

# AI-Based Smart System for Personalized IELTS Preparation and Feedback Generation

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**Abstract:** *The IELTS Personal Assistant System is a web-based tool designed to help students prepare well for the IELTS exam. It uses React for the front end and Python Flask for the back end. The app creates an intelligent learning environment where users can practice the four main parts of the IELTS: Reading, Writing, Listening, and Speaking.*

*The system starts with a user authentication part that lets people register and log in. Once they log in, they see a dashboard with options for the four practice areas.*

*In the Reading section, students read texts provided by the system. Once the test is complete, the system automatically reviews the answers, assigns band scores, points out areas that need improvement, and offers tips for getting better. For the Writing section, users write responses to tasks similar to those in the IELTS exam. The system then evaluates their writing, providing feedback on how well they addressed the task, how clearly their ideas are organized, their grammar, their strengths, and where they should focus more effort, along with an overall band score.*

*The Speaking module lets students record their spoken responses. The system analyzes the audio and checks things like fluency, coherence, vocabulary, grammar, and pronunciation. It then gives a band score and a plan to improve. In the Listening section, the system creates audio content and matching questions on the back end. After the candidate completes the listening test, the system evaluates the answers and provides scores, feedback, weaknesses, and improvement plans.*

*The dashboard also contains a sidebar with additional features such as My Courses, Progress Tracking, Study Materials, and Profile Settings. The My Courses section provides syllabus-based learning resources for each module and mock tests for practice. After completing tests, scores are calculated and stored by the backend.*

*The Progress section visualizes user performance through graphs for Reading, Writing, Listening, and Speaking modules. The Study Materials section lets users upload learning resources in PDF or image format. The Profile Settings module lets users manage their account information.*

*This system helps candidates improve their IELTS performance through automated evaluation, personalized feedback, and progress tracking, making the preparation process more structured and effective.*

**Keywords:** Artificial Intelligence, IELTS Preparation, Automated Evaluation, Personalized Learning, Natural Language Processing (NLP), Speech Recognition, Web-Based Learning System, Progress Tracking

## I. INTRODUCTION

The International English Language Testing System, known as IELTS, is one of the most widely recognized tests for measuring English language proficiency, used around the world for purposes such as education, employment, and immigration.



ation. Many students and professionals prepare for this examination to demonstrate their ability to communicate effectively in English. The IELTS exam evaluates

Candidates prepare for the IELTS examination through four major modules: Reading, Writing, Listening, and Speaking. This preparation involves continuous practice, personalised feedback, and performance evaluation. However, many students face challenges such as limited access to practice materials, a lack of personalised feedback, and difficulty tracking their learning progress. To address these challenges, the IELTS Personal Assistant System has been developed as a web-based platform. This system helps candidates prepare for the IELTS examination in an organised and interactive manner. It provides a digital learning environment where users can practice all four IELTS modules and receive automated analysis and feedback. The application is built using React for the frontend and Python Flask for the backend, ensuring a responsive user interface and efficient processing of user inputs.

The system starts with a user authentication process that allows users to sign up and log in to use the platform. Once they successfully log in, they are taken to a dashboard featuring four primary modules: Reading, Writing, Listening, and Speaking. Each module is designed to simulate real IELTS exam scenarios and provide detailed evaluation of the candidate's performance.

In the Reading module, candidates read passages provided by the system and answer questions generated based on the content of the passage. After submission, the backend evaluates the answers and provides scores, band estimation, feedback, and suggestions for improvement. The Writing module allows users to submit written responses to IELTS-style prompts. The system analyzes the content and provides feedback on task response, coherence, grammar, strengths, and areas that require improvement.

The Speaking module lets users practice speaking by recording their answers to given topics. The system listens to the recording and gives feedback on how fluent, clear, varied in vocabulary, correct in grammar, and properly pronounced the response is. The Listening module plays audio clips and asks related questions. Users listen to the audio, answer the questions, and then get feedback and a score once they submit their answers. Besides these practice tools, the system has other helpful features like My Courses, Progress Tracking, Study Materials, and Profile Settings.

My Courses offers learning content and practice tests that follow a syllabus for each module. The Progress section uses graphs to show how well users are doing in all four modules. Study Materials lets users upload files like images and PDFs for later use. Profile Settings let users update their personal info and account details.

The IELTS Personal Assistant System aims to provide an intelligent and structured learning platform that assists candidates in improving their English language skills. By offering automated evaluation, performance tracking, and personalized feedback, the system helps students prepare effectively and improve their chances of achieving a higher band score in the IELTS examination.

## II. PROBLEM STATEMENT

The International English Language Testing System (IELTS) is one of the most widely accepted English language proficiency examinations required for higher education, employment, and immigration in many countries. The examination evaluates a candidate's English language ability through four main modules: Reading, Writing, Listening, and Speaking. To achieve a high band score in the IELTS exam, candidates must practice regularly and improve their language skills through continuous evaluation and feedback. However, many students face significant challenges during their IELTS preparation due to the lack of proper guidance, structured practice platforms, and personalized feedback.

Most students rely on traditional learning methods such as books, coaching classes, or scattered online resources. These approaches often provide limited opportunities for real-time assessment and do not offer detailed analysis of a student's performance. As a result, candidates find it difficult to identify their weaknesses and understand which areas require improvement. Additionally, existing practice systems rarely provide automatic evaluation of writing responses or speaking recordings, which are critical components of the IELTS examination.



Another challenge faced by students is the absence of a unified platform where all four IELTS modules can be practiced in an organized manner. Students often need to use different platforms or resources for each module, which makes the preparation process complicated and inefficient. Furthermore, many existing systems do not offer personalized feedback, improvement suggestions, or progress tracking features that allow candidates to monitor their learning development over time.

### **III. LITERATURE REVIEW**

The rapid growth of digital learning platforms has significantly improved the way students prepare for language proficiency examinations such as the International English Language Testing System (IELTS). Many researchers and developers have proposed intelligent systems and online platforms to support students in practicing language skills and improving their performance. These systems aim to provide automated evaluation, learning resources, and personalized feedback to enhance the learning experience.

Several online learning platforms have been developed to assist IELTS candidates by providing practice materials, mock tests, and interactive exercises. These platforms help learners become familiar with the test format and improve their language skills through continuous practice. However, many of these systems mainly focus on providing static practice questions and do not offer detailed analysis or personalized feedback to help students understand their weaknesses.

Recent studies in educational technology highlight the importance of intelligent tutoring systems that can automatically evaluate student responses and provide suggestions for improvement. Such systems use techniques like natural language processing and speech analysis to assess writing and speaking performance. Automated essay evaluation systems have been introduced to analyze written responses based on grammar, coherence, vocabulary usage, and overall structure. These systems help learners receive quick feedback without requiring manual evaluation by instructors.

Similarly, speech recognition and audio analysis technologies have been used to develop speaking assessment tools. These tools analyze pronunciation, fluency, and grammatical accuracy in spoken responses. By providing feedback on these aspects, the system helps students identify areas where they need improvement in their speaking skills.

Listening and reading comprehension systems have also been integrated into many language learning platforms. These systems generate questions based on passages or audio content and evaluate user responses to determine their comprehension level. Automated scoring mechanisms help learners understand their performance and improve their understanding of the language.

In addition to practice modules, modern learning systems also incorporate progress tracking and data visualization features. These features allow students to monitor their learning performance through graphs and statistics. By analyzing progress data, learners can focus more on weaker modules and improve their preparation strategy.

Although many existing systems support IELTS preparation, most of them lack a fully integrated platform that combines reading, writing, listening, and speaking modules along with automated evaluation, feedback generation, progress tracking, and study material management. Therefore, the proposed IELTS Personal Assistant System aims to fill this gap by providing a comprehensive and intelligent platform that supports all four IELTS modules and offers personalized feedback, improvement plans, and performance monitoring to enhance the overall preparation process.

### **IV. OBJECTIVES**

The rapid growth of digital learning platforms has significantly improved the way students prepare for language proficiency examinations such as the International English Language Testing System (IELTS). Many researchers and developers have proposed intelligent systems and online platforms to support students in practicing language skills and improving their performance. These systems aim to provide automated evaluation, learning resources, and personalized feedback to enhance the learning experience.



- To provide automated evaluation of user responses by generating band scores, feedback, and improvement suggestions for each module.
- To enable students to track their learning progress through performance analysis and graphical representation of scores across different modules.

## V. PROPOSED SYSTEM

The proposed system is a web-based IELTS Personal Assistant designed to help students prepare effectively for the IELTS examination through an interactive and intelligent learning platform. The system integrates all four IELTS modules—Reading, Writing, Listening, and Speaking—into a single application that provides practice tests, automated evaluation, feedback, and progress tracking. The application is developed using React for the frontend interface and Python Flask for the backend processing, ensuring efficient communication between the user interface and the evaluation system.

The system begins with a user authentication process where candidates can register and log in to access the platform. After successful login, the user is directed to the dashboard, which acts as the central interface of the system. From the dashboard, users can access the four main practice modules: Reading, Writing, Listening, and Speaking.

In the Reading module, the system provides passages that users must read carefully. Based on these passages, the backend automatically generates questions for comprehension testing. Users answer the questions and submit their responses, after which the system evaluates the answers and generates scores, band estimation, feedback, and suggestions for improvement.

The Writing module allows candidates to submit written responses based on IELTS-style topics or prompts. The system analyzes the submitted paragraph and evaluates it according to key IELTS assessment criteria such as task response, coherence, grammatical accuracy, and vocabulary usage. After analysis, the system provides feedback, identifies grammar mistakes, highlights strengths, and suggests improvement plans along with a band score.

In the Speaking module, candidates can record their spoken responses to IELTS-style questions. The system processes the audio input and evaluates it based on parameters such as fluency, coherence, lexical resource, grammatical range, and pronunciation. The backend then generates a band score and provides feedback and recommendations to help users improve their speaking ability.

The Listening module dynamically generates audio content whenever the user accesses the module. Based on the generated audio, the system also creates related questions. Users listen to the audio and answer the questions provided. After submitting the test, the system evaluates the answers and generates scores, feedback, weaknesses, and improvement suggestions.

In addition to the main modules, the system also includes several supporting features accessible through the dashboard sidebar. The My Courses section provides structured course content and syllabus-based learning materials for each module. It also includes mock tests that allow users to evaluate their preparation level after completing the course content.

The Progress section tracks the user's performance across different modules. After each test submission, the scores are stored in the system and analyzed to generate performance graphs. These graphs visually represent the user's progress in Reading, Writing, Listening, and Speaking modules.

The Study Materials section allows users to upload learning resources such as images or PDF files that can be used for personal study and reference. Additionally, the Profile Settings page enables users to manage their account information and update personal details.

Overall, the proposed IELTS Personal Assistant System provides a structured, intelligent, and user-friendly platform that helps candidates practice IELTS modules, receive automated feedback, track their progress, and improve their English language proficiency in an efficient manner.



**VI. RESULTS AND DISCUSSION**

The implementation of the **IELTS Personal Assistant System** demonstrates that an integrated web-based platform can effectively support students in preparing for the IELTS examination. The system successfully combines the four main IELTS modules—Reading, Writing, Listening, and Speaking—into a single environment where users can practice and receive automated feedback. By using React for the frontend and Python Flask for the backend, the system provides a responsive user interface and efficient data processing.

The Reading module allows users to read passages and answer generated questions. After submission, the system evaluates the responses and provides scores, estimated band levels, and feedback. This helps students understand their comprehension abilities and identify areas where they need to improve. The automated question generation and evaluation process ensures that users receive immediate results, which encourages continuous practice.

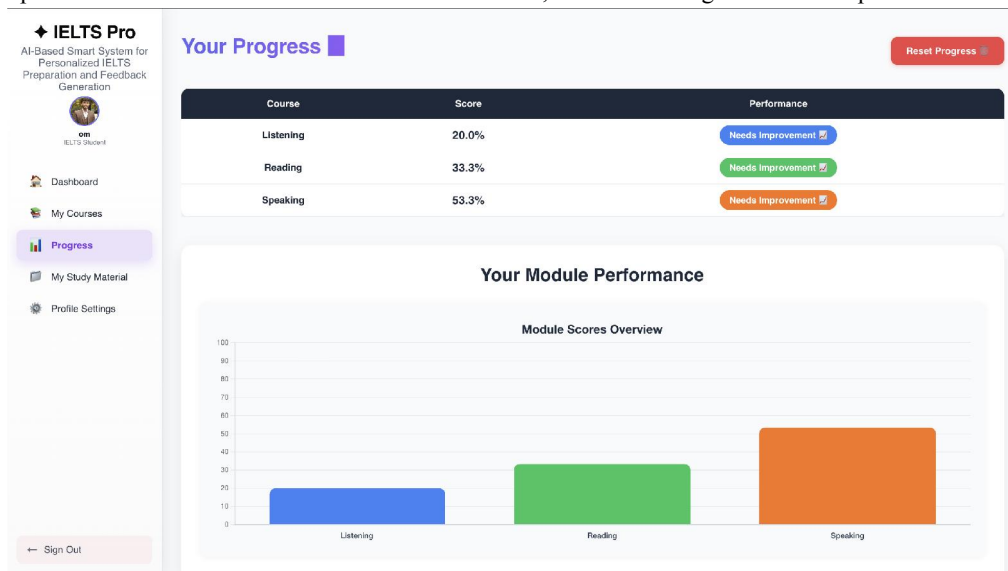


Figure 1: Dashboard Interface of AI-Based IELTS Preparation System

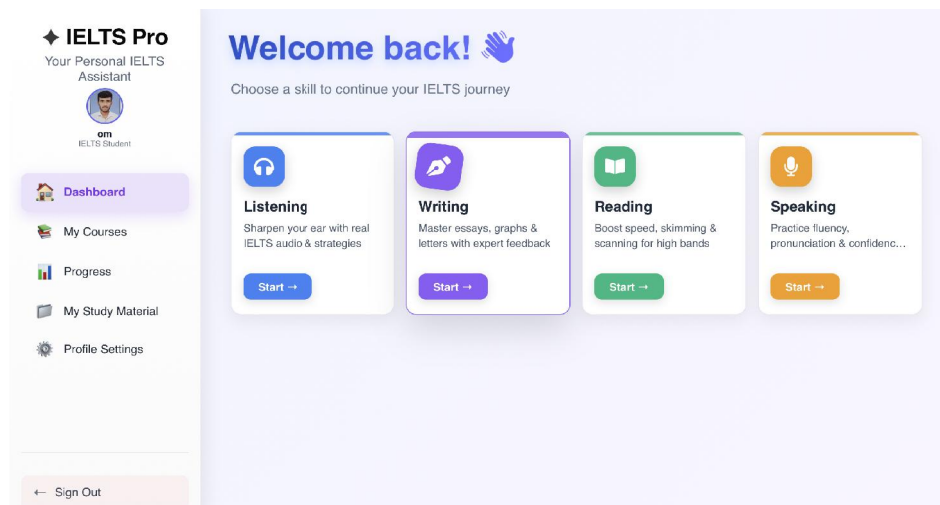


Fig. 2. Progress Tracking Interface of the AI-Based IELTS Preparation System



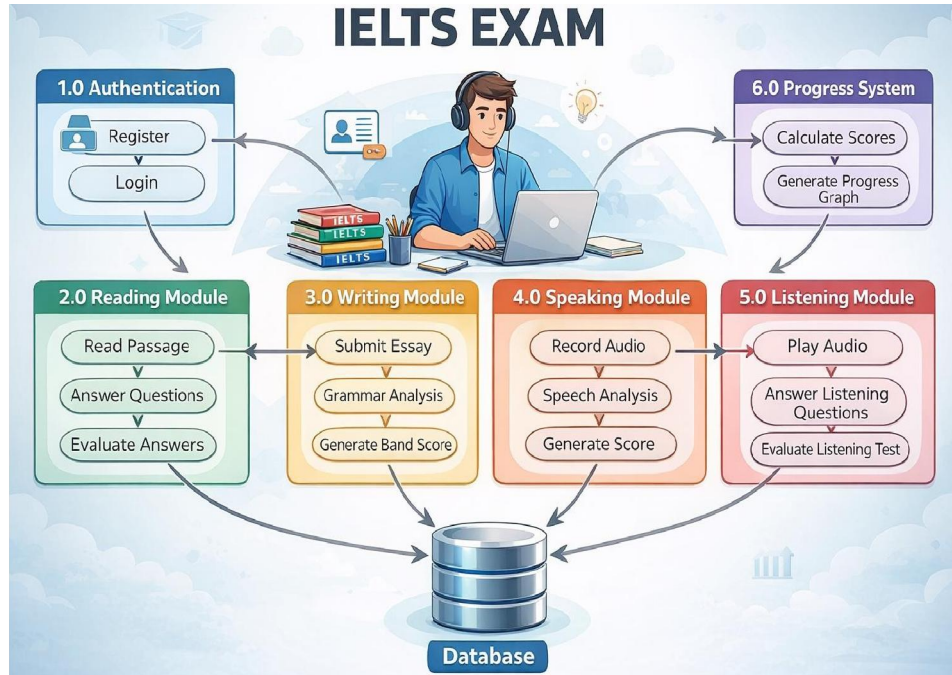
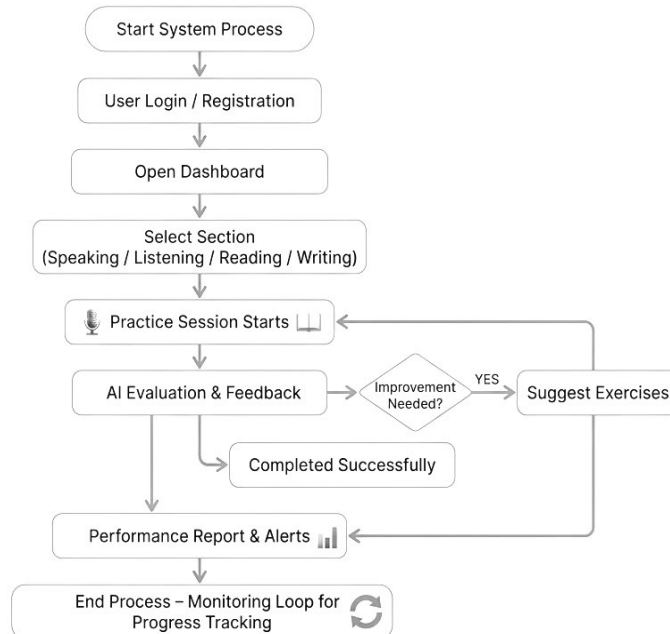


Fig.3. System Architecture of the AI-Based Smart System for Personalized IELTS Preparation

**Flow diagram :-**



**DFD Diagram:**

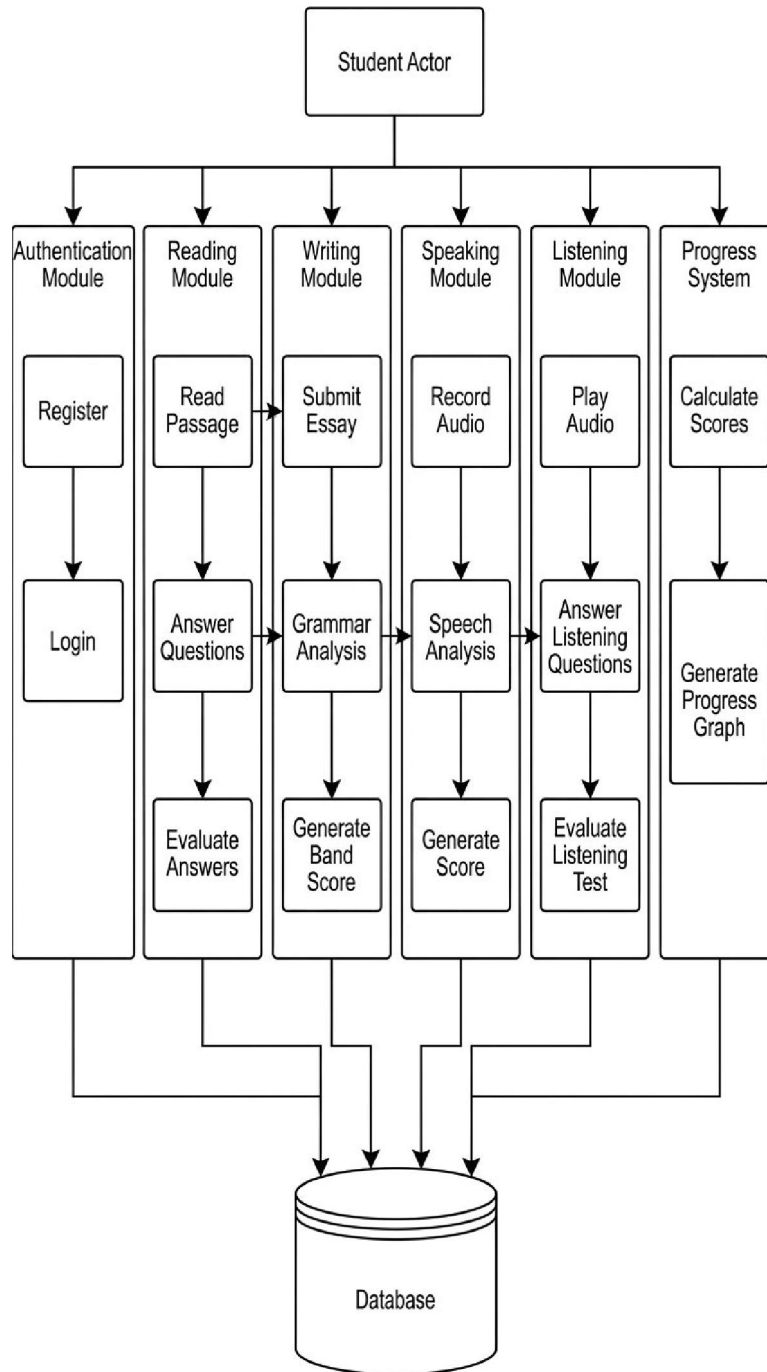


Fig. 5. Data Flow Diagram (DFD) of the AI-Based IELTS Preparation System



**TABLE I**

Module	Function Performed	Result Obtained
Reading	Users read passages and answer generated questions	System evaluates answers and provides band score, feedback, and improvement suggestions
Writing	Users submit IELTS-style written responses	System analyzes grammar, coherence, and task response and provides band score and feedback
Speaking	Users record speaking responses	System evaluates fluency, pronunciation, lexical resource, and provides band score with improvement plan
Listening	System generates audio and related questions	User answers questions and receives score, feedback, and weakness analysis

### VII. METHODOLOGY

The methodology of the **IELTS Personal Assistant System** focuses on developing an interactive and intelligent platform that assists users in practicing the four main IELTS modules: Reading, Writing, Listening, and Speaking. The system follows a structured workflow starting from user authentication, module interaction, response evaluation, and performance tracking. The application is implemented using a React-based frontend for creating a dynamic user interface and a Python Flask backend for processing user inputs, generating questions, and evaluating responses.

Initially, the system begins with the user registration and login process. New users create an account by providing necessary details, and existing users log in using their credentials. After successful authentication, users are redirected to the main dashboard where they can access all system features through a sidebar navigation panel.

From the dashboard, users can select any of the four IELTS practice modules. In the Reading module, the system provides passages to the user. The backend processes the passage and generates comprehension questions. Users read the passage, answer the questions, and submit their responses. The system evaluates the answers and calculates scores, identifies weak areas, and generates improvement suggestions.

In the Writing module, the system presents IELTS-style writing prompts. Users write their responses in the provided text area and submit them for analysis. The backend processes the written content and evaluates it based on grammar, coherence, vocabulary usage, and task response. After evaluation, the system provides feedback, band score estimation, strengths, and improvement recommendations.

In the Speaking module, users record their spoken responses based on IELTS speaking prompts. The system captures the audio input and processes it for evaluation. The backend analyzes the audio for pronunciation accuracy, fluency, grammatical range, and lexical resource. Based on this analysis, the system generates feedback, band score estimation, and suggestions for improvement.

In the Listening module, the system dynamically generates audio content along with related questions. Users listen to the audio carefully and answer the provided questions. Once the responses are submitted, the backend evaluates the answers and generates scores, feedback, and improvement plans based on the user's performance.

The system also includes additional functionalities such as My Courses, Progress Tracking, and Study Materials. The My Courses section provides syllabus-based learning content and mock tests for each module. The Progress module collects test results from all modules and displays the user's performance through graphical representations. The Study Materials section allows users to upload educational resources such as images or PDF files for personal study.



Overall, the methodology ensures a systematic flow of interaction between the user and the system. It enables automated evaluation, structured learning, and continuous progress monitoring, which helps users improve their IELTS preparation effectively.

### VIII. CONCLUSION

The IELTS Personal Assistant System provides an effective and interactive platform for students preparing for the IELTS examination. The system integrates the four major IELTS modules—Reading, Writing, Listening, and Speaking—into a single web-based application, allowing users to practice and improve their language skills in a structured environment. By combining a React-based frontend with a Python Flask backend, the system ensures smooth user interaction and efficient processing of user responses.

The system enables candidates to practice IELTS-style tests and receive automated evaluation and feedback. Through features such as band score estimation, performance analysis, and improvement suggestions, users can better understand their strengths and weaknesses in each module. This helps learners focus on specific areas that require improvement and enhances their overall preparation strategy.

In addition to practice modules, the system provides supportive features such as course materials, mock tests, study material uploads, and progress tracking through graphical analysis. These features help create a comprehensive learning environment where users can continuously monitor their development and improve their performance over time.

Overall, the proposed system simplifies the IELTS preparation process by offering an organized, intelligent, and user-friendly platform. It reduces dependency on traditional coaching methods and provides candidates with a flexible and accessible way to practice and improve their English language proficiency. The system can therefore serve as a valuable tool for students aiming to achieve higher band scores in the IELTS examination.

The system enables candidates to practice IELTS-style tests and receive automated evaluation and feedback. Through features such as band score estimation, performance analysis, and improvement suggestions, users can better understand their strengths and weaknesses in each module. This helps learners focus on specific areas that require improvement and enhances their overall preparation strategy.

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