Software Requirements Specification Document

Bilingual Grammar Error Correction Tool Using Deep Learning

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1 Introduction

1.1 Product Overview

This project's objective is to develop an efficient DL Grammar Error Correction (GEC) tool for Hindi and English that will primarily be used by students and teachers in schools, colleges, and institutions. This instrument will change the field of education and be a blessing for academics, especially those who speak Hindi.

The users will be able to summarise texts and check spelling as well as grammar for the input provided. There are numerous input alternatives available, including speech-to-text, file upload, and text entry.

The "Expert Review" option, which has extra features including cross-checking the rectified content and chatting with a verified language expert, is available to premium users. In addition to using the tool as a regular user, the user can register as an expert by uploading documentation of their language qualification, which will be verified before the expert's acceptance. Additionally, this application has templates features that enable users to swiftly edit papers or files that have a predesigned format, which speeds up user writing.

2 Specific Requirements

2.1 External Interface Requirements

2.1.1 User Interfaces

The user interface used will be completely GUI (Graphical User Interface).This interface must be highly intuitive or interactive because there will not be any assistance for the user who is operating the system. The interface is designed to be very user-friendly so anyone with a very little knowledge of the computers can also operate the system. The web application will be responsive and dynamic in nature. The navigation menu will have options like Home, Login, Profile, Expert Review and GEC Tools. The web pages in the application are:

- Home Page
- Login and Registration Page
- GEC Tools Page
- Profile Page
- Expert Review Page

2.1.2 Hardware Interfaces

The hardware requirements for the application are:

1. Monitor: 4 GB RAM, Intel i5, 3.5 GHz processor
2. System Configuration
3. Keypad
4. Mouse
5. Connection to the user database

2.1.3 Software Interfaces

The software package is developed using HTML, CSS3, ReactJS and JQuery as frontend tools. The backend of the software is developed using Python with DJango Framework, SQLite and MySQL to store the database.

1. Operating system: Windows XP/Vista/7 or later version, Linux OS which supports Networking.
2. Web Browser: MS Edge, Chrome, Firefox, Safari, Opera
3. Database system: MySQL 8.0 and above
4. Python v3.6 and above

2.1.4 Communication Protocols

The product will require Node to run the Library Management System on a local host. Machine should be connected to the internet through LAN/WAN for Communication purpose and APIs for the different tools offered by the software.

2.2 Software Product Features

1. Registration: This allows the user to create a new account as an expert or general user and get registered into the system. The system shall perform validation checks on the inputs and ask the user to enter correct information in case of an error. After successful registration, the user will be directed to the home page.

2. Login: It is essential for the user to login into the system to access, borrow and view books. If an unregistered user tries to login into the system, the application will redirect it to the registration page.

3. Spelling Check: The user can provide input in the system by speech-to-text, bulk upload or manual text field. The output will be in the form of text or file as requested by the user in the form the report of spell check.

4. Grammar Check: The user can provide input in the system by speech-to-text, bulk upload or manual text field. The output will be in the form of text or file as requested by the user in the form the report of grammar check.

5. Text Summarizer: The user can provide input in the system by speech-to-text, bulk upload or manual text field. The output will be in the form of text or file as requested by the user in the form the report of text summary.

6. Expert Review: It is important for the user to pay the membership fees in order to use the system. The user can request for expert review by uploading their required file and within a certain time frame, an expert will be allotted to therm. They can chat anonymously with the expert regarding the required changes and get the desired output.

7. Profile: It displays relevant information about the user. It is an interface to view/edit one's profile. It also provides the mechanism to reset the password in case the user forgets it and other settings.

2.3 Software System Attributes

2.3.1 Reliability

- Both the data and the software is backed up periodically on the local server.
- An off-site backup is also ensured for recovery from major failure to ensure business continuity.
- Mean Time to Repair (MTTR) - Even if the system fails, the system will be recovered back up within an hour or less.

2.3.2 Availability

- The system shall be operational 7 days a week, 24 hours a day.
- The information on the application can be viewed and accessed at all times, 365 days of the year.

2.3.3 Security

- The product is secured as only registered users can login. User authentication is done to ensure full security.
- Users can only read information but can not edit or modify anything except their own profile details.

2.3.4 Maintainability

- The information is refreshed depending upon whether some updates have occurred or not in the application.

2.3.5 Portability

- The application is independent of the operating system used and has a portable setup with a few modifications.
- The use of HTML, CSS, ReactJS and JavaScript makes it easier to run the application on any browser.

2.3.6 Performance

- The same resources of system can be used many times by a number of users.
- The system responds to the user in not less than two seconds from the time of the request submission.
- The system is allowed to take more time when doing large processing jobs.
- Responses to view information takes no longer than 5 seconds to appear on the screen.

2.4 Database Requirements

- MySQL is used as a relational database as it is easy to maintain and retrieve records by simple queries which are in English language which are easy to understand and easy to write.
- User will be the main entities of the database system.
- Every registered member will have a unique id which would be the Primary Key. This table will also consist of name, email id, address and type of user.
- Passwords will be stored in hashed form.
- Integrity constraints: All member IDs will be UNIQUE, NOT NULL and used as PRIMARY KEY.
- The email id of members will have UNIQUE and NOT NULL constraint.