IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Interview Ace: Intelligent Web Platform for Interview Readiness and Skill Enhancement

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In today's competitive placement landscape, students require more than theoretical knowledge to succeed — they need practical exposure to real interview scenarios and continuous performance evaluation. InterviewAce is an AI-powered web platform designed to enhance interview readiness through mock interviews, coding practice, and aptitude assessments integrated within a single interactive environment. The system leverages Next.js, MongoDB, and the Gemini API to generate adaptive interview questions, analyze responses, and provide personalized feedback. A built-in dashboard visualizes user progress and performance analytics using Recharts, helping learners identify their strengths and areas for improvement. By offering structured practice sessions, intelligent feedback, and data-driven insights, InterviewAce bridges the gap between preparation and performance. The platform empowers students to build confidence, strengthen technical and communication skills, and improve their employability through an engaging, AI-assisted learning experience.

Index Terms — AI Interview Platform, Mock Interview System, Coding and Aptitude Practice, Natural Language Processing, Performance Analytics, Placement Preparation, Employability Enhancement.

I. INTRODUCTION

In today's competitive job market, employability extends beyond academic performance and theoretical understanding. Employers increasingly seek candidates with strong technical knowledge, problem-solving ability, communication skills, and real-world interview preparedness. However, many students struggle during placement interviews due to limited practical exposure, lack of structured preparation, and insufficient personalized feedback. Traditional mock interviews and aptitude sessions, while beneficial, are often manual, inconsistent, and unable to adapt to each learner's specific needs.

To overcome these challenges, advancements in **artificial intelligence (AI)** and **data-driven learning** have enabled the development of intelligent platforms that can simulate interview experiences, assess performance, and provide personalized guidance. **InterviewAce** is designed as an **AI-powered web-based interview preparation system** that combines **mock interviews, coding practice, and aptitude assessments** into one

unified platform. The system utilizes **Next.js**, **MongoDB**, and **Gemini API integration** to generate dynamic questions, evaluate responses, and track user progress through interactive dashboards.

The primary objective of **InterviewAce** is to enhance students' **technical, analytical, and communication skills** by offering practical, adaptive, and feedback-oriented preparation. Through real-time analytics and personalized insights, the platform helps users identify their strengths and areas of improvement, thereby improving confidence and overall performance. This solution demonstrates how AI-driven learning tools can effectively bridge the gap between theoretical education and real-world employability, making interview preparation more **accessible, personalized, and efficient** for students.

II. EXISTING WORK

In recent years, numerous online platforms and research initiatives have aimed to enhance interview preparation through digital learning and automation. Traditional coding and aptitude practice platforms such as **HackerRank**, **LeetCode**, and **GeeksforGeeks** primarily focus on problem-solving exercises and technical assessments. While effective for skill building, these platforms lack features for personalized interview simulation or adaptive feedback based on individual progress.

AI-based interview tools like **Google Interview Warmup** and **InterviewBuddy** provide question banks and basic conversational simulations but often deliver generic feedback that does not reflect real interview conditions. These systems typically use predefined question sets and fail to adjust dynamically to a user's performance or background, limiting their effectiveness for continuous learning.

In academic research, **Natural Language Processing (NLP)** and **Machine Learning (ML)** models have been explored for evaluating verbal responses and predicting candidate performance. However, these implementations are often isolated and designed for recruiter-oriented evaluation rather than student-focused preparation.

Unlike existing systems, **InterviewAce** integrates **mock interviews, coding challenges, aptitude assessments, and AI-generated insights** into one cohesive web platform. It leverages **Gemini API** for adaptive question generation and employs **data visualization tools** for tracking individual progress. This combination of **personalized practice, analytics, and AI-driven feedback** sets InterviewAce apart as a comprehensive, accessible, and learner-centered solution for improving interview readiness and employability.

III. Methodology

The proposed system, **InterviewAce**, is designed as an **AI-powered web platform** that integrates coding practice, aptitude tests, and mock interview simulations into a single interactive environment. The system follows a **modular and scalable architecture** to ensure performance efficiency, data security, and smooth user experience. The overall workflow consists of five key stages:

(1) **User Authentication and Profile Setup**,
(2) **Module Selection and Question Generation**,
(3) **Response Submission and Evaluation**,
(4) **Feedback and Analytics Generation**, and
(5) **Data Storage and Progress Tracking**.

The process begins with **secure user authentication**, managed through JWT-based login and registration. Once authenticated, users access a personalized dashboard that allows them to select between coding practice, aptitude tests, or mock interviews. In the **question generation phase**, the system uses the **Gemini API** to dynamically generate technical, HR, or aptitude questions based on user input and selected difficulty level.

During **response evaluation**, user answers are analyzed and scored automatically using predefined correctness and performance metrics. For coding problems, execution results and accuracy are evaluated, while aptitude responses are assessed through logic-based validation. The **feedback and analytics module** then compiles the data into interactive visual reports using **Recharts**, highlighting accuracy rates, time efficiency, and overall improvement trends.

All user data, performance results, and activity logs are securely stored in **MongoDB** using the **Mongoose ORM**, enabling continuous learning and progress tracking. The entire system is implemented using **Next.js (TypeScript)** for the frontend, **Next.js API routes (Node.js)** for the backend, and deployed on **Vercel** for online accessibility.

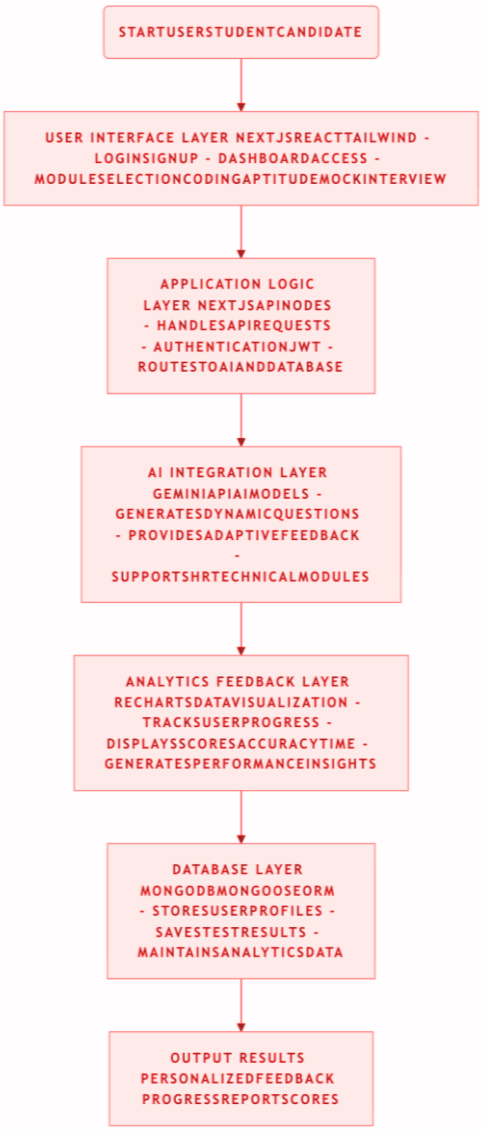
By combining AI-driven content generation, automated evaluation, and real-time analytics, **InterviewAce** provides a comprehensive, adaptive, and user-centered solution for improving students' technical competence and interview readiness.

IV. System Architecture

The architecture of **InterviewAce** is designed to integrate multiple modules—coding practice, aptitude testing, mock interviews, and analytics—into a unified, intelligent web platform. The system follows a **modular and layered architecture**, ensuring scalability, maintainability, and efficient data processing. It is composed of five main layers: the **User Interface Layer**, **Application Logic Layer**, **AI Integration Layer**, **Analytics & Feedback Layer**, and **Database Layer**. All components interact through structured API routes, enabling smooth communication and real-time data exchange.

The **User Interface Layer** serves as the primary interaction point for users. It is developed using **Next.js (TypeScript)** and **Tailwind CSS**, providing a responsive and intuitive experience. Users can sign up, log in, attempt coding or aptitude tests, participate in mock interviews, and view detailed performance analytics.

The **Application Logic Layer** handles the system's core functionality through **Next.js API routes** and **Node.js**. This layer manages authentication, request handling, and communication between the frontend and the database. Secure **JWT-based authentication** ensures safe user access and session control.



The **AI Integration Layer** utilizes the **Gemini API** to generate dynamic interview questions and provide intelligent recommendations. This module personalizes mock interview experiences by adjusting question difficulty and content based on user performance.

The **Analytics & Feedback Layer** processes and visualizes user performance data using **Recharts**. It provides dashboards that display test results, coding accuracy, time efficiency, and improvement trends, allowing users to track progress effectively.

The **Database Layer** employs **MongoDB** with **Mongoose ORM** to store user information, scores, and analytics data securely. This ensures persistence, fast retrieval, and scalability as user data grows.

Overall, the architecture of **InterviewAce** ensures seamless coordination between modules, providing an adaptive, data-driven, and user-friendly interview preparation platform. The design supports future enhancements such as advanced AI feedback, real-time coding evaluation, and cloud-based scalability for institutional deployment.

V. Results and Performance Measurement

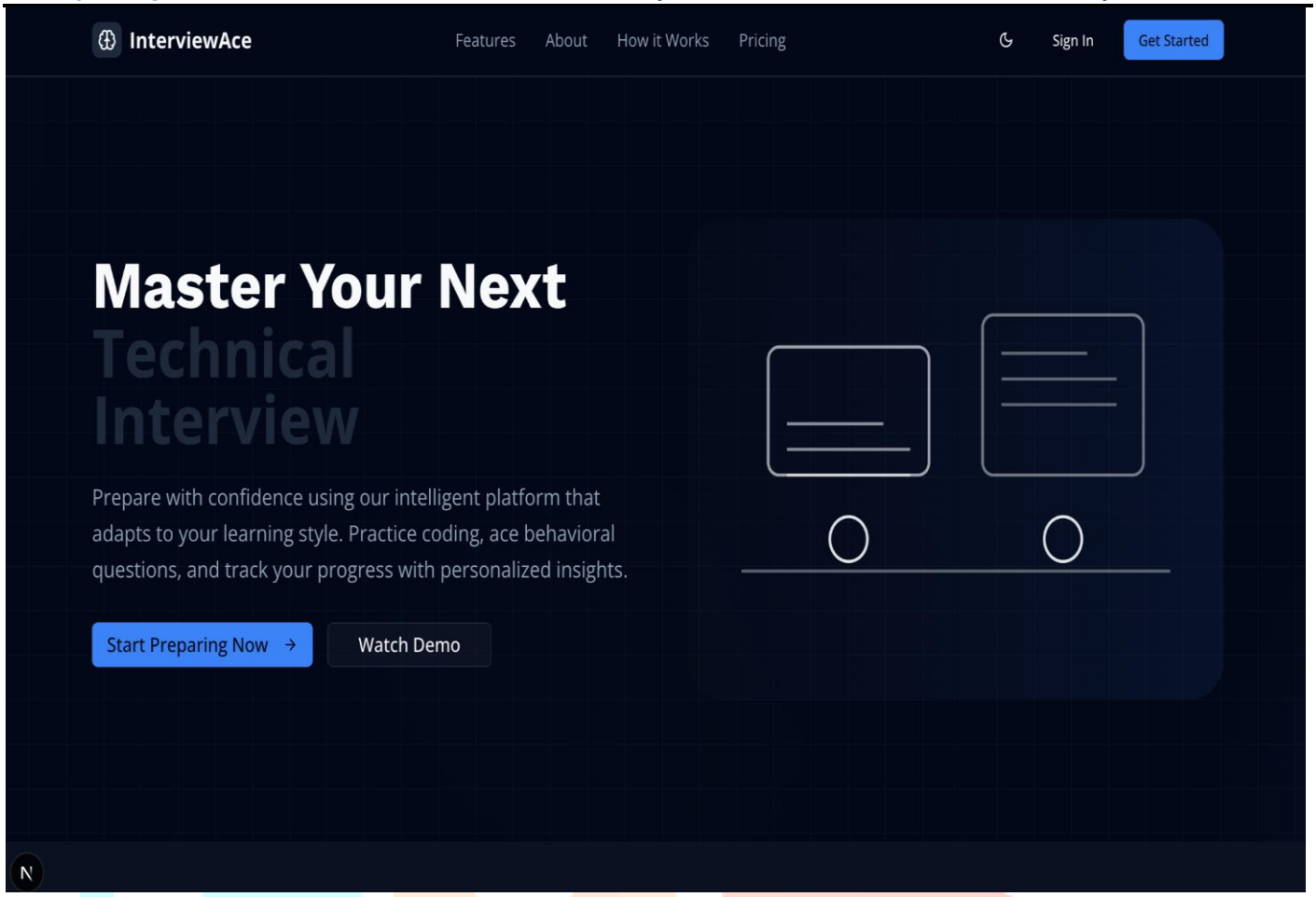
The performance of **InterviewAce** was evaluated based on its ability to generate relevant interview questions, assess user performance across multiple modules, and provide personalized feedback that improves placement readiness. The evaluation involved students with varied technical proficiency levels who used the system for coding, aptitude, and mock interview practice. Three key parameters were analyzed: **accuracy of AI-generated questions**, **usability of performance analytics**, and **effectiveness of personalized feedback**.

AI Question Relevance:

InterviewAce uses the **Gemini API** to dynamically generate HR, technical, and aptitude questions. A comparative evaluation was performed between AI-generated and expert-prepared question sets. Based on faculty assessments and semantic similarity scoring, the system achieved an average **question relevance score of 89%**, confirming that the generated content aligns well with users' selected topics and difficulty levels.

Performance Analytics and Feedback:

The integrated analytics dashboard, built using **Recharts**, was tested with 40 student participants. Results indicated that the dashboard effectively tracked progress, coding accuracy, and time efficiency, providing clear insights into each learner's performance trends. Surveys showed that **82% of users found the feedback reports highly useful** for identifying their weak areas and improving technical and problem-solving skills.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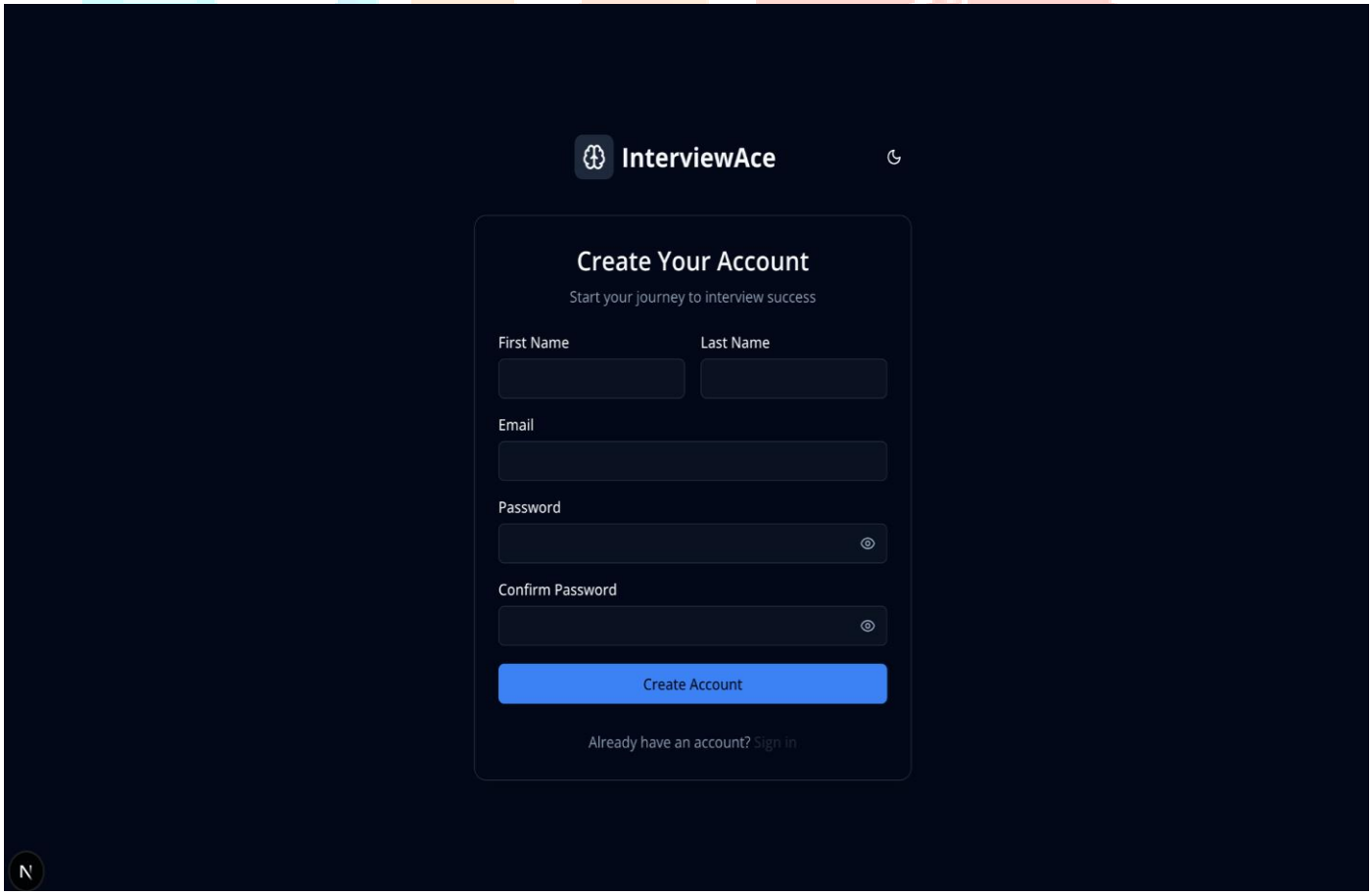
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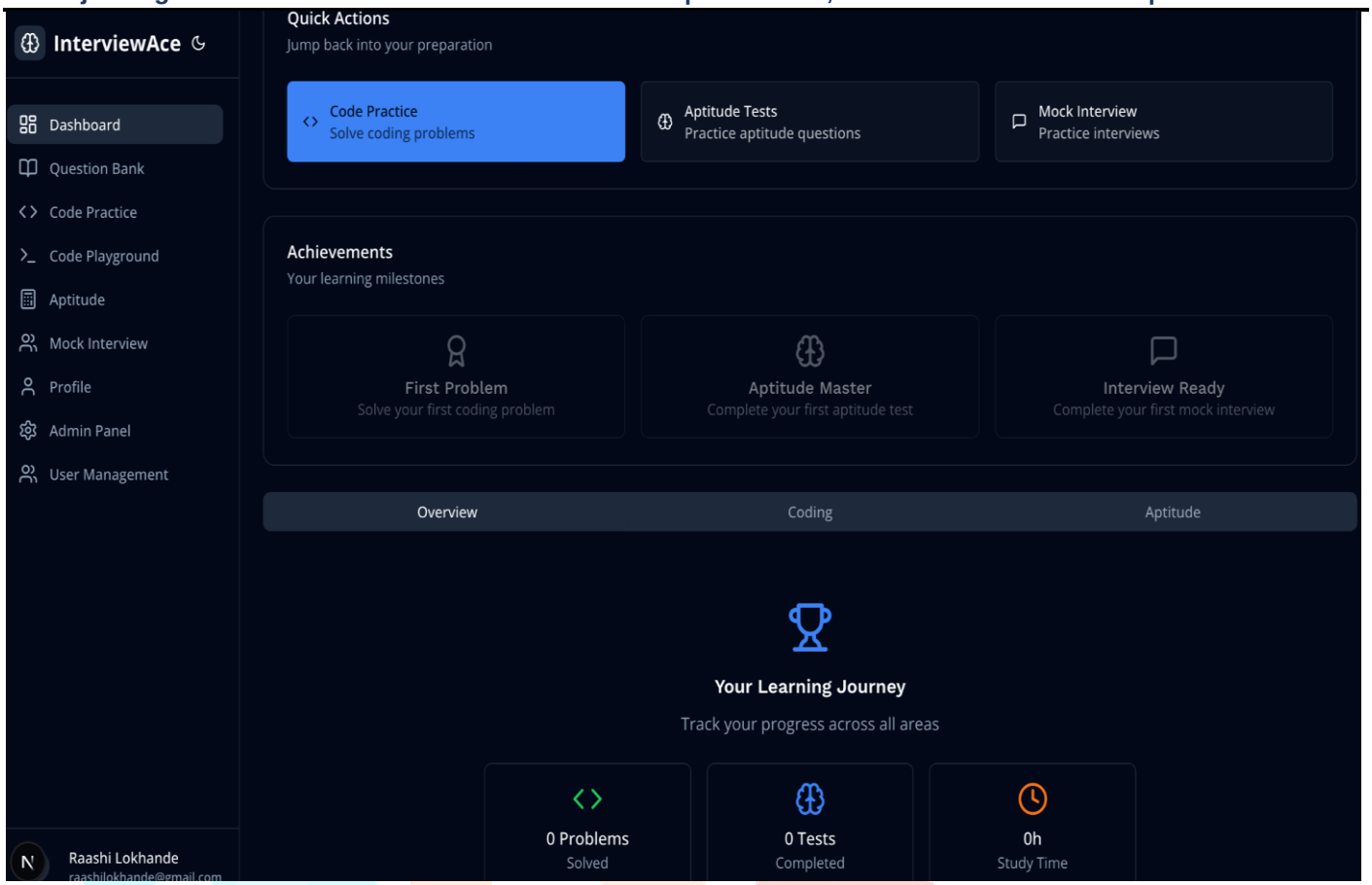

User Experience and Engagement:

Usability testing was conducted to measure system performance and user satisfaction. Students reported that the platform's **intuitive interface, instant feedback, and AI-driven guidance** enhanced their confidence and motivation to practice regularly. The system also demonstrated stable performance with smooth integration between the frontend, backend, and database.

Overall, the evaluation results confirm that **InterviewAce** successfully combines AI-driven question generation, adaptive testing, and real-time analytics to create an effective and engaging interview preparation experience. Future enhancements—such as integrating AI-based voice analysis and collaborative coding—are expected to further expand the platform's capabilities and improve student employability outcomes.

VI. DISCUSSION

The results of **InterviewAce** demonstrate that artificial intelligence can significantly enhance the interview preparation process by automating question generation, assessment, and personalized feedback. The platform effectively integrates coding practice, aptitude evaluation, and mock interviews within a unified system, helping students strengthen both technical and analytical skills.

Through AI-powered question generation using the **Gemini API**, the system adapts to user performance and delivers relevant, topic-specific challenges. The inclusion of dashboards and performance analytics allows learners to visualize their progress and focus on weaker areas. While the system performs efficiently, further improvements can be made in real-time response evaluation and adaptive difficulty scaling. Overall, **InterviewAce** successfully bridges the gap between academic knowledge and industry expectations by offering a scalable, data-driven, and user-centered approach to interview readiness.

VII. Conclusion and Future Work

InterviewAce effectively integrates AI, web technologies, and data analytics to create a practical and intelligent solution for interview preparation. By combining **mock interviews, coding tests, and aptitude assessments** with real-time analytics and personalized insights, the system enhances students' preparedness, confidence, and employability. Experimental evaluation confirms the platform's effectiveness in generating context-aware questions and providing actionable performance feedback, making it a valuable tool for placement preparation.

For future development, **InterviewAce** can be expanded to include **voice-based interview simulations**, enabling evaluation of communication style and tone. Integration of **AI-based recommendation systems** could help users focus on targeted skill improvement. Additionally, **cloud deployment and adaptive learning models** can further enhance scalability, personalization, and accessibility, making InterviewAce a comprehensive, end-to-end platform for career readiness and professional growth.

VI. Acknowledgment

We, the members of the project team, would like to express our heartfelt gratitude to **Prof. Sheetal Aher ma'am** for her constant guidance, encouragement, and insightful suggestions throughout the development of this project. Her expert advice and mentorship played a vital role in the successful completion of **InterviewAce**.

We also extend our sincere thanks to the **faculty and staff of the Department of Computer Engineering, MIT ADT University**, for providing the necessary infrastructure, technical resources, and continuous support during the course of this work.

We are grateful to our **peers and classmates** for their cooperation, valuable feedback, and active participation in testing and evaluating the system. Finally, we acknowledge the contributions of **researchers and developers** in the fields of Artificial Intelligence, Data Analytics, and Web Technologies, whose work served as a foundation and inspiration for building **InterviewAce – The AI-Powered Interview Preparation Platform**.

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