

AI Mock Interview Platform

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Abstract—This project introduces an AI-powered mock interview platform that simulates real-world job interviews through real-time voice-based interactions. Users engage with an AI interviewer capable of generating role-specific questions and providing detailed, structured feedback on performance across key areas such as communication, technical skills, problem-solving, confidence, and cultural fit. The platform is built using Next.js, Tailwind CSS, Firebase, Vapi, and Google Gemini, delivering a secure, scalable, and low-latency web application. By offering realistic, accessible interview practice, the system aims to enhance user confidence and readiness for actual interviews.

I. INTRODUCTION

In today's competitive job market, candidates are expected to perform exceptionally well in interviews[2][9], often under pressure and without adequate preparation tools. Existing methods—like reading question lists or practicing with peers—lack realism, consistency, and scalability [3][4]. They don't replicate the stress, spontaneity, or flow of real interview settings [8][3]. As a result, many candidates face low confidence, poor communication, and missed opportunities [6][9]. This project addresses that gap by introducing a voice-based AI Mock Interview Platform—a full-stack web application designed to simulate real job interviews using conversational AI agents [2][7].

II. PROBLEM STATEMENT

Preparing for job interviews is a critical yet challenging process for many job seekers[9][2], often hindered by the lack of realistic and accessible practice tools. Traditional preparation methods—such as studying static question banks[3][4], reading guides, or practicing with peers—fall short in replicating the real-time dynamics Interviews[8][3]. This mismatch results in candidates

entering interviews underprepared[6][9], lacking both the confidence and situational experience necessary for success.

III. RELATED WORK / LITERATURE REVIEW

This platform provides realistic, voice-based interview simulations to help candidates practice in a pressure free environment, boosting their confidence[4][8][2]. With AI-driven analytics, users receive personalized feedback to improve communication and technical skills [6][9][1]. It ensures accessibility by offering high-quality coaching regardless of location or financial background[2][7], while adapting to various job profiles with customized question sets for both technical and non-technical roles[5][1]. accessible manner. Traditional methods—such as reading question banks, watching videos, or practicing with peers—fail to simulate the high-pressure, unpredictable, and interactive nature of actual interviews[3][4]. This gap leads to Underdeveloped communication and problem-solving skills and Low confidence in high-stress scenarios[6][9].

IV. PROPOSED SYSTEM

NexInterview is an innovative AI-powered interview preparation platform[2]designed to transform how job seekers prepare for interviews through advanced technology integration and user-centered design[7].

At its core, NexInterview utilizes sophisticated AI technologies to create tailored interview experiences[1][5]. The platform integrates Google Gemini's advanced language capabilities for generating highly relevant, role-specific interview questions and producing detailed, actionable feedback[1][5]. This AI engine analyzes job descriptions, technical requirements, experience levels, and industry contexts to create questions

that accurately reflect real-world interview scenarios[5][1]. VAPI's voice interaction technology enables natural, conversational mock interviews[8][3] that closely simulate the dynamics of human-to-human interactions, allowing users to practice verbal communication skills in an authentic context.

The system architecture is built on a modern, scalable foundation using Next.js, React, and TypeScript for a responsive and intuitive user interface. The application employs Next.js API Routes and Server Actions for secure backend operations, while Firebase provides robust authentication and database services.

NexInterview's workflow is designed for simplicity and effectiveness. Users begin by creating an account through Firebase Authentication, providing secure access to personalized interview preparation. Once authenticated, they interact with a VAPI assistant to specify their target job role, experience level, preferred technologies, and interview type (technical, behavioral, or mixed).

When users are ready to practice, they engage in a mock interview with a second VAPI assistant that assumes the role of a professional interviewer. This voice-based interaction creates a realistic interview environment where users can articulate responses as they would in an actual interview. The platform's user interface adheres to modern design principles, offering intuitive navigation and a distraction-free interview environment.

Data security is a paramount consideration in NexInterview's design. Firebase Firestore provides secure storage for user profiles, interview configurations, transcripts, and feedback. All communication between system components is encrypted, and clear privacy policies govern the handling of user data, ensuring that sensitive career information remains protected.

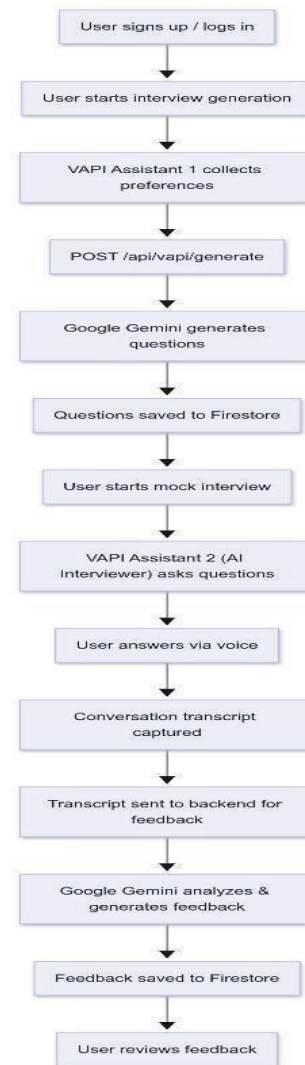


Fig.1 : SYSTEM ARCHITECTURE

V. PROPOSED METHODOLOGY

1. Frontend & Backend Development:

Framework: Next.js for unified development (SSR + REST).

Styling: Tailwind CSS for responsive and clean UI design

2. Authentication & Data Handling:

Firestore Authentication: For secure signup/login and user profile management.

Cloud Firestore: To store user interview data, feedback logs, and analytics securely.

G. Voice Interaction Engine:

Vapi API: To manage two-way real-

Time voice communication with ~500ms latency target. Speech-to-Text (STT): _ For accurate conversion of user responses into text. Gemini Integration for Text Generation. The Gemini API is accessed through a secure key.

3. AI Question Generation & Evaluation:[1]

4. Google Gemini (Generative AI):[5][6]
Tailors interview questions to job roles.

Analyzes user responses and generates feedback across key evaluation metrics.

5. Feedback Visualization:[9][5]

Graphical UI Elements: Charts and scores display performance in categories like communication, confidence, problem-solving, etc

6. Testing & Deployment:

Performance Testing: Ensure low latency under varied conditions.

Deployment: Host on a cloud platform (e.g., Vercel or Firebase Hosting) for public access.

VI. SYSTEMARCHITECTURE

A. Overview

The system architecture of NexInterview is meticulously crafted to ensure a seamless, scalable, and efficient interview preparation experience. It integrates cutting-edge technologies across the frontend, backend, and artificial intelligence layers to deliver a cohesive solution that enables personalized mock interviews and insightful feedback for job seekers.

B. Frontend

The user interface is developed using Next.js with the App Router architecture, providing an interactive and dynamic experience through React components written in TypeScript. Tailwind CSS enables responsive design and consistent styling throughout the application. The frontend includes:

A dashboard for users to track their interview preparation progress. An interview configuration interface where users specify job roles and preferences. A voice-based mock interview environment with real-time transcription. A feedback review interface with detailed performance analysis. An interview history section for revisiting past sessions and tracking improvement Key components are:

modularized for maintainability, with client-

side state management optimized for the interview flow experience. The responsive design ensures accessibility across desktop and mobile devices, prioritizing a seamless user experience during the critical voice interaction phases [7].

C. Backend

The backend leverages Next.js API Routes and Server Actions, creating a unified full-stack architecture that streamlines development and deployment. This approach enables: Secure handling of user authentication flows via Firebase Authentication Efficient processing of interview generation requests Real-time data synchronization during interview sessions Secure API endpoints for AI model interactions Server-side processing of interview transcripts for feedback generation.

The backend implements robust error handling and security measures to protect sensitive user data throughout the interview preparation process. Server Actions enable direct database operations with proper validation, reducing API surface area and potential vulnerabilities[4].

D. Artificial Intelligence Layer

The AI layer forms the core intelligence of NexInterview powered by:

Google Gemini (via @ai-sdk/google): Generates tailored interview questions based on user preferences. Analyzes interview transcripts to provide comprehensive feedback Personalizes question complexity based on specified experience levels Adapts to different interview types (technical, behavioral, or mixed)[5][1].

E. VAPI Voice AI

Powers two distinct conversational assistants:

Preference collection assistant:

Guides users through setting up interview parameters Interviewer assistant: Conducts natural-sounding mock interviews with realistic pacing and follow-up questions[8]. Provides real-time voice interaction with transcript generation. Ensures a realistic interview experience with natural language processing. The AI components work in concert, with data flowing between them via secure API calls, creating a seamless experience [3] from interview generation to feedback delivery.

F. Data Layer

The data layer is built on Firebase Fire store providing:

Structured storage of user profiles and preferences Document-based storage for generated interview questions. Collections for interview transcripts and AI-generated feedback and Real-time data synchronization capabilities.

Main Functions

- Connects to databases
- Stores and retrieves data
- Performs queries and transactions
- Ensures data integrity and security
- Handles data validation and mapping

VI. IMPLEMENTATION

The implementation of the AI Mock Interview Platform focuses on building a full-stack web application that provides users with a realistic, voice-based mock interview experience. The platform leverages artificial intelligence and modern web technologies to simulate human-like interview interactions. At its core, the system uses Vapi for real-time voice processing—converting user speech to text and AI-generated text back to speech—enabling a natural conversational flow between the user and the AI interviewer. Google Gemini is integrated to generate context-aware, role-specific interview questions and to analyze user responses. Based on these responses, it produces detailed feedback covering multiple evaluation criteria such as communication skills, technical knowledge, confidence, and problem-solving abilities. User authentication and data management are handled through Firebase, ensuring secure access and personalized profile tracking. Each user can log in, practice interviews tailored to their selected job role, and receive structured feedback that is saved and visualized within their dashboard. The entire system is deployed on a cloud platform (such as Firebase Hosting or Vercel), allowing it to scale efficiently while maintaining low latency and high performance. The application is designed with accessibility and

responsiveness in mind using Next.js and Tailwind CSS, offering a seamless user experience across devices. Overall, the implementation concept merges advanced AI capabilities with a user centric design to offer an effective, scalable, and modern tool for interview preparation.

VII. RESULT AND ANALYSIS

The AI-powered mock interview platform significantly enhances candidates' preparedness by providing realistic, voice-based interview simulations, boosting confidence and skill development[9]. Users benefit from personalized feedback across communication, technical proficiency, and overall performance, enabling iterative improvement. Leveraging advanced technologies ensures scalability, accessibility, and data security, making high-quality interview coaching widely available. The platform effectively bridges the gap between traditional preparation methods and real-world interview dynamics, empowering candidates for success.

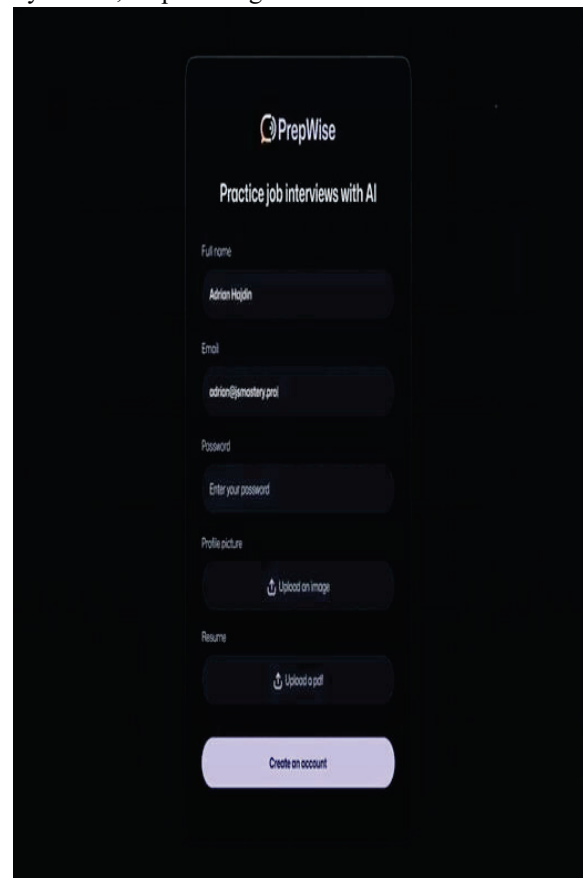


Figure 1. Sign in page

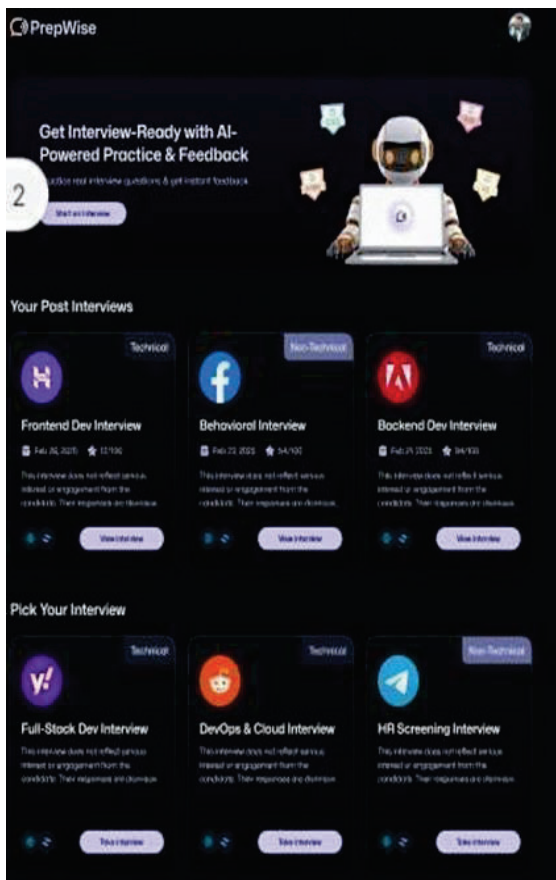


Figure 2. Home page

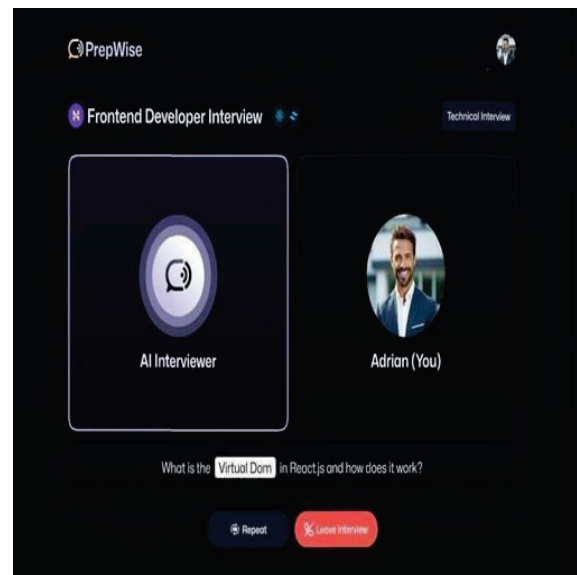


Figure 4. On-going Interview page

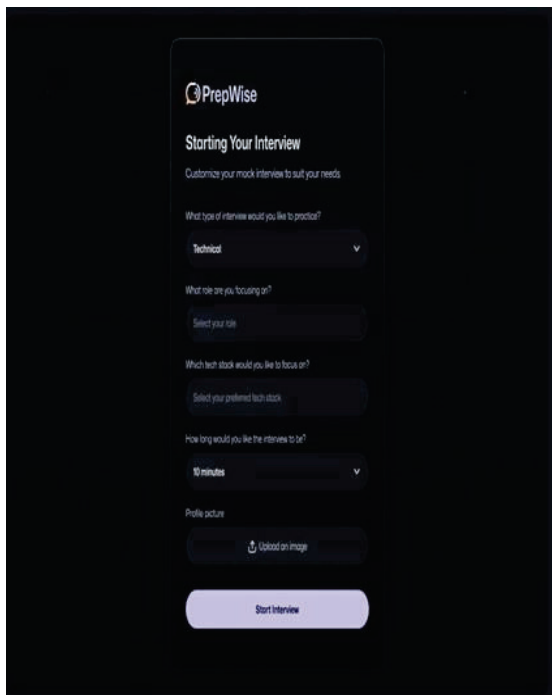


Figure 3. Interview Confirmation page

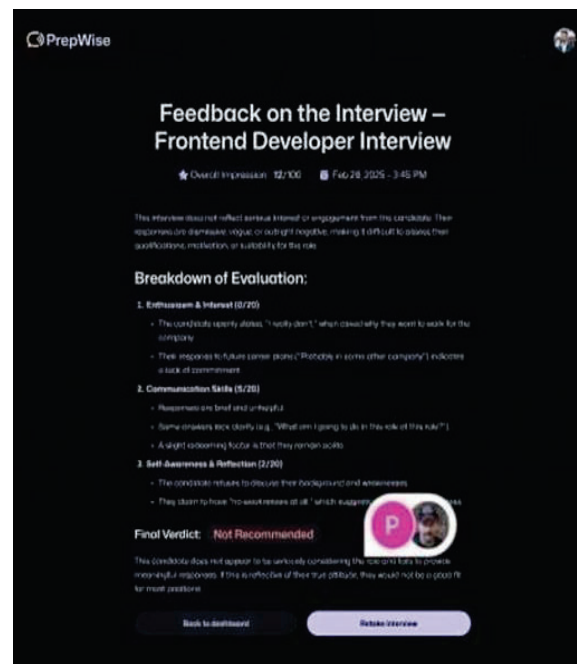


Figure 5. On-going Interview page

VIII. CONCLUSION

The AI Mock Interview Platform effectively bridges the gap in job interview preparation by offering realistic, voice-based simulations powered by advanced AI technologies. It enhances candidates' confidence, communication, and problem-solving skills, ensuring they are well-prepared for real-world interviews. The AI Mock Interview Platform revolutionizes job interview preparation by

providing dynamic, voice-based simulations that replicate real world interview conditions. With AI-driven analytics and personalized feedback, it empowers candidates to refine their skills, build confidence, and bridge the gap between traditional study methods and live interview experiences.

IX. FUTURE WORK

Future enhancements include multi-language support, adaptive difficulty levels, video-based interview simulations, and analytics dashboards for performance tracking. Incorporating mock panel interviews, sentiment analysis, gamification, and advanced speech recognition will further improve accessibility, engagement, and personalization, making the platform a comprehensive career development tool. Future enhancements could also integrate AI-driven roleplaying scenarios, where candidates can practice behavioural and situational questions tailored to specific industries. Expanding collaboration features, such as peer-to-peer mock interviews or mentorship programs, could further enhance learning. By continuously evolving with technological advancements and user feedback, the platform has the potential to become an indispensable tool for career readiness.

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