

# Requirements Analysis Report

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## 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.