

AI – Powered Mock Interview Application

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Abstract - The rise of the competitive environment during the recruitment process has resulted in an increased need for efficient, accessible, and personalized tools for interview preparation. The traditional method of conducting mock interviews has been found to have various difficulties, such as limited access, inconsistent feedback, and reliance on human mentors. Therefore, the emergence of Artificial Intelligence (AI), Natural Language Processing (NLP), and Large Language Models (LLMs) has resulted in the creation of AI-based mock interview systems as an efficient alternative to traditional tools that can provide realistic interview simulation with immediate feedback to enhance communication skills. This literature review seeks to explore the existing AI-based mock interview systems, their technologies, advantages, and disadvantages. This review of the literature revealed various limitations of the existing systems that need to be improved. Therefore, to improve the existing AI-based mock interview systems, the proposed AI-based mock interview application, developed using Next.js, seeks to provide an efficient, accessible, and user-friendly interface with the integration of modern web technologies.

the way we think, work, and learn. The growing importance of AI has created opportunities for improving the process of interview preparation. AI-based systems have the potential to create a simulated environment, provide relevant questions, and give instant feedback based on the answers provided by the candidate. This will help candidates practice more efficiently, as there will be no need for repetition or guidance from a mentor. In this project, an AI-based system for conducting a mock interview has been created, which will provide a better platform for practicing an interview. The system will allow candidates to select a particular job role or technology, and relevant questions will be generated through an AI-based system. The candidate will have the facility of answering the questions through text or voice input, which will be evaluated through Natural Language Processing (NLP). The system has been created using Next.js, which will provide a better interface for the candidate. The system will have the facility of storing the interview history, which will help candidates track their performance over a period of time. The proposed system will provide a better platform for improving the skills of candidates through a combination of web technologies and AI-based evaluation systems.

Key Words: Node.js, Next.js, Automated Evaluation, Interview Preparation, Real-Time Feedback, Web-based learning system.

1. INTRODUCTION

Interview preparation has become an important part of career development, especially with the growing intensity of competition in the job market. Students and candidates face difficulties in getting proper guidance, practice, and timely feedback during the process of interview preparation. The traditional methods of practicing with a partner or through a mock interview are limited by the availability of the partner, the consistency of the practice, and the guidance of a mentor. With the advent of Artificial Intelligence (AI), there has been a tremendous change in

2. LITERATURE REVIEW

The problem of effective interview preparation has been studied widely due to its significance in recruitment and skill evaluation. Conventional interview preparation techniques mainly focus on human interviewers and static questions. However, these techniques are often time-consuming, expensive, and not scalable. In addition, these techniques do not offer any form of customized feedback or learning, hence limiting their potential to effectively improve candidate performance. The first systems designed for interview preparation were mainly based on rule-based systems and questionnaire systems. These systems were based on a set of rules and criteria that were used to evaluate the user's response. These systems were

not flexible enough to cope with different types of user input. Moreover, the evaluation of the user's communication skills and confidence level was not taken into account in the inter-view preparation systems. The integration of machine learning has significantly expanded the capacity of Natural Language Processing (NLP) to evaluate and interpret candidate responses. Techniques like keyword matching, similarity, and even simple sentiment analysis have been employed to test the responses given. However, these techniques, even with the advent of machine learning, have shown to be insufficient to analyze the responses given. Recent advancements in the field of deep learning have greatly impacted the effectiveness of automated interview systems. Neural network models, especially the transformer models, have shown promise in the evaluation of contextual relationships in text. This has led to the effective evaluation of user feedback and the generation of questions for users. However, the systems that have been implemented face a number of challenges. Recently, large language models (LLMs) have been developed as efficient models for understanding and producing human-like texts. They can engage in dynamic conversations, generate role-based interview questions, and provide intelligent feedback based on user input. Their ability to process complex language patterns makes them highly suitable for an interview simulation system. The proposed AI-Powered Mock Interview System aims to take advantage of the developments made in the related fields, where interaction, AI-generated questions, and evaluation are considered. The system offers a tailored interview experience based on user-defined roles and skills, along with performance evaluation and feedback, as well as interview history for tracking and improvement analysis. Compared to other conventional and existing methods, the proposed system promises better scalability, flexibility, and evaluation, making it highly suitable for today's interview process.

3. PROPOSED SYSTEM

The proposed system will utilize Artificial Intelligence along with modern web technologies to deliver an interactive and adaptive mock interview experience. The system will be developed using Next.js, providing a responsive interface for users to select interview domains and simulate interviews. Natural Language Processing techniques along with Large Language Models will be utilized to generate dynamic questions based on interview domains. The user's answers

will be evaluated on the spot using LLMs. The system will assist users in improving communication skills, confidence, clarity, and content. This will be achieved by providing feedback to users on their performance. The adaptive interview will change based on user performance, helping them to learn continuously. This will be achieved by utilizing intelligent evaluation along with modern web technologies to deliver interface.

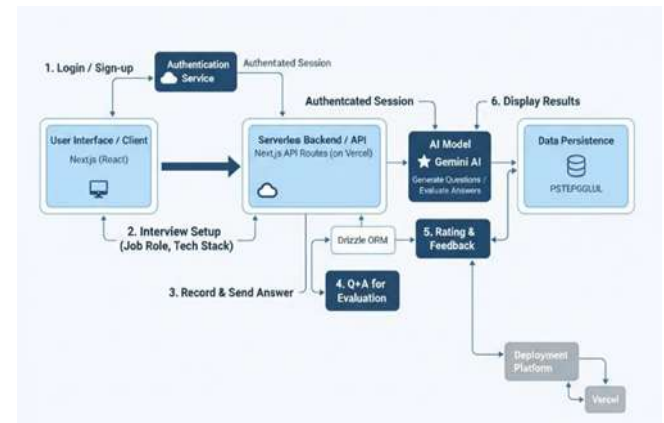


Fig -1: Architecture of AI Powered Mock Interview

3.1 System Architecture

The Fig-1 system architecture comprises a Next.js-based user interface, serverless backend, AI evaluation model, and database for data storage. Users will first be required to authenticate themselves using the login/signup module, which will establish a secure session to access the application. After choosing their interview role and tech stack, the frontend will send requests to the Next.js API routes available in the backend. The backend will then be required to integrate with the AI model, i.e., Gemini AI, to produce questions for interviews and evaluate user responses. Finally, the ratings will be stored using a PostgreSQL database.

4. IMPLEMENTATION

4.1 Login / Sign-Up

The process starts with user authentication. This is to provide secure access to the mock interview system. The user will interact with the interface developed using Next.js and React technologies. Here, the user can either register as a new user or log in using their existing credentials. The authentication service will verify the user information provided. Then, it will provide a secure authenticated session using session tokens or authentication middleware. This will ensure that only

authorized users can access the system features. Once the authentication is complete, the session information will be passed to the backend services to associate the user's interview activity with their user information. This authentication process will also provide security to the system.

4.2 Interview Setup

Once authenticated, the next step for the user will be to continue with the process of configuring the parameters of the interview setup. In this step of the process, the user will be asked to input parameters like the kind of job role they want to practice for, the domain they want to practice for, or the technology stack they want to practice for. For instance, the user might want to practice sessions by selecting specific professional roles such as frontend, backend, or data analysis or practice for a technology stack like React, JavaScript, Python, etc. This will be done through the Next.js frontend interface, which will send it to the backend through Next.js API Routes, which will be a serverless environment with Vercel.

4.3 Record & Send Answer

The AI model produces a set of questions for a mock interview, but it is up to the user to respond through the user interface or, according to how it was developed (designed), in the form an audio recording (recorded response). The audio recordings will be captured while the user is recording his/her answer (think of this as the user interface) and transmitted to the serverless back end using secure API calls. Both the client-side (user interface) and serverless back end (application server) will communicate with each other to ensure a seamless process. The audio recordings are temporarily processed by the AI system and can be used for both analysis and evaluation. The processing of the audio recordings creates the main communication layer between the end user and the mock interview platform.

4.4 Q&A Processing For Evaluation

The response from the interviewer will be stored in a file designated by the user to indicate that the questionnaire has been received. Next, the system will use the Drizzle ORM (Object Relational Mapper) for PostgreSQL (which connects the software with the database) and do all the necessary database organization work to implement and process the user input. After successful completion of all of these processes, the original user input is sent to the AI evaluation module for its AI model to evaluate each piece of data. Because the Q&A data are structured in an

identical manner to what exists in the database, the AI evaluation module can evaluate all Q&A data consistently based on uniform input.

4.5 Rating & Feedback

Gemini AI is the model responsible for evaluating the user's response to an AI evaluation question and delivering this evaluation to you as the user. The question and answer will be submitted to Gemini through [an application programming interface (API) called "NLP"]. Gemini will use natural language processing (NLP) techniques to evaluate your answer based upon several factors, including how relevant the content is, how accurate the content is, the structure in your answer, how well your answer is explained, and how effectively your response communicated your answer. After evaluating your submission, Gemini will return to you with two types of results:

- (1) an overall score (performance score) that reflects how well you performed relative to other similar users; and
- (2) comprehensive feedback pointing out the areas of strength in relation to your submission, as well as recommendations for improvement for those areas of need. The evaluation process will provide you with an intelligent, organised assessment of your overall performance so that you can experience a simulated environment for a real-life interview.

4.6 Display Results & Data Persistence

As soon as evaluations are completed, the assessments that were generated along with all the responses from interviews and feedback as well as an actual score are stored into a long-term persistent PostgreSQL data-base. This way, users will be able to view their past interview sessions and be able to measure their growth over time. After the interview has been processed, the results will then be able to be viewed on the Next.js frontend dashboard. Here, users will see their scores and feedback from all of their interviews to better prepare them for their next interview. The application is deployed to Vercel which is a highly scalable cloud environment where the server-less backend and front-end interface are hosted. This deployment model also ensures that the performance is very fast, that the application will automatically scale, as

well as being continuously available to users on this platform.

5. METHODOLOGY

The proposed AI-Powered Mock Interview System has been developed using a structured methodology that includes user interaction, real-time processing, and AI evaluation in a way that can mimic a real interview environment using modern web technologies and AI systems.

5.1 User Authentication and Session Management:

The process starts with user authentication to provide secure access to the platform. Users can register or log in through a web interface built with Next.js and React. Various authentication methods such as token-based session management and middleware are implemented to authenticate the users. After authentication, session management is performed to record the activities of the users and map the interview session with the user profile securely.

5.2 Input Parameter Collection:

After the authentication process, the system collects user-defined parameters. The parameters are required for the interview generation process. The parameters are job role, domain, and technology stack. The process ensures that the interview process is conducted according to the user's requirements. The data collected is then sent from the frontend to the backend through API routes.

5.3 Dynamic Question Generation:

On the basis of user information provided, the system uses an AI model for the dynamic generation of questions in the interview. The AI model processes the selected role and skills and provides relevant questions to the user in the interview. Dynamic generation of questions provides variety and eliminates repetition.

5.4 Response Capture and Processing:

The responses to the generated questions are given by the user through audio input. The responses are then collected by the system through the frontend interface and are sent to the backend. The audio inputs are processed and

changed to an analyzable form. This step acts as the main interface between the user and the system.

5.5 AI-Based Evaluation:

The collected answers are then sent to an AI system for evaluation, based on a large language model. Evaluation is done by using Natural Language Processing (NLP) to analyze the answers based on various parameters, such as their relevance, accuracy, clarity, and confidence.

5.6 Feedback Generation and Scoring:

Based on the evaluation, the system provides a performance score along with feedback. The feedback provides users with areas for improvement, thus helping users improve their interview skills. This step provides an intelligent evaluation of the user's performance.

5.7 Data Storage and Result Visualization:

All interview data, such as interview responses, scores, and feedback, is stored in a PostgreSQL database for future use.

6. RESULTS



Fig -2: Login Page

To enable user authentication prior to accessing MockMate AI, the login page has been created with email/password entry fields as shown in the Fig-2 and a submit button to send the two to MockMate AI's servers. Upon entering correct information into the email and password fields, users will be taken to their dashboard page, where they can begin conducting mock interviews based on AI. This page helps to provide basic security by stopping un-authorized users from accessing the application and also pro-vides users with a secure place to store their interview data. Additionally, demo login information is provided to allow both testing users and

evaluators the opportunity to try out the product without creating a new account.



Fig -3: Dashboard Page

The Dashboard layout as shown in the Fig-3 in the MockMate AI app is the central management hub for Users. Users access the Dashboard to create a comprehensive new Mock Interview from providing the basic details, such as the Job Role and Tech Stack they are preparing for, to providing the amount of Past Experience they have. Users also view their history of all Previous Mock Interviews, providing Role, Experience Level, and Date Created, along with the two options on each Interview Card to start a new Mock Interview or to review their Feedback based on their Past Performance, empowering Users to track their Progress, access any previous attempts, and improve their preparation through interaction with the MockMate AI interface. The entire Dashboard layout has been designed with User-Friendly guidelines to ensure Users have a quick and efficient Interview Preparation Process.



Fig -4: Interview Setup Page

In the MockMate AI application, an interactive environment as shown in the Fig-4 allows users to participate in AI-based mock interviews for the user-specified job role, required skillset, and professional experience level in order to provide context during their interview. Users can interact with the webcam and microphone through the interface as if they were doing a

live interview (speaking their responses), rather than having to type them. Questions will appear one at a time, in a sequential manner, helping to organize and focus the flow of the interview. This process promotes user engagement and replicates a live interview experience, thus allowing the user to develop their communication skills, build confidence and expand their technical knowledge through the MockMate application.



Fig -5: Feedback Page

MockMate AI users can evaluate their interview performance in detail with the Feedback Page. The system creates a score based on user responses that indicates how well, or poorly, the user performed during a mock interview as shown in the Fig-5. In addition, the Feedback Page affirms where the user needs to work on their interview performance by including their scores for different categories (communications skills, technical skills accuracy, and their level of confidence). This page may help users identify strengths and weaknesses. The users will be able to track how they develop over time and how they are developing their interviewing skills systematically through this feature as well as providing suggestions or correcting users' answers to demonstrate understanding of where they made mistakes.

7. CONCLUSION

This project has developed an AI-powered mock interview app that provides a realistic and efficient way to get ready for interviews. The app allows users to answer questions about their preferred position in a realistic simulated environment, with instant feedback on how they did. Because the apps simulate a real-life experience, the apps also provide users with the opportunity to use the practice of their strengths and to find areas to improve their performance.

The integration of artificial intelligence and natural language processing allows the system to evaluate the

user's answers based on multiple factors, including relevance, clarity, and quality of communication. The generated feedback and performance scores provide useful information that will enable the user to continue their education and improve their skills. This differs from traditional methods of preparing by giving the user the opportunity to practice at any time and without having to depend on an outside source for that support.

Utilizing Next.js offers seamless usability and a highly responsive user experience; the modular aspect offers a successful means for links between frontend/backend/AI architecturally within the ecosystem. Storing candidate interview data alongside time tracking improves the platform's functionality as well. In summary, the overall system provides evidence of AI being implemented successfully to assist individuals preparing for interviews in a user-friendly and scalable manner; by enhancing development of candidates' technical & interpersonal communication skills & improving their degree of self-confidence for actual interview scenarios.

As mentioned previously there is still future potential for continued development of this platform by integrating additional capabilities; like emotion detection, expressional analysis through facial recognition, real-time feed-back of speech during the evaluation process could create a much more extensive picture of the candidate's performance. Also, reducing potential bias would be another key focus area moving forward as it relates to AI evaluation processes along with maintaining compliance related to data privacy support.

To sum up, this AI-powered mock interview software can be a scalable, smart, and people-driven way for everyone to prepare for an interview. It connects old ways of practicing for an interview with current technologies available for training purposes, creating a way for learners to develop their skills and abilities more effectively and flexibly. With ongoing updates and advancements, this system has unlimited potential to have a major impact on how people will get ready for work and develop new skills, as well as on the future of how interview preparation will occur.

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