Software Requirements Specification

For

VocabVault

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Name	Date	Reason for Changes	Version
Jillienne N.	05/24/2024	Formatting	01
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| Jillienne N. | 05/26/2024 | Use Cases, UI Design, Testing | 01 |
| Max M. | 05/26/2024 | Diagrams | 01 |

1.   Introduction
  1.1.   Purpose

This Software Requirements Specification (SRS) is intended to provide a detailed description of the VocabVault web application. The SRS will also provide the developers with a guided framework that is required to implement the system functionality to ensure the system is successfully built and deployed.

  1.2.   Scope

This document specifies the requirements for the following capabilities:
  1. VocabVault Application
  2. The Database
  3. The User Interface

  1.3.   Definitions

BDD: Block Definition Diagram.
SRS: Software Requirements Specification.
UML: Unified Modeling Language
UI: User Interface
API: Application Programming Interface
Django: A high-level Python web framework used for the backend.
React: A JavaScript library for building user interfaces, used for the frontend.
IEEE: Institute of Electrical and Electronics Engineers, providing guidelines for software documentation.

  1.4.   References

IEEE Std 830-1998 - IEEE Recommended Practice for Software Requirements Specifications - Revision of IEEE Std 830-1993

1.5.   Overview

This document follows the recommended format specified in IEEE Std 830-1998 IEEE Recommended Practice for Software Specifications. For Section 3, the specific template A.5 for organizing information by feature is followed.

2.   Overall Description
2.1.   Product Perspective

VocabVault is a web application designed to aid users in enhancing their vocabulary in various languages. The application provides an interactive platform where users can learn new words, hear their correct pronunciations, and practice using flashcards. The system is built using Django for the backend and React for the frontend, ensuring a robust and user-friendly experience.
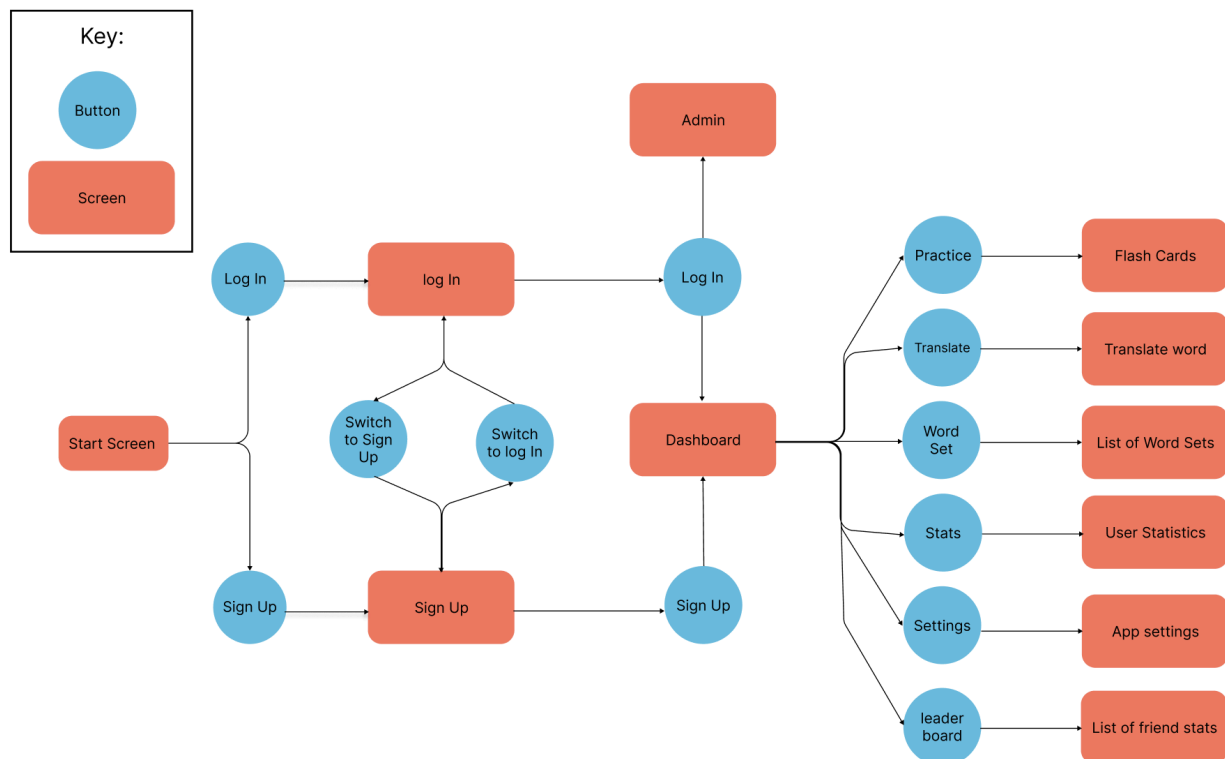

Figure 1: Behavior Diagram

2.2.   Product Functions

   2.2.1.   User Authentication: Registration and login functionality to ensure secure access.

   2.2.2.   Vocabulary Lists: Users can create, edit, and manage personal vocabulary lists.

   2.2.3.   Translation: App can translate words from English to the target language and vice versa.

   2.2.4.   Quizzes and Tests: Interactive quizzes to test the user's knowledge of the words in their lists.

   2.2.5.   Progress Tracking: Monitoring user progress over time with detailed statistics and reports.

   2.2.6.   Notifications: Reminders and notifications to encourage regular practice and learning.

   2.2.7.   Translation: Ability to translate words from English to the target language and vice versa.

   2.2.8.   Speech: Ability to hear words in the desired target language.

   2.2.9.   Flashcards: Flashcards can be used to practice and reinforce learning. The flashcard feature includes spaced repetition to optimize retention.

2.3.   Use Case Descriptions

   2.3.1.   Create an Account

General Characteristics	
Intent	Allow a new user to create an account in the app
Scope	The user registration process, including entering personal information, demographic info, setting up account credentials and choosing language.
Primary Actor	User
Secondary Actor	UI
Preconditions	The user must have access to the app's registration page.
Assumptions	The user has a valid email address and password meets criteria.
Trigger	The user navigates to the registration page and clicks on the "Create Account" button.

Success Post Condition	The user's account is created successfully and they can log in to the app.
Failed Post Condition	The user's account creation fails due to invalid or incomplete informations and they are prompted to try again.

2.3.2. Set a Daily Goal

General Characteristics	
Intent	Allow the user to set a daily goal for practicing vocabulary words
Scope	The process of setting or modifying the user's daily goal
Primary Actor	User
Secondary Actor	UI
Preconditions	The user must be logged into the app
Assumptions	The user did not set up a goal during account creation.
Trigger	The user navigates to the "Goals" section and clicks on "Today" or "No Goal".
Success Post Condition	The user's daily goal, long term goal, and deadline are set.
Failed Post Condition	The user enters an invalid or unrealistic daily goal, and the app prompts them to try again.

2.3.3. View a Vocabulary Word Set

General Characteristics	
Intent	Allow the user to view vocabulary words in different categories based on their learning status.
Scope	The process of filtering and displaying vocabulary words based on their status (Not Learned, In Progress, Learned, All).
Primary Actor	User

Secondary Actor	Database
Preconditions	The user must be logged in to the app and have vocabulary words in their stack.
Assumptions	The user understands the different categories of vocabulary word statuses.
Trigger	The user navigates to the "Practice" or "Word Sets" section or and selects a specific category or filter.
Success Post Condition	The app displays the vocabulary words in the selected category or filter.
Failed Post Condition	The app fails to retrieve or display the vocabulary words in the selected category due to a technical issue or lack of data.

2.3.4. Add Vocabulary Set to the Stack

General Characteristics	
Intent	Allow the user to add a new vocabulary set to their stack for practice.
Scope	The process of adding a new vocabulary set.
Primary Actor	User
Secondary Actor	UI
Preconditions	The user must be logged in to the app.
Assumptions	The user would like to learn a vocabulary set of a specific theme or topic.
Trigger	The user navigates to the "Word Sets" section, chooses a set, and clicks on the "Add all" or individual add button.
Success Post Condition	The new vocabulary set is added to the user's stack.
Failed Post Condition	The user fails to add the new vocabulary set due to invalid or incomplete information, and the set is not added.

2.3.5. Practice Vocabulary from a Set

General Characteristics	
Intent	Allow the user to practice vocabulary words from a selected set using flashcards.
Scope	The process of practicing vocabulary words by flipping flashcards and marking them as "I knew" or "I didn't know."
Primary Actor	User
Secondary Actor	Database
Preconditions	The user must be logged in to the app and have a vocabulary set in their stack.
Assumptions	The user understands the practice mechanism and the meaning of "I knew" and "I didn't know" responses.
Trigger	The user selects a vocabulary set from their stack and clicks on the "Practice" button.
Success Post Condition	The user successfully practices the vocabulary words in the set, and their knowledge is tracked and updated accordingly.
Failed Post Condition	The user encounters a technical issue or interruption during the practice session, preventing them from completing the practice or tracking their progress.

2.3.6.   Track Goals

General Characteristics	
Intent	Allow the user to track their progress towards their goal of practicing vocabulary words.
Scope	The process of monitoring and displaying the user's current progress against their set goal.
Primary Actor	User
Secondary Actor	Database

Preconditions	The user must be logged in to the app and have a goal set.
Assumptions	The user's practice sessions and vocabulary word interactions are accurately tracked and recorded.
Trigger	The user opens the app or navigates to the "Goals" section to view their progress.
Success Post Condition	The app displays the user's progress, including words practiced that day, the number of words practiced in total, deadline, frequency, and previous goals.
Failed Post Condition	The app fails to accurately track or display the user's daily progress due to a technical issue or data inconsistency.

2.3.7.   Track Streak

General Characteristics	
Intent	Allow the user to track their consecutive streak of daily practice.
Scope	The process of monitoring and displaying the user's streak.
Primary Actor	User
Secondary Actor	UI
Preconditions	The user must be logged in to the app and have a goal set.
Assumptions	The user's practice sessions and daily progress are accurately tracked and recorded.
Trigger	The user opens the app or navigates to the "Streak" section to view their streak.
Success Post Condition	The app displays the user's current streak, next goal, and best streak.
Failed Post Condition	The app fails to accurately track or display the user's streak due to a technical issue or data inconsistency.

2.3.8.   Translate a word

General Characteristics	
Intent	Allow the user to translate a word from the language they are learning to their native language or vice versa.
Scope	The process of translating a single word using the app's translation functionality.
Primary Actor	User
Secondary Actor	LibreTranslate API
Preconditions	The user must be logged in to the app, and the app must have access to a translation service.
Assumptions	The user knows the word they want to translate, and the translation service supports the languages involved.
Trigger	The user navigates to the "Translate" section and types in a word.
Success Post Condition	The app displays the translation of the word successfully and option to add an example.
Failed Post Condition	The app fails to translate the word due to a technical issue, unsupported language, or lack of a translation.

2.3.9.   Compete with friends

General Characteristics	
Intent	Allow the user to compete with their friends or other users in practicing vocabulary words and achieving streaks.
Scope	The process of connecting with friends, comparing progress and streaks.
Primary Actor	User
Secondary Actor	Other registered users (friends or connections).
Preconditions	The user must be logged in to the app and have friends or connections within the app.
Assumptions	The user and their friends have consented to share their

	progress and streaks with each other.
Trigger	The user navigates to the "Leaderboard" section to view their friends' progress and streaks.
Success Post Condition	The app displays the user's progress and streaks alongside those of their friends.
Failed Post Condition	The app fails to retrieve or display the progress and streaks of the user's friends due to technical issues or data privacy restrictions.

2.3.10.   Share streak

General Characteristics	
Intent	Allow the user to share their current streak with others, either within the app or on external platforms.
Scope	The process of sharing the user's streak, which represents the number of consecutive days they have met their goal.
Primary Actor	User
Secondary Actor	Other users or external social media platforms.
Preconditions	The user must be logged in to the app and have an active streak.
Assumptions	The user has the necessary permissions and connections set up to share their streak with others.
Trigger	The user navigates to the "Streak" section or clicks on a "Share with friends" button.
Success Post Condition	The user's current streak is successfully shared with their intended audience, either within the app or on external platforms.
Failed Post Condition	The app fails to share the user's streak due to technical issues, lack of permissions, or connectivity problems with external platforms.

2.3.11.   View Statistics

General Characteristics	
Intent	Allow the user to view various statistics related to their vocabulary learning progress.
Scope	The process of retrieving and displaying a comprehensive set of statistics to the user.
Primary Actor	User
Secondary Actor	Database
Preconditions	The user must be logged in to the app, and have tracked and recorded the necessary data for generating statistics.
Assumptions	The user wants to gain insights into their recent vocabulary learning activities.
Trigger	The user navigates to the "Statistics" section.
Success Post Condition	The app displays the following statistics for the specified time period (e.g., the current week): words learned, words added, card sets added, level, days practiced.
Failed Post Condition	The app fails to retrieve or display the statistics due to technical issues, data inconsistencies, or lack of tracked data for the specified time period.

2.4.   User Characteristics
    2.4.1.   Language Learners: Primary users who want to improve their vocabulary.
    2.4.2.   Teachers/Educators: Users who may want to use the app to aid in teaching.
    2.4.3.   Administrators: Users who manage the app's content and user data.

2.5.   User Constraints
    2.5.1.   Users have access to a device with an internet connection.
    2.5.2.   The app will rely on third-party libraries for pronunciation functionality.

3.   Specific Requirements
3.1.   Overview

This section outlines the detailed requirements for the VocabVault web application, covering functional, non-functional, and UI aspects. This section serves as a

comprehensive guide for the development team, ensuring that the application meets the desired functionality, performance, security, and usability standards.

3.2.   Functional Requirements
  3.2.1.   The system shall allow users to register with an email and password.
  3.2.2.   The system shall authenticate users using email and password.
  3.2.3.   The system shall display flashcards for vocabulary practice.
  3.2.4.   The system shall provide audio pronunciation for each word.
  3.2.5.   The system shall track and display user progress.

3.3.   Non-Functional Requirements
  3.3.1.   Security: The app should use HTTPS for all communications.
  3.3.2.   Usability: The app should be intuitive and easy to use.
  3.3.3.   Performance: The application should be able to handle a large number of users and data without significant performance degradation.
  3.3.4.   Compatibility: The application should be compatible with the latest versions of popular web browsers.

3.4.   Interface Requirements
  3.4.1.   The user interface should be intuitive, visually appealing, and consistent across different sections of the application.
  3.4.2.   The interface should provide clear navigation and easy access to various features and functionalities.
  3.4.3.   The interface should provide appropriate feedback and error messages to guide users through various actions and processes.
  3.4.4.   The interface should provide a clear and organized way to view, create, edit, and delete vocabulary sets and words.
  3.4.5.   The interface should allow users to easily categorize words based on their learning status (Not Learned, In Progress, Learned).
  3.4.6.   The interface should present vocabulary words in a flashcard-like format, with options to mark words as "Knew" or "Didn't Know."
  3.4.7.   The interface should prominently showcase the user's current streak and streak history.

3.5.   System Features

4.   User Interface Design
  4.1.   Overview

The user interface (UI) of the vocabulary flashcard web application will be designed with a focus on simplicity, intuitive navigation, and a visually appealing experience. The UI

will be responsive and adaptable to different screen sizes and devices, ensuring a consistent experience across desktops, tablets, and mobile devices.

The application will follow a modern and clean design aesthetic, with a color scheme that is easy on the eyes and promotes a productive learning environment. The layout will be organized with clear sections and logical grouping of related functionalities.

4.2.   Screen Descriptions
    4.2.1.   Login and Registration
        4.2.1.1.   This screen will be the entry point for users to access the app.
        4.2.1.2.   It will feature a clean and simple layout with fields for entering login credentials (username, email and password) or creating a new account.
        4.2.1.3.   Appropriate validation messages and error handling will be provided for incorrect or missing information.
        4.2.1.4.   Users will have the option to reset their passwords if forgotten.

    4.2.2.   Practice
        4.2.2.1.   This screen will serve as the main hub for users after logging in.
        4.2.2.2.   It will display an overview of the user's progress, including their current streak, goal status, and vocabulary groups.
        4.2.2.3.   Quick access tiles will be provided for navigating to different sections of the application, such as practice mode, translate, word sets, and statistics.
    4.2.3.   Flashcards
        4.2.3.1.   This screen will allow users to practice their vocabulary sets through the use of flashcards.
        4.2.3.2.   A flashcard displays a word, button to hear the pronunciation, and a "show answer" button.
        4.2.3.3.   Users can select "I knew" or "I didn't know".
        4.2.3.4.   Flashcards display the learning progress of individual words.

    4.2.4.   Translate
        4.2.4.1.   This screen will allow users to translate a word from their native language to their learning language and visa versa.
        4.2.4.2.   Translated words get added to a Translations vocabulary set and are displayed on this screen.
        4.2.4.3.   Users can select a word they've translated and add an example.

           4.2.4.4.   Users can listen to the pronunciation of translated words.

       4.2.5.   Word Sets
           4.2.5.1.   This screen will allow users to seach through a list of predetermined vocabulary sets of differing themes.
           4.2.5.2.   Users can add entire sets or individual words to their stack.

       4.2.6.   Statistics
           4.2.6.1.   This screen will allow users to view the following statistics for the specified time period (e.g., the current week): words learned, words added, card sets added, level, days practiced.

       4.2.7.   Leaderboard
           4.2.7.1.   This screen will allow users to connect with friends or other users within the application.
           4.2.7.2.   Users can view the progress and streaks of their friends or connections.
           4.2.7.3.   Leaderboards or ranking systems may be implemented to showcase the top performers within the user's social circle.

       4.2.8.   Profile
           4.2.8.1.   This screen will allow users to customize various settings and profile information within the application.

5.   Testing
   5.1.   Testing Objectives
       5.1.1.   Verify the correctness and completeness of the application's functionality.
       5.1.2.   Ensure the application meets the specified functional and non-functional requirements.
       5.1.3.   Validate the usability and user experience of the application's interface.
       5.1.4.   Identify and resolve any defects, bugs, or issues in the application.
       5.1.5.   Ensure the application's performance and scalability under different load conditions.
       5.1.6.   Verify the accuracy and integrity of data storage, retrieval, and manipulation operations.

   5.2.   Testing Strategies
       5.2.1.   Unit Testing
           5.2.1.1.   Develop and execute unit tests for individual components, functions, and modules of the application.

5.2.1.2.   Ensure each unit of code works as expected and meets the defined specifications.

5.2.1.3.   Use test-driven development (TDD) approach, where applicable.

5.2.2.   Integration Testing

5.2.2.1.   Test the integration of different components and modules within the application.

5.2.2.2.   Verify the correct interaction and data flow between integrated components.

5.2.2.3.   Test the application's functionality across multiple integrated components.

5.2.3.   Functional Testing

5.2.3.1.   Test the application's functionality against the specified functional requirements.

5.2.3.2.   Develop test cases to cover various user scenarios and workflows.

5.2.3.3.   Use manual and automated testing techniques, as appropriate.

5.2.4.   Usability Testing

5.2.4.1.   Conduct usability tests with representative users or user groups.

5.2.4.2.   Evaluate the application's user interface, navigation, and overall user experience.

5.2.4.3.   Identify and address any usability issues or areas for improvement.

5.3.   Test Cases

5.3.1.   User Registration and Authentication

5.3.1.1.   Test case: Verify successful user registration with valid inputs.

5.3.1.2.   Test case: Validate error messages for invalid or missing data.

5.3.1.3.   Test case: Test user login with correct credentials.

5.3.1.4.   Test case: Verify error messages for incorrect login credentials.

5.3.1.5.   Test case: Test password reset functionality.

5.3.2.   Word Sets Management

5.3.2.1.   Test case: View vocabulary words in a word set

5.3.2.2.   Test case: Add a word set to users vocabulary groups

5.3.2.3.   Test case: Delete a word set and verify its removal.

5.3.2.4.   Test case: Add individual words to random words group.

5.3.3.   Practice and Learning

5.3.3.1.   Test case: Practice vocabulary words and mark them as "I knew" or "I didn't know."

5.3.3.2.   Test case: Verify the correct updating of word statuses based on user responses.

5.3.3.3.   Test case: Test the flashcard "flipping" and visual cues.

5.3.3.4.   Test case: Validate the progress tracking and updating of word statuses after practice sessions.

5.3.4.   Progress Tracking and Streaks

5.3.4.1.   Test case: Set a aily goal and verify its display and tracking.

5.3.4.2.   Test case: Practice words and validate the daily progress calculation.

5.3.4.3.   Test case: Test the streak calculation and display.

5.3.4.4.   Test case: Verify the streak reset when failing to meet goal.

5.3.4.5.   Test case: Validate the display of historical progress and streak data.

5.3.5.   Pronouciation

5.3.5.1.   Test case: Verify that the pronunciation audio plays correctly for a flashcard word in the desired language.

5.3.5.2.   Test case: Validate that the pronunciation audio matches the displayed word.

5.3.5.3.   Test case: Verify that the pronunciation audio plays correctly for the translated word.

5.3.5.4.   Test case: Ensure the pronunciation function works as expected when switching between languages or vocabulary sets.

5.3.5.5.   Test case: Validate that the audio playback does not interfere with other application functionalities.

5.3.6.   Translation

5.3.6.1.   Test case: Verify that the translation function correctly translates a word from the user's input language to the desired language.

5.3.6.2.   Test case: Validate the translation accuracy for different word categories (e.g., nouns, verbs, adjectives).

5.3.6.3.   Test case: Verify the "Add example" feature for translated words.

5.3.6.4.   Test case: Verify the application's behavior when the user inputs a word or phrase that cannot be translated.

5.3.6.5.   Test case: Validate that appropriate error messages or fallback mechanisms are in place for untranslatable inputs.

5.3.6.6.   Test case: Test the translation function when switching between different language pairs.

5.3.7.   User Interface and Usability

    5.3.7.1.   Test case: Verify the responsiveness and adaptability of the UI across different screen sizes.

    5.3.7.2.   Test case: Test the navigation and flow between different sections of the application.

    5.3.7.3.   Test case: Validate the clarity and visibility of UI elements, labels, and instructions.

    5.3.7.4.   Test case: Assess the overall user experience and identify any usability issues.