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SBGI –AI Interview Practice Platform

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***Abstract*—** The AI Interview Simulator is a browser-based, AI-driven interview preparation system designed to deliver realistic, structured, and measurable interview practice without backend dependency. The platform simulates technical and behavioral interviews through intelligent question generation, voice-based interaction, and real-time performance analysis. Built using React, TypeScript, and Tailwind CSS, the system integrates Google Gemini AI for dynamic question generation, Web Speech APIs for voice input and output, and the MediaDevices API for live camera-based interview simulation. Interview responses are evaluated using AI-driven logic to provide detailed feedback, confidence scoring, and improvement insights. All session data is stored locally in the browser to ensure privacy and security, with no persistent server-side storage. A built-in demo mode allows full functionality without API configuration, ensuring accessibility and continuous usability. The system emphasizes ethical AI usage, learner-centric feedback, and privacy-first design, enabling users to improve communication skills, technical understanding, and interview confidence through repeated practice and intelligent analysis.

I. INTRODUCTION

Interview readiness plays a critical role in professional recruitment processes; however, many candidates lack access to consistent, realistic practice environments and objective evaluation mechanisms. Traditional preparation methods, such as self-study resources or peer-based mock interviews, are often unstructured, subjective, and difficult to measure quantitatively. As modern recruitment increasingly emphasizes communication skills, problem-solving ability, and behavioral competence, there is a growing need for intelligent systems that can simulate real interview conditions while providing immediate, data-driven feedback.

The AI Interview Simulator is proposed as a browser-based, AI-driven interview preparation platform that enables candidates to rehearse technical and behavioral interviews in a structured digital environment. The system dynamically generates interview questions, supports voice-based interaction, and evaluates user responses using transparent, predefined assessment criteria rather than opaque or biased decision-making models. Immediate scoring and constructive feedback help users identify skill gaps and improve performance through repeated practice.

Unlike conventional interview platforms that rely on backend infrastructure and centralized data storage, the proposed system follows a privacy-first, client-side architecture. All interview sessions and performance data are stored locally within the browser, eliminating persistent server-side data retention. A built-in demo mode ensures uninterrupted usability even in the absence of external AI service configuration.

The primary objective of the system is to enhance interview preparedness by combining realism, accessibility, ethical AI usage, and measurable performance analytics within a fully browser-based application. This approach enables scalable, secure, and user-centric interview training without compromising data privacy.

II. LITERATURE REVIEW

1. Kumar et al. examined digital interview preparation tools and found that structured mock interviews significantly improve candidate confidence and response clarity compared to unstructured preparation methods.
2. Verma and Iyer studied the application of natural language processing in response evaluation systems and demonstrated that keyword relevance and semantic alignment are effective indicators of answer quality.
3. Mehta and Kulkarni analyzed virtual assessment platforms and reported that real-time feedback mechanisms accelerate learning by enabling immediate self-correction.
4. Deshpande and Malhotra explored voice-enabled learning systems and highlighted that auditory interaction improves realism and user engagement in simulated environments.
5. Singh and Nair focused on privacy considerations in AI-based assessment systems and emphasized the importance of secure authentication and controlled data access.

These studies collectively support the feasibility of AI-assisted interview practice systems that prioritize transparency, feedback quality, and user data protection.

Research Objectives

a. To develop an original AI-powered interview practice system for technical and behavioral preparation.

b. To implement transparent and explainable scoring mechanisms for interview responses.

c. To provide analytics-driven performance tracking for continuous improvement.

d. To ensure secure, scalable, and ethical system design.

III. METHODOLOGY

The methodology of the proposed system, titled **AI Interview Simulator**, defines a structured and systematic approach for designing and implementing an intelligent interview preparation platform. The primary objective of the system is to enhance users' technical and behavioral interview performance through simulated interviews, real-time interaction, automated evaluation, and analytics-driven feedback using artificial intelligence techniques.

The system is implemented as a **modular, browser-based web application** developed using React 18 and TypeScript, with Tailwind CSS for responsive user interface design. Unlike conventional full-stack interview platforms, the proposed solution operates without a dedicated backend server. All interview sessions, user responses, and performance metrics are processed and stored locally within the browser using localStorage, ensuring a privacy-first and self-contained execution model. External AI services are accessed only when configured, and their usage remains optional.

AI-driven techniques are employed for dynamic interview question generation, response evaluation, scoring, and feedback generation. Google Gemini AI is used to generate role-specific and difficulty-based interview questions, while response evaluation follows predefined and transparent scoring criteria. Voice-based interaction is supported through the Web Speech API for speech recognition and speech synthesis, enabling natural verbal communication between the user and the AI interviewer. The MediaDevices API is utilized to provide live camera access, simulating real interview conditions.

The system follows a **modular design methodology**, where core functional components—including interview session management, AI question delivery, voice interaction, real-time analysis, feedback generation, analytics visualization, and demo mode fallback—are developed and tested independently before integration. This approach enhances

maintainability, extensibility, and system reliability. A built-in demo mode ensures uninterrupted functionality by providing preconfigured questions and mock evaluations when external AI services are unavailable.

Emphasis is placed on usability, ethical AI usage, and data security. The evaluation logic avoids opaque or automated decision-making, instead providing explainable scores and constructive feedback to support user learning. By combining modular client-side architecture with intelligent AI integration, the proposed methodology delivers a scalable, secure, and user-centric interview preparation system.

3.1 System Overview

The **AI Interview Simulator** provides an end-to-end solution for interview preparation by simulating realistic technical and behavioral interview scenarios within a browser-based environment. The platform enables users to select interview categories, job roles, and difficulty levels, participate in structured interview sessions, and receive immediate AI-driven evaluation and feedback. By combining interactive questioning with performance analysis, the system supports continuous improvement in communication skills, technical understanding, and interview confidence.

Unlike traditional interview preparation tools that rely on static question banks or manual evaluation, the proposed system adopts an interactive and feedback-oriented workflow. Interview questions are dynamically generated, and user responses are evaluated against predefined and transparent assessment criteria. The system produces clear performance scores, strengths, and improvement suggestions, enabling users to understand evaluation outcomes rather than relying on opaque decision-making processes. Optional voice-based interaction further enhances realism while maintaining full user control and consent.

The system architecture is organized into multiple logical client-side modules, each responsible for a specific function, including interview configuration, session management, AI-powered question generation, response evaluation, voice interaction, performance analytics, local data storage, and demo mode fallback. This modular design improves maintainability, extensibility, and reliability, ensuring consistent operation across different devices and usage conditions without requiring backend infrastructure.

3.2 Module-Wise Methodology

3.2.1 User Panel (Interview Candidate Interface)

The **User Panel** serves as the primary interaction layer between the candidate and the AI Interview Simulator. It is designed to provide a centralized, intuitive, and accessible interface that enables users to conduct interview practice sessions efficiently. The interface emphasizes clarity, responsiveness, and ease of navigation to support repeated and uninterrupted interview preparation.

Users can initiate interview sessions directly through the browser without mandatory account registration or server-side authentication. The panel allows candidates to select interview categories such as technical or behavioral interviews, specify job roles, and choose difficulty levels based on individual preparation needs. Once configured, the system guides users through structured interview sessions by presenting questions sequentially and capturing responses through text input or optional voice-based input using browser-supported speech recognition.

During the interview, the User Panel displays session progress indicators, question flow status, and immediate response-level feedback where applicable. Upon completion of a session, candidates are presented with a detailed results view that includes question-wise scores, qualitative feedback, confidence indicators, and overall performance summaries. These insights enable users to quickly assess strengths, identify weaknesses, and track improvement areas.

Additional functionalities include local session history storage, difficulty-based performance comparison, progress visualization through charts, and session reset or termination controls. All user data is stored locally within the browser, ensuring privacy and user control. Collectively, these features enhance transparency, user engagement, and effective interview preparation without reliance on backend infrastructure.

3.2.2 AI Evaluation and Scoring Engine

The **AI Evaluation and Scoring Engine** serves as the analytical core of the AI Interview Simulator and is responsible for evaluating candidate responses and generating structured, explainable feedback. This module processes both textual inputs and transcribed voice responses using AI-assisted analysis techniques, enabling consistent assessment across different response modalities. The engine is designed to support technical as well as behavioral interview evaluation scenarios.

Each interview question is mapped to predefined evaluation criteria, including expected concepts, key points, and relevant keywords. User responses are analyzed for relevance, completeness, clarity, conceptual accuracy, and logical structure. Based on these dimensions, the engine computes normalized scores that allow fair comparison across sessions and difficulty levels.

In addition to quantitative scoring, the engine performs qualitative analysis to identify common response patterns such as vague explanations, insufficient detail, or weak reasoning structure. The generated feedback emphasizes learning by clearly outlining strengths, highlighting missing components, and suggesting areas for improvement. Visual elements such as progress indicators and score representations enhance interpretability and motivate repeated practice.

Ethical AI principles are integrated into the evaluation process by ensuring that all scoring mechanisms are transparent, reproducible, and derived solely from user-provided input. The engine avoids automated decision-making or biased inference and includes safeguards for handling incomplete responses or evaluation inconsistencies. This approach ensures fairness, reliability, and trustworthiness in the interview assessment process.

3.2.3 Interview Session Management Module

The **Interview Session Management Module** governs the complete lifecycle of interview sessions within the AI Interview Simulator. It is responsible for initializing sessions based on user-selected parameters, managing question flow, capturing responses, and determining session completion. Each session is associated with descriptive metadata such as interview category, difficulty level, timestamps, and completion status to ensure structured execution and traceability.

During an active interview, the module enforces controlled question sequencing to prevent skipping, repetition, or out-of-order navigation. This structured flow maintains interview realism and ensures consistent evaluation conditions across users and sessions. User responses are securely captured through text or voice input and systematically forwarded to the AI Evaluation and Scoring Engine for analysis.

Upon completion of an interview, the module compiles all response data, evaluation scores, and feedback into a unified session summary. This summary represents the complete outcome of a single interview attempt and enables immediate presentation of results through the user interface in a clear and interpretable format.

Completed session records are stored locally within the browser, allowing users to review historical performance, compare outcomes across multiple attempts, and observe improvement trends over time. This persistent yet privacy-preserving session management approach supports repeatable practice, performance benchmarking, and continuous skill development without reliance on backend storage.

3.2.4 Voice Interaction Module

The **Voice Interaction Module** enhances the realism of the interview experience by enabling optional voice-based communication between the candidate and the AI Interview Simulator. This module supports text-to-speech delivery of interview questions and microphone-based voice input for candidate responses, closely simulating real-world interview conditions and increasing user engagement.

The module manages browser-level microphone permissions, audio playback controls, and recording state transitions to ensure smooth and uninterrupted interaction. Users retain full control over when voice features are activated, maintaining transparency and consent throughout the interview process. This design ensures that voice interaction remains user-driven rather than mandatory.

Captured voice responses are optionally transcribed into text using browser-supported speech recognition technologies. This transcription allows the system to apply consistent evaluation and scoring logic across both voice and text-based inputs, ensuring fairness and uniformity in response assessment regardless of input modality.

The Voice Interaction Module is designed to be device-agnostic and adaptable across modern web browsers. By functioning as an optional enhancement rather than a requirement, the module preserves accessibility for users with limited hardware capabilities while providing a more immersive interview simulation for those who choose voice interaction.

3.2.5 Analytics and Performance Review Module

The **Analytics and Performance Review Module** converts raw interview evaluation data into meaningful and actionable insights to support continuous learning. This module aggregates performance metrics generated during interview sessions and organizes them into structured analytical views that enable users to understand their overall interview readiness.

The module provides visual dashboards presenting key indicators such as session-wise scores, category-based performance summaries, difficulty-level trends, and recent interview activity. These visual representations allow users to quickly assess progress and identify areas requiring focused improvement.

Interactive charts, progress indicators, and comparative views help users recognize recurring strengths and weaknesses across multiple interview attempts. By enabling comparison between sessions and difficulty levels, the system supports reflective learning and encourages users to adopt goal-oriented preparation strategies.

All analytics are generated using locally stored data and are displayed in an intuitive and user-friendly format. By emphasizing clarity and interpretability, the module promotes informed self-assessment and sustained improvement without relying on external data processing or centralized analytics services.

3.3 Design Considerations

The system design prioritizes **usability** by emphasizing intuitive navigation, responsive layouts, and a clear interaction flow that minimizes cognitive load during interview practice. The user interface is designed to support repeated use, allowing candidates to focus on answering questions rather than managing complex controls or configurations.

Scalability and maintainability are addressed through a modular client-side architecture in which each functional component operates independently. This design approach enables future feature expansion, such as additional interview formats or advanced analytics, without requiring fundamental changes to the existing system structure.

Security and privacy are core design considerations of the platform. All interview data, including responses and performance metrics, are stored locally within the user's browser, eliminating centralized data collection and reducing exposure to data breaches. User control over data retention is maintained through local storage management and session reset options.

Ethical AI usage underpins the overall system design by ensuring transparent and explainable scoring logic, explicit user consent for optional features such as voice interaction, and avoidance of automated decision-making that could adversely affect users. The platform is designed as a learning support tool rather than a judgment-based evaluation system, promoting fairness, trust, and responsible AI adoption.

3.4 Testing and Validation

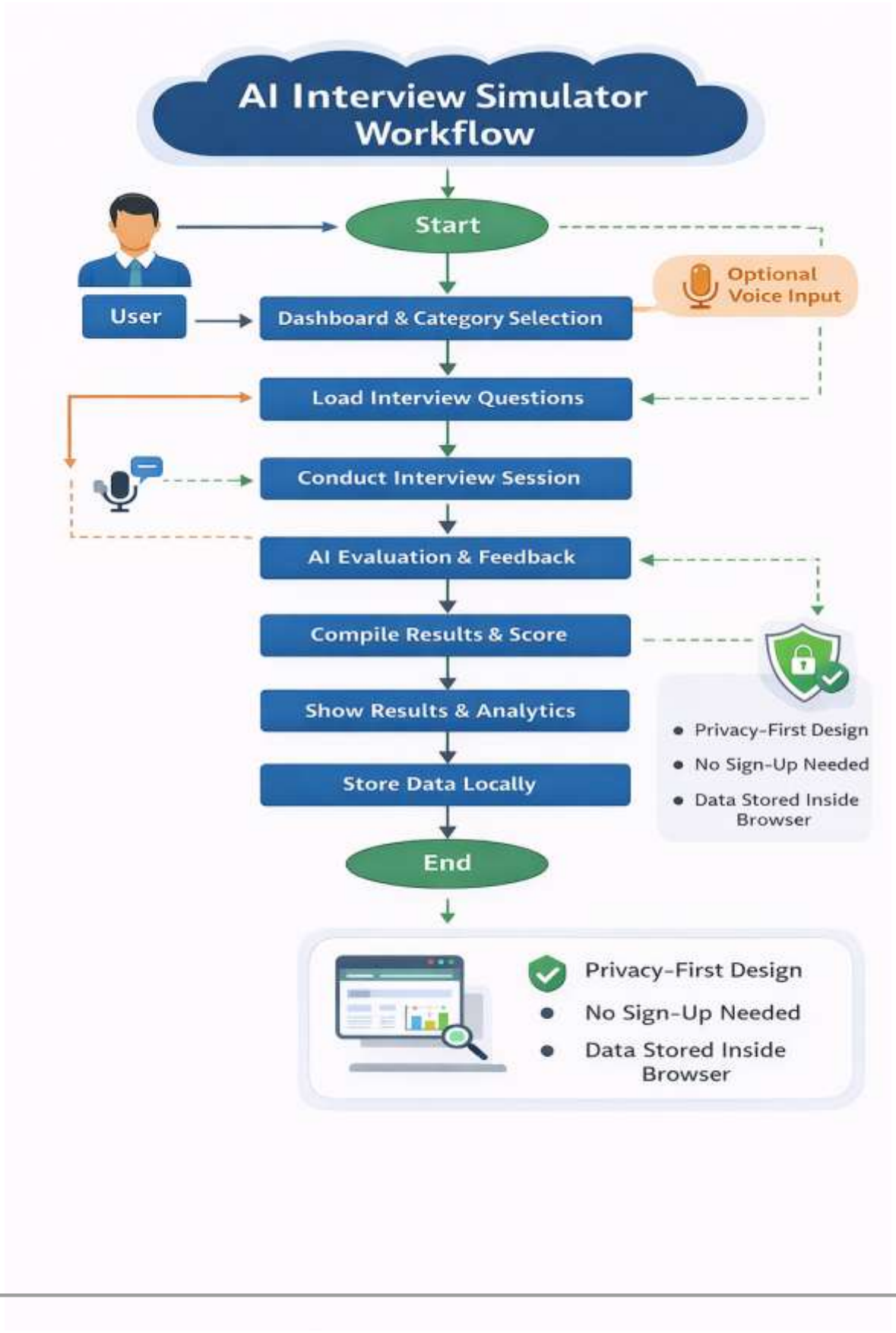
Testing and validation were conducted using a comprehensive, multi-layered approach to verify system correctness, performance, and ethical compliance. Unit testing was applied to validate individual client-side components such as interview configuration, question sequencing, response capture, scoring logic, and session state management.

Integration testing ensured seamless interaction between core system modules, including interview session management, AI-driven evaluation, voice interaction, analytics visualization, and local data storage. Functional testing confirmed that all user-facing features—such as interview initiation, structured question delivery, feedback presentation, and performance analytics—operated according to defined specifications.

Performance testing evaluated system responsiveness and stability under typical usage conditions, ensuring smooth operation during extended interview sessions. Security and privacy validation focused on verifying local data isolation, correct handling of browser permissions, and user control over stored session data. Usability and accessibility testing further ensured intuitive navigation, responsive layouts, and compatibility with modern browsers and assistive technologies.

Regression testing was conducted to confirm that newly introduced features did not disrupt existing functionality. In addition, qualitative evaluation of AI-generated feedback was performed to assess clarity, relevance, and educational value. Iterative refinements based on testing outcomes improved feedback quality, system reliability, and overall user trust in the platform.

3.5 Flowchart of System Working



IV. CONCLUSIONS

The **AI Interview Simulator** represents a modern and effective approach to enhancing interview preparedness in competitive professional environments. By leveraging artificial intelligence, interactive web technologies, and browser-native APIs, the platform enables structured interview simulations, real-time evaluation, and personalized feedback without reliance on backend infrastructure. The system addresses key limitations of traditional interview preparation methods by offering measurable performance insights and repeatable practice opportunities in a self-contained digital environment.

The platform provides an engaging and user-friendly experience through an intuitive interface, optional voice-based interaction, and detailed performance analytics. Transparent scoring mechanisms and immediate feedback support informed self-assessment and continuous improvement, allowing users to better understand their communication effectiveness, technical clarity, and interview readiness. The inclusion of a built-in demo mode ensures uninterrupted usability even when external AI services are unavailable, improving accessibility and system robustness.

Strong emphasis on **privacy, security, and ethical AI usage** distinguishes the proposed system from conventional interview preparation platforms. All interview data is stored locally within the user's browser, ensuring full user control over personal information and eliminating risks associated with centralized data storage. The evaluation logic is transparent and explainable, avoiding automated decision-making that could negatively impact users and reinforcing trust in the system.

Overall, the AI Interview Simulator delivers a scalable, cost-effective, and learner-centric solution for interview preparation. Its modular client-side architecture allows for future enhancements such as advanced speech analysis, video-based interviews, and adaptive question generation. The successful implementation of this platform demonstrates the potential of browser-based AI-assisted systems to bridge the gap between candidate preparation and real-world interview expectations, contributing meaningfully to modern career development practices.

REFERENCES

[1] R. Kumar and A. Sharma, "Artificial intelligence applications in interview assessment and candidate evaluation," *International Journal of Computer Science and Information Technologies*, vol. 11, no. 2, pp. 95–102, 2020.

[2] N. Verma and S. Iyer, "Natural language processing techniques for evaluating spoken and written responses," *Journal of Artificial Intelligence Research and Applications*, vol. 7, no. 1, pp. 34–42, 2021.

[3] R. Mehta, P. Kulkarni, and K. Deshpande, "AI-driven virtual interview systems and performance analytics," *IEEE International Conference on Computing, Communication and Automation*, pp. 210–216, 2022.

[4] S. Patil and M. Kulkarni, "Design of intelligent assessment platforms using machine learning," *International Journal of Advanced Research in Computer Engineering & Technology*, vol. 10, no. 6, pp. 301–307, 2021.

[5] N. Joshi and P. Malhotra, "Semantic analysis of candidate responses in AI-based evaluation systems," *Journal of Emerging Technologies and Innovative Research*, vol. 8, no. 7, pp. 1185–1191, 2021.

[6] A. Chavan, S. More, and R. Pawar, "Serverless architectures for scalable AI-based web applications," *International Journal of Cloud Computing and Services Science*, vol. 11, no. 3, pp. 145–152, 2022.

[7] V. Desai and K. Shah, "Ethical considerations in AI-assisted evaluation and decision-support systems," *Journal of Information Security and Ethics*, vol. 15, no. 2, pp. 41–49, 2023.

[8] Supabase Inc., "Supabase documentation: Authentication, database, and edge functions," 2024. [Online]. Available: https://supabase.com/docs

[9] ElevenLabs, "Text-to-speech API documentation," 2024. [Online]. Available: https://elevenlabs.io/docs

[10] OpenAI, "Language models for content analysis and feedback generation," OpenAI Documentation, 2024. [Online]. Available: https://platform.openai.com/docs

[11] Mozilla Foundation, "Web accessibility guidelines and best practices," *Mozilla Developer Network*, 2023. [Online]. Available: https://developer.mozilla.org

[12] R. S. Pressman and B. R. Maxim, *Software Engineering: A Practitioner's Approach*, 8th ed. New York, NY, USA: McGraw-Hill Education, 2019.