it is fully functional and accessible on both desktop and mobile devices.
- **Consistency:** All pages must share a consistent header, navigation bar, and footer. Buttons, form fields, and typographic styles should be uniform across the entire application.
- **Feedback:** The system must provide immediate visual feedback for user actions.
For example:
 - A loading spinner must be displayed when fetching questions or submitting a quiz.
 - After a quiz submission, results must be displayed instantly.
 - Success or error messages (e.g., "Profile Updated Successfully") must be shown in a clear, non-disruptive manner.
- **Accessibility:** The application should follow WCAG 2.1 Level AA guidelines, including keyboard navigation, sufficient color contrast, and descriptive alt text for images.

API Interface Criteria:

- **Authentication:** All protected backend routes must expect a JSON Web Token (JWT) in the Authorization header. Requests without a valid JWT must be rejected with a 401 Unauthorized status code.

- **Status Codes:** The API will use standard HTTP status codes to indicate the outcome of a request:
 - 200 OK: For successful GET requests.
 - 201 Created: For successful POST requests (e.g., creating a new question or user).
 - 400 Bad Request: For requests with invalid or missing data (e.g., submitting a form with empty fields).
 - 403 Forbidden: For when a non-admin user attempts to access an admin-only route (e.g., deleting a topic).
 - 404 Not Found: When a requested resource does not exist (e.g., GET /api/questions/:id for an invalid ID).
- **Error Response Structure:** All error responses from the API must follow a consistent JSON structure, such as { "message": "Descriptive error message" }.

Acceptance Criteria

Feature: User Registration

User Story: As a new user, I want to create an account so that I can log in and take quizzes.

Acceptance Criteria:

Scenario 1: Successful Registration

- Given I am on the registration page
- When I fill in my name, a unique email, and a valid password and click "Register"
- Then my account is created, I am automatically logged in, and I am redirected to the dashboard.

Scenario 2: Email Already Exists

- Given I am on the registration page
- When I fill in an email address that already exists in the system and click "Register"

- Then I see an error message "Email already in use" and I remain on the registration page.

Scenario 3: Invalid Data

- Given I am on the registration page
- When I submit the form with an invalid email or a password that is too short
- Then I see a validation error message indicating which field is incorrect.

Feature: Taking a Quiz

User Story: As a logged-in user, I want to take a quiz, submit my answers, and see my results immediately.

Acceptance Criteria:

Scenario 1: Start and Submit a Quiz

- Given I am a logged-in user on the "Topics" page
- When I select a topic and click "Start Quiz"
- Then I am presented with a series of questions for that topic.

Scenario 2: View Instant Results

- Given I have answered all the questions in a quiz
- When I click the "Submit Quiz" button
- Then I am immediately taken to a results page showing my score, the correct answers, and my chosen answers.

Scenario 3: View Past Attempts

- Given I have completed a quiz
- When I navigate to my User Dashboard
- Then I can see the quiz I just completed in my quiz history.

Feature: Admin Manages Questions

User Story: As an Admin, I want to add, update, and delete questions so I can manage the quiz content.

Acceptance Criteria:

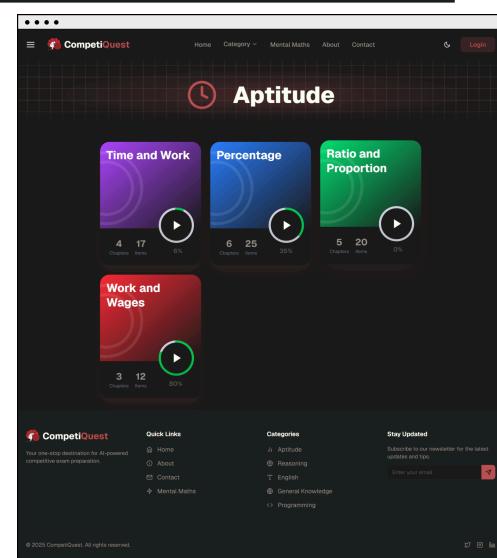
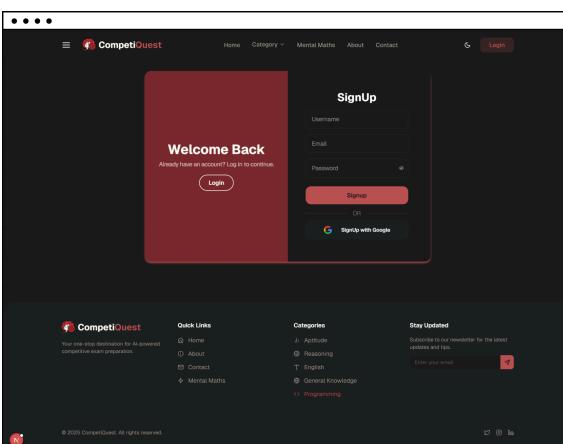
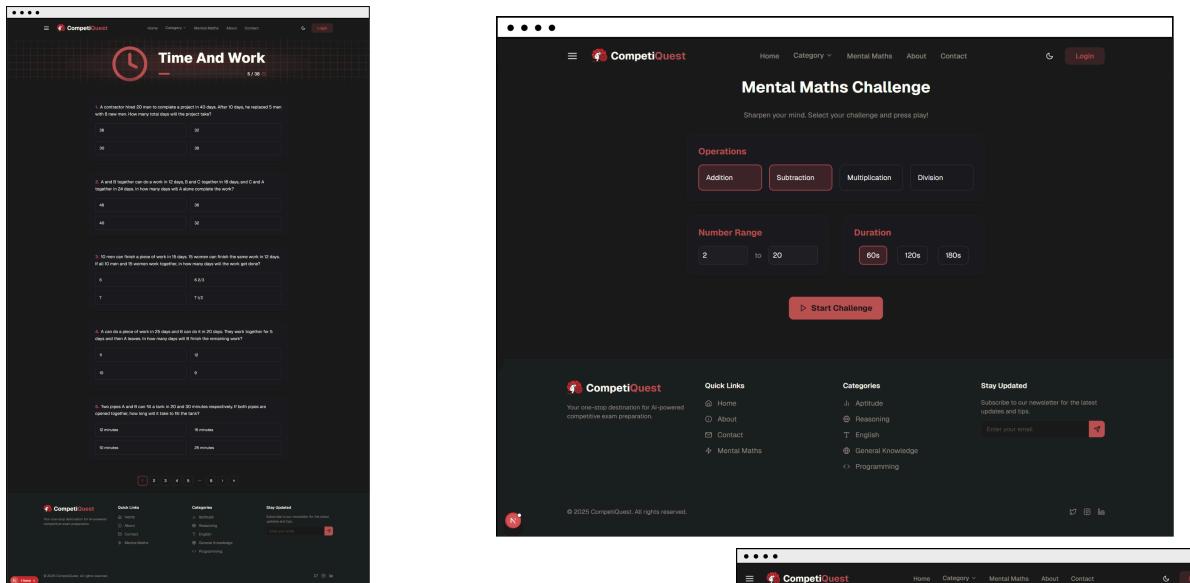
Scenario 1: Admin Adds a New Question Successfully

- Given I am logged in as an Admin and am on the question management page
- When I fill out all required fields for a new question and click "Save"
- Then the question is added to the system, and I see a success message.

Scenario 2: A Regular User Tries to Add a Question

- Given I am logged in as a regular (non-admin) user
- When I attempt to access the question creation page or send a POST request to /api/questions
- Then I am denied access and see a "Forbidden" or "Unauthorized" error.

Wireframes and UI/UX MockUps



The image displays three screenshots of the CompetiQuest website. The first screenshot shows the homepage with a dark background and a large central text area. It features the title "Dominate Your Competitive Exams with AI Precision" in a large, bold, white font. Below the title, there is a brief description of the platform's offerings and two buttons: "Start Practicing Now" and "Browse Topics". The second screenshot shows the "Login" page with a dark theme. It includes fields for "Username" and "Password", a "Login" button, and a "Log in with Google" button. A red sidebar on the right contains a "New Here" section with a "Sign up" button. The third screenshot is a detailed view of the website's features, showing sections like "A Journey Through Our Features" and "Explore Our Core Offerings". These sections contain various icons and descriptions of the platform's capabilities.

This screenshot provides a detailed look at the CompetiQuest website's features and impact. The top section features the title "Dominate Your Competitive Exams with AI Precision" and a brief description of the platform's offerings. Below this, the "A Journey Through Our Features" section highlights several key components: "Extensive Question Bank" (Maths, Aptitude, Reasoning, English, GK), "AI Chatbot Tutor" (instant answers and topic explanations), "Progress Tracking" (monitoring strengths and weaknesses), "Mental Maths" (improving calculation speed), "Modern UI & Dark Mode" (study in style), and "Regular Updates" (keeping content relevant). The "The Philosophy Behind Our Platform" section discusses the mission, vision, and approach. The "Our Impact in Numbers" section shows statistics: 5,000+ registered users, 1,000+ active users, and 90% user satisfaction. The "Get In Touch" section allows users to contact the office via email, phone, or fax, and provides social media links. The footer includes a "CompetiQuest" logo, a "Quick Links" menu, and copyright information.

This screenshot continues the detailed view of the website's features. The "Explore Our Core Offerings" section lists "Aptitude", "Logical Reasoning", and "English Language". The "The Philosophy Behind Our Platform" section reiterates the mission, vision, and approach. The "Our Impact in Numbers" section provides more statistics: 5,000+ registered users, 1,000+ active users, and 90% user satisfaction. The "Get In Touch" section includes a "Contact Us" form with fields for name, email, subject, and message, along with a "Send Message" button. The footer includes a "CompetiQuest" logo, a "Quick Links" menu, and copyright information.

The image shows two side-by-side screenshots of the CompetiQuest website.

Left Screenshot (Sign Up):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A red "Welcome Back" box with a "Login" button. To its right is a "SignUp" form with fields for Username, Email, Password, and a "Signup" button. Below it is a "Google Sign Up" button.
- Footer:** CompetiQuest logo, Quick Links (Home, About, Contact, Mental Maths), Categories (Aptitude, Reasoning, English, General Knowledge, Programming), Stay Updated newsletter sign-up, and a copyright notice.

Right Screenshot (Login):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A red "New Here" box with a "Sign up" button. To its right is a "Login" form with fields for Username and Password, and a "Log in with Google" button.
- Footer:** CompetiQuest logo, Quick Links, Categories, Stay Updated newsletter sign-up, and a copyright notice.

The image shows four screenshots of the CompetiQuest website, illustrating different sections of the platform.

Top Left Screenshot (Aptitude Section):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A large "Aptitude" section featuring three cards: "Time and Work" (4 chapters, 17 items, 6%), "Percentage" (6 chapters, 25 items, 35%), and "Ratio and Proportion" (5 chapters, 20 items, 0%). Below is a "Work and Wages" card (3 chapters, 12 items, 80%) with a play button.
- Footer:** CompetiQuest logo, Quick Links, Categories, Stay Updated newsletter sign-up, and a copyright notice.

Top Right Screenshot (Topic Page):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A "Time And Work" topic page with a clock icon and a progress bar at 5/38. It contains five math problems with input fields for answers.
- Footer:** CompetiQuest logo, Quick Links, Categories, Stay Updated newsletter sign-up, and a copyright notice.

Bottom Left Screenshot (Math Problem):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A math problem: "1. A contractor hired 20 men to complete a project in 40 days. After 10 days, he replaced 5 men with 8 new men. How many total days will the project take?" Input fields show 36, 32, 30, and 38.
- Footer:** CompetiQuest logo, Quick Links, Categories, Stay Updated newsletter sign-up, and a copyright notice.

Bottom Right Screenshot (Math Problem):

- Header:** CompetiQuest logo, navigation bar with Home, Category, Mental Maths, About, Contact, and a Login button.
- Main Content:** A math problem: "2. A and B together can do a work in 12 days. B and C together in 16 days, and C and A together in 24 days. In how many days will A alone complete the work?" Input fields show 48, 36, 40, and 32.
- Footer:** CompetiQuest logo, Quick Links, Categories, Stay Updated newsletter sign-up, and a copyright notice.