Software Requirements Specification

For

Safwaat

Version 1.1

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1 INTRODUCTION

1.1 PURPOSE OF REQUIREMENT DOCUMENT

The purpose of this Software Requirement Specification document is to comprehensively describe the whole software system of the Safwaat application by stating all of the requirements. The document also highlights the different types of constraints under which the system will operate, while also mentioning the purpose and benefits of the features.

It forms the basis of the design and architecture of the system as it sets out the framework that all the development teams will follow. It describes what features the system will contain, and how those features will function, and also defines the necessary user interactions with different use cases.

In addition to that, it acts as an input to the design specification and also serves as a source document for testing and validation. It also aims to ensure that the requirement elicitation team understands the client or stakeholders' needs.

The **intended audience** of this system are the people who intend to enhance their Arabic pronunciation, learn the Tajweed rules and regulations and practice these rules directly from the Quran to improve their Quranic recitation.

1.2 PROJECT SCOPE

1.2.1 Description

Safwaat is a comprehensive and engaging educational application designed to empower users with effective learning tools, personalized experiences, and meaningful progress tracking. With a range of dynamic features, our platform provides an enjoyable and highly effective learning journey for users seeking to excel in Arabic pronunciation and Tajweed skills.

Our platform's key features include a Friendship Hub that fosters user connections and ensures secure friend requests, a Leaderboard that encourages competition and recognition, and Social Media Sharing for expanding the reach of accomplishments. Users can also engage in real-time group discussions and private chat rooms with ChatSpace, personalize their profiles, and showcase achievements with the User Profile feature. Taqraar facilitates structured discussions and questions, while the Consistency Companion helps users maintain daily learning consistency.

The Learning Unit seamlessly blends teaching and practice, and the Notifications System keeps users informed while respecting their preferences and data protection. Users can participate in daily challenges, achieve badges and rewards with the Quest Arena, and efficiently organize learning materials with FlashCraft. The Level Map offers easy navigation through the educational journey. Safwaat is designed to cater to users of all levels, providing a rich and engaging educational experience that makes learning enjoyable and highly effective. Hence the users can connect with peers, track their progress, and achieve their Tajweed learning goals with Safwaat.

1.2.2 Benefits

The application offers a holistic Tajweed learning experience that leads to enhanced long-term knowledge retention, making it easier for users to remember and apply what they've

learned. Users benefit from improved pronunciation skills through comprehensive teaching and assessment. The competitive elements, such as leaderboards and daily challenges, keep users motivated and committed to the learning journey, ensuring consistent progress. The application allows easy progress tracking and helps in structuring the knowledge learned for better understanding and features to keep users informed and involved.

The application is designed to cater to diverse user needs, making learning inclusive and enjoyable. It offers a secure and user-friendly environment, respecting user preferences and ensuring data protection. Additionally, the app encourages collaborative learning and fosters connections among users. These advantages collectively create an enriching Tajweed learning environment that empowers users to succeed in their Arabic pronunciation journey.

1.2.3 Corporate Goals

The application's corporate goals encompass a multifaceted approach. Firstly, it aims to establish itself as a leading platform for effective Tajweed learning, contributing to the users' personal and professional development. Secondly, the application strives to foster a sense of community among users, promoting collaboration and peer support. Thirdly, it seeks to expand its user base by offering an engaging and competitive learning environment, attracting a diverse audience. Additionally, the application endeavors to continuously enhance its features, staying at the forefront of technology and educational advancements. Overall, the corporate goals revolve around providing a comprehensive and rewarding Tajweed learning experience while achieving growth and innovation in the educational technology sector.

1.3 DEFINITIONS,ACRONYMS AND ABBREVIATIONS

1.3.1 Definitions

1. **Ambience:** It refers to a glow surrounding the place.

2. **Event Driven Architecture:** Event-Driven Architecture is a design approach where systems respond to and process events as they occur. Events, which can be anything notable within a system, trigger actions in other parts of the system.

3. **Latency:** It refers to the time taken for data to go from source to destination.

4. **Makhraj:** It refers to the place from which the sound of a letter originates.

5. **Oral Cavity:** It refers to the mouth.

6. **Overhead:** Memory overhead is the amount of memory required by a program or system beyond the minimum necessary to execute the program or system.

7. **Quad Topology:** It refers to 3D geometry constructed using 4-sided polygons that provide smoother animations and reduce rendering overhead.

8. **Rendering:** It refers to the process of generating images from a 2D or 3D model using a computer program.

9. **Subdivision Level:** It refers to the level of detail; higher levels mean higher detail and smoother textures.

10. **Tajweed:** Tajweed (or Tajwid) is the set of rules and principles that govern the proper pronunciation and recitation of the Quran in Arabic. It involves rules for correct articulation, pronunciation, and intonation to ensure that the Quran is recited with clarity and beauty, preserving its original text and meaning.

11. **Tonal Palate:** It refers to the roof of the mouth that separates the oral cavity from the nasal cavity.

12. **Translucent:** Translucent refers to an object that allows seeing through it partially.

13. **Request Response Architecture:** Request-Response Architecture is a model where one system, known as the client, sends a request to another system, known as the server. The server processes the request and sends back a response.

14. **UV Mapping:** UV mapping is the 3D modelling process of projecting a 2D image onto a 3D model's surface. The term "UV" refers to the bi-dimensional nature of the process: the letters "U" and "V" denote the axes of the 2D texture.

15. **Web Sockets:** Web Sockets is a protocol that enables two-way communication between a client and a server, allowing real-time data transfer over a single, persistent connection. This technology is crucial for creating interactive, real-time web applications.

1.3.2 Abbreviations

1. **API:** An API (Application Programming Interface) is a set of protocols, tools, and definitions that enable different software applications to communicate and interact with each other. It allows one software application to access the functionalities or data of another.

2. **ARIA:** ARIA (Accessible Rich Internet Applications) is a set of attributes that can be added to HTML elements to improve accessibility for users with disabilities. It aids in making web content and applications more accessible by providing additional information to assistive technologies.

3. **BIN:** A "BIN" file is a binary file, which contains compiled computer data, code, or information that is not in plain text. These files can store various types of data, such as executable programs or data for hardware devices.

4. **PECA:** PECA (Prevention of Electronic Crimes Act) is a legislation designed to address cybercrimes, electronic fraud, and other illegal activities conducted through electronic means. It defines offenses and penalties related to electronic crimes.

5. **CPU:** CPU (Central Processing Unit) is the primary component of a computer that performs instructions and carries out computations. It is often referred to as the brain of the computer.

6. **GLTF:** GLTF (Graphics Library Transmission Format) is an open standard file format used for 3D scenes and models. It's designed to be compact and efficient for fast transmission and loading of 3D content in applications.

7. **GLB:** GLB stands for "Binary Representation of 3D Models" and is a file format used for the efficient and compact transmission of 3D scenes and models. It encapsulates 3D model data (geometry, textures, and more) into a single file, making it easier to share and render 3D models in various applications and platforms.

8. **GDPR:** GDPR (General Data Protection Regulation) is a European Union regulation that governs the data protection and privacy of individuals within the EU and the European Economic Area. It sets guidelines for the collection, processing, and storage of personal data.

9. **JWT:** JWT (JSON Web Tokens) is a compact, URL-safe means of representing claims to be transferred between two parties. It's commonly used in authentication and information exchange in web services.

10. **PNG:** PNG stands for "Portable Network Graphics." It is a raster graphics file format that supports lossless data compression. PNG files are commonly used for storing images on the internet. They support transparent backgrounds and a wide range of colors, making them suitable for various types of images, including graphics, icons, and photographs.

11. **REST:** REST (Representational State Transfer) is an architectural style for designing networked applications. It relies on a stateless communication protocol, usually HTTP, and emphasises a uniform interface for interactions.

12. **SDK:** An SDK (Software Development Kit) is a set of software tools and programs provided by developers to create applications for specific platforms, often including application programming interfaces, libraries, and documentation.

13. **XP:** "XP" stands for "experience." It refers to the experience level of the user in app which increases as users perform in-app tasks like but not limited to quest and lesson completion.

1.4 REFERENCES

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1.5 OVERVIEW

The rest of this SRS is organized as follows:

- Section 2 gives an overall description of the software. It gives what level of proficiency is expected of the user and the description of different features of software.
- Section 3 contains some general constraints while making the software and some assumptions and dependencies that are assumed.
- Section 4 contains most important features presented with detailed description, and requirements. It gives specific requirements which the software is expected to deliver. Functional requirements are given in this section. This section is written primarily for the developers and describes in technical terms the details of the functionality of the product and about safety and performance

All sections of the document describe the same software product in its entirety, but are intended for different audiences and thus use different language.

2 GENERAL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

Users will have access to the application that offers several key functionalities. Users can create and manage their profiles, track their learning progress, and earn achievements and badges as they improve their pronunciation skills. They have access to a variety of pronunciation lessons and practice materials, where they can listen to audio clips, practice speaking, and receive feedback.

The application also fosters a sense of community through features like a forum where users can discuss challenges and seek guidance from others. Social media integration allows users to share their achievements with their network, while a leaderboard encourages competition and motivation.

Notifications keep users updated on new lessons and interactions, and a friendship hub facilitates connections with fellow learners. These functionalities collectively provide a comprehensive platform for users to enhance their pronunciation abilities and engage in a supportive learning environment.

2.2 PRODUCT FUNCTION

2.2.1 Feature 1: Registration

The system shall validate the user inputs for correctness and adherence to the specified criteria.If any input is invalid, the system shall display appropriate error messages and prevent registration until valid input is provided.Upon successful validation, the system shall create a new user account and store the provided credentials in the database. The system shall ensure the uniqueness of usernames to prevent duplication.The system shall provide feedback to the user upon successful registration.

2.2.2 Feature 2: Login

The system shall permit the user to enter their username and password to log into their account. It also aloows user to login through Google Account.

2.2.3 Feature 3: Level Map

The 'Level Map' feature offers a visual representation of the user's educational journey, allowing easy navigation through lessons via clickable lesson icons. Users can efficiently interact with the map, view lesson details, and start a lesson through the level map. This feature enhances learning, provides intuitive navigation, and user-friendly tutorials, and stores user progress data for a personalized learning experience. It simplifies learning, motivates users, and aids in assessment.

2.2.4 Feature 4: Learning Unit

Our app's Interactive 'Learning Unit' feature offers a dynamic and structured educational experience that seamlessly blends teaching and practice to promote effective learning. Users progress through a well-organized sequence of slides, comprising 'Teaching Slides' and 'Practice Slides.' Teaching Slides deliver concise textual and visual content, ensuring that users grasp essential concepts without feeling overwhelmed. Practice Slides reinforce and apply this knowledge through diverse assessment methods. Users must provide correct answers to advance, with incorrect responses followed by clarifications. Post-lesson

summaries provide insights into performance metrics, such as points, XP, stars earned, and completion time. This feature is purpose-built to maximize learning outcomes, bolster knowledge retention, motivate users through rewards and level progression, and, ultimately, deliver an enjoyable and highly effective learning journey. It equips users with the knowledge and skills needed to excel in their Arabic pronunciation while making learning a gratifying experience.

2.2.5 Feature 5: User Profile

The User Profile feature of the application encompasses a comprehensive set of functionalities designed to enhance user engagement and personalization, with options to display their name, bio, nationality, and connections. It offers a range of engagement tools such as adding friends, tracking mutual connections, and showcasing achievements, fostering a vibrant and personalized community.

2.2.6 Feature 6: Taqraar

Taqraar is a collaborative cross-questioning and assessment session designed to facilitate dynamic conversations and insightful interactions within user groups. With Taqraar, hosts orchestrate structured discussions, enabling participants to take turns posting questions, providing answers, and engaging in meaningful exchanges. This feature primarily increases knowledge retention by many folds along with enhancing group communication, knowledge sharing, and fun, making it an ideal tool for learning, team-building, and interactive social experiences.

2.2.7 Feature 7: Consistency Companion

The "Consistency Companion" is a feature designed to inspire users to maintain daily engagement with our application. It displays a visual calendar that highlights each day a user successfully completes a lesson, contributing to their streak count. This not only fosters a sense of accomplishment but also encourages users to stay committed to their learning journey. With reminders, precise tracking, and user-friendly design, this feature provides a motivating and visually appealing way to track and sustain daily learning consistency.

2.2.8 Feature 8: Notifications System

The Notification System Feature serves to provide users with educational updates through pop-up and email notifications. It empowers users to easily manage their notification preferences, ensuring a user-friendly experience. In cases where notifications are not supported, a fallback mechanism provides clear guidance. The feature's key benefit lies in delivering personalized, engaging weekly progress emails that summarize the user's educational journey, promoting user engagement and convenience. Furthermore, it securely stores user data and offers clear documentation for managing communication preferences and notification permissions.

2.2.9 Feature 9: Quest Arena

The Quest Arena Feature offers users a diverse and engaging experience within the application. Users can access and complete daily challenges and achievements, with tailored objectives and real-time updates, earning rewards such as XP points and gems. The system maintains a challenge pool with varying difficulty levels, dynamically assigning new challenges each day. A sense of accomplishment and progress tracking is encouraged, and users can share their achievements on social media, promoting engagement and attracting new users to the app. This feature provides a rewarding experience and drives user retention along with enhancing user satisfaction and app growth.

2.2.10 Feature 10: FlashCraft

The "FlashCraft" feature is a versatile tool in our application, designed to help users efficiently organize and enhance their learning materials. Users can create flashcard sets with titles and populate them with flashcards containing terms and descriptions, making it easy to structure and categorize their study content. With the option to modify, delete, or remove specific flashcards, self-assessment capabilities, and progress tracking, this feature promotes effective learning and memory retention. Users can also enhance their flashcards with images, categorize and sort them, collaborate with others, and even enjoy gamified elements, all within a single, user-friendly interface.

2.2.11 Feature 11: SocialMedia Sharing

The SocialMedia Sharing feature allows users to effortlessly share their achievement scores on popular social media platforms. Users can select WhatsApp, Facebook, or Twitter (formerly known as X) to share their accomplishments with friends and followers. This feature promotes engagement and recognition, offering the benefits of easy sharing and expanding the reach of their achievements

2.2.12 Feature 12: Leaderboard

The 'Leaderboard' feature introduces dynamic leaderboards with multiple weekly leagues, offering promotions and demotions based on user performance. These leaderboards accommodate around 30 users each and adapt even with fewer users. Users receive XP rewards, promotions, and historical record-keeping, with a scheduler ensuring regular updates. This promotes heightened user engagement and competition, offering structured gameplay, recognition, and rewards. The result is a more engaging and competitive user experience.

2.2.13 Feature 13: Friendship Hub

The 'Friendship Hub' feature introduces a friend request and management feature, allowing users to send, accept, or reject friend requests. It prevents duplicate requests and enforces limits to maintain user privacy and a positive user experience. Hence, this feature fosters user connections, enhances social interactions, and offers a streamlined and secure friend request process, ultimately promoting a more engaging and user-friendly platform where multiple users can learn together.

2.2.14 Feature 14: ChatSpace

ChatSpace is a feature designed to foster interactive learning and collaboration between the users of the application. With ChatSpace, users can effortlessly create private rooms for group discussions, enhancing peer-to-peer learning experiences. Through the utilization of WebSockets and the socket.io library, seamless real-time connections are established as users click on invitation links. Administrators can invite peers, prompting confirmation

messages for user admission. Once admitted, participants can engage in chat activities, including private and group chats. The feature offers the benefits of organized, real-time communication, with timestamps on messages, simplified member management, and disbanding of rooms when not in use, ensuring a seamless and efficient learning environment.

2.2.15 Feature 15: 3D Model

The 3D model feature in our app offers users a unique and immersive experience for understanding Makhraj pronunciation. With the ability to visualize the Makhraj in a 3D view, rotate the model for a comprehensive perspective, trigger synchronized animations, and interact with anatomical elements involved in pronunciation, our feature enhances the learning process. This feature serves as an indispensable educational tool, enabling users to grasp the intricacies of pronunciation with clarity and precision.

2.2.16 Feature 16: Analytics

The Analytics section serves as a powerful tool for our users, offering a clear and insightful way to track their progress and achievements. By visualizing data through charts and graphs, users can gain a better understanding of their XP growth, streaks, and Taqraar points. This feature enhances their ability to make informed decisions and stay motivated, ultimately leading to improved performance and a more rewarding experience.

3 USER CLASSES AND CHARACTERISTICS

The Project has only one user class.

3.0.1 General User

General Users include anyone who is interested in learning and improving Arabic pronunciation and Tajweed skills. The user maybe a school or university going student, self-learner who is enthusiastic in enhancing their Tajweed, or those involved in religious studies and want to enhance their Quranic recitation. The user can easily navigate through the platform and learn the content in an efficient, interactive, and convenient manner. They can utilize all the features that would assist them in gaining proficiency in Arabic pronunciation.

3.1 GENERAL CONSTRAINTS

3.1.1 Hardware Constraints

- The system's software and operations must be designed to effectively function within the defined hardware specifications of at least a dual-core processor (e.g., Intel CoreTM2 Duo or equivalent AMD) and a minimum of 4GB RAM. Any software updates must not demand hardware upgrades beyond these established specifications to ensure continued smooth performance.

3.1.2 Network Constraints

- The system must be designed to operate within specified latency thresholds to facilitate real-time interaction and responsiveness. The measured latency for system operations must not exceed predefined limits, ensuring swift and timely responses for user interactions and real-time functionalities.
- The system is inherently dependent on a constant and reliable internet connection to deliver some of its features to users effectively.

3.1.3 Software Constraints

- The system's architecture and codebase must be developed using cross-platform technologies or compatible frameworks to ensure uniform execution and functionality across multiple operating systems (e.g., iOS, Android, Windows, macOS). The system must not rely on OS-specific functionalities, enabling consistent user experiences across diverse platforms without compromising performance or features.
- The system must be designed to ensure full compatibility across a range of widely used web browsers, including but not limited to Google Chrome, Mozilla Firefox, Safari, Microsoft Edge, and others. The system's features and functionalities must remain consistent and fully operational across these browsers, adhering to web standards and best practices without compromising user experience.

3.1.4 Performance Constraints

- The system's design must prioritize efficient resource utilization, ensuring that complex tasks are executed with less overhead. Optimization strategies must be employed to manage system resources effectively without compromising functionality, preventing excessive CPU, memory, or other resource usage during complex operations.
- The system's design should be flexible enough to consistently meet predetermined response time targets for user interactions. Any changes or updates introduced to the system should not compromise the predefined response time benchmarks.

3.1.5 Compatibility Constraints

- The system is constrained to maintain backward compatibility with older versions of the software or applications. This constraint is in place to ensure a smooth transition for existing users and systems during updates or changes.

3.2 ASSUMPTIONS AND DEPENDENCIES

3.2.1 Assumptions

It is assumed that the user's system meets the necessary hardware and software requirements for the proper installation and functioning of the pronunciation learning website.Also user's system is assumed to have reliable internet connectivity, as some features or resources of the software may require online access.

3.2.2 Dependencies

1. Cross-Browser Compatibility: The website's functionality is contingent on ensuring cross-browser compatibility. It is imperative that the website functions seamlessly across a wide spectrum of web browsers, encompassing but not confined to Chrome, Firefox, Safari, and Edge. Any incompatibilities with certain browsers have the potential to hinder user accessibility, thereby impacting the overall quality of the user experience.

2. Reliable Hosting and Server Capacity: The website's operational continuity hinges upon dependable hosting services and servers possessing adequate capacity to accommodate user traffic. Ensuring minimal downtime and latency is of utmost importance in order to maintain a high-quality user experience.

3. Audio and Video Hardware Dependence: The effective delivery of pronunciation lessons is contingent upon the availability and proper functioning of audio and video hardware on the user's device. The software relies on the assumption that the user's device is equipped with functional speakers or headphones.

4. Third Party APIs and Security Measures: To establish a secure and safe learning environment, particularly for children, the website relies on a comprehensive suite of security measures. These encompass third-party data encryption, user authentication protocols, and safeguards against potential cyber threats.

5. Network Connectivity and Internet Stability: The software's performance is acutely dependent on the uninterrupted availability of network connectivity and a stable

internet connection. It relies on the uninterrupted transmission of multimedia content, encompassing essential audio and visual elements, crucial for the effective instruction of pronunciation to children.

4 SPECIFIC REQUIREMENT

4.1 FUNCTIONAL REQUIREMENT

4.1.1 Feature 1: Registration

4.1.1.1 The system will ask the user to enter the following credentials:

- First name
- Last name
- Date of birth
- Gender
- Email Address
- Phone number
- Username and Password

4.1.1.2 The date of birth should be in DD/MM/YY format.

4.1.1.3 The phone number should be eleven digits long.

4.1.1.4 The password length must be greater than 8, and it should comprise of at least one capital letter, a small letter and a number.

4.1.1.5 The length of the username entered must be less than 20 and should not include special characters like #, % etc.

4.1.1.6 The system shall include a mechanism for users to review and accept the terms and conditions or user agreement during the registration process.

4.1.2 Feature 2: Login

4.1.2.1 The system will permit the user to enter their username and password to log into their account.

4.1.2.2 The system will identify the type of user and direct them to their respective panel of the application.

4.1.2.3 The system will verify the credentials entered by the user.

4.1.2.4 The system will generate a 'Fill all entries' error message if the user proceeds to log in with either or both entry fields left blank.

4.1.2.5 The system will prompt an 'Invalid username' or 'Invalid password' error message if these respective credentials entered are incorrect.

4.1.2.6 The system will allow the users to restore their accounts in case they forget their username or password.

4.1.2.7 The system will allow the user to enter the new password of his account.

4.1.2.7.1 The system will update the password of the user in the database.

4.1.2.8 The system will provide user a button for login through existing Gmail Account.

4.1.3 Feature 3: Level Map

4.1.3.1 The system must present the whole level map on the user interface, illustrating the user's progression through lessons.

4.1.3.2 The system must support the import of design assets, including maps and interactive elements created in design tools like Figma or Illustrator.

4.1.3.3 Users must be able to interact with specific elements on the map, such as clickable ellipses that represent individual lessons.

4.1.3.4 The system will employ image coordinates and remapping techniques to assist users in navigating and progressing through lessons.

4.1.3.5 When a user hovers over a lesson element, the system must display relevant information about the level, such as its title or description.

4.1.3.6 Clicking an element should trigger a specific action, such as navigating to a new page or displaying relevant information.

4.1.3.7 Initially, lessons that are locked or inaccessible should be visually distinguished with subdued colors.

4.1.3.8 As the user advances and unlocks a new lesson, the color of the lesson icon should revert to its default state.

4.1.3.9 The lesson number must be displayed prominently on the lesson icon.

4.1.3.10 The map should display stars above the lesson icon to represent user's performance of a particular lesson.

4.1.3.11 The system must provide a means of navigation between different areas of the map.

4.1.3.12 The system shall provide clear and user-friendly tutorials that guides new users on how to effectively use the level map and its features.

4.1.3.13 The system should store data related to the map, including each user's progress.

4.1.4 Feature 4: Learning Unit

4.1.4.1 Upon selecting a lesson, a "Start" button becomes available, enabling users to commence the lesson.

4.1.4.2 Each lesson consists of multiple slides categorised into two types: 'Teaching Slides' and 'Practice Slides' where the 'Teaching Slides' are followed by 'Practice Slides'.

4.1.4.3 Each teaching slide shall feature a topic heading describing what will be discussed in that slide.

4.1.4.4 The system provides the teaching content through both textual and visual representations to facilitate comprehension.

4.1.4.5 The system shall ensure that textual information is presented concisely, avoiding excessive length to ensure that users can efficiently absorb the content without being overwhelmed.

4.1.4.6 Visual elements may include 2D/3D models, images, videos, or labelled diagrams, all intended to promote user understanding and improve the delivery of information.

4.1.4.7 The system will provide an option to play the 3D animation.

4.1.4.8 The system shall allow the user to pause the animation so that the user can analyse the specificities of the Makhraj of the model.

4.1.4.9 For each 3D model presented in the teaching slides, a textual description will be provided to elucidate the specific aspects or points that the model is intended to highlight to provide additional context.

4.1.4.10 The Teaching Slides will have no points.

4.1.4.11 Users can navigate to the next teaching slide by clicking a "Next" button, once the user feels that they have grasped the concept presented in that particular slide.

4.1.4.12 Each Practice Slide shall only contain one question.

4.1.4.13 In the Practice Slide, clear and concise instructions will be provided to guide the user on the specific task or activity they are required to perform for each practice question.

4.1.4.14 The system shall apply different assessment methods in Practice Slides, such as multiple-choice questions (MCQs), drag-and-drop, labelling, matching, and audio assessment to enhance the user's knowledge retention and understanding.

4.1.4.14.1 The system shall perform an audio assessment using techniques like presenting the user with a verse along with its

audio having an error, and the user will have to identify the mispronounced word by selecting the correct option.

4.1.4.15 Users must answer the practice question to proceed to the next slide; the "Next" button remains disabled until an answer is selected.

4.1.4.16 The questions in the practice slides will be based on the knowledge gained in the previous teaching slides of the same lesson, or of the previous lessons to reinforce and apply the acquired knowledge.

4.1.4.16.1 The system shall use spaced repetition learning technique that involves revisiting material at increasing intervals over time to improve long-term retention.

4.1.4.17 In many of the questions, audio will also be provided which will be played on click event.

4.1.4.18 The system shall provide two options to play the audio either at its normal speed or at a slow speed.

4.1.4.19 Users earn points for correctly answering practice questions (1 point per practice slide).

4.1.4.20 The system tracks and stores the total points gained throughout the lesson.

4.1.4.21 If a user answers a practice question incorrectly, the system shall provide the correct answer for reference.

4.1.4.22 The system shall restrict the user to only proceed in a forward direction through the lesson; no option to revisit previous slides or skip questions is provided.

4.1.4.23 Upon completing the lesson, the system displays the following information:

- Total points earned
- XP gained

- Stars earned
- Time taken to complete the lesson

4.1.4.24 Users are given an option to exit the lesson, with a confirmation message warning about potential progress loss.

4.1.4.25 At lesson completion, the system calculates the stars gained based on points earned:

- Less than 30% correct: 0 stars
- 30%-60% correct: 1 star
- 60%-90% correct: 2 stars
- Above 90% correct: 3 stars

4.1.4.26 The system must track and store user progress, including points, XP, stars, and completion time.

4.1.4.27 The system shall calculate the XP based on the stars earned and the time taken to complete the lesson.

4.1.4.28 Lesson progression is sequential; users must achieve at least 1 star to unlock the next lesson.

4.1.4.29 Users can choose to reattempt lessons regardless of the stars earned. The highest score obtained among all attempts is considered.

4.1.4.30 XPs are used to advance on the leaderboard and unlock higher levels.

4.1.4.31 As levels increase, more XPs are required to rank up the level.

4.1.4.32 After the lesson completion, the system shall redirect the user to the level map seamlessly.

4.1.5 Feature 5: User Profile

4.1.5.1 The system shall prominently display the user's full name and their unique username.

4.1.5.2 The system shall display the bio of the user, allowing users to edit and update this information.

4.1.5.3 The system shall allow users to see a list of individuals following their profile as well as whom the profile owner follows.

4.1.5.4 The system shall display the nationality flag corresponding to the country of origin of the user.

4.1.5.5 The system shall allow the user to add other users as friends through a designated button when viewing their profile.

4.1.5.6 The system shall display a list of mutual friends when a user views another user's profile.

4.1.5.7 The system shall automatically record and display the date when a user joined the platform.

4.1.5.8 The system shall allow users to upload and change their profile picture to personalize their profile.

4.1.5.8.1 The system shall support widely accepted image file formats, including JPEG and PNG.

4.1.5.8.2 The system shall recommend profile picture dimensions of 200x200 pixels, providing a balance between image quality and performance.

4.1.5.8.3 Excessively high resolutions shall be discouraged, as they can increase page load times.

4.1.5.8.4 The system shall enforce a file size limit for profile pictures, typically ranging from 100KB to 200KB.

4.1.5.8.5 The system shall encourage users to maintain a round aspect ratio for their profile pictures (1:1), to ensure consistency in how profile pictures are displayed across the platform.

4.1.5.8.6 The system shall provide a default image option for users who have not uploaded a personalized profile picture.

4.1.5.9 The system shall track and display following statistics:

- Total XP
- Streak Count
- Current League Name
- Total lessons cleared
- Total three star levels
- Number of Flashcard sets

4.1.5.10 The system shall showcase the user's earned achievements in a dedicated section of the user profile.

4.1.6 Feature 6: Taqraar

4.1.6.1 Any particular user (host) in a personal room can start a quiz session.

4.1.6.2 The system shall allow the host to specify the parameters for the session.

4.1.6.2.1 The host can select participants from the personal room to include in the session.

4.1.6.2.2 The host can set the total number of rounds for inclusion in the quiz session.

4.1.6.2.3 The host can define the time interval within which participants must provide answers to questions.

4.1.6.2.4 The host can specify a uniform mark value for each question throughout the session.

4.1.6.3 The participants can take turns to post questions for other members.

4.1.6.4 The system should ensure that the questions are asked one after another in a round-robin fashion.

4.1.6.5 The participants shall have a defined time to provide answers.

4.1.6.5.1 The system would display a timer that counts down the specified time interval for answering questions.

4.1.6.5.2 Users can submit their answers within the specified time frame.

4.1.6.5.3 Once the timer elapses, the system removes answer fields from the user's screen.

4.1.6.6 The system shall alert the user of their turn to ask questions or provide answers.

4.1.6.7 After answering a question, other participants should be able to mark the answer and assign marks.

4.1.6.8 Users should receive feedback on their answers and scores.

4.1.6.9 The system should keep track of the progress of each round and session.

4.1.6.10 The session ends once all rounds are completed as specified by the host.

4.1.6.11 The system shall showcase the user's earned achievements in a dedicated section of the user profile.

4.1.6.12 The system should calculate and display the total marks gained by each user.

4.1.6.13 The system should display the ranking of users based on their total marks.

4.1.6.14 The system should ensure that each participant gets a turn to ask a question in a round-robin manner.

4.1.7 Feature 7: Consistency Companion

4.1.7.1 The system should display a calendar to visually represent the user's streak.

4.1.7.1.1 The calendar can be implemented using a frontend library or a custom component.

4.1.7.1.2 The system shall expose an API endpoint to retrieve the streak data for each user to populate the calendar with the user's streak information.

4.1.7.1.3 The streak days shall be highlighted on the calendar through a circular marker providing a clear visual representation of the user's progress.

4.1.7.2 The streak days shall be highlighted on the calendar through a circular marker providing a clear visual representation of the user's progress.

4.1.7.3 An algorithm should be developed to calculate the user's streak based on lesson completion.

4.1.7.3.1 The developed algorithm should be accurate and capable of handling different edges, including different time zones.

4.1.7.4 A well-defined database schema shall be established to store user data, including fields to track lessons completed, lesson completion date and time, and the streak count.

4.1.7.5 The system shall track the user's activity and maintain the streak for each user, ensuring the integrity and continuity of streak data.

4.1.7.5.1 A streak day shall be counted only when the user successfully completes a particular lesson.

4.1.7.5.2 When the user completes the first lesson of the day, the system shall update relevant fields and increment the streak count.

4.1.7.5.3 Completing multiple lessons on the same day shall not update the streak data and counter, ensuring accurate tracking of daily progress.

4.1.7.5.4 The system shall reset the streak data at the start of each new day, while retaining the streak counter.

4.1.7.5.5 The system should increment the streak counter and associated data when the user uses the application on consecutive days, encouraging continued engagement.

4.1.7.5.6 The system shall reset the streak count if the user fails to complete a lesson for an entire day.

4.1.7.6 The system allows the user to freeze the streak using app-specific perks, such as gems, providing flexibility for occasional breaks while preserving overall progress.

4.1.7.7 The system should implement a notification system to remind users to complete a lesson to maintain their streak, enhancing user engagement and consistency.

4.1.7.8 The system must support robust user authentication to ensure their streaks are associated with the correct user accounts.

4.1.8 Feature 8: Notifications System

4.1.8.1 The system shall request explicit user consent before displaying notification pop-ups.

4.1.8.1.1 The system shall allow users to easily grant or revoke notification permissions.

4.1.8.2 The system shall send notification pop-ups to users about specific educational updates, such as lessons or modules.

4.1.8.3 The system shall support both pop-up and email notifications.

4.1.8.4 The pop-up notifications displayed by the system shall include a title and a clear and concise message.

4.1.8.5 The system shall implement a fallback mechanism to address scenarios where a user's device or browser does not support notifications. In such cases, the system shall present a message informing the user of this limitation.

4.1.8.6 The system shall automatically send a weekly email to each user, summarizing their educational progress, through the node-cron task scheduling library.

4.1.8.7 The system shall maintain a database of user email addresses.

4.1.8.8 The system shall generate weekly progress emails that contain engaging, easy-to-read content, summarizing the user's weekly progress. These emails shall adhere to a well-defined template.

4.1.8.9 The system shall include a scheduling mechanism to send emails on specific days and times each week.

4.1.8.10 The system shall personalize emails with the recipient's name and relevant information based on the user's database.

4.1.8.11 The system shall provide an option for users to unsubscribe from email updates if they no longer wish to receive them.

4.1.8.12 The system shall protect user data and ensure compliance with data protection regulations, including GDPR.

4.1.8.13 The system shall be designed to handle a growing number of users and increasing email volumes.

4.1.8.14 The system shall provide clear documentation explaining how users can opt-in or opt-out of email updates.

4.1.8.15 The system shall provide clear documentation explaining how users can grant or disable permissions for notifications.

4.1.8.16 The system shall feature a feedback option on the website, enabling users to report issues and share their experiences with notification pop-ups and emails.

4.1.9 Feature 9: Quest Arena

4.1.9.1 The system shall enable users to view available challenges/quests by clicking on the ‘Challenges’ section.

4.1.9.2 The system shall categorize the challenges section into two distinct categories: ’Daily Challenges’ and ’Achievements’ for improved user organization and clarity.

4.1.9.3 The system shall generate ’Daily Challenges’ that are short, ensuring they are easily achievable within a single day. The system may tailor these to the user’s activity and capabilities.

4.1.9.4 At the beginning of each new day, the system shall automatically refresh the ’Daily Challenges’ category, resetting the progress made on the previous day’s challenges to provide users with a fresh set of daily objectives and promote daily engagement.

4.1.9.5 The system shall provide challenges with clear description and completion criteria.

4.1.9.6 The system shall provide users with clear visibility of their current progress and target on each challenge.

4.1.9.7 The system shall provide users with real-time updates on challenge progress and completion

4.1.9.8 The system shall provide users with rewards like XP points and gems on challenge completion.

4.1.9.9 The system shall maintain a challenge Pool having varying difficulty levels.

4.1.9.10 The system should dynamically assign new challenges at the start of each day from the challenge Pool.

4.1.9.11 The systems should assign challenges based on the current experience level of the user.

4.1.9.12 The system shall provide an option for users to reset or reroll their challenges once a day using application-specific perks, like gems.

4.1.9.13 The system shall provide an option for users to claim the reward of completed challenges.

4.1.9.14 The system shall provide users with 1-time achievement challenges.

4.1.9.15 The system shall provide users with unique rewards such as badges on achievement completion.

4.1.9.16 The achievements shall be more rewarding than the daily quests.

4.1.9.17 The system may include a feature that allows users to review their past completed challenges and their respective rewards, providing a sense of accomplishment and progress tracking.

4.1.9.18 The system shall allow the users to share their challenge progress and achievements on social media, promoting user engagement and potentially attracting new users to the app.

4.1.10 Feature 10: FlashCraft

4.1.10.1 The system shall allow the user to create flashcards in an organized and structured manner, enabling them to add information they want to reference later for practice.

4.1.10.2 The system should provide the user with the ability to create a new flashcard set, labelled with a title.

4.1.10.3 The system shall enable user to add new flashcards with a term and description.

4.1.10.3.1 The term is on one face of the card, while the description is on the other face of the card. The user can switch between the front and back face of card by clicking on the card.

4.1.10.4 Users should have the capability to modify both the term and description of existing flashcards within a set.

4.1.10.5 The system shall enable users to remove specific flashcards from a set when necessary.

4.1.10.6 The system shall provide the option to delete an entire flashcard set, removing all contained flashcards.

4.1.10.6.1 The system shall display a confirmation prompt before proceeding with deletion.

4.1.10.7 Users should be provided with the option to assess themselves using their own flashcards, requiring them to describe the term displayed.

4.1.10.7.1 The system shall present flashcards in a randomized order during self-assessment to prevent users from memorizing the sequence.

4.1.10.7.2 Users should have the option to flip a flashcard to reveal the description after attempting to describe the term.

4.1.10.7.3 Generate progress reports or summaries after each self-assessment session, providing insights into areas where the user may need more practice.

4.1.10.8 The system shall allow user to only create flashcard set when there are atleast two cards in a set.

4.1.10.9 The user shall only be able to create flashcard when the term and description inputs are filled.

4.1.10.10 The system should support the assignment of categories to flashcards.

4.1.10.11 The system shall provide users with a category select functionality to find specific flashcard sets.

4.1.10.12 Users shall have an option to insert a single image into flashcard.

4.1.10.12.1 The system shall only accept flashcard image having size less than 300KBs.

4.1.10.13 The system should allow users to sort flashcards within a set based on criteria such as alphabetical order, date created, or category.

4.1.10.14 Users should be able to share flashcard sets with others, promoting collaborative learning and study groups.

4.1.10.15 The system shall include gamification elements, like earning badges or rewards for completing flashcard sets or achieving certain milestones.

4.1.10.16 The system shall provide the users with insights into their learning progress, such as the number of flashcards reviewed.

4.1.11 Feature 11: SocialMedia Sharing

4.1.11.1 The system allows the user to share their scores after completion of their lesson or achievements to their social media accounts including WhatsApp, Facebook, and X.

4.1.11.2 Users can initiate the sharing process on WhatsApp by clicking on the WhatsApp icon, which will activate the WhatsApp API to send a pre-generated message to contacts or groups selected from their contact list.

4.1.11.2.1 The message will have pre-generated text or template.

4.1.11.2.2 The message will be sent to the Whatsapp accounts and groups which the user selects from their contact list.

4.1.11.3 The system provides a Facebook icon to share on Facebook, which upon clicking triggers the Facebook share dialog.

4.1.11.3.1 For the sharing scores on Facebook the developer must create a Meta Developers Account and register their app after which they will use this app's ID in the application for implementing this feature.

4.1.11.3.2 The system will use JavaScript SDK provided by Facebook for this purpose.

4.1.11.3.3 If the user uses this feature on the device on which they have their Facebook account logged in, then they will be redirected to the post creation section on Facebook which has the URL or information of the achievement or lesson to be shared.

4.1.11.3.4 If the user uses this feature on a device on which they are not currently logged into Facebook, then they are redirected to the Facebook login page first.

4.1.11.3.5 The feature will allow users to preview their posts before posting.

4.1.11.4 The system provides a X (formally known as Twitter) icon to share on X, which upon clicking triggers the X's share dialog.

4.1.11.4.1 The system implements the X sharing feature using the Twitter SDK or API.

4.1.11.4.2 If the user uses this feature on the device on which they have their X(Twitter) account logged in, then they will be redirected to the tweet created for them having the URL

for checking their lesson scores and some pre-generated text from where they can tweet this.

4.1.11.4.3 If the user uses this feature on a device on which they are not currently logged into X's , then they are redirected to the X's login page first.

4.1.11.4.4 The pre-generated text must be in accordance with X's character limit and ensure that the content shared does not exceed this limit.

4.1.11.5 The text generated and the URL for the messages on all social media accounts will be encrypted according to the best practices.

4.1.12 Feature 12: Leaderboard

4.1.12.1 The system shall show two types of leaderboards, normal 'Experience Leaderboard' and 'Streak leaderboard'.

4.1.12.2 The system shall show an Experience leaderboard section that displays the progress of users in different leagues.

4.1.12.3 The system shall create multiple leaderboards for each league based on the number of users, with a preferred range of around 30 users in each Experience leaderboard.

4.1.12.4 The system shall create multiple Experience leaderboards for each league based on the number of users, with a preferred range of around 30 users in each leaderboard.

4.1.12.5 The system randomly adds the users in the Experience leaderboard corresponding to the leagues in which they are enrolled.

4.1.12.6 The system shall build the Experience leaderboard, even if there are less than 30 users for the last leaderboard of each league.

4.1.12.7 The system shall have 5 leagues which may have these league titles:

- Novice league: Top 15 members get promoted to the Explorer league
- Explorer league: Top 10 members get promoted to the Bronze league
- Bronze league: Top 6 members get promoted to the Silver league
- Silver league: Top 5 members get promoted to the Gold league
- Gold league: The top 3 members are rewarded heavily.

4.1.12.8 The Experience leaderboards will be divided into 3 parts, the members in the top part will be promoted to the next league, the middle part's members will remain on the same league, while the members in the bottom part will be relegated to the previous league.

4.1.12.8.1 The system shall display these sections with distinct colors to visually represent them.

4.1.12.9 At the end of each league, users shall receive XP rewards and promotions based on their progress and the Experience leaderboard they are featured in.

4.1.12.10 The system shall promote the top members at the end of each league cycle to the next league as per the defined rules.

4.1.12.11 The system shall display a league archive, documenting the history of all leagues they've participated in and their positions on the respective Experience leaderboards.

4.1.12.12 The system shall implement a scheduler to automatically end league cycles, calculate promotions, and reward XP at specific intervals (e.g., weekly).

4.1.12.13 The system shall delete user data from the leaderboard system if users choose to delete their account from the application.

4.1.12.14 The system shall restrict leaderboard access to logged-in users, allowing them to see only the leaderboards in which they are featured.

4.1.12.15 The system will have a streak leaderboard section which is a global leaderboard that displays the current streak of each user in the application along with their name.

4.1.12.16 The system shall display the users with the longest streaks at the top, and others sorted in descending order in the streak board.

4.1.12.17 The system will highlight the user's position on both leaderboards i.e. streak leaderboard and league leaderboard.

4.1.12.18 The system shall update the leaderboard in real-time, reflecting changes in user streaks and positions as soon as users complete daily activities.

4.1.12.19 The system will add new users to both leaderboard types.

4.1.12.20 The system will send notifications to user when they advance in the leaderboard rankings

4.1.13 Feature 13: Friendship Hub

4.1.13.1 The system allows to send friend requests to other users by specifying the recipient's user_ID.

4.1.13.1.1 The system shall provide a search bar where the user can specify the username to find other users.

4.1.13.2 The system must prevent users from sending duplicate friend requests to the same recipient.

4.1.13.3 The system shall include the sender's information with friend requests.

4.1.13.4 Users will be able to view incoming friend requests in their account.

4.1.13.5 The users will have the option to accept or reject incoming friend requests.

4.1.13.6 Users should be able to view their friend list.

4.1.13.7 Users should have the option to remove friends from their list.

- Novice league: Top 15 members get promoted to the Explorer league
- Explorer league: Top 10 members get promoted to the Bronze league
- Bronze league: Top 6 members get promoted to the Silver league
- Silver league: Top 5 members get promoted to the Gold league
- Gold league: The top 3 members are rewarded heavily.

4.1.13.8 The system shall prevent the user to send friend request to another user who has already rejected the sender thrice.

4.1.13.9 The system shall not expose sensitive user information in friend requests.

4.1.13.10 The system must comply with relevant privacy regulations and guidelines, ensuring the protection of user data and friend request information.

4.1.13.11 Users should be able to send friend requests to multiple users.

4.1.13.12 The system shall automatically add users to friend list of the receiver and sender, if the the receiver accepts the incoming friend request.

4.1.14 Feature 14: ChatSpace

4.1.14.1 The system shall allow users to create a private room for group chat and other activities.

4.1.14.2 The user who creates the private room is automatically designated as the room administrator.

4.1.14.3 The system shall generate a unique room identifier (auto-generated ID) for each created room to be used as the session ID.

4.1.14.4 The user can assign a name for the private room during its creation.

4.1.14.5 The system shall implement web sockets to create private rooms for the user by utilizing the socket.io web service library.

4.1.14.6 The room administrator can invite other users by sharing the session ID of the room.

4.1.14.7 The system shall prompt the web socket to emit a socket connection event allowing clients to connect to the room when they click on the invitation link.

4.1.14.8 A confirmation message will be sent to the administrator, enabling them to admit or reject a particular user's invite request.

4.1.14.9 After the administrator admits an invited user, the web socket connection is established between the user and the system, enabling him to join the private room.

4.1.14.10 Users invited to the private room can engage in chat activities with each other.

4.1.14.11 The room members can converse with each other in two ways: private chat and group chat.

4.1.14.11.1 Events for sending and receiving messages will be registered in the web socket, facilitating communication between clients and the backend.

4.1.14.11.2 When a user sends a private message to another member of the room, the web socket shall broadcast the message to that particular user's ID.

4.1.14.11.3 In group chats, web sockets shall broadcast messages to all room members whenever they detect a message posted by the members.

4.1.14.11.4 The user's messages shall include user-typed text and timestamps when they will be posted.

4.1.14.12 The system shall display a list of all members present in the private room, providing visibility to users.

4.1.14.13 The room admin shall have the authority to remove a specific member from the group, or a member can also voluntarily leave the room.

4.1.14.13.1 The system shall emit a disconnection event through the web socket to disconnect the user's client, preventing access to the private room and group chat.

4.1.14.14 The admin can disband the room which shall remove all members from the private room.

4.1.14.15 The system shall detect the absence of all room members and will terminate the web socket connection, effectively dissolving the room.

4.1.15 Feature 15: 3d Model

4.1.15.1 The system shall provide users with the capability to visualise the pronounced Makhraj in a 3D view.

4.1.15.2 The system shall enable users to rotate the 3D model up to 180 degrees along both the X and Y axes from the front view.

4.1.15.3 The system shall support the triggering of animations specific to each Makhraj, synchronised with corresponding audio.

4.1.15.4 The system shall incorporate an interactive 3D model representing the anatomical elements involved in pronunciation, including gums, teeth, tongue, and tonal palate.

4.1.15.5 The 3D model shall exhibit responsive behaviour, accommodating various screen sizes and device types for an optimal user experience.

4.1.15.6 The 3D model shall distinguish the areas within the oral cavity that are involved in pronunciation for similar Makhraj by utilising distinct colours to indicate the specific locations where the tongue makes contact.

4.1.15.7 The 3D model shall be exportable in .gltf format having separate full scene description (*.glb), textures (*.png)'s and binary (*.bin) files.

4.1.15.8 The 3D model shall have translucent upper gums to provide greater visibility within the model

4.1.15.9 The 3D model shall be created using Blender, an open-source modelling software.

4.1.15.10 The 3D model shall be modelled with a maximum subdivision level of 3 to ensure appropriate detailing.

4.1.15.11 The 3D model shall be properly texture painted and UV unwrapped for an accurate and visually appealing representation.

4.1.15.12 The 3D model shall be accompanied with appropriate lighting and ambience.

4.1.15.13 The 3D model shall be created with quad topology to enhance the model's flexibility during manipulation and rendering processes.

4.1.16 Feature 16: Analytics

4.1.16.1 The system shall show an Analytics section that illustrates different statistics through graphs and charts.

4.1.16.2 The system should utilise chart.js and react-chartjs-2 libraries for plotting the charts.

4.1.16.3 The system shall generate an area graph that illustrates the Xp gained over the last 7 days.

4.1.16.3.1 The system should plot an area chart with a top-to-bottom gradient instead of a solid colour for improved visual representation.

4.1.16.4 The system should smoothen the sharp edge points on the area chart.

4.1.16.5 The system should be able to plot the bar chart for the last 6 and longest streak.

4.1.16.5.1 The system should signify the longest streak bar with a distinct colour.

4.1.16.6 The system should be able to plot a bar chart for the Taqraar points of different members of the same private room.

4.1.16.6.1 The system should signify the Top Three achievers with distinct colours for each of them

4.1.16.7 The system should start plotting bar charts with a scale beginning at 0 instead of using the lowest value as the starting point.

4.1.16.8 The system will introduce a smooth transition effect when the chart is first displayed for enhanced user experience.

4.1.16.9 The system should provide tooltips for:

- Bars in bar chart
- Points in the area chart

4.1.16.10 The system must overlay the charts on a grid structure for improved readability and understanding.

4.1.16.11 The system should show an appropriate label for each chart to provide clarity and context.

4.1.16.12 The system should ensure that the chart is accessible by using ARIA-specified attributes on charts as:

- aria-label: "Name: for example: streak-chart"
- role: "chart"

4.2 NON-FUNCTIONAL REQUIREMENT

4.2.1 Product Requirement

4.2.1.1 Performance

1. The system shall ensure that the response times for loading lessons and features are within acceptable limits.
2. The application shall be designed for efficient performance on both low-end and high-end devices to accommodate a wide range of users.
3. Response times for sharing achievements, chat interactions, and lesson loading shall be optimized for a smooth user experience.
4. The application shall provide fast loading times for all features and content under 3 seconds, ensuring a responsive user experience.

4.2.1.2 Availability

1. The application shall be highly available, with minimal downtime for maintenance or updates.
2. The application must meet the minimum acceptable uptime percentage (e.g., 99.9

4.2.1.3 Reliability

1. The system shall be stable and reliable, with a minimal occurrence of crashes or errors.
2. The system shall implement effective error-handling mechanisms to provide users with clear error messages and log errors.

4.2.1.4 Security

1. The system shall protect user data and privacy through encryption, secure authentication, and access controls.
2. The system shall be compliant with specific security standards.
3. The system shall encrypt the messages and data when sharing content on social media.

4.2.1.5 Compliance

1.The application shall comply with relevant laws and regulations, including copyright, accessibility, and data protection laws.

4.2.1.6 Usability and Accessibility

1. The application shall be user-friendly, with intuitive navigation and clear instructions.
2. Usability testing should be performed to ensure a positive user experience.
3. The application shall ensure efficient navigation, allowing users to easily switch between lessons, features, and sections, promoting a smooth and intuitive user experience.

4.2.1.7 Compatibility

1. The application shall be compatible with various devices, operating systems, and web browsers.
2. The system shall ensure compatibility with screen readers and assistive technologies.

4.2.1.8 Interoperability

1. The application shall integrate with other systems or services, such as third-party authentication or payment gateways.

4.2.2 External Requirement

4.2.2.1 Interoperability

1. The system must be interoperable with screen readers or assistive technologies for the visually impaired.
2. The system's interoperability with the database shall be achieved through:

- Utilising RESTful API for the request-response architecture.
- Implementing WebSockets to facilitate an event-driven architecture.

4.2.2.2 Ethical

1. The system must respect user privacy and ensure that personal data remains secure and is not shared or used without explicit permission.
2. The system should provide reliable, accurate, and verifiable information and teachings about Tajweed.
3. The system must utilise fair and unbiased algorithms, avoiding favouritism or discrimination against any user.

4.2.2.3 Legislative

1. The system must comply with applicable data protection laws and regulations concerning the collection, storage, and usage of user data. It should include obtaining explicit consent for data processing and ensuring user rights regarding their personal information in adherence to laws such as GDPR, PECA or other relevant data privacy laws.
2. The system must respect and safeguard intellectual property rights, including trademarks, patents, and trade secrets. It should not infringe upon the intellectual property of others.
3. The system must uphold copyright laws, prevent unauthorised use of copyrighted material, and prevent plagiarism by ensuring content originality.

4.2.2.4 Security

1. The system must employ robust authentication methods such as JWT to prevent unauthorised access to user accounts.
2. The system should request only necessary permissions from users and ensure they are informed about the purpose behind such permissions.

4.3 EXTERNAL INTERFACE REQUIREMENTS

4.3.1 Hardware Interfaces

1. User Devices: The website should be accessible from various user devices, including desktop computers, laptops, tablets, and mobile phones. It should adapt to different screen sizes and input methods.

2. Audio and Video Hardware: The website relies on the audio and video hardware of user devices. This includes speakers or headphones for listening to pronunciations and, if interactive lessons are provided, a microphone for users to practice pronunciation. Additionally, cameras may be used for video content.

3. Network Devices: Network devices such as routers, switches, and LAN cables are essential for providing an internet connection. The website's functionality is highly dependent on the availability of these network devices and a proper LAN connection.

4.3.2 Software Interfaces

1. Operating Systems: The application should be compatible with common operating systems, including Windows, macOS, and various Linux distributions.For mobile devices, the application should support iOS and Android.

2. Client-Side Interface: The front-end of the application is built using React.js, a JavaScript library for building user interfaces. React handles the presentation layer, user interactions, and the rendering of pronunciation exercises, user profiles, and interactive lessons.

3. API Endpoints And Server: The server-side of the application is powered by Express.js and NodeJs, which provides API endpoints and Console for communication between the front-end (React) and the back-end (Node.js)

4. Database Interface(MongoDB Atlas & Compass): The database management system used to store user profiles, pronunciation data, and interactive lesson content. The software interacts with MongoDB to read and write data for user progress and content updates.

5. Socket.io: Socket.IO is a library that enables low-latency, bidirectional and event-based communication between a client and a server. The Socket.IO connection can be established with different low-level transports.

6. Meta Developers Interface: For Facebook integration, the application should register as a Meta (Facebook) Developer and use the Facebook JavaScript SDK.It should adhere to Facebook's developer platform policies and requirements.

7. Third Party Libraries and Email Services Interface: Third-party libraries are used for flashcard creation,management and for authorization purposes, the application should interface with these libraries efficiently.For Example:Facebook,Whatsapp,Oauth etc. Application should interface with email services to send weekly progress emails.It should support common email service providers, such as SMTP servers or third-party email APIs.

8. CDN for Content Delivery: A Content Delivery Network (CDN) could be used for delivering multimedia content, the application should interface with the CDN services.

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XP Page 07

6 TRELLO (PROJECT MANAGEMENT)

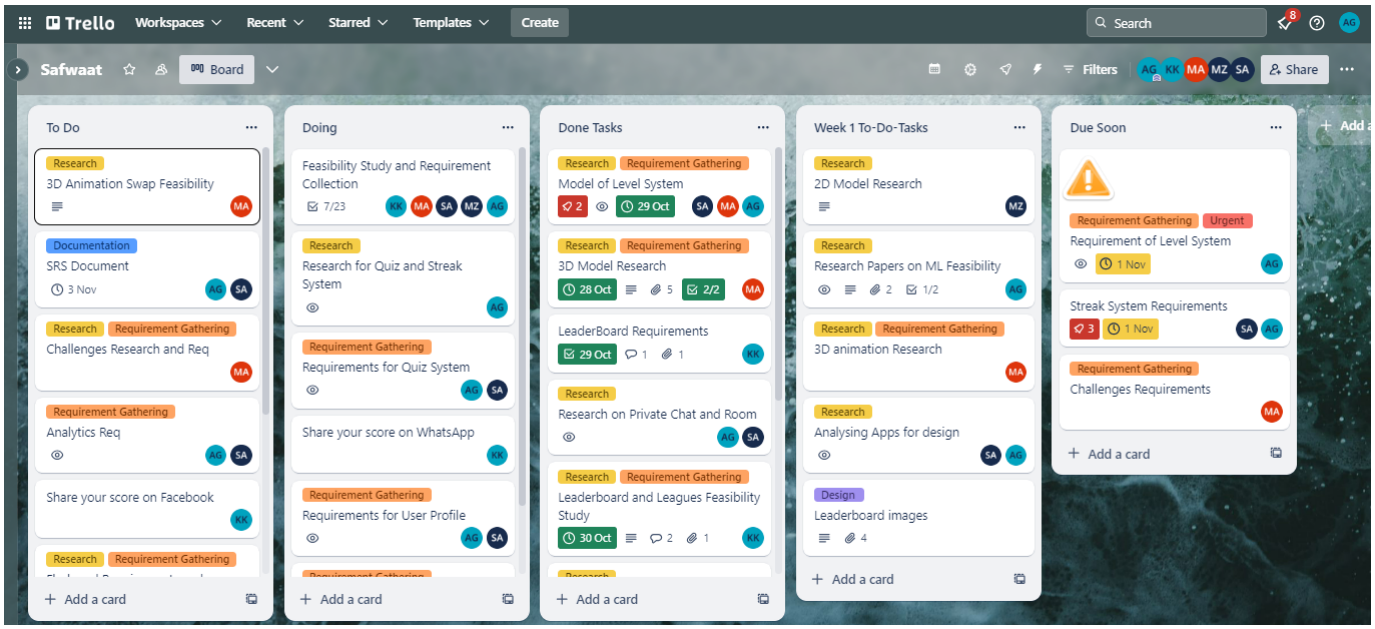

Figure 1: Trello Board (Week 01)

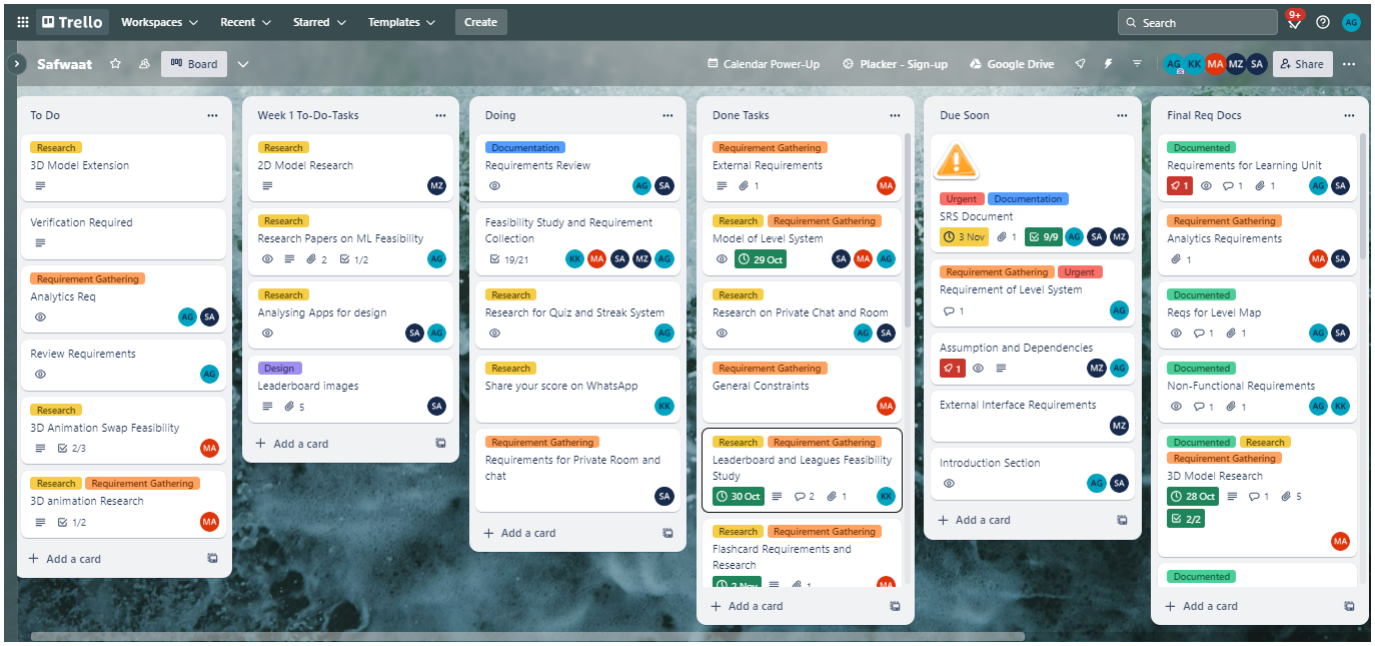

Figure 2: Trello Board (Week 02)

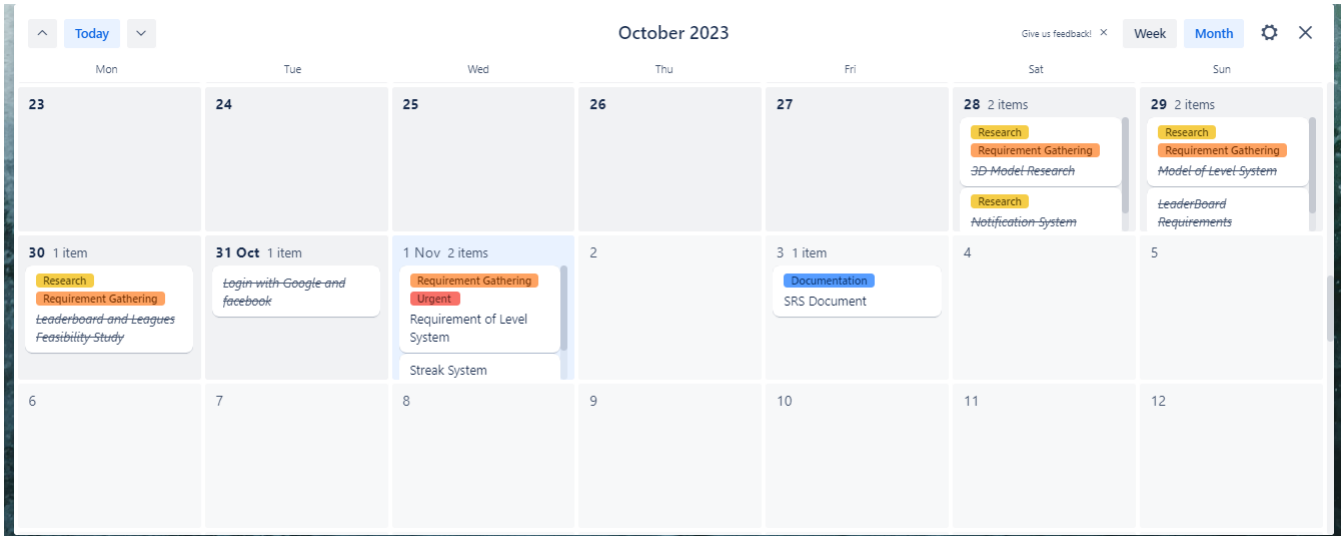

Figure 3: Trello Calender View

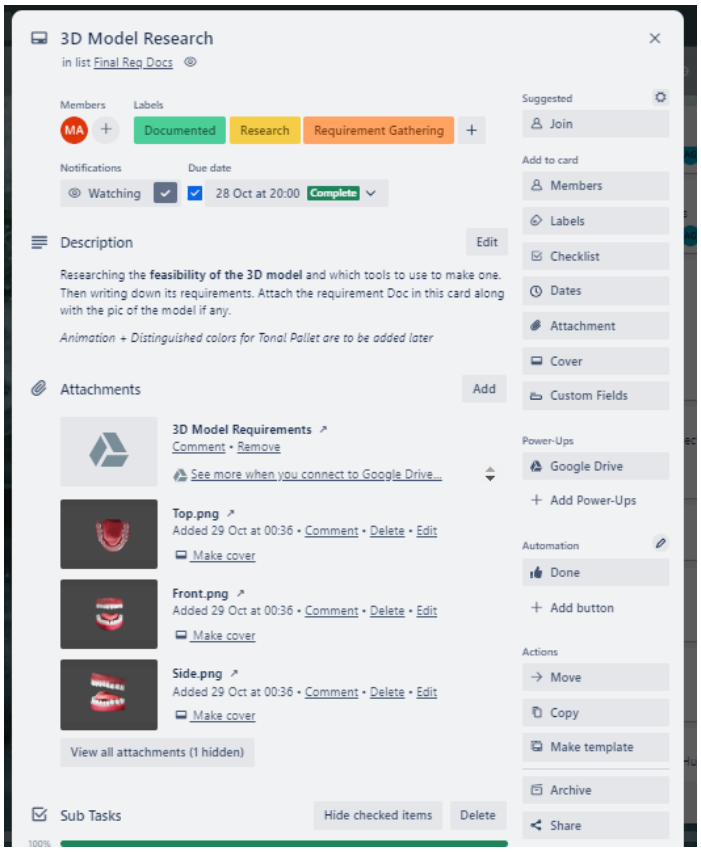

Figure 4: Trello Card