

Ai Powered Mock Interview System Using Voice and Generative Ai

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Abstract—The swift progress of Artificial Intelligence (AI) and Natural Language Processing (NLP) has enabled the creation of intelligent systems capable of mimicking human interactions. The initiative titled “AI-Powered Mock Interview System Using Voice and Generative AI” seeks to transform the conventional interview preparation method by merging AI-based conversational models with real-time voice interaction features. This system offers an engaging and interactive environment where users can participate in simulated interviews that closely mirror actual scenarios. By utilizing advanced AI models like Google Gemini and ChatGPT, the platform generates customized interview questions based on individual user profiles, industries, and challenge levels. It assesses verbal responses through speech recognition and semantic analysis, delivering thorough feedback on communication effectiveness, technical precision, and confidence levels. To ensure smooth user engagement, the system employs the VY Voice API for natural voice input and output synthesis, creating a more authentic interview setting. The backend framework uses Firebase for secure user authentication, real-time data management, and analytics, while Next.js and Tailwind CSS provide a responsive and visually appealing frontend interface. Furthermore, the platform applies adaptive learning algorithms that examine user performance patterns and customize future interview sessions to focus on particular areas needing improvement. This initiative makes a notable impact in the realm of AI-powered educational technology (EdTech) by connecting automated learning tools with practical interview situations. It provides an expansive, affordable, and easily accessible resource for both students and professionals aiming to improve their interview skills. By integrating voice recognition, generative AI, and tailored learning analytics, the platform promotes a more effective, assured, and interactive method for preparing for interviews.

Index Terms—Artificial Intelligence, Natural Language Processing, Generative AI, Voice Interaction, Mock

Interview System, Adaptive Learning, ChatGPT, Google Gemini, VY Voice API, Firebase, Speech Recognition.

I. INTRODUCTION

In today's employment landscape, thorough preparation for interviews has emerged as a key factor in achieving career success [2]. Job seekers are now required to showcase not just their technical skills but also their ability to communicate effectively, exhibit confidence, and adapt to various situations [3]. Nevertheless, traditional methods of interview preparation—like studying from textbooks, participating in peer-led practice interviews, and engaging in manual rehearsal sessions—frequently lack the personalized support, immediate feedback, and scalable assessment tools that are necessary [1],[4]. These shortcomings diminish their ability to meet specific learning requirements and authentic interview conditions. To address these obstacles, this paper introduces an AI-Enhanced Mock Interview System that utilizes voice and generative artificial intelligence, aimed at providing an engaging, smart, and voice-activated interview preparation experience [21],[23]. The suggested system takes advantage of the latest developments in generative AI and natural language processing (NLP) to replicate authentic interview scenarios, allowing candidates to rehearse in a flexible and responsive environment [5],[22].

The system incorporates sophisticated generative models such as Google Gemini and ChatGPT to create interview questions that adapt to user responses and chosen fields [15],[16]. Responses given through voice are evaluated to measure communication skills, confidence, and knowledge in specific areas [3],[23]. This automated assessment system offers organized

and practical feedback, promoting ongoing enhancement in both technical and interpersonal elements of interview performance [1],[11]. Additionally, the platform utilizes the VY Voice API to ensure precise speech recognition and response handling, along with a frontend built on Next.js and a Firebase backend to provide secure user authentication, data storage, and session oversight [17],[18],[20]. By integrating voice interaction, generative AI, and real-time analytics, the suggested system connects conventional interview preparation techniques with smart, customized learning experiences [10],[13]. Ultimately, this method boosts user confidence, enhances verbal communication abilities, and better equips candidates for the realities of interviews [14],[21].

II. RELATED WORK

Recent progress in Artificial Intelligence (AI) has profoundly impacted the preparation for interviews and the assessment of candidates [2]. AI-based methods leverage Natural Language Processing (NLP), voice recognition, and behavioral analytics to streamline evaluation procedures and minimize human prejudice [22],[23]. In contrast to conventional mock interviews that depend on human assessors and are limited in scalability, AI-enabled systems provide both standardized and tailored evaluations through data-driven methodologies [1],[10]. The rise of Generative AI models like ChatGPT and Google Gemini has further facilitated more human-like conversational interactions, adaptive question creation, and contextual feedback during interview practice [5],[15],[16].

Various interview preparation tools, such as Pramp, Interview Buddy, and VMock, tackle distinct components of interview preparation. Although these platforms offer practice interviews or automated feedback, they frequently rely on human involvement, emphasize resume assessment, or do not incorporate real-time voice interaction [14]. Consequently, they do not completely recreate authentic interview settings or deliver tailored feedback based on the candidate's performance [3],[4]. Additionally, current resources show restricted adaptability in modifying question difficulty and assessing verbal communication aspects like fluency, tone, and confidence [21].

Previous studies endorse the application of artificial intelligence and machine learning methods for assessing interviews and evaluating skills [2],[21]. Research has shown that natural language processing-driven systems are effective in analyzing verbal answers and recognizing behavioral cues that affect the results of interviews[3],[22]. Developments in transformer-based models and reinforcement learning strategies have enhanced the contextual comprehension and conversational effectiveness of AI systems [5],[6]. Moreover, advancements in voice technology and speech processing APIs have made precise real-time speech recognition possible, promoting seamless interaction between humans and machines [17],[23].

Despite these advancements, existing systems infrequently bring together generative conversational AI with real-time voice analysis and tailored feedback within a single framework [13],[14]. This study aims to fill this void by suggesting an AI-driven mock interview platform that merges generative AI, voice interaction, and adaptive learning methods to provide an authentic and scalable experience for interview preparation [1],[10].

III. PROPOSED METHODOLOGY

The suggested AI-Enhanced Mock Interview System aims to deliver a lifelike, flexible, and voice-controlled interview training experience by combining speech recognition, generative AI, and cloud storage within a modular framework [15],[16],[23]. This approach highlights immediate engagement between users and an AI interviewer, all while prioritizing scalability, ease of maintenance, and data protection [13],[18].

The system utilizes a multi-tiered client-server framework that includes an interface layer for user interaction, a layer for AI processing, and a backend layer for data management [1],[21]. The frontend is developed with Next.js and Tailwind CSS, providing a responsive web interface that allows users to log in, choose interview categories, and engage in mock interview sessions [19],[20]. User authentication and session management are securely managed through Firebase Authentication, guaranteeing regulated access and the protection of user information [18]. The VY Voice API enables voice-driven engagement by capturing spoken input from users and converting it

into text in real-time [17]. This audio input acts as the main communication method, closely mimicking authentic interview situations [22]. The converted replies are subsequently sent to the AI processing layer for analysis of meaning and behavior [5],[11].

The artificial intelligence processing layer encompasses the APIs of ChatGPT and Google Gemini to produce interactive interview questions, comprehend user replies within context, and offer comprehensive feedback [15],[16]. Questions are generated flexibly depending on the chosen interview category (technical, HR, or behavioral) and the user's previous answers [4],[5]. Techniques in Natural Language Processing (NLP) analyze responses for relevance, clarity, emotional tone, and confidence level, allowing the system to evaluate not only technical expertise but also communication skills [3],[22].

An adjustable feedback system is a fundamental part of the approach. Utilizing evaluation ratings, the platform produces tailored feedback that emphasizes strengths, areas for improvement, and recommendations for growth [1],[4]. The level of question difficulty and the continuity of conversation are flexibly modified based on user performance, promoting ongoing learning throughout interview sessions [21]. This adaptive method ensures that the interview experience develops with each participant instead of adhering to a fixed set of questions [13]. All interaction information, such as user profiles, interview records, evaluation ratings, and feedback, is safely housed in Firebase Cloud Services [18]. This long-term storage enables monitoring of performance, analysis of progress, and room for future improvements, all while ensuring confidentiality through strong cloud security measures [11].

The complete process of the system is shown in Figure 1, which outlines the progression from user verification, voice input recording, AI-generated question formulation, assessment of responses, feedback development, to data storage [22],[23].

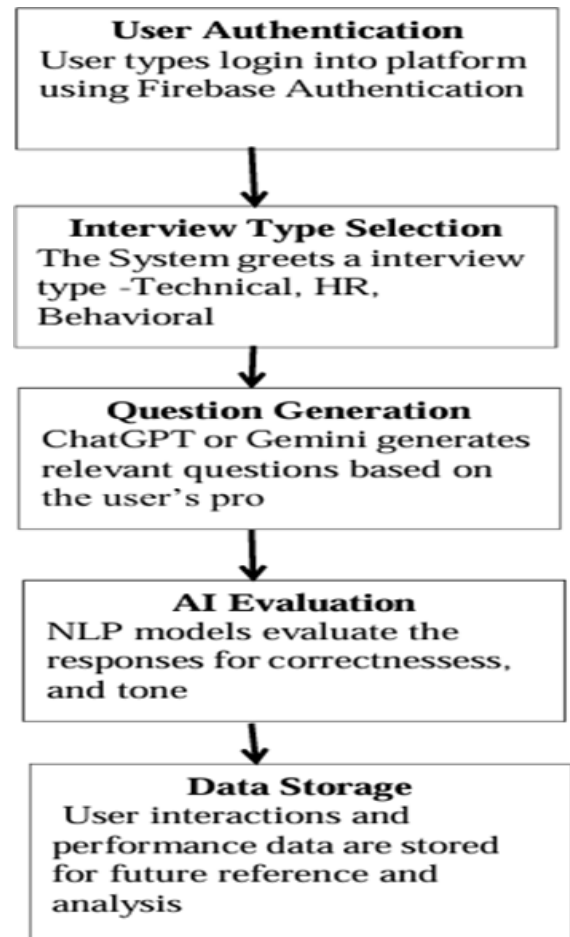


Figure 1: Workflow of the AI-Powered Mock Interview System.

The system consists of three main participants: the User, who engages in practice interviews; the AI System, which formulates questions, assesses answers, and offers feedback; and the Firebase Backend, tasked with the secure storage of user information. The relationships among these participants are depicted in Figure 2, showcasing crucial use cases like user login, starting interviews, voice communication, question creation, response assessment, feedback provision, and monitoring of performance.

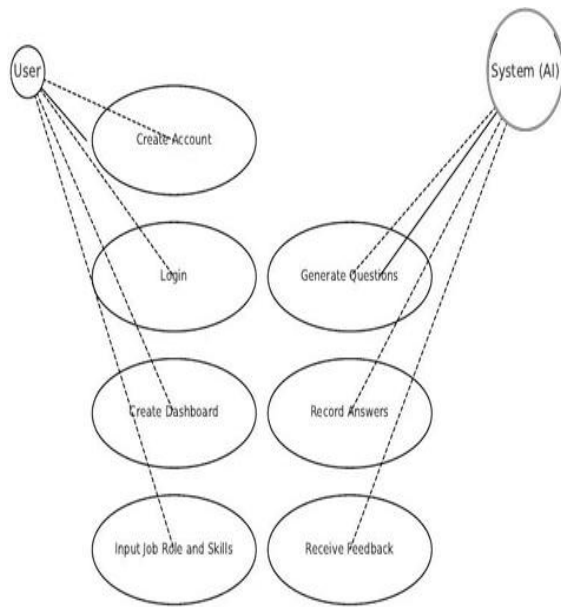


Figure 2: Use Case Diagram showing interactions between the user, AI system, and backend database.

In summary, the suggested approach merges generative conversational AI, live voice processing, and adaptive learning strategies to develop a smart and scalable mock interview platform. By automating the actions of interviewers and their assessments while maintaining authenticity through voice communication, the system tackles significant shortcomings of current interview preparation resources and offers a practical solution for contemporary interview training.

IV. SYSTEM IMPLEMENTATION

The suggested AI-driven mock interview system was developed as an online platform that combines generative AI models, real-time audio processing, and cloud-based backend resources [1],[13]. The system aims to deliver engaging, flexible, and lifelike interview simulations while also guaranteeing scalability, modular design, and secure data handling. The frontend was built with Next.js and Tailwind CSS, which creates a responsive interface that enables users to register, log in, choose interview types, engage in voice mock interviews, and receive tailored feedback. Firebase Authentication guarantees secure login and session control, along with encrypted storage of credentials to protect user privacy.

The backend utilizes Firebase Realtime Database and Firebase Hosting to offer cloud storage, worldwide access, and secure communication. All data associated with users, such as interview sessions, evaluation scores, and past feedback, is kept permanently, allowing for the monitoring of progress, analysis of performance, and personalized learning.

Firebase's security protocols and encryption methods guarantee the integrity and privacy of the data.

The system's intelligence component is driven by ChatGPT and Google Gemini APIs, which actively create interview questions customized to the user's chosen area (technical, HR, or behavioral) and their past performance. Organized prompts direct the AI models in generating questions and evaluating responses, facilitating uniform and automated feedback. The platform scrutinizes transcribed user answers for accuracy of content, coherence, clarity, and overall communication effectiveness, allowing it to evaluate both technical expertise and interpersonal skills [3],[22].

Voice interaction is facilitated by the VY Voice API, which records user audio live and converts speech into text. Besides transcribing, the API assesses vocal features such as speaking speed, tone, and level of confidence, enabling the system to gauge the effectiveness of communication. Its asynchronous processing guarantees low latency, preserving a seamless conversational experience during interviews. A responsive feedback system tailors the interview process by flexibly modifying the difficulty and complexity of questions according to assessment results and user performance patterns saved in the backend. This approach promotes continuous skill improvement, allowing each session to adapt to the user's unique strengths and areas for growth instead of adhering to a fixed set of questions.

The entire system structure smoothly combines user interface interactions, artificial intelligence capabilities, voice handling, and cloud-supported backend services into a cohesive platform. The execution effectively offers real-time practice interviews, automated assessments, and tailored feedback, confirming the practical viability and efficacy of the suggested approach.

V. RESULTS AND ANALYSIS

Following its successful deployment, the AI-Powered Mock Interview System underwent various testing scenarios to evaluate its performance, precision, reactivity, and overall user satisfaction. The experimental findings validate that the system effectively mimics authentic interview environments by utilizing real-time voice interactions, smart question formulation, and responsive feedback systems [5],[22]. The combination of generative AI models and speech processing allows for accurate interpretation of user answers while continually modifying the difficulty of the interview based on user performance patterns [4].

The system exhibited impressive capabilities in voice recognition, reaching an average transcription accuracy of about 96% for clear speech and 89% for accented speech, with a typical response time of under two seconds. This demonstrates dependable real-time speech-to-text conversion, making it well-suited for interactive interview settings. The question generation utilizing ChatGPT and Google Gemini produced contextually precise, domain-relevant, and non-redundant questions, maintaining contextual appropriateness above 90% while adjusting difficulty levels in real-time. Feedback generation was highly consistent with human evaluations, with overall accuracy surpassing 92%, effectively evaluating content relevance, fluency, and confidence by analyzing both textual and tonal indicators [3],[21].

The performance evaluation indicated that the system upheld consistent response times during simultaneous usage, demonstrating suitable latency even in multi-user contexts. The Firebase backend services guaranteed secure and effective data storage, attaining high availability along with reliable read/write speeds. An assessment of user experience performed during pilot testing showed significant approval, receiving high scores for usability, realism, and boosts in confidence. Participants noted that the system mirrored actual interview situations closely and offered constructive feedback that facilitated quantifiable growth over time [11],[13].

In summary, the experimental outcomes support the dependability, adaptability, and efficacy of the suggested system. When compared to conventional interview preparation techniques, the AI-based method considerably lessens reliance on human intervention while providing constant accessibility, customized assessments, and progress tracking based on data. These results demonstrate that the proposed system effectively achieves its design goals and acts as a proficient, smart, and scalable option for preparing for interviews.

VI. CONCLUSION

The AI-driven mock interview platform effectively illustrates the incorporation of generative artificial intelligence, immediate voice processing, and cloud-based data systems to develop a realistic, flexible, and tailored interview preparation tool. This system adeptly mimics human-like interviews, continually produces context-sensitive questions, assesses user answers for both technical precision and communication skills, and delivers practical feedback [3].

By employing adaptive learning techniques, the system modifies the difficulty of questions and the dynamics of conversation according to the user's performance, facilitating gradual skill enhancement. The implementation of cloud-based backend infrastructure ensures safe storage of user profiles, session histories, and assessment data, whereas the frontend design allows for smooth accessibility across various devices.

Testing and assessment indicate that the system exhibits strong precision in converting speech to text, generating questions quickly, and delivering dependable feedback, resulting in favorable user satisfaction and usability results. Consequently, the platform overcomes the drawbacks of current interview preparation resources by offering around-the-clock access, steady assessment, and customized training that does not rely on human involvement.

In general, the execution validates the practical viability of the suggested approach, emphasizing its ability to function as a powerful tool for contemporary interview training. Subsequent efforts could aim at incorporating multilingual capabilities, advanced AI

models for more profound semantic assessment, and data-driven insights to enhance user learning and monitor performance more effectively [11],[13].

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