PES UNIVERSITY, BANGALORE
Department of Computer Science and Engineering
B. Tech (CSE) – 5th Semester – Aug-Dec 2023

SOFTWARE REQUIREMENTS SPECIFICATION

PROJECT TITLE

VERSION 1 APPROVED

Team Member 1	SRN 1
Team Member 2	SRN 2

Team Member 3	SRN 3
Team Member 4	SRN 4

Organization : PES University
Date Created :

General Instructions (Delete these instructions from the document before submission) :

- Formatting Guidelines : Submit in pdf format
- Naming convention : **SRS SRN1-SRN2-SRN3-SRN4** (Write SRNs in ascending order)
- In the Table of Contents below, the page numbers are just placeholders. Change them as per your document.
- In case of any confusion regarding what to fill under each heading, read this Format. It has all been explained.
- Don't forget to fill the Project Title on the **first page** as well as the **footer**

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Revision History

Name	Date	Reason for Change	Version

1. Introduction

1.1 Purpose

This SRS describes the software functional and nonfunctional requirements for release 1.0 of the Collaborative Text Editor which will be a web-based text editing application, enabling multiple users to simultaneously create, edit various textual content in multiple languages from remote locations. This document will primarily help in steering the course for the development of our product with the highest possible quality assurance of the software.

1.2 Intended Audience

This document is intended for the developers and outlines the functional and non-functional requirements, system architecture, user interface design and deployment plans for the Collaborative Text Editor.

. *1.3 Product Scope*

An online collaborative text editor is a digital platform designed to facilitate real-time, web-based collaboration among multiple users on a single text document.

The collaborative online text editor will have the following functionalities:

- Create text documents
- Access and edit contents of the document in real time simultaneously from different systems
- Spell and Grammar checking
- Auto complete
- Multi-Language support
- Speech Recognition
- Cross platform compatibility

1.4 References

The following references have been consulted and utilized in the preparation of this software

1. Next.js Documentation, https://nextjs.org/docs
2. Tailwind CSS Documentation, https://tailwindcss.com/
3. Supabase Documentation, https://supabase.com/docs

4. JSpell Checker API Documentation, https://rapidapi.com/page-scholar-inc-page-scholar-inc-default/api/jspell-checker
5. Jest Snapshot Testing Documentation, https://jestjs.io/docs/snapshot-testing
6. Vercel Deployment, https://vercel.com/docs/deployments/overview
7. Stack Overflow, https://stackoverflow.com/

2. Overall Description

2.1 Product Perspective

The online collaborative text editor is not intended to be part of any existing family of products, nor is it meant to act as a replacement or extension for any existing functioning system. The text editor described in this document aims to provide users with a versatile and user-friendly platform for creating, editing, and collaborating on text documents across various industries and use cases.

2.2 Product Functions

- Access and edit contents of the document in real time simultaneously from different systems: Simultaneous editing between multiple multiple users from remote locations
- Spell and Grammar checking : Help users maintain correct spelling and grammar accuracy.
- Auto complete : Will assist the users by providing word and phrase suggestions as they type.
- Multi-Language support: Enabling users to collaborate and work in multiple languages, accommodating multilingual users.
- Speech To Text : Easens the work of users by converting spoken language to text instantaneously.

2.3 User Classes and Characteristics

Potential user classes:

1) Casual Users:
    - Limited technical expertise
    - Infrequent use for creating basic text documents or notes
    - May use the product for personal use or simple collaborative tasks.

2) Professionals:
   - Moderate to high technical expertise.
   - Frequent use for work-related tasks like document creation, editing and collaborative projects.
   - May include managers, professors, team leads, students.
3) Creatives:
   - Varying technical expertise, from moderate to high.
   - Use the editor for content creation, blogging or creative writing
   - May include authors, bloggers and journalists.

2.4 Operating Environment

OE-1: The collaborative text editor will operate on Windows 10 and above on Google Chrome version 117.0.5938.149.

OE-2: The collaborative text editor will operate on Ubuntu 23.04 and above on Firefox version 118.0.1.

2.5 Design and Implementation Constraints

CO-1: The number of users that can collaborate real time on a single document cannot exceed 7.

CO-2 : The number of languages that our product can support is 5.

CO-3 : Credibility and accuracy of autocomplete and spell checker features cannot be guaranteed for all the languages supported by our product.

CO-4: All JavaScript code will conform to the ES13 version.

CO-5 : All HTML code will conform to HTML5 standard

CO-6 : All CSS code will conform to CSS 4.15 version

2.6 Assumptions and Dependencies

<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to

use, issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>

3. External Interface Requirements

3.1 User Interfaces

The user interface of the Collaborative Text Editor is designed to provide an intuitive and efficient interaction experience for the user. This section outlines the logical characteristics of the user interface components, including sample screen images, GUI standards, screen layout constraints, standard buttons and functions, keyboard shortcuts, error message display standards, and other relevant information.

3.1.1 User Interface Components

The software components for which a user interface is needed include, but are not limited to:

1. Text Editor Canvas: This is the main area where users can create, edit, and collaborate on text documents.
2. Toolbar : Provides access to various formatting options such as text styling, alignment and more.
3. Collaboration Panel : Displays user avatars and indicates the presence and activities of collaborators in real-time.
4. Language Selection : Allows users to choose the desired language for text editing.
5. Speech-to-Text Input: Provides a speech recognition interface for users to input text via voice.
6. Auto-Correction and Auto-Suggestions: Implements auto-correction and auto-suggestion features during text editing.

3.1.2 GUI Standards and Style Guidelines

The user interface design will adhere to the following GUI standards and style guidelines:

1. Responsives Design: The user interface will be responsive to ensure optimal usability on various screen sizes and devices.
2. Tailwind CSS Framework : The software will utilize the Tailwind CSS framework for consistent styling and layout.

3.1.3 Standard Buttons and Functions

Standard buttons and functions that will appear on various screens include:

1. Save : Allows users to save their documents.
2. Undo/Redo: Provides the ability to undo and redo actions.
3. Help: Accesses the help documentation and support resources.
4. Settings: Opens the settings menu for customizations options.
5. Collaborator List: Displays a list of current collaborators.

3.1.4 Keyboard Shortcuts

Key Shortcuts will be implemented for common actions, such as Ctrl+S for saving, Ctrl+Z for undo, and Ctrl+C/Ctrl+V for copy/paste. A comprehensive list of keyboard shortcuts will be provided in the User Interface Specification.

3.1.5 Error Message Display Standards

Error messages will follow a consistent format and display standards. They will provide clear and informative feedback to users in case of errors or issues.

3.1.6 User Interface Specification

Detailed information about the user interface design, including screen layouts, sample images, and interaction guidelines, will be documented in a separate User Interface Specification document.

3.2 Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

3.2.1 System Connections

The collaborative Text Editor Web Software interfaces with the following software components:

1. Database : Utilizes Supabase for storing and retrieving user documents and collaborative data.
2. Operating System: The software is designed to be cross platform and is compatible with various os, including Windows 7 and later, macOS, Linux distributions, Android and IoS
3. Third-Party Tools and Libraries: Software uses Web speech API for speech to text functionality, enabling users to input text through voice commands accurately.

3.2.2 Data FLow

Data items and messages coming into and going out of the systems are essential for its core functionality

3.2.2.1 Incoming Data and Messages

1. User Input: Users provide text input, such as typing, pasting, or voice dictation. This input forms the core content of the text documents.

2. Formatting Commands: Users send commands to format text, such as changing font size, text color, alignment, and style (e.g., bold or italic).
3. Collaborative Actions: Real-time collaborative activities from other users include their text edits, formatting changes, cursor positions, and selection highlights. These actions ensure that all users in a collaborative session see real-time updates.
4. Acknowledgments: When a user performs an action the system acknowledges the action's completion.

3.2.2.1 Outgoing Data and Messages

1. Collaborative Updates: Messages about text edits, formatting changes, cursor movements, and selections made by the user are sent to the server and other collaborating users. These updates synchronize the document across all participants in real time.
2. System Notifications: The system sends notifications to users for events such as document saves, system updates, and errors.
3. Saved Documents: The final version of a document is saved, and the system acknowledges the successful save to the user.

3.2.3 Services and Nature of Communication

1. Real-Time Collaboration Services:
   a. Allows users to see and edit a shared document among multiple users in real time.
   b. Users changes are communicated with the server and broadcasted to all the users in the session. The communicated data might include cursor positions, texts, and highlights.
2. Speech-to-Text Conversion Service:
   a. Converts users voice based input to text, enables users to provide input to the document through voice.
   b. Service is unidirectional. It involves receiving audio from the user and returning the text.

3. Auto-Correction and Auto-Suggestion Service
    a. Provides auto correction and auto suggestion functions which assists the user while the user types or edits the text.
    b. As a user types or edits the text, the snippet of text is processed and resulting information is displayed to the user to decide. Service is unidirectional.

4. Database Service (Supabase)
    a. Database will be used to store user documents, user details, session details.
    b. Communication to database is bidirectional . Communication between software and database is CRUD operations over HTTP protocol.

3.3 Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

<if any Hardware Interfaces include as 3.4 Hardware Interfaces>

4. Analysis Models

<Include pertinent analysis models, such as use case diagrams and if applicable entity-relationship diagrams.>

5. System Features

<This template illustrates organizing the functional requirements for the product by system features, the major services provided by the product. You may prefer to organize this section by use case, mode of operation, user class, object class, functional hierarchy, or combinations of these, whatever makes the most logical sense for your product.>

System Feature 1

<Don't really say "System Feature 1." State the feature name in just a few words.>

5.1.1 Description and Priority

<Provide a short description of the feature and indicate whether it is of High, Medium, or Low priority. You could also include specific priority component ratings, such as benefit, penalty, cost, and risk (each rated on a relative scale from a low of 1 to a high of 9).>

5.1.2 Stimulus/Response Sequences

<List the sequences of user actions and system responses that stimulate the behavior defined for this feature. These will correspond to the dialog elements associated with use cases.>

5.1.3 Functional Requirements

<Itemize the detailed functional requirements associated with this feature. These are the software capabilities that must be present in order for the user to carry out the services provided by the feature, or to execute the use case. Include how the product should respond to anticipated error conditions or invalid inputs. Requirements should be concise, complete, unambiguous, verifiable, and necessary. Use "TBD" as a placeholder to indicate when necessary information is not yet available.>

<Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.>

REQ-1:
REQ-2:

System Feature 2 (and so on)

6. Other Nonfunctional Requirements

6.1 Performance Requirements

Latency:

Real-time collaboration latency should be less than 100 milliseconds.

Web page load time:

The web page load time should be less than 2 seconds.

Document load time:

The document should load within 2 seconds irrespective of the language.

Auto-complete response time:

Auto-complete suggestions should appear within 300 milliseconds.

Speech Recognition:

Speech Recognition should achieve an accuracy rate of 95% or higher with response times under 500 milliseconds.

6.2 Safety Requirements

SA-1: Secure user authentication to ensure that only authorized individuals can access the documents.

SA-2: Owner of the document can grant specific permissions to collaborators by controlling access and edit permissions.

SA-3 : Maintained logs of user activities, including document changes and access attempts.

SA-4: Real time collaboration features do not compromise the security of documents.

6.3 Security Requirements

SE-1: Content written by users should not be available to other users unless explicit information is given

SE-2: Users have to log in before making any changes to any document

SE-3: The software must maintain a list of all users along with their passwords

6.4 Software Quality Attributes

Usability-1: Easy to use and efficient interface

Usability -2: Easy to use shortcuts
Usability-3: The product should have a shallow learning curve

Availability-1: The software shall be available to users at all times unless under maintenance.

Portability-1: The software shall run on windows and linux as long as the user's browser satisfies the version constraints listed in the section 2.4 Operating Environments.

Robustness-1: If the surveyor's internet connection was cut off before saving the document, they will still be able to recover and continue from the state where they left off.

6.5 Business Rules

No Business Rules are applicable here.

7. Other Requirements:

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A: Glossary

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>

Appendix B: Field Layouts

<An Excel sheet containing field layouts and properties/attributes and report requirements.>

Sample sheet with information required to register the customer

Field	Length(bytes)	Data type	Description	Is Mandatory
Account Number	16	Numeric		Y
ISFC code	11	Alphanumeric		Y
Card Amount	20	Numeric		Y
Mandate Start Date	8	Date	Date of Mandate Registration	N
Mandate End Date	8	Date	Date of Mandate Expiry	N
Status	25	Alphanumeric	Status of Registration	Y
Customer Name	60	String		Y
Reject Reason Code	4	String	Reject Reason code in case mandate is rejected	N

Sample Report Requirements: Include the fields to be included in the report

Registration Report	Transaction Report
Bank Account Number	Transaction Reference Number
ISFC Code	Bank Account Number
Bank Name	IFSC Code

Account Status	Bank Name
Account Type	Customer Name
Customer Name	Card Number
Card Number	Debit Transaction Amount
SI Start Date	Transaction Date
Status	Status
Remarks	Debit Attempt Number
	Remarks

Appendix C: Requirement Traceability matrix

Sl. no.	Requirement ID	Brief Description of Requirement	Architecture Reference	Design Reference	Code File Reference	Test Case ID	System Test Case ID