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PREP-AI: AI-POWERED JOB PREPARATION APP

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ABSTRACT

In today's competitive job market, strong interview performance plays a crucial role in securing employment. Beyond technical knowledge, interviews also assess a candidate's communication skills, confidence, and ability to respond to challenging questions. However, many candidates lack access to effective practice methods and personalized feedback to identify and improve their weaknesses. Traditional preparation methods such as self-study or generic question banks often fail to provide interactive learning experiences or meaningful feedback.

This project presents Prep-AI, an AI-powered career preparation platform that uses Gemini AI to generate domain-specific interview questions and provide feedback on user responses. In addition to interview practice, the platform includes features such as a Resume Analyzer, Resume Builder, Cover Letter Generator, and Technical Question Practice module. Built using Next.js, Drizzle ORM, Neon PostgreSQL, and secured with Clerk authentication, Prep-AI offers a reliable and interactive environment that helps users improve their resumes, strengthen interview responses, and build confidence for job applications. By consolidating various preparation tools and furnishing custom feedback, it seeks to democratize high-quality interview preparation and build users' self-assurance for professional success.

KEYWORDS: *AI-powered, Gemini, Resume Analyzer, Mock Interview, Career Readiness, HR Preparation, Cover Letter Generator*

Article History

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INTRODUCTION

Successful interview performance is a decisive factor in securing employment in today's fiercely contested job landscape. Beyond technical expertise, interviews scrutinize a candidate's communication skills, self-assurance, and ability to tackle unexpected challenges. Still, it's common for candidates to misjudge their weaknesses or lack effective practice strategies. Typical approaches, like self-directed study or using standard question banks, rarely provide custom feedback or indicate when a candidate is truly prepared [1].

The increasing influence of Artificial Intelligence and Generative AI offers a new way to rethink interview training. AI-fueled systems allow for immersive, tailored experiences that react to the user's skill level, analyze answers on the fly, and suggest tangible improvements [7][8]. When these capabilities are merged with the latest web technologies, interview prep can become more motivating, adjustable, and insightful. Studies have emphasized AI's effectiveness in improving career readiness and personalizing the learning process [3][10].

To meet these challenges, the project presents Prep-AI: an AI-powered platform that unites adaptive mock interviews, technical drill practice, automated resume screening, and automatic resume or cover letter creation. Utilizing Next.js, Drizzle ORM, Neon PostgreSQL, and protected by Clerk authentication, Prep-AI delivers a reliable, secure, and interactive platform. Consolidating various prep tools and furnishing custom feedback, it seeks to democratize high-quality interview preparation and build users' self-assurance [11][12][13].

LITERATURE REVIEW

Existing Approaches

Research into AI-driven mock interviews shows promise for enhancing candidate preparation. Studies have demonstrated how automated interview simulators can use speech and sentiment analysis to gauge responses effectively [6]. Similarly, recent work has highlighted how AI can provide impartial evaluations in interview simulations [7].

There is also ground-breaking work on AI resume analyzers. ResumeAtlas demonstrated that large language models can reliably classify and judge resumes for relevance, clarity, and suitability for specific roles [1]. However, the FAIRE system cautioned that unless bias is addressed, AI-driven resume checkers might unintentionally reinforce inequalities, pointing to the importance of rigorous fairness audits [2].

In the sphere of career counseling, research has evaluated how AI tools can support resume improvement and personalized guidance, as realized in ResumAI and now mirrored in this system [3]. Other researchers have proposed comparable recruitment readiness tools, testifying to the sector's enthusiasm for automated professional upskilling [4][5].

Recent studies have demonstrated both the strengths and inherent risks posed by employing large language models as interviewers, calling attention to ethical and reliability dilemmas [6]. Additionally, research has examined how generative AI can be woven into job preparation platforms to better support career readiness [10].

Challenges

Despite steady advancements, the field faces ongoing concerns, especially in terms of ethical AI deployment, data safety, and clarity around giving user feedback. Research argues that trustworthiness in AI depends on designing processes that stress fairness and accountability [11]. Scholars urge strict safeguards for personal details, including when AI sifts through resumes and sensitive information [12]. The FAIRE system further underscores the danger of unchecked bias in resume review [2], while global standards have been advocated to guide ethical, AI-powered hiring [13].

METHODOLOGY

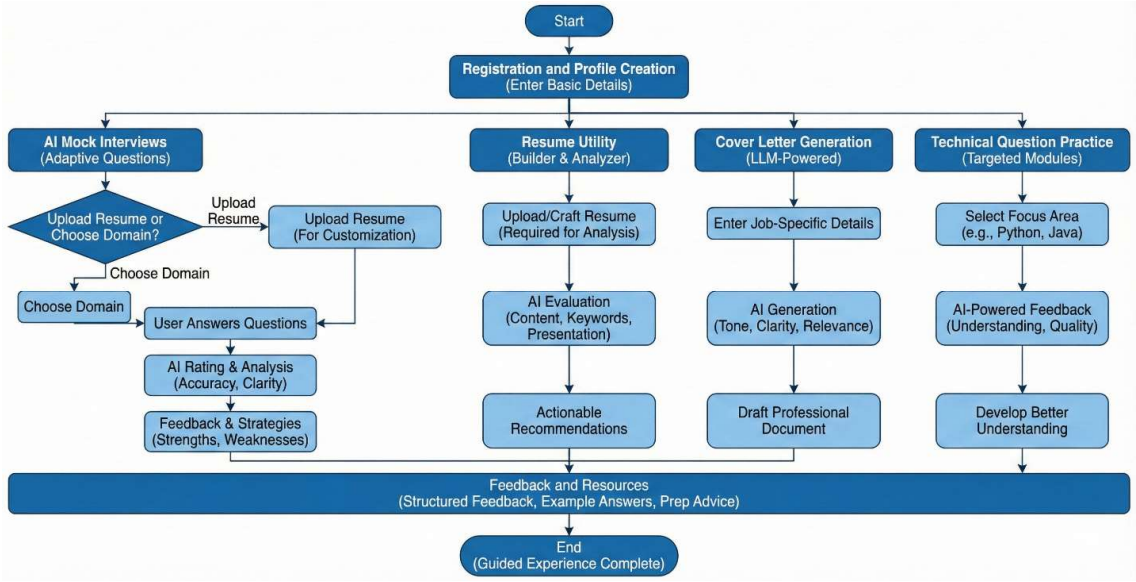

Figure 1: Functional Flow of the Model.

Prep-AI's workflow is centered on creating an integrated, AI-enabled space for optimizing resumes and improving interview skills. The platform combines artificial intelligence, interactive sessions, and automated evaluation to help users strengthen both technical knowledge and behavioral readiness. By providing personalized suggestions and structured feedback, Prep-AI guides candidates through different stages of job preparation.

Registration and Profile Creation

The process starts by first signing up on the website to create their own profiles. In the process, new users will input basic details such as their education and skillset as well as their desired job positions. Users can upload their resumes, giving the artificial intelligence a good overview of their qualifications and aspirations. The website then creates customized interview questions and practices for the user, along with resume suggestions.

AI Mock Interviews

Prep-AI gives you access to AI-driven interview simulations that recreate realistic interview scenarios. You can choose a specific area of interest or you could let Prep-AI create questions based on your resume/profile. The AI asks behavioral, HR-related, and technical questions and you can answer the questions either in text form or voice form. Prep-AI assesses your answers and tells you how well your communication skills, accuracy, and comprehensiveness were in answering those questions [2][4].

Resume Utility

The Resume Builder and Resume Analyzer functions facilitate users' efforts to draft and refine their resumes. The Resume Builder module provides the user with the option to create a resume from scratch through the use of pre-set templates, as well as artificial intelligence-based suggestions for content. The Resume Analyzer module provides users with the option to upload a pre-existing resume and receive feedback on its format, keyword usage, structure, and ATS-readiness [1][3].

Cover Letter Generation

Prep-AI includes an AI-powered cover letter generator that helps users create personalized cover letters for specific job applications. By analyzing the user's resume and the job role, the system generates a structured and professional cover letter. Users can adjust the tone and customize the content, enabling them to quickly produce tailored application documents.

Technical Question Practice

The platform also offers a technical practice module where users can attempt topic-based questions related to areas such as Python, Java, and web development. The AI evaluates the user's responses and provides explanations, corrections, and suggestions for improvement. This helps users strengthen both their conceptual understanding and their ability to communicate technical solutions during interviews.

Feedback and Resources

Prep-AI provides structured feedback across mock interviews, technical exercises, and resume analysis. Users receive improvement suggestions, example answers, and preparation tips that help them identify weaknesses and refine their skills. These resources create a guided learning experience that supports continuous improvement [10].

By integrating these modules into a single platform, Prep-AI provides a comprehensive and personalized system for career preparation. The platform enables users to improve their resumes, practice interviews, and strengthen technical knowledge, all supported by AI-driven insights and recommendations.

SYSTEM ARCHITECTURE

Prep-AI is designed using a modern and modular architecture that integrates AI capabilities with scalable web technologies. The system combines a responsive frontend, secure backend services, and intelligent AI processing to provide users with an efficient platform for resume optimization and interview preparation. The architecture ensures smooth communication between components while maintaining security, scalability, and performance.

AI Layer – Gemini AI

- Gemini AI serves as the core intelligence of the Prep-AI platform, responsible for generating interview questions, analyzing user responses, and providing personalized feedback.
- The Gemini API connects the backend with the AI model, enabling secure communication and efficient processing of requests.
- It supports generation of behavioral, HR, and technical questions based on user profiles or uploaded resumes.
- The AI also performs natural language analysis to evaluate answer quality, clarity, and relevance.
- Additionally, it provides resume analysis and suggestions to improve formatting, keywords, and overall content effectiveness [4][7].

Front-End and Full-Stack Layer – Next.js

- The platform is built using Next.js, which manages both frontend interfaces and backend API routes within a unified framework.
- It provides interactive modules such as AI mock interviews, resume builder, resume analyzer, cover letter generator, and technical practice sections.
- React components and TailwindCSS are used to create a responsive and user-friendly interface.
- Server-side processing in Next.js ensures secure handling of AI requests and improves application performance.

Database Layer – Neon PostgreSQL with Drizzle ORM

- Neon PostgreSQL is used as the primary database to store user profiles, resumes, interview sessions, and technical practice data.
- It enables scalable data storage and efficient query handling for large volumes of user information.
- Drizzle ORM simplifies database interactions by providing structured queries and type-safe operations.
- The combination ensures reliable data management and easier backend maintenance.

Authentication – Clerk

- Clerk handles secure user authentication including sign-up, login, and session management.
- It provides built-in features such as secure authentication flows and multi-factor authentication (MFA).
- Role-based access control helps protect sensitive data and ensures that only authorized users can access certain features.
- This layer strengthens the overall security of the platform.

Workflow Modules

- The platform is divided into several functional modules including AI Mock Interview, Resume Builder, Resume Analyzer, Cover Letter Generator, and Technical Practice.
- Each module follows a clear workflow where users provide inputs such as resumes, answers, or job details.
- The system processes the input using AI and generates feedback, suggestions, or improved content.
- This modular design allows easier feature updates and future scalability.

Security and Privacy

- All AI requests are processed through secure server-side APIs to protect sensitive user data.
- Personally identifiable information is minimized and securely stored in the database.
- Users can update or delete their data whenever required.
- Authentication and controlled access mechanisms ensure protection against unauthorized access [11][12][13].

Main Benefits

- Real-time AI-driven interview question generation and response evaluation.
- Personalized feedback to improve resumes and interview performance.
- Scalable architecture that supports future feature expansion.
- Secure data handling with strong authentication and privacy protection.
- Fast and responsive interactions enabled by modern web technologies.

RESULTS

Prep-AI demonstrated strong performance across all its major modules, including Resume Builder, Resume Analyzer, AI Mock Interview, Technical Question Practice, Cover Letter Generator, and Performance Dashboard. The system successfully provided real-time feedback, ATS score analysis, personalized cover letter generation, and adaptive interview practice based on user responses.

Performance evaluation showed low response time and smooth execution across different modules. Resume analysis, interview question generation, answer evaluation, and dashboard loading were completed efficiently, ensuring a seamless user experience. The use of Server-Sent Events (SSE) enabled real-time streaming of AI responses, which improved user engagement and reduced perceived waiting time. The serverless architecture also supported better scalability and stable performance under multiple user requests.

Compared to traditional career preparation systems, Prep-AI offered a more integrated and intelligent workflow. Instead of using separate tools for resumes, interviews, and ATS analysis, users could access all functionalities within one platform. The system provided instant structured feedback, context-aware suggestions, and performance tracking, making the preparation process faster, more personalized, and more effective.

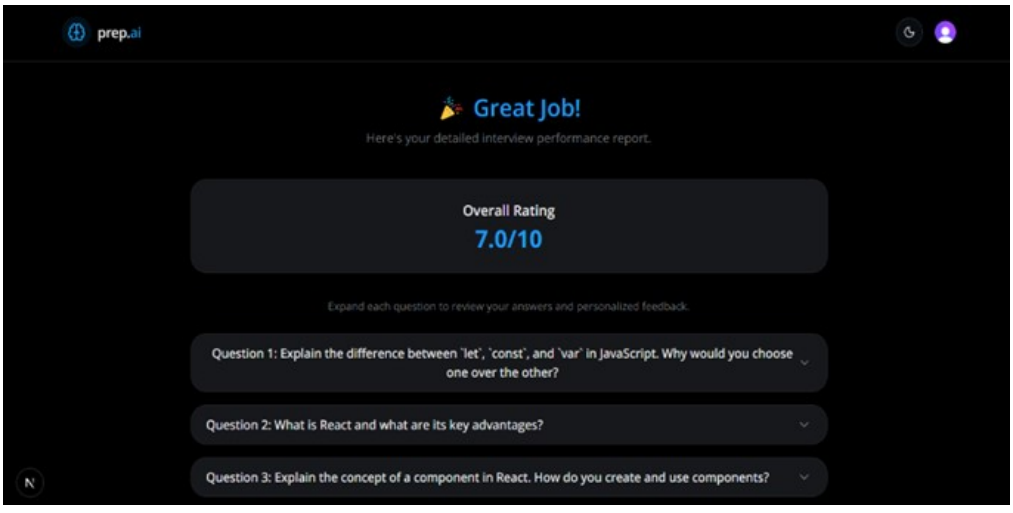

Figure 2: Interview Feedback Page.

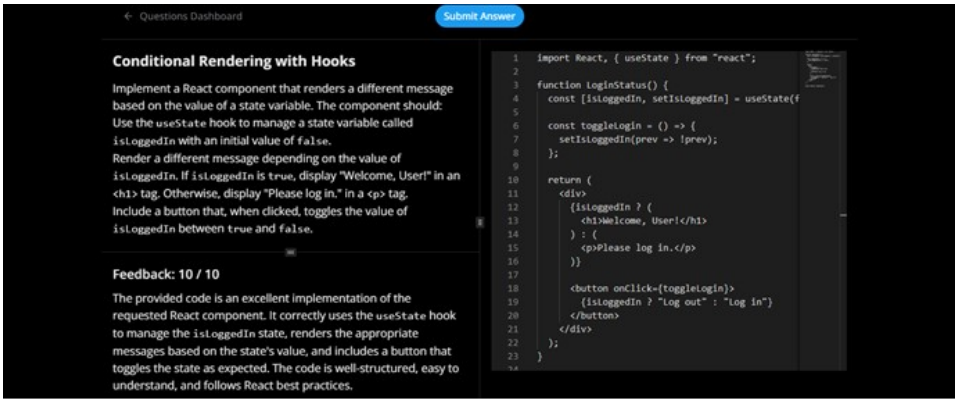

Figure 3: Technical Question Feedback.

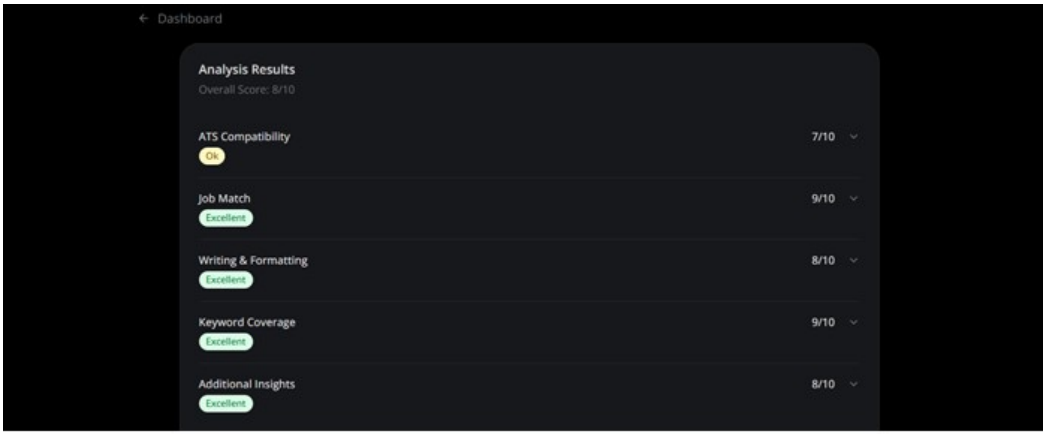

Figure 4: Analysis of a Resume.

CONCLUSION

Prep-AI successfully combines all essential career preparation tools into a single AI-powered platform, reducing the need for multiple disconnected systems and manual human feedback. It integrates resume building, resume analysis, technical interview preparation, AI-based mock interviews, and cover letter generation to help users improve both their professional documents and interview performance.

By using advanced AI models, the platform generates context-aware interview questions, evaluates answers intelligently, and provides structured feedback for continuous improvement. This helps users identify their weaknesses, improve technical knowledge, strengthen resume quality, and build confidence for real-world job interviews.

The project proves that artificial intelligence can significantly improve the efficiency and quality of career preparation by making the process faster, smarter, and more accessible. For future enhancements, Prep-AI can be extended with multilingual support, additional technical domains, recruiter-based feedback, and more advanced analytics to make the platform even more practical and industry-ready.

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