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AI-Powered Mock Interview Web Application

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Abstract—The recruitment process has evolved significantly with the adoption of Artificial Intelligence (AI), automation, and intelligent assessment technologies. Interview preparation remains one of the most challenging aspects for students, fresh graduates, and job seekers due to limited access to professional guidance, lack of realistic practice environments, and insufficient personalized feedback. Traditional mock interview approaches often depend on mentors, coaching institutes, or predefined questionnaires, which restrict flexibility and scalability. Recent developments in Natural Language Processing (NLP), Large Language Models (LLMs), and Generative Artificial Intelligence have enabled the creation of intelligent interview preparation platforms capable of generating contextual questions and evaluating candidate responses automatically.

This survey paper reviews recent research in AI-based mock interview systems, behavioral analysis frameworks, remote hiring platforms, transformer-based language models, and generative AI technologies. Various methodologies, technologies, advantages, and limitations are analyzed through comparative evaluation. Based on identified research gaps, an AI-Powered Mock Interview Web Application is discussed that integrates Google Gemini AI, Next.js, MYSQL, Firebase, and Clerk authentication to provide personalized interview experiences, automated feedback, performance analytics, and multimodal interaction through text, voice, and video responses. The survey highlights the role of intelligent automation in improving interview readiness and discusses future directions including emotion recognition, multilingual support, adaptive learning mechanisms, and resume-based interview generation.

Keywords: Artificial Intelligence, Mock Interview System, Gemini AI, Natural Language Processing, Large Language Models, Generative AI, Interview Preparation, Performance Analytics, Web Application.

I. INTRODUCTION

Interviews serve as one of the most widely used evaluation mechanisms in recruitment, academic admissions, internships, and professional certification processes. Organizations use interviews to assess technical competency, communication skills, confidence, problem-solving ability, and cultural compatibility. Success in interviews often determines career opportunities for students and professionals [1][2]. However, many candidates face challenges due to insufficient preparation, lack of realistic practice environments, and limited access to professional guidance.

Traditional interview preparation methods include coaching centers, peer discussions, and mock interview sessions conducted by mentors. Although these methods provide useful guidance, they often suffer from limitations such as high cost, scheduling constraints, subjective evaluation, and restricted accessibility [3][4]. Furthermore, static interview question repositories fail to adapt to individual candidate profiles, job roles, and skill requirements.

The rapid advancement of Artificial Intelligence has introduced innovative approaches to interview preparation and assessment. AI-powered systems can generate interview questions dynamically, analyze candidate responses, evaluate communication effectiveness, and provide personalized feedback [5][6]. The emergence of Large Language Models such as GPT and Gemini has significantly improved the capability of intelligent systems to understand context and engage in realistic conversations [7][8][9].

Modern web technologies combined with cloud computing infrastructure have enabled the development of scalable interview preparation platforms accessible from anywhere. These systems provide candidates with continuous practice opportunities while reducing dependency on human evaluators [1][3].

This survey paper examines current research related to AI-driven interview preparation systems and explores technologies that contribute to intelligent interview simulation and evaluation.

II. PROBLEM STATEMENT

Interview preparation is a critical challenge for students and job seekers seeking employment opportunities. Traditional mock interview methods often depend on mentors, trainers, or coaching institutes, making them expensive, time-consuming, and inaccessible to many candidates.

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Additionally, conventional interview preparation platforms generally rely on static question banks and provide limited personalized feedback. Candidates often struggle to identify their weaknesses in communication skills, technical knowledge, confidence, and problem-solving abilities.

With the growing demand for efficient and accessible interview training solutions, there is a need for an intelligent system capable of generating personalized interview questions, evaluating candidate responses, and providing constructive feedback automatically. Therefore, a scalable AI-powered mock interview platform is required to simulate realistic interview scenarios and support continuous skill improvement.

Objectives

The main objectives of the proposed AI-Powered Mock Interview Web Application are:

1) To develop an intelligent web-based platform for interview preparation using Artificial Intelligence and Generative AI technologies.
2) To generate personalized interview questions based on job role, skills, and experience level using Google Gemini AI.
3) To provide text-based, voice-based, and video-based mock interview experiences for users.
4) To analyze candidate responses and generate automated feedback for communication skills, technical knowledge, and answer relevance.
5) To maintain interview records and performance history using MYSQL database management.
6) To provide performance analytics and progress tracking through an interactive dashboard.
7) To ensure secure user authentication and data management using modern web technologies.
8) To improve interview confidence, communication abilities, and overall employability of students and job seekers.

III. LITERATURE REVIEW

Yashaswini Nag M. N., Lokesh Chowdary K., Shashank L., and Gokul D. [1] have written a paper titled “AI-Driven Mock Interview: A New Era in Candidate Preparation.” The authors proposed an AI-based mock interview platform that evaluates candidates across emotions, confidence, and knowledge. The system uses Convolutional Neural Networks (CNN) for facial expression analysis and Natural Language Processing (NLP) for speech and semantic evaluation. The platform provides real-time personalized feedback to reduce interview anxiety and improve preparedness. However, the study mainly focuses on behavioral and emotional assessment rather than scalable web deployment architecture.

Akshada Katakar, Namrata Kadam, Sakshi Jagtap, and Pratik Hole [2] presented a review on a mock interview system using AI that analyzes non-verbal cues such as eye movement, smiling, and head motion to assess personality traits. The system integrates deep learning techniques, speech recogni-tion, and NLP to simulate realistic interview environments. It emphasizes behavioral analytics and performance comparison between interview and non-interview scenarios. While effec-tive in non-verbal analysis, the system does not extensively discuss hybrid database integration or cloud scalability.

B. Anitha, G. Bhavani, B. Divya, and M. Jyoshna [3] proposed an AI-Based Mock Interview Evaluator that auto-mates candidate assessment using facial recognition, speech analysis, and sentiment detection. The system utilizes CNN and LSTM models for emotion and confidence classification. It aims to reduce bias and enhance hiring precision through data-driven evaluation. Although the system improves fairness and automation, it primarily targets recruitment evaluation rather than personalized candidate self-preparation.

Rubi Mandal, Pranav Lohar, Dhiraj Patil, Apurva Patil, and Suvarna Wagh [4] developed an emotion and confidence classifier model for AI-based mock interviews. Their research explores machine learning approaches for detecting non-verbal cues and speech-based emotional patterns. The system integrates personality assessment techniques and behavioral analysis using human-computer interaction frameworks. The study highlights the importance of emotional intelligence in interviews but does not focus on dynamic AI-based question generation.

Nirgide Shubhangi Vishal, Sayyed Arsh Aktharali, Patil Paresh Narendra, Raktate Shriraj Vikas, and Pathan Md Fazal Mushtaque [5] introduced an AI-Based Interview Critique System that incorporates deep learning models for speech emotion recognition and behavioral analysis. The system pro-vides personalized feedback based on verbal and non-verbal performance metrics. It emphasizes confidence estimation and real-time evaluation techniques. However, the architecture lacks detailed discussion on scalable web frameworks and structured relational data management.

Aditi S. More, Samiksha S. Mobarkar, Siddhita S. Salunke, and Reshma R. Chaudhari [6] proposed a Smart Interview system using AI to evaluate personality traits through speech and facial emotion recognition.

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The system applies CNN and TensorFlow-based models to analyze emotional states during interviews. It aims to create an unbiased and efficient evaluation process. While the model enhances recruitment automation, it does not integrate generative AI models for adaptive, role-specific question creation.

Rahul Sharma and Neha Gupta [7] have written a paper on an Intelligent Virtual Interview System using Natural Language Processing and Machine Learning techniques. The proposed system focuses on generating interview questions based on predefined job domains and evaluating candidate responses using semantic similarity and keyword matching algorithms. The authors emphasize the importance of auto-mated scoring mechanisms to reduce human bias and improve evaluation efficiency. However, the platform relies on static question banks and rule-based evaluation methods, which limit adaptability and contextual understanding compared to modern generative AI-based systems.

IV. COMPARATIVE ANALYSIS OF EXISTING SYSTEMS

Ref. No.	Authors	System Focus	Technologies Used	Advantages	Limitations
[1]	Yashaswini Nag M. N., Lokesh Chowdary K., Shashank L., and Gokul D.	AI-Driven Mock Interview Platform	CNN, NLP, AI	Real-time feedback, emotion and confidence analysis, personalized evaluation	Limited focus on scalable web architecture and deployment
[2]	Akshada Katakar, Namrata Kadam, Sakshi Jagtap, and Pratik Hole	AI-Based Mock Interview with Non-Verbal Analysis	Deep Learning, Speech Recognition, NLP	Effective behavioral assessment, realistic interview simulation	Lack of cloud scalability and database integration
[3]	B. Anitha, G. Bhavani, B. Divya, and M. Jyoshna	AI-Based Mock Interview Evaluator	CNN, LSTM, Sentiment Analysis	Automated assessment, reduced evaluation bias, improved hiring accuracy	Focused more on recruitment than candidate self-preparation
[4]	Rubi Mandal, Pranav Lohar, Dhiraj Patil, Apurva Patil, and Suvarna Wagh	Emotion and Confidence Classification	Machine Learning, Behavioral Analytics, HCI	Effective emotion detection and personality assessment	Does not support dynamic AI-based question generation
[5]	Nirgide Shubhangi Vishal, Sayyed Arsh Aktharali, Patil Paresh Narendra, Raktate Shriraj Vikas, and Pathan Md Fazal Mushtaque	AI-Based Interview Critique System	Deep Learning, Speech Emotion Recognition	Personalized feedback, confidence estimation, real-time evaluation	Limited discussion on scalable web frameworks and database management
[6]	Aditi S. More, Samiksha S. Mobarkar, Siddhita S. Salunke, and Reshma R. Chaudhari	Smart Interview System	CNN, TensorFlow, Emotion Recognition	Unbiased evaluation, personality assessment, recruitment automation	No generative AI integration for adaptive interview generation
[7]	Rahul Sharma and Neha Gupta	Intelligent Virtual Interview System	NLP, Machine Learning, Semantic Analysis	Automated scoring, reduced human bias, domain-based interview questions	Static question bank and limited contextual understanding
[8]	Proposed System	AI-Powered Mock Interview Web Application	Gemini AI, Next.js, MYSQL, Firebase, Clerk Authentication	Dynamic question generation, personalized feedback, voice/video support, analytics	Limited multilingual support and dependence on internet connectivity

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Ref. No.	Authors	System Focus	Technologies Used	Advantages	Limitations
				dashboard, scalable web architecture	

Table 1. Literature Review of Existing AI-Powered Mock Interview Web Application

V. RESEARCH GAPS

Analysis of existing systems reveals several limitations:

1) Most systems focus on only one aspect such as question generation or behavioral analysis.
2) Limited personalization according to candidate profile and experience level.
3) Lack of comprehensive performance analytics.
4) Dependence on predefined question repositories.
5) Limited support for multimodal interaction involving text, voice, and video.
6) High hardware requirements in behavioral analysis systems.
7) Lack of integrated architecture combining AI generation, evaluation, storage, and analytics.

These gaps indicate the need for a unified AI-powered interview preparation platform.

VI. METHODOLOGY

The proposed AI-Powered Mock Interview Web Application follows a modular and scalable architecture that integrates generative AI, hybrid database systems, and modern web technologies to simulate realistic interview environments [1][2][3].

A. System Overview

The system is designed as a web-based application where users can register, select interview parameters, participate in mock interviews, and receive automated feedback. The overall workflow consists of user authentication, interview configuration, AI-based question generation, response evaluation, and performance analytics storage [1][3][6].

B. User Authentication and Profile Management

User authentication and session management are handled using secure authentication mechanisms integrated through Firebase services. Upon successful login, user data such as profile information, selected job roles, and interview history are managed and stored securely. This ensures data integrity and controlled access to the system.

C. Interview Configuration Module

Before starting a mock interview, users provide input parameters including job role, technical skills, and experience level. These parameters are processed and structured into prompts that are sent to the Google Gemini AI model for dynamic question generation. This allows the system to generate customized and role-specific interview questions instead of relying on static question banks [7][8][9].

D. AI-Based Question Generation and Evaluation

Google Gemini AI serves as the core intelligence engine of the system. It performs two major functions:

1) Dynamic Question Generation – The model generates context-aware technical and HR interview questions based on user inputs.
2) Automated Feedback Generation – After the user submits responses, the AI analyzes the content for relevance, clarity, technical accuracy, and completeness. Structured feedback is generated to highlight strengths and areas of improvement. This generative approach enables adaptive and realistic interview simulation compared to rule-based systems [1][5][7][8][9].

E. Data Storage and Hybrid Architecture

The system adopts a hybrid data management approach:
MYSQL is used for structured data storage, including user profiles, interview records, scores, and performance analytics.

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Firebase supports real-time services and cloud-based functionalities required for seamless user interaction. This hybrid architecture ensures both structured relational data management and scalable cloud support.

F. Performance Analytics Module

After each mock interview session, performance metrics are computed and stored. The analytics module tracks user progress over time, allowing candidates to monitor improvement trends and identify weak areas. The dashboard visualizes interview history and feedback summaries in an organized format [2][3][5].

G. Frontend Implementation

The frontend of the application is developed using Next.js and React to provide a responsive and interactive user interface. Tailwind CSS is used to design a clean and user-friendly layout. The system follows a component-based architecture to ensure maintainability and scalability.

VII. WORKFLOW OF PROPOSED SYSTEM

The proposed AI-Powered Mock Interview Web Application follows a systematic workflow that enables users to participate in personalized interview sessions and receive automated feedback through Google Gemini AI. The workflow begins with user authentication and proceeds through interview configuration, AI-driven question generation, response evaluation, data storage, and performance analytics.

Workflow Steps

- User Login
  The user logs into the application securely using the web browser.
- Interview Setup
  The user selects interview details such as job role, skills, and experience level.
- AI Question Generation
  The system uses Gemini AI to generate interview questions based on the selected preferences.
- User Response Capture
  The user answers the interview questions through the application.
- AI Feedback Analysis
  The AI analyzes the user's answers and provides feedback and scores.
- Data Storage
  All interview data, responses, and feedback are stored securely in the database.
- Analytics Dashboard
  The user can view previous interview records, scores, and performance analysis on the dashboard.

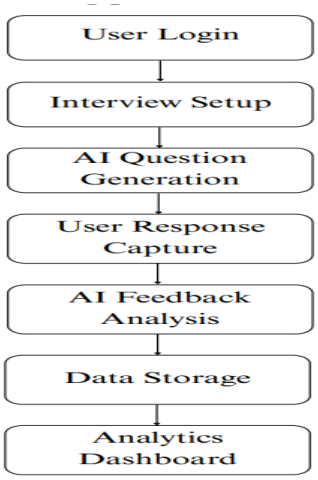


Fig. 1. Workflow Diagram

VIII. RESULTS AND ANALYSIS

The proposed AI-Powered Mock Interview Web Application is expected to provide personalized interview preparation through AI-generated questions and automated feedback mechanisms. By utilizing Google Gemini AI, the system can generate role-specific interview questions and evaluate candidate responses in real time.

The analytics module helps users track interview performance across multiple sessions and identify areas requiring improvement. Compared to traditional mock interview methods, the proposed system offers improved accessibility, scalability, and continuous availability. The integration of AI-based evaluation and cloud-supported architecture is expected to enhance interview readiness and user engagement while reducing dependency on human evaluators.

Expected Benefits

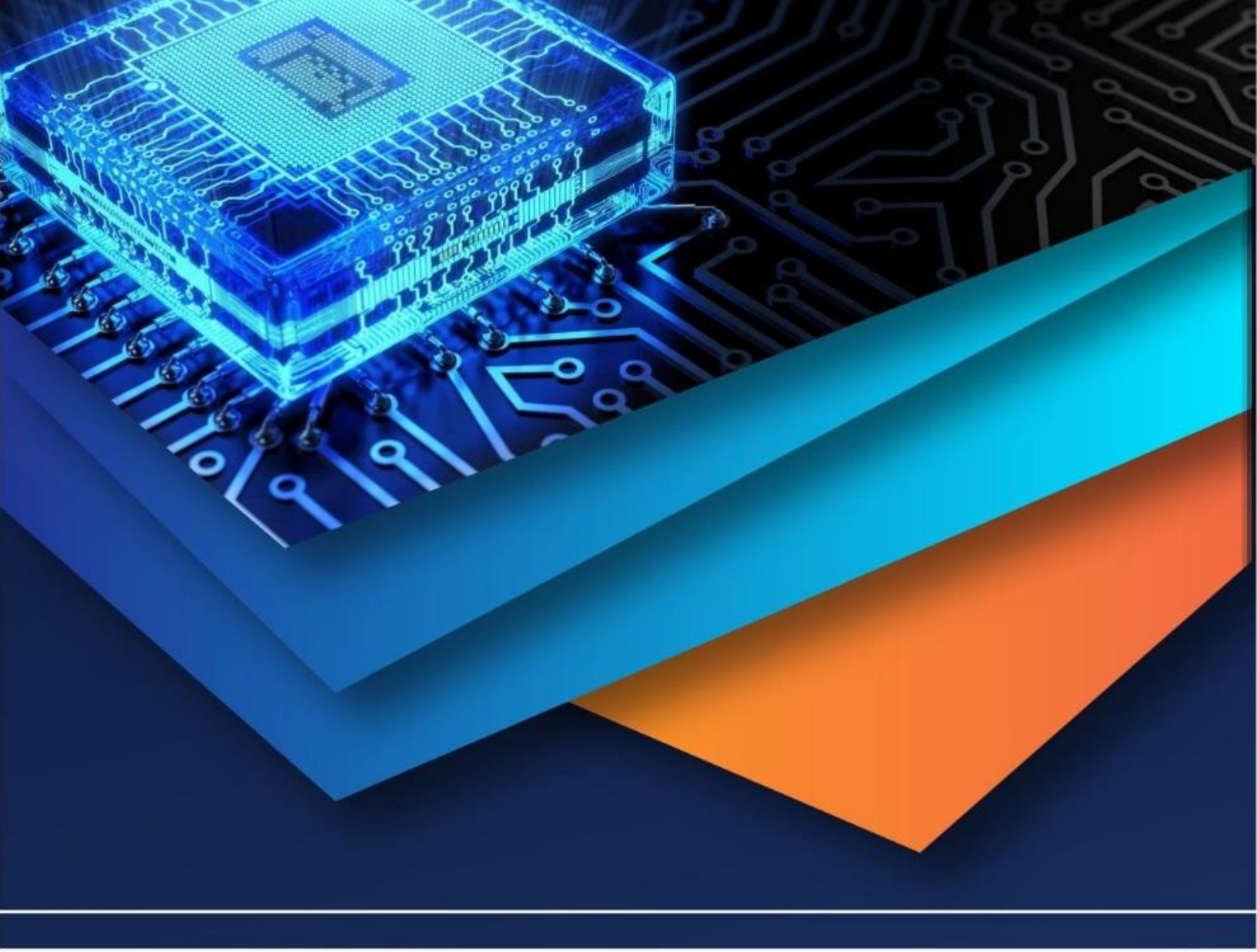
- Personalized interview experience
- Dynamic AI-generated questions
- Automated feedback and suggestions
- Performance tracking and analytics
- Secure cloud-based data management
- Improved interview confidence and preparation

IX. CONCLUSION

This paper reviewed recent advancements in AI-based mock interview systems and analyzed various approaches used for interview preparation and candidate evaluation. The study highlighted the growing role of Artificial Intelligence, Natural Language Processing, and Generative AI in providing personalized interview experiences and automated feedback. Based on the identified research gaps, an AI-Powered Mock Interview Web Application was proposed that integrates Google Gemini AI with modern web technologies to support dynamic question generation, response evaluation, and performance analytics. The proposed solution offers a scalable and intelligent platform for interview training, helping users improve their communication skills, technical knowledge, and overall interview readiness. The architecture also provides flexibility for future enhancements, making it suitable for both academic and professional applications.

REFERENCES

[1] Y. Nag M. N., L. Chowdary K., S. L., and G. D., “AI-Driven Mock Inter-view: A New Era in Candidate Preparation,” International Journal of Advanced Research in Computer and Communication Engineering (IJAR-CCE), vol. 13, no. 11, 2024, doi: 10.17148/IJARCCE.2024.131134.
[2] P. S. Khapekar, S. Bothara, T. Babar, and R. Kine, “AI Powered Mock Interview System with Real-Time Voice and Emotion Analysis,” International Journal of Novel Research and Development (IJNRD), vol. 10, no. 2, 2025.
[3] “AI-Based Mock Interview System,” International Journal of Research Publication and Reviews (IJRPR), vol. 6, no. 5, pp. 4887–4893, 2025.
[4] A. S. More, S. S. Mobarkar, S. S. Salunke, and R. R. Chaudhari, “Smart Interviews Using AI,” 2022.
[5] D. Y. Dissanayake, V. Amalya, R. Dissanayaka, L. Lakshan, P. Sama-rasinghe, M. Nadeeshani, and P. Samarasinghe, “AI-Based Behavioral Analyser for Interviews/Viva,” 2021.
[6] B. C. Lee and B. Y. Kim, “Development of an AI-Based Interview System for Remote Hiring,” 2021.
[7] J. Devlin et al.,” BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding,” 2019.
[8] T. Brown et al.,” Language Models are Few-Shot Learners,” 2020.
[9] Google,” Gemini AI Technical Report,” 2024.



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