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Smart Hire: AI Interview Platform

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Abstract: ***Interview preparation is a critical aspect of career development, yet many candidates lack access to effective and personalized practice tools. To address this gap, we have developed an AI-powered mock interview platform that simulates real-world interview experiences using advanced natural language processing (NLP) and other technology. The platform conducts automated interviews across various domains, evaluates user responses in real time, and provides detailed, constructive feedback on aspects such as content quality, communication skills, confidence, and body language (if applicable). By offering a scalable, accessible, and unbiased practices environment, our solution empowers users to improve their performance, reduce interview anxiety, and build confidence—ultimately enhancing their chances of success in actual interviews.***

Keywords: AI-powered mock interview, natural language processing, real-time feedback, communication skills, career development.

I. INTRODUCTION

In today's highly competitive job landscape, interview performance plays a crucial role in determining a candidate's success. Traditional methods of interview preparation, such as peer-to-peer mock interviews, coaching classes, or manual question banks, often fall short in offering personalized feed- back, real-time interaction, and dynamic adaptability. These methods can also be time-consuming, resource-intensive, and inconsistent in evaluation quality. With the advancement of artificial intelligence (AI), natural language processing (NLP), and speech recognition technologies, there is a significant opportunity to revolutionize the interview preparation process through smart, automated systems that simulate real- world interview experiences. This research introduces a robust, AI-driven mock interview platform that integrates modern frontend and backend technologies with intelligent APIs to create a seamless and interactive experience for users. The system is developed using ReactJS and Tailwind CSS for the frontend interface, providing a responsive and visually intuitive environment. For backend services and data management, the platform leverages Supa base and PostgreSQL, ensuring real- time operations and secure storage of user data. Central to the intelligence of the platform is the integration of the Gemini API, which enables contextual understanding of candidate responses, dynamic question generation, and automated feed- back based on semantic and linguistic analysis. Unlike static question banks or rule-based assessment systems, this platform offers real-time interaction and immediate evaluation of user performance. The responses provided by the candidate are analyzed using the Gemini API to assess the clarity, coherence, and relevance of the answers. A scoring mechanism then provides users with feedback on their performance, allowing them to identify strengths and areas for improvement. The use of speech recognition also ensures that verbal responses can be transcribed and assessed effectively, simulating real-life interview pressure and helping users enhance their spoken communication skills. In addition to its core assessment features, the platform includes security and integrity functionalities such as email verification, tab-switch detection, and a built- in code editor, which are particularly beneficial for technical roles. These features ensure a distraction-free environment and help prevent malpractice during the assessment process, making the tool suitable not only for individual users but also for educational institutions and recruitment firms. Overall, this platform represents a significant step toward intelligent, accessible, and scalable interview preparation. By merging AI capabilities with modern web technologies, it offers users a practical, data-driven approach to refining their interview skills and improving their chances of success in real-world job interviews.[1]

II. LITERATURE REVIEW

The integration of artificial intelligence (AI) into mock interview platforms has seen rapid growth due to its potential to provide scalable, personalized, and data-driven feedback to candidates. Early implementations of these systems primarily relied on rule-based assessments, but more recent research emphasizes the use of advanced NLP, speech recognition, and machine learning models.

Chakraborty and Bhattacharyya laid foundational work by designing an AI-based mock interview platform that utilizes semantic analysis to evaluate user responses.

Their approach focused on extracting keywords from candidates' answers and matching them with expected responses using NLP techniques. This allowed for a structured evaluation of knowledge and relevance, paving the way for more intelligent assessment mechanisms. [2]

Expanding on this, Singh and Sharma proposed a system that combined NLP with deep learning models for real-time question-answer evaluation. Their work focused on dynamic interview environments, where candidate responses were assessed for both content quality and coherence. This research highlighted the significance of integrating contextual language understanding to simulate human-like evaluation, making the interview process more realistic and effective. [3]

Sharma and Kaur explored the role of machine learning in adaptive interview bots. Their system could generate follow-up questions based on previous answers, aiming to replicate the depth of a real human interviewer. This dynamic questioning model improved engagement and provided more accurate feedback by analyzing how well a candidate responded under varied questioning. [4]

Mishra and Singh contributed by introducing a voice-based AI interview system that utilized speech recognition to trancribe and evaluate spoken responses. Their platform measured fluency, tone, and clarity, incorporating these aspects into the final performance evaluation. This addition of speech analysis marked a significant shift from purely text-based evaluation to multimodal interaction. [5]

Collectively, these early systems demonstrate a clear progression in the development of intelligent mock interview tools—from static keyword matching to dynamic, voice- enabled assessments. Their methodologies serve as a strong foundation for platforms like the one proposed in this study, which utilizes Gemini API and modern web technologies for real-time and adaptive interview simulations.

III. PROPOSED METHODOLOGY

The AI-based mock interview platform integrates frontend, backend, database, and AI technologies to simulate real-time interview experiences.

1) System Architecture:Modular design that includes authentication, question delivery, response recording, scoring, and feedback.
2) Front-End:Built with ReactJS and Tailwind CSS, featuring dynamic question display, a code editor, tab-switch warnings, and email verification.
3) Back-End**:** Developed using JavaScript and TypeScript to handle session logic, API communication, and score computation.
4) Database:Uses PostgreSQL with Supa base for storing user data, questions, responses, and results securely.
5) AIEvaluation:EmploystheGeminiAPItosemantically analyzeuserresponsesandscorethembasedonrelevance and completeness.
6) *Security Measures*:Includes email verification, tab-switch detection, and session timing to ensure fair assessments.

Fig. 1. Block Diagram of Proposed Method

The overall workflow of the platform is illustrated in Fig. 1 and is described as follows:

1) User Interface (Web/App):The user accesses the plat- form through a web or mobile application interface.
2) User Registration & Profile Setup:Users sign up and create a profile, providing basic details necessary for interview customization.
3) Select Interview Type, Job Role, and Difficulty: The user chooses the kind of interview (e.g., HR, technical), the job role they are targeting, and the desired difficulty level.

4) AI-Generated Interview Questions:Based on the selected inputs, the system generates relevant interview questions using predefined data and AI logic.

5) Gemini AI API Processes Input:The user's spoken or written answers are processed using the Gemini API for natural language understanding and evaluation.

6) Feedback & Scoring**:** The system analyzes the responses and provides feedback along with a performance score based on answer quality and relevance.

IV. IMPLEMENTATION

The AI-based mock interview platform is designed to facilitate realistic interview simulations using cutting-edge technologies. The system is structured around four primary components: frontend, backend, database, and API, each playing a critical role in delivering a smooth and responsive interview experience.

The frontend is developed using HTML, Tailwind CSS, and React JS. React JS enables the creation of dynamic and inter- active user interfaces, capable of handling real-time updates and maintaining a seamless user experience. Tailwind CSS is employed for styling, ensuring a modern, consistent, and clean design that enhances usability. Through this interface, users can interact with the platform, respond to interview questions, and receive feedback in an intuitive environment. [5]

The backend is implemented using JavaScript and Type- Script. It manages the application's core logic, handles data processing, and facilitates communication between the frontend and the database. Additionally, it integrates the Gemini API to enable advanced natural language processing (NLP), al- lowing for semantic analysis and evaluation of user responses. [6]

PostgreSQL and Supa base are used for data storage and management. PostgreSQL serves as the primary relational database, securely storing user credentials, interview questions, responses, and performance metrics. Supa base supports real-time data access and authentication, simplifying session handling and secure data retrieval.

V. RESULT AND DISCUSSION

The AI-based mock interview platform is a comprehensive solution designed to simulate real interview environments using advanced technologies. It features a responsive frontend built with ReactJS and Tailwind CSS, and a secure backend powered by Supa base and PostgreSQL. The core of the platform leverages the Gemini API for analyzing user responses and delivering intelligent feedback in real time. It evaluates responses based on accuracy, clarity, and completeness, providing users with a performance score to guide improvement. Additional features like speech-to-text analysis, tab-switch detection for focus, email verification for security, and an integrated code editor for real-time coding assessments make the platform highly effective for both behavioral and technical interview preparation. This interface plays a critical role in integrating the platform's core functionalities—question delivery, real-time user input capture, and subsequent evaluation thus serving as a central component of the AI-driven interview simulation system.

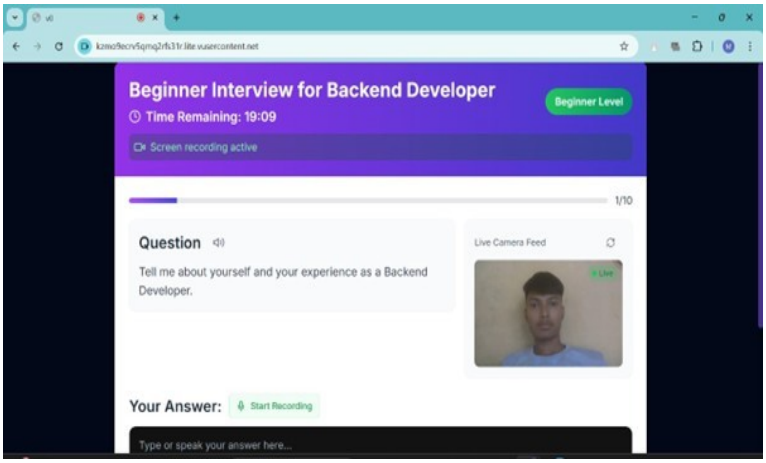

Fig.2.User interface of the AI-based mock interview platform.

Figure 2 presents the user interface of the AI-based mock interview platform, showcasing the environment in which users undergo simulated interviews. The screen displays a question prompt specific to a backend developer role, indicating a structured and role-oriented questioning format.

At the top of the interface, the timer and difficulty level are visible, which help regulate the interview duration and align the question complexity with the user's selection. A unique feature is the live camera feed, which ensures candidate presence and adds realism to the mock interview experience. Below the question, the platform provides an option to start recording the answer either by typing or speaking, enabling the use of speech-to-text processing and NLP for analysing verbal responses. The interface also includes a screen recording indicator, which signifies that user behaviour and responses during the session are being monitored for integrity and feedback analysis. The clean and intuitive design, built using ReactJS and Tailwind CSS, enhances user engagement and provides a seamless experience across devices.

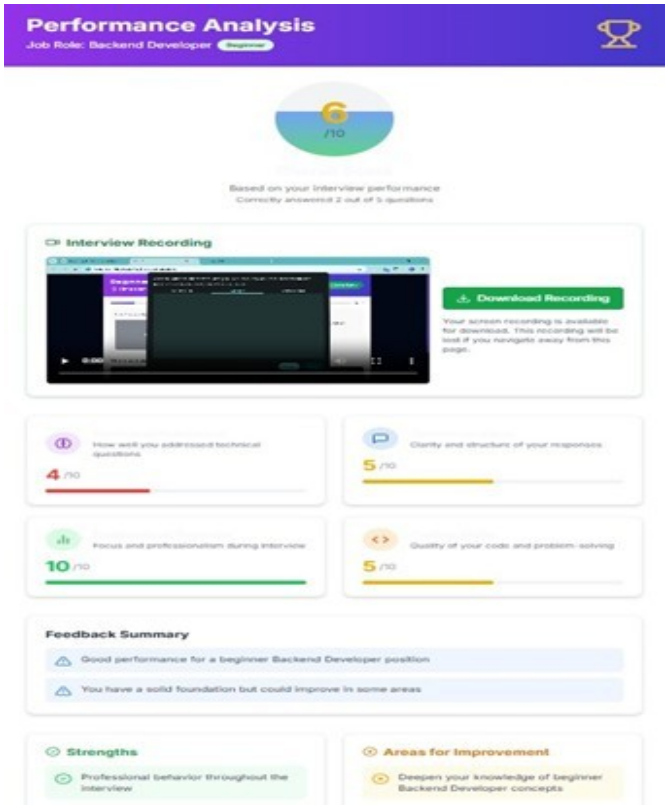

Fig. 3. Performance Analysis

Figure 3 illustrates a performance analysis dashboard for a candidate applying for a beginner Backend Developer position. The candidate received an overall score of 6 out of 10, having correctly answered 2 out of 5 technical questions during the interview. The dashboard evaluates the candidate across four key areas. In technical knowledge, the candidate scored 4 out of 10, indicating a need for improvement in addressing technical questions effectively. The clarity and structure of responses were rated at 5 out of 10, suggesting average communication skills that could benefit from more organization and precision. A perfect score of 10 out of 10 was achieved for professionalism, highlighting the candidate's focused and respectful conduct throughout the interview process. In terms of coding and problem-solving, a score of 5 out of 10 reflects basic competency, with opportunities to enhance problem-solving strategies and technical execution.

In addition to the scores, the feedback summary notes that the candidate has demonstrated good potential for a beginner role, with a solid foundational understanding. However, it also emphasizes the need for further development, particularly in strengthening knowledge of backend development concepts. The candidate's professionalism was identified as a major strength, while the primary area for improvement lies in deepening technical expertise. The dashboard also includes a downloadable video recording of the interview, offering a resource for reviewing performance and identifying specific areas for growth. This figure serves as a comprehensive visual and analytical tool to assess the readiness and developmental needs of aspiring backend developers.

VI. CONCLUSION

The developed AI-based mock interview platform offers a smart, scalable solution for interview preparation using the Gemini API, ReactJS, Supa base, and PostgreSQL.

It simulates real interviews, evaluates candidate responses in real time, and provides instant, personalized feedback. Key features like speech analysis, dynamic questioning, email verification, and tab-switch detection enhance user engagement and assessment accuracy. Testing showed that users improved with repeated practice, gaining confidence and better performance. Overall, this platform serves as an effective and modern tool for candidates to prepare for real-world interviews efficiently.

VII. ACKNOWLEDGMENT

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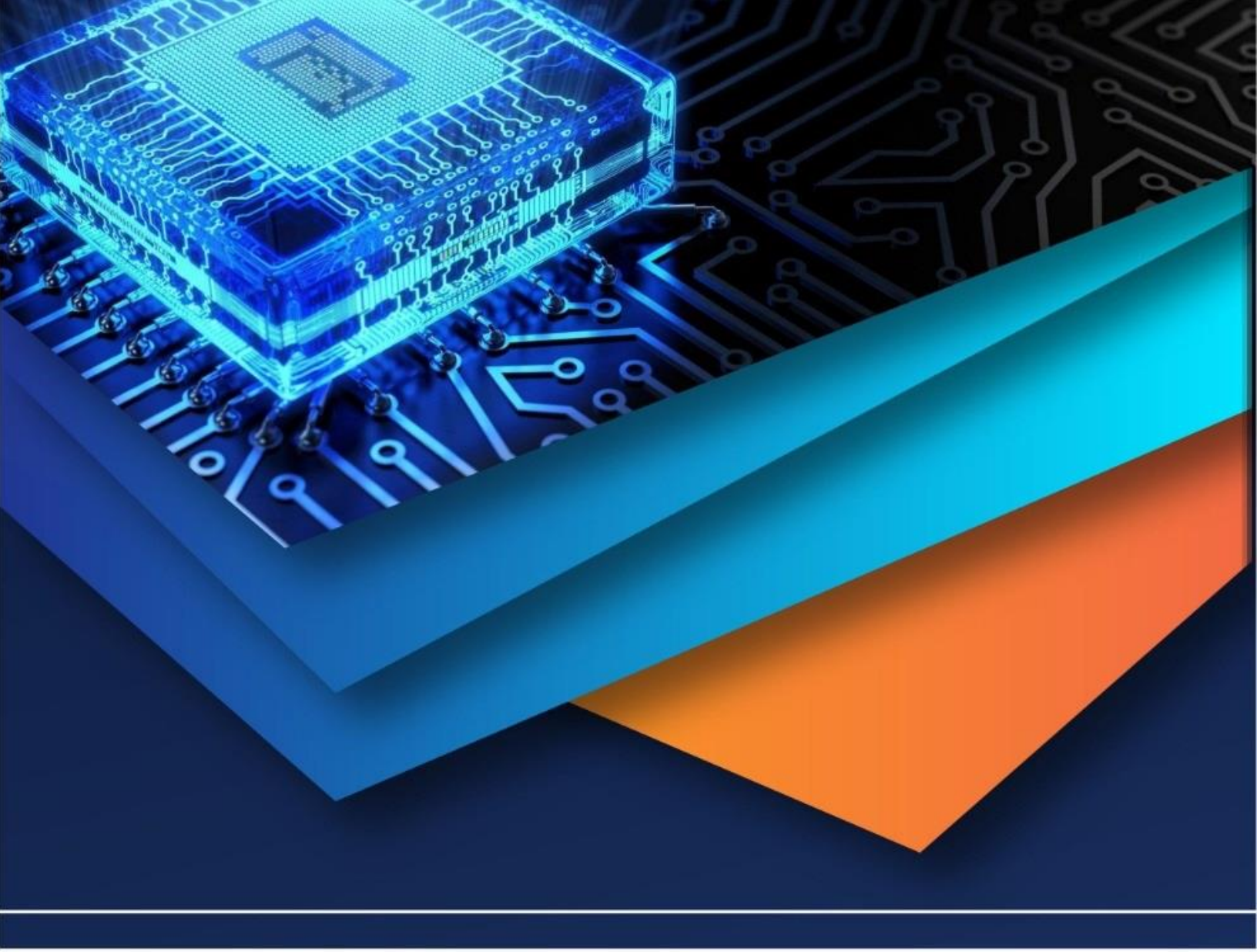

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