

Requirements Analysis Report

1. Requirements Overview

This document specifies the functional and non-functional requirements for the English Speaking Practice and Pronunciation Analysis System. The system assists learners in practicing spoken English through speech recognition, scoring, and progress tracking.

2. Stakeholders

The system involves the following stakeholders:

No.	Stakeholder	Description
1	Learner (User)	Students, professionals, or ESL learners using the platform for practice and feedback.
2	Administrator	Manages lessons, users, and system statistics.
3	Project Team (Dev Team)	Developers responsible for designing, building, and deploying the system.
4	Sponsor / Instructors	Faculty and lecturers providing requirements, guidance, and evaluation.

3. Functional Requirements

Authentication & User Management

- Allows users to register using email and password.
- Provides secure login to access personal learning data.
- Maintains a user profile containing name, level, and progress.
- Uses secure authentication such as JWT or session-based login.

Learning & Practice Module

- Provides a list of speaking topics with multiple lessons.
- Displays target English sentences along with sample audio.
- Allows learners to record their voice directly from the web interface.
- Converts recorded speech to text using speech recognition.
- Compares learner's speech with the target sentence for scoring.
- Generates an overall pronunciation score based on similarity.
- Performs phoneme-level analysis and highlights mispronounced sounds.
- Provides suggestions for improvement.
- Includes a Random Practice Mode that selects sentences suitable for the user's level.

Progress Tracking & Gamification

- Generates performance reports including score, accuracy, and error list.
- Stores learning history for long-term tracking.
- Provides gamification features such as badges or rankings.

Administration Module

- Allows administrators to add, delete, or update lesson content.
- Allows management of user accounts (view, disable).
- Provides tools for monitoring learner statistics.

4. Non-Functional Requirements

Performance Requirements

- Voice processing and feedback completes within 3–5 seconds.
- Speech recognition accuracy maintains above 85%.
- System supports at least 1,000 concurrent users through scalable architecture.

Security Requirements

- All credentials and sensitive data are encrypted in storage and during transmission.
- Implements input validation and sanitization to prevent security attacks such as SQL Injection and XSS.

Interface & Usability Requirements

- Developed as a web-based application.
- Responsive design ensures compatibility with desktops and mobile devices.
- Supports modern browsers (Chrome, Edge) with HTML5, CSS3, and JavaScript.

Reliability & Availability

- Requires stable Internet connection as speech processing is cloud-based.
- Backend hosted on reliable cloud platforms such as Google Cloud Platform.