

AI-Mock Interview Platform

Anushka G.Raut

Modern Education Society's Cusrow Wadia Institute of Technology, Pune Department of Computer Engineering

E-mail: anushkaraut844@gmail.com

Shilpa S.Memane

Modern Education Society's Cusrow Wadia Institute of Technology, Pune Department of Computer Engineering

E-mail: memaneshilpa36@gmail.com

Jyotsna G.Raut

Modern Education Society's Cusrow Wadia Institute of Technology, Pune Department of Computer Engineering

E-mail: rautjyotsna016@gmail.com

Sudarshan J. Sikchi(Guide)

Modern Education Society's Cusrow Wadia Institute of Technology, Pune Department of Computer Engineering

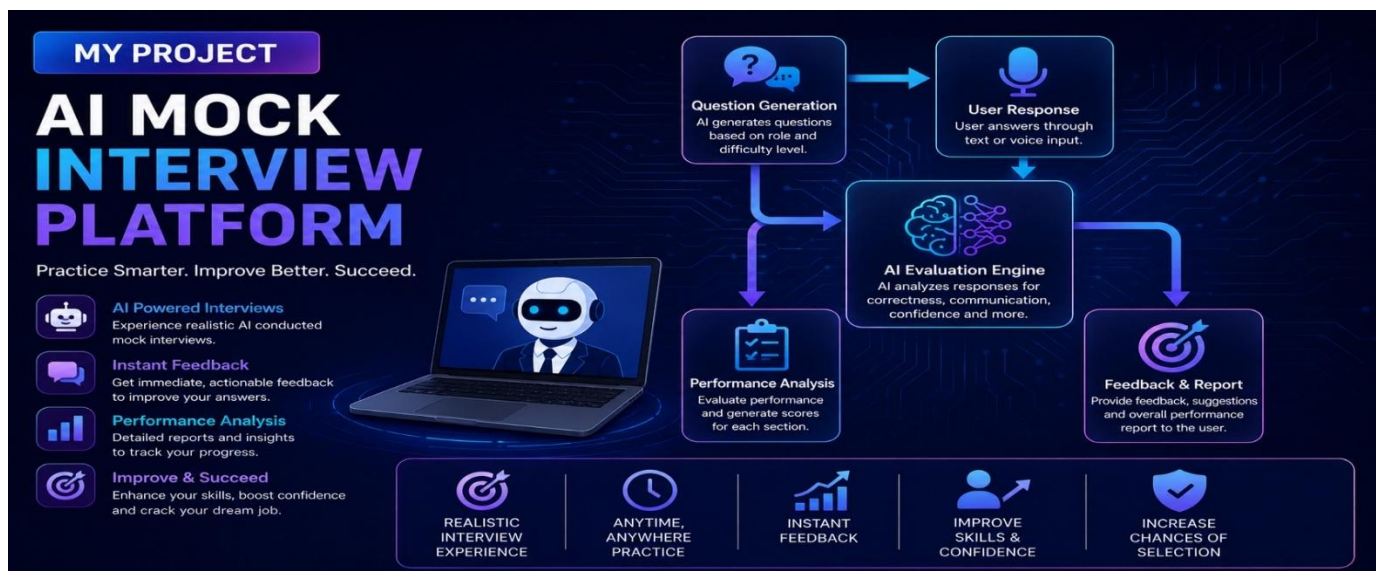


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Abstract: The AI Mock Interview Platform is a smart system designed to help students and job seekers improve their interview skills using Artificial Intelligence. The platform simulates real interview situations by asking technical and HR questions based on the user's selected job role. It analyzes the answers and provides feedback on communication skills, confidence, correctness, and performance. The system helps users practice interviews anytime without needing a human interviewer. The main aim of this project is to reduce interview fear, improve preparation, and increase the chances of

getting selected in job interviews. The system asks technical, HR, and aptitude-based questions according to the selected job role. Users can answer using text or voice input. The AI system analyzes the responses based on correctness, confidence, communication quality, and response time. After evaluation, the platform generates scores and suggestions for improvement. The platform reduces dependency on human interviewers and allows users to practice interviews anytime and anywhere. It is cost-effective, user-friendly, and beneficial for placement preparation, corporate training, and self-learning. Future improvements may include emotion detection, facial expression analysis, and multilingual support.

.Keywords: Artificial Intelligence, Mock Interview, Machine Learning, Interview Preparation, Web Application, NLP, Career Guidance.

1 INTRODUCTION

In the modern digital era, the recruitment process has become highly competitive. Companies and organizations conduct interviews to evaluate the technical knowledge, communication skills, confidence, and problem-solving abilities of candidates. Interviews are considered one of the most important stages in the hiring process because they help employers identify suitable candidates for specific job roles.

However, many students, freshers, and job seekers face difficulties during interviews due to lack of preparation, nervousness, fear of communication, and limited interview experience. Even candidates with strong academic backgrounds often fail to perform well because they are unable to answer questions confidently or communicate effectively during interviews.

Traditional interview preparation methods usually involve attending coaching classes, practicing with teachers, or participating in mock interviews conducted by professionals. These methods may not always be accessible to every student because they require time, money, and availability of experts. In many cases, students do not get enough opportunities to practice interviews regularly.

Artificial Intelligence (AI) has introduced new possibilities in education and recruitment systems. AI-based systems can automate tasks, analyze user responses, and provide intelligent feedback. Using AI technology, it is possible to create a smart interview platform that can simulate real interview experiences without requiring a human interviewer.

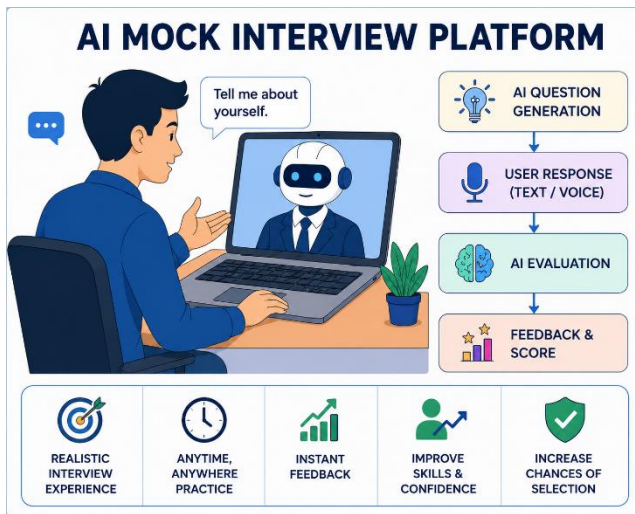
The AI Mock Interview Platform is a web-based intelligent system developed to help users improve their

interview skills through continuous practice. The platform creates a virtual interview environment where users can attend mock interviews anytime and anywhere. The system asks technical, HR, and aptitude-based questions according to the selected job role or category.

Users can answer questions through text or voice input. The AI engine analyzes the responses based on multiple factors such as correctness of the answer, communication quality, confidence, grammar, response timing, and fluency. After completing the interview, the system generates a detailed performance report with scores and suggestions for improvement.

The platform helps candidates identify their strengths and weaknesses and improve their overall interview performance. It reduces interview fear and increases confidence through repeated practice sessions. The system is especially useful for college students preparing for campus placements, fresh graduates searching for jobs, and professionals preparing for career advancement opportunities.

The AI Mock Interview Platform also saves time and cost because users can practice interviews online without needing trainers or professional interviewers. The system provides instant feedback, tracks user progress, and maintains interview history for future analysis.



The project combines technologies such as Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), web development, and database management to create an interactive and intelligent learning platform. The main objective of this project is to make interview preparation easier, smarter, and more accessible for everyone.

In the future, the platform can be enhanced with advanced features such as facial expression analysis, emotion detection, multilingual support, real-time video interviews, AI chatbot interviewers, and resume-based question generation. These improvements can make the system more realistic and efficient.

Overall, the AI Mock Interview Platform is an innovative solution that helps users build confidence, improve communication skills, and prepare effectively for real-world interviews using Artificial Intelligence technology.

2 THEORY

2.1 Background Theory

The AI Mock Interview Platform is based on Artificial Intelligence (AI) technologies used for automated interview practice and evaluation. Artificial Intelligence enables machines to perform tasks that normally require human intelligence such as learning, analysis, and decision-making. The platform helps students and job seekers improve their interview skills through continuous practice. Many candidates fail interviews because of nervousness, lack of confidence, and poor communication skills. Traditional mock

interviews require professional trainers and consume more time and money. The proposed system provides an online interview environment that users can access anytime and anywhere. The system uses Machine Learning (ML) algorithms to analyze user responses and generate performance scores. Machine Learning helps the system identify patterns in answers and improve evaluation accuracy. Natural Language Processing (NLP) is used to understand and analyze text-based responses. NLP checks grammar, fluency, relevance, and communication quality of answers. Speech Recognition technology allows users to answer questions using voice input. The platform converts speech into text and evaluates the response automatically. The frontend of the system is developed using HTML, CSS, and JavaScript. The backend is developed using Python and Flask/Django framework. The database stores user details, interview history, and performance reports. The system generates technical, HR, and aptitude-based interview questions. After the interview, the platform provides instant feedback and suggestions for improvement. The system helps users improve confidence, communication skills, and interview performance. It reduces interview fear and provides a realistic interview experience. Thus, the AI Mock Interview Platform is an intelligent and effective solution for modern interview preparation.

2.2 Literature Review

The interview process is one of the most important stages in recruitment and placement activities. Many students and job seekers face difficulties during interviews due to lack of confidence, communication skills, and practical experience. To solve these problems, researchers and developers have introduced different online interview preparation systems and AI-based interview platforms.

Traditional mock interview systems mainly provide predefined interview questions and manual evaluation methods. These systems help users practice interviews but do not provide intelligent analysis or personalized feedback. As Artificial Intelligence technology developed, modern interview systems started using AI

and Machine Learning techniques for automated evaluation and performance analysis.

Several research studies show that AI-based interview platforms improve interview preparation by providing instant feedback, automated scoring, and communication analysis. Natural Language Processing (NLP) techniques are used to understand user responses, analyze grammar, check fluency, and evaluate answer relevance. Speech Recognition technology is also used in some systems to convert voice input into text for further analysis.

Existing AI interview systems provide features such as technical interview practice, HR interview simulation, score generation, and performance tracking. Some advanced systems also include emotion detection, facial expression analysis, and video interview monitoring to improve evaluation accuracy.

Researchers found that AI-powered interview systems reduce interview fear and increase user confidence through continuous practice. Machine Learning algorithms can identify response patterns and generate personalized suggestions for improvement.

However, many existing systems still have limitations such as:

- Limited language support
- High implementation cost
- Complex user interfaces
- Lower accuracy in analyzing long answers
- Lack of detailed feedback
- Limited real-time interaction

Therefore, there is a need for a simple, intelligent, and affordable AI Mock Interview Platform that provides realistic interview practice, automated evaluation, instant feedback, and performance tracking.

The proposed system combines Artificial Intelligence, Machine Learning, Natural Language Processing, and Speech Recognition technologies to create an effective and user-friendly interview preparation platform for students, freshers, and professionals.

2.3 Gaps Identified

After studying existing interview preparation systems and AI-based mock interview platforms, several research gaps and limitations were identified.

1. Most existing systems provide only fixed interview questions without intelligent evaluation.
2. Many platforms focus only on technical interviews and ignore HR and aptitude rounds.
3. Existing systems do not provide detailed feedback on communication skills and confidence level.
4. Personalized suggestions for user improvement are limited in many applications.
5. Voice-based interview support is missing in basic mock interview platforms.
6. Some systems require human interviewers for evaluation, increasing time and cost.
7. Many applications have complex interfaces that are difficult for beginners to use.
8. Existing systems often fail to create a realistic interview environment.
9. Real-time performance tracking and progress monitoring features are limited.
10. Accuracy of answer evaluation is low for lengthy or complex responses.
11. Multilingual interview support is not available in many systems.
12. Some platforms do not analyze grammar, fluency, or communication quality properly.
13. Existing systems are expensive and not affordable for all students.
14. Data management and report generation features are limited in some applications.
15. Therefore, there is a need for a smart, affordable, user-friendly, and AI-powered mock interview platform that provides automated evaluation, instant feedback, realistic interview practice, and detailed performance analysis.

3 SYSTEM ARCHITECTURE

3.1 Overview

The AI Mock Interview Platform is a web-based application developed to help students, freshers, and job seekers improve their interview skills using

Artificial Intelligence technologies. The system provides a virtual interview environment where users can practice interviews anytime and anywhere without requiring a human interviewer.

The platform allows users to register, log in, and select interview categories such as technical, HR, or aptitude interviews. Based on the selected category and difficulty level, the AI system automatically generates interview questions. Users can answer questions through text or voice input.

The system uses technologies such as Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), and Speech Recognition to analyze user responses. The platform evaluates answers based on correctness, communication quality, grammar, fluency, confidence, and relevance.

After completing the interview, the system generates scores, feedback, and suggestions for improvement. All interview data and reports are stored in the database for future reference and progress tracking.

The frontend of the system is developed using HTML, CSS, and JavaScript, while the backend is developed

using Python and Flask/Django framework. The AI Mock Interview Platform helps users improve confidence, reduce interview fear, and prepare effectively for real-world interviews through intelligent automated practice.

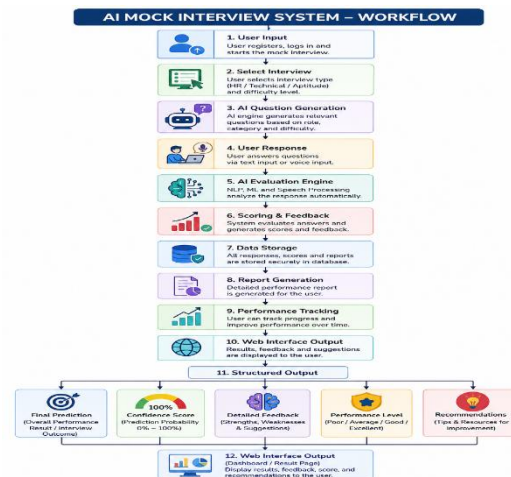


Figure 2 System Architecture of AI Mock Interview Platform

Table 1 Research Papers Methods Comparison

Sr. No.	Research Paper / Author	Method Used	Features	Limitations
1	AI-Based Interview Preparation System	Artificial Intelligence	Automated interview questions and feedback	Limited communication analysis
2	Smart Mock Interview Platform	Machine Learning	Performance scoring and answer evaluation	No voice-based interview support
3	NLP-Based Interview Analyzer	Natural Language Processing (NLP)	Grammar and text analysis	Limited technical interview support
4	Online Interview Training System	Web-Based System	Online mock interview practice	Manual evaluation process
5	Speech Recognition Interview System	Speech Recognition	Voice input and speech-to-text conversion	Accuracy issues in noisy environments
6	Intelligent Recruitment System	AI and Data Analytics	Candidate performance analysis	Complex implementation
7	Automated HR Interview Platform	Chatbot and AI	HR question generation and instant feedback	Limited personalization
8	Deep Learning Interview Evaluation System	Deep Learning	Advanced answer evaluation	High computational cost

Sr. No.	Research Paper / Author	Method Used	Features	Limitations
9	Virtual Interview Assistant	NLP and ML	Real-time interview interaction	Limited multilingual support
10	Proposed AI Mock Interview Platform	AI, ML, NLP, Speech Recognition	Automated interviews, voice/text support, performance analysis, feedback generation	Future improvements needed for emotion and facial analysis

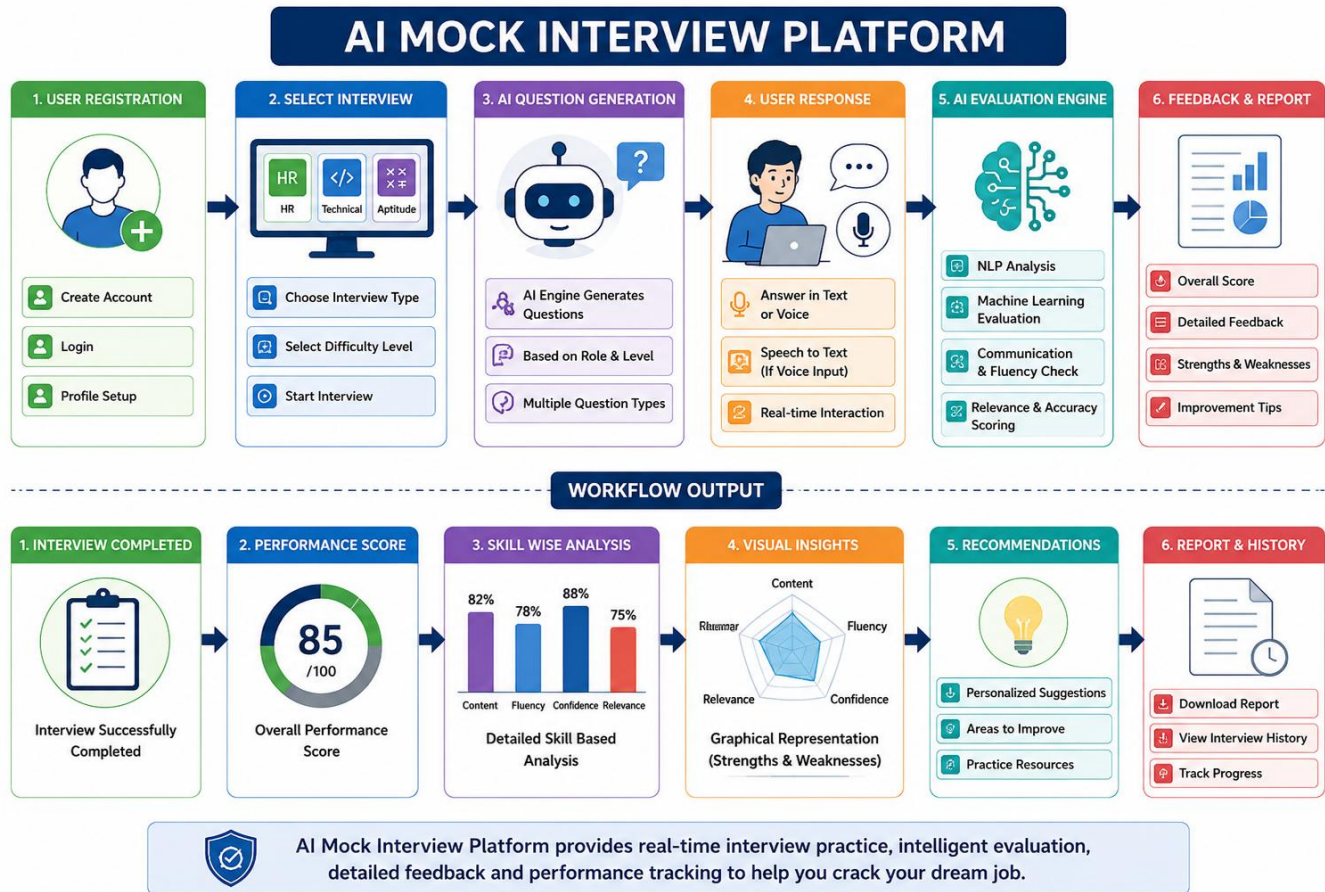


Figure 3 Detailed Workflow of AI Mock Interview Platform

3.2 AI Mock Interview Platform Using Artificial Intelligence

The AI Mock Interview Platform uses Artificial Intelligence technologies to conduct automated interviews and evaluate candidate performance. The system helps users practice interviews through a virtual interview environment without requiring a human interviewer.

The platform uses Machine Learning (ML), Natural Language Processing (NLP), and Speech Recognition technologies to analyze user responses. The AI engine generates interview questions based on the selected interview category such as technical, HR, or aptitude interviews.

Users can answer questions using text or voice input. If the user provides a voice response, Speech Recognition technology converts speech into text for further processing. NLP techniques analyze grammar, fluency, relevance, and communication quality of the response. Machine Learning algorithms evaluate the answers and generate performance scores based on correctness, confidence, response timing, and communication skills. After evaluation, the system provides instant feedback,

strengths, weaknesses, and suggestions for improvement.

The platform stores interview history, scores, and reports in the database, allowing users to track progress and improve performance over time. The system provides a realistic interview experience and helps users improve confidence and communication skills for real-world interviews.

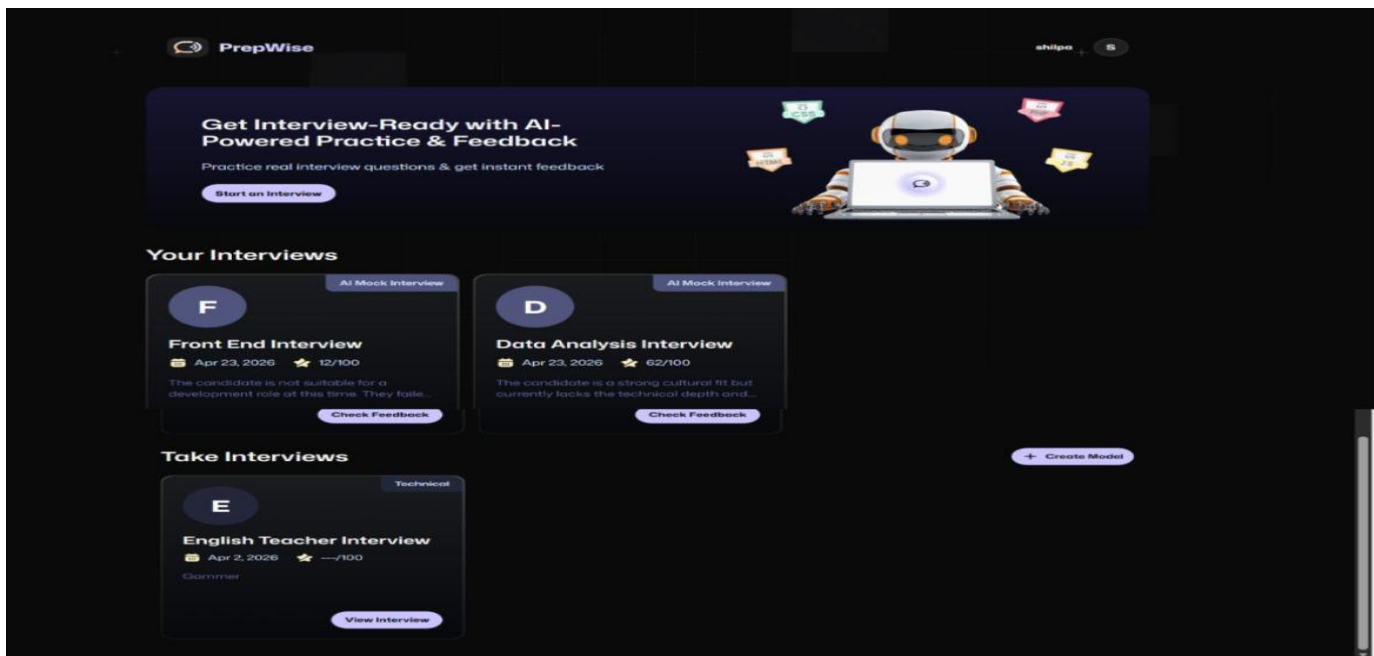


Figure 4 AI mock Interview Platform Output

3.3 Performance Analysis and Feedback Evaluation

The AI Mock Interview Platform analyzes user performance after completing the interview process. The system evaluates candidate responses using Artificial Intelligence, Machine Learning, and Natural Language Processing techniques.

The platform checks multiple parameters such as:

- Correctness of answers
- Communication skills
- Grammar and fluency
- Confidence level
- Relevance of response
- Response timing

The AI evaluation engine analyzes both text and voice responses to identify strengths and weaknesses of the

user. Speech Recognition technology converts voice input into text for processing and analysis.

Machine Learning algorithms generate performance scores for different interview sections such as technical knowledge, HR communication, and aptitude performance. The system also compares user responses with expected answers to improve evaluation accuracy.

The feedback module provides:

- Overall performance score
- Detailed feedback report
- Skill-wise analysis
- Improvement suggestions
- Communication evaluation

The platform helps users identify weak areas and improve their interview performance through continuous practice. Performance reports and interview

history are stored in the database for future tracking and analysis.

Thus, the Performance Analysis and Feedback Evaluation module plays an important role in improving user confidence, communication skills, and interview readiness.

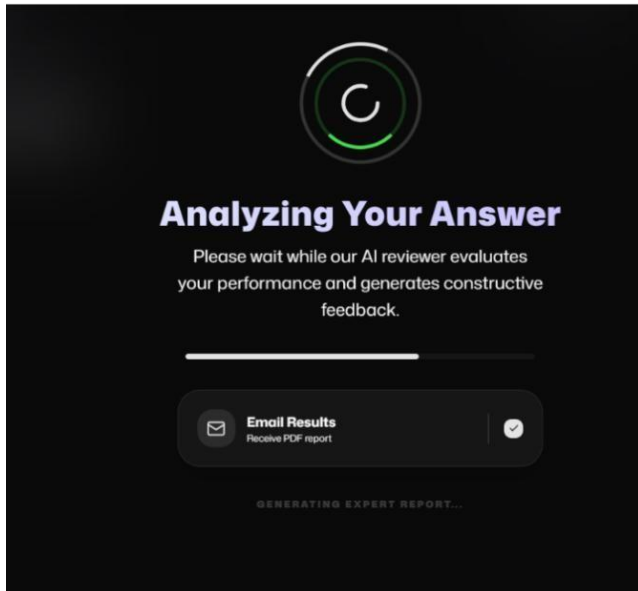


Figure 5 Feedback Evaluation

3.4 Recommendation and Guidance Process

The Recommendation and Guidance Process is an important module of the AI Mock Interview Platform. This module helps users improve their interview performance by providing personalized suggestions and guidance based on their interview results. After completing the mock interview, the AI evaluation system analyzes the user's responses, communication skills, confidence level, grammar, fluency, and performance score. Based on this analysis, the system identifies the strengths and weaknesses of the candidate.

The platform then generates recommendations such as:

- Improve communication skills
- Practice technical questions
- Increase confidence while answering
- Improve grammar and fluency

- Reduce response time

- Practice HR interview questions

The system also provides guidance for improving weak areas by suggesting:

- Practice sessions
- Learning resources
- Interview tips
- Communication improvement techniques

Machine Learning algorithms help generate personalized recommendations according to the user's interview performance and progress history. The guidance module motivates users to improve continuously through regular practice and feedback.

The recommendation system helps users prepare more effectively for real interviews and increases their chances of selection. All recommendations and guidance reports are stored in the database for future reference and performance tracking.

Thus, the Recommendation and Guidance Process improves user learning, confidence, communication skills, and overall interview readiness.

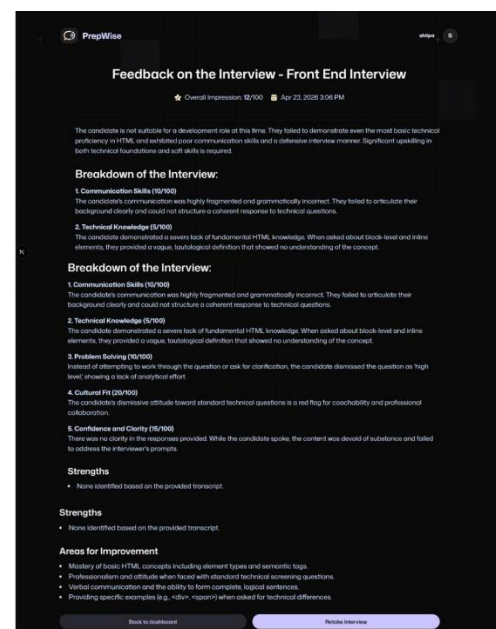


Figure 6 Recommendation to Improve Performan

4 EXPERIMENTAL SETUP AND RESULTS

4.1 Experimental Environment

The experimental environment of the AI Mock Interview Platform consists of both hardware and software components required for developing, testing, and running the system successfully. The platform is developed as a web-based application using Artificial Intelligence technologies.

Hardware Requirements

- Processor : Intel Core i3 or higher
- RAM : 4 GB or above
- Storage : 500 GB Hard Disk
- Input Devices : Keyboard, Mouse, Microphone
- Output Devices : Monitor, Speakers

Software Requirements

- Operating System : Windows 10 / Linux
- Programming Language : Python
- Frontend Technologies : HTML, CSS, JavaScript
- Backend Framework : Flask / Django
- Database : SQLite / MySQL
- AI Technologies : Machine Learning, NLP, Speech Recognition

- Code Editor : VS Code / PyCharm

- Browser : Google Chrome / Microsoft Edge

Development Environment

The system is developed using Python programming language because of its strong support for Artificial Intelligence and Machine Learning libraries. HTML, CSS, and JavaScript are used for creating the user interface and improving user interaction.

Flask or Django framework is used to handle backend operations such as user authentication, question generation, answer evaluation, and database connectivity. SQLite or MySQL database stores user details, interview records, scores, and feedback reports.

The platform is tested in a web browser environment to ensure proper functioning of all modules such as login, interview process, AI evaluation, and feedback generation.

The experimental environment supports voice input, text processing, and performance analysis, making the

system efficient and user-friendly for interview preparation.

4.2 Dataset Description

4.2 Dataset Description

The AI Mock Interview Platform uses datasets containing interview questions, sample answers, user responses, and performance evaluation data. The dataset is used for training and testing the Artificial Intelligence and Machine Learning models used in the system.

The interview question dataset includes different categories such as:

- Technical Interview Questions
- HR Interview Questions
- Aptitude Questions
- Communication Skill Questions

The technical dataset contains programming, database, networking, and computer science-related questions. HR datasets include questions related to self-introduction, strengths, weaknesses, leadership, teamwork, and career goals.

The system also uses sample answer datasets to compare user responses and evaluate correctness, relevance, grammar, and fluency. Natural Language Processing (NLP) techniques analyze text-based answers using keywords and sentence structures.

Voice datasets are used for speech recognition and voice-to-text conversion. These datasets help the system analyze communication quality and speaking confidence.

The dataset contains the following fields:

- Question ID
- Question Category
- Difficulty Level
- Expected Answer
- User Response
- Performance Score
- Feedback

The data is stored in SQLite/MySQL databases for efficient management and retrieval. The dataset helps

the AI system improve interview evaluation accuracy and generate personalized feedback for users.

The quality and size of the dataset directly affect the performance of the AI Mock Interview Platform. A well-structured dataset improves question generation, response analysis, and recommendation accuracy.

4.3 Evaluation Metrics

Evaluation metrics are used to measure the performance and accuracy of the AI Mock Interview Platform. These metrics help analyze how effectively the system evaluates user responses and provides feedback.

The platform evaluates interview performance based on multiple parameters such as correctness, communication skills, fluency, confidence, and response quality.

Metrics Used in the System

1. Accuracy

Accuracy measures how correctly the system evaluates user responses compared to expected answers. Higher accuracy indicates better system performance.

2. Precision

Precision measures how many predicted correct responses are actually correct. It helps improve the reliability of answer evaluation.

3. Recall

Recall measures the ability of the system to identify relevant and meaningful responses from users.

4. F1-Score

F1-Score is the combination of precision and recall. It provides balanced evaluation performance.

5. Response Time

Response time measures how quickly users answer interview questions. It helps analyze user confidence and communication speed.

6. Communication Score

This metric evaluates grammar, fluency, pronunciation, and speaking quality of the candidate.

7. Confidence Score

The confidence score measures how effectively and clearly the user responds during the interview.

8. Overall Performance Score

The final score is calculated by combining technical performance, communication quality, confidence, and response relevance.

The evaluation metrics help generate detailed feedback reports and improvement suggestions for users. These metrics also improve the accuracy and effectiveness of the AI Mock Interview Platform.

4.4 Results and Observations

The AI Mock Interview Platform was successfully developed and tested in a web-based environment. The system conducted automated mock interviews and evaluated user responses using Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Speech Recognition technologies.

During testing, the platform generated technical, HR, and aptitude-based interview questions according to the selected interview category. Users were able to answer questions using both text and voice input methods.

The system successfully analyzed user responses based on:

- Correctness of answers
- Communication skills
- Grammar and fluency
- Confidence level
- Response timing
- Relevance of responses

The AI evaluation module generated performance scores and feedback reports automatically after completion of interviews. The recommendation module provided suggestions for improving communication skills, confidence, and technical knowledge.

Observations

1. The platform reduced interview fear and improved user confidence through regular practice.

2. Users found the system easy to use and interactive.
3. Voice input improved the realism of the interview experience.
4. NLP techniques improved answer evaluation accuracy.
5. The feedback system helped users identify strengths and weaknesses.
6. Performance tracking allowed users to monitor improvement over time.
7. The system provided instant results and saved time compared to manual interviews.
8. AI-based evaluation reduced dependency on human interviewers.

The results showed that the AI Mock Interview Platform effectively helps students and job seekers prepare for real-world interviews. The system improved interview readiness, communication skills, and overall performance through intelligent automated practice and feedback.

4.5 Discussion

The AI Mock Interview Platform was developed to provide an intelligent and automated solution for interview preparation. The system successfully created a virtual interview environment where users could practice technical, HR, and aptitude interviews without the need for a human interviewer. The use of Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Speech Recognition technologies improved the efficiency and effectiveness of the interview process. The platform was able to analyze user responses, evaluate communication skills, and generate instant feedback reports. During testing, it was observed that users became more confident and comfortable after repeated interview practice sessions. The voice and text input features made the system interactive and user-friendly. NLP techniques helped in analyzing grammar, fluency, and relevance of answers, while Machine Learning algorithms improved performance evaluation accuracy. The recommendation and feedback modules helped users identify weak areas and improve their interview skills. The system also reduced time and cost compared to traditional mock interview methods. Users were able to access the platform anytime and practice interviews according to

their convenience. However, some limitations were identified during system implementation. The accuracy of speech recognition may decrease in noisy environments, and complex answers may not always be analyzed perfectly. The system currently supports limited advanced features such as emotion detection and facial expression analysis. Overall, the AI Mock Interview Platform proved to be an effective and user-friendly solution for modern interview preparation. The project demonstrated how AI technologies can improve communication skills, confidence, and interview readiness through automated evaluation and personalized feedback.

5 DISCUSSION AND CONCLUSION

The AI Mock Interview Platform was developed to provide an intelligent and automated solution for interview preparation. The system creates a virtual interview environment where users can practice technical, HR, and aptitude interviews without the need for a human interviewer.

The platform uses Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Speech Recognition technologies to analyze user responses and generate performance feedback. These technologies improve the efficiency and accuracy of interview evaluation.

During system testing, it was observed that users were able to improve their communication skills, confidence, and interview performance through regular practice sessions. The platform provided a realistic interview experience using both text and voice input methods.

The NLP module successfully analyzed grammar, fluency, and relevance of user responses, while Machine Learning algorithms helped generate accurate performance scores and personalized recommendations. The instant feedback system allowed users to identify strengths and weaknesses quickly.

The platform also reduced the dependency on professional interviewers, making interview preparation more affordable and accessible. Users found the system easy to use, interactive, and beneficial for placement preparation.

However, some limitations were observed during implementation. Speech recognition accuracy may decrease in noisy environments, and complex answers may not always be evaluated perfectly. The current system also lacks advanced features such as facial expression analysis and emotion detection.

Overall, the AI Mock Interview Platform proved to be an effective and user-friendly solution for improving interview readiness, communication skills, and confidence through intelligent automated practice and feedback.

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14	Data Science and AI Resources	Online Learning Platforms	AI and data science concepts



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