PrepWise: A Generative AI-Powered Personalized Interview Preparation and Multi-Dimensional Assessment Platform

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Abstract:

The field of recruiting is encountering considerable difficulties in effectively searching for qualified candidates. Numerous individuals employ broad-spectrum techniques that might not be relevant to their targeted roles. At the same time, employers waste countless hours evaluating applications that can lack actual competencies. Current systems frequently fail to provide appropriate feedback, neglecting other vital qualities like communication, logical reasoning, and cultural fit. In this paper, we introduce PrepWise, a system powered by artificial intelligence that creates personalized interviews that enable recruiters to better evaluate candidates. PrepWise uses the contents of a resume and a desired position to generate pertinent interview questions, followed by the evaluation of the candidate's answers through a structured rubric. Our platform is modular and consists of a React frontend, a Node.js backend, and a PostgreSQL database. We leverage large language models through the OpenRouter API to provide candidates with feedback based on multiple criteria, including technical proficiency, communication, and problem-solving skills. Additionally, PrepWise supports various functions such as parsing resumes, finding suitable jobs, and monitoring individual performance. Our experiments show that our platform improves candidates' interview preparedness and skill recognition.

Keywords— **Generative AI, Personalized Interview, Resume Parsing, Rubric-Based Scoring, Large Language Models, AI Orchestrator, Semantic Job Matching, Interview Readiness Assessment**

I. INTRODUCTION.

With the current level of competition in the job market, preparation has become an essential process, especially for students and professionals who are working in technical fields, like engineers. It is very difficult for many individuals to present their abilities effectively since the practice environment available to them is very unrealistic. Similarly, it has also been challenging for firms to identify ideal candidates, thereby causing inefficiencies in the recruitment process.

The traditional techniques used by people to prepare for interviews are not sufficient enough because these methods usually fail to take into account some key components, such as the need to communicate and think structurally about the

problem. To help solve these problems, this paper will discuss the development of an **intelligent** and **AI-based software** called PrepWise. The system analyzes the CVs and job positions of people and asks them relevant questions based on their abilities. It provides feedback for the questions answered, which can be very useful. The framework of PrepWise uses modern technologies, including React, Node.js, and PostgreSQL.

I. METHODOLOGY

The proposed system, PrepWise: AI Interview Ecosystem, was developed using a structured and iterative approach that integrates modern software engineering principles with advanced Artificial Intelligence techniques. The methodology focuses on building a scalable, intelligent, and user-friendly platform capable of simulating real-world interview scenarios while providing meaningful and actionable feedback to users.

1.1 System Architecture and Design

The architecture of PrepWise is designed to ensure seamless performance, scalability, and efficiency. It follows a modular, multi-tier structure in which each component operates

independently while remaining well-integrated with the overall system. This design approach enhances maintainability, flexibility, and system performance, enabling the platform to handle multiple users and processes simultaneously.

1.2 System Features and Functionalities

PrepWise provides an AI-driven environment for personalized interview preparation. The system automatically generates relevant interview questions based on a candidate's resume and the selected job role. It delivers real-time feedback and evaluates user performance across multiple dimensions, including technical expertise, communication skills, and problem-solving ability.

Additional functionalities include intelligent resume-to-job matching, a comprehensive analytics dashboard for monitoring progress, secure user authentication, and administrative tools for system management. The platform is designed with scalability in mind, ensuring a smooth and consistent user experience for both candidates and recruiters.

1.3 Problem Definition and Objectives

The traditional recruitment process faces several challenges, including a lack of personalized interview preparation for candidates and inefficient, time-consuming evaluation methods for recruiters. Many existing solutions fail to effectively assess essential soft skills such as communication and problem-solving, resulting in a gap between preparation and actual job performance.

PrepWise addresses these challenges by leveraging Artificial Intelligence to generate personalized interview questions and provide instant, constructive feedback. The primary objectives of the system include multidimensional performance evaluation, accurate identification of skill gaps, and automation of the interview preparation process. Ultimately, the system aims to improve candidate readiness and enhance recruitment efficiency.

1.4 Scope of the System

The scope of PrepWise encompasses a comprehensive AI-based platform for interview preparation and evaluation, catering to both candidates and recruiters. Candidates can practice interviews in a realistic environment, receive detailed feedback, and continuously improve their skills. Recruiters, on the other hand, can analyze candidate performance and identify suitable talent more effectively.

The platform is web-based, highly scalable, and capable of supporting multiple concurrent users. It incorporates secure data handling, seamless AI integration, and robust analytical capabilities. While the current version focuses on text-based interviews, future enhancements are planned to include advanced features such as voice and video analysis.

I. MODELING AND ANALYSIS

The modeling and analysis phase converts the concept of the PrepWise system into a structured and implementable solution. It focuses on understanding system behavior and interactions and ensuring that all functional and nonfunctional requirements are met.

View:

The view component represents the user interface of the PrepWise system, where all user interactions take place. It presents data clearly and in an organized manner, while ensuring smooth navigation and usability. A well-designed view enhances the user experience by making the system easy to understand and interact with the system.

real-time feedback and evaluate performance across multiple dimensions, such as technical skills, communication skills, and problem-solving ability. The system also includes resume-to-job matching and an analytics dashboard to track the progress. Additionally, features such as secure authentication, admin monitoring, and scalable design ensure both usability and efficiency for candidates and recruiters.

Controller:

The controller acts as the central unit that manages communication between the user interface and data layer. It processes user requests, applies business logic, and interacts with the model to store and retrieves data. The PrepWise system also integrates AI services to generate questions and to evaluate responses. The controller ensures smooth data flow and returns structured outputs, such as scores and feedback, to the user. This separation improves system organization, maintainability, and scalability..

Model:

The model represents the core data layer of the PrepWise system, which is responsible for storing and managing information, such as user profiles, resumes, interview sessions, and feedback. It uses a relational database with an object-relational mapping (ORM) to ensure efficient data handling and maintenance. The model maintains structured relationships among different entities to ensure consistency and accuracy. It also supports data integrity, security, and scalability when handling large amounts of data. Additionally, it enables analytics by storing historical data for performance tracking and providing insights into the process.

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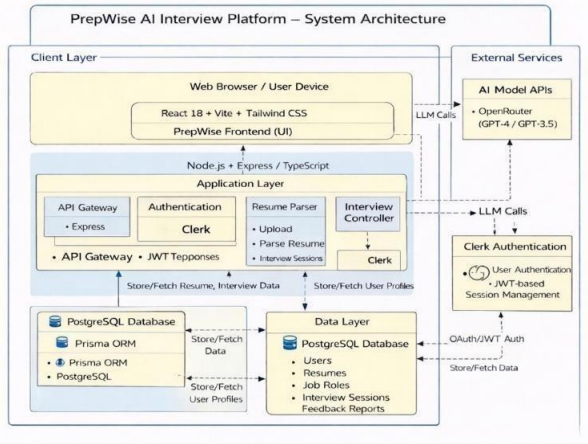

Figure 1: System Architecture

I. RESULTS AND DISCUSSION

Result:

The implementation of the PrepWise AI Interview Ecosystem demonstrated significant improvements in interview preparation and evaluation compared with the traditional methods. The system was tested across multiple scenarios to analyze its effectiveness, accuracy, and usability from the perspectives of candidates and recruiters.

1. The client side of the PrepWise AI Interview Ecosystem is designed to provide a modern, interactive, and user-friendly interface that enables seamless communication between users and the system itself. It was developed using contemporary web technologies and focuses on delivering an intuitive experience for both candidates and recruiters.

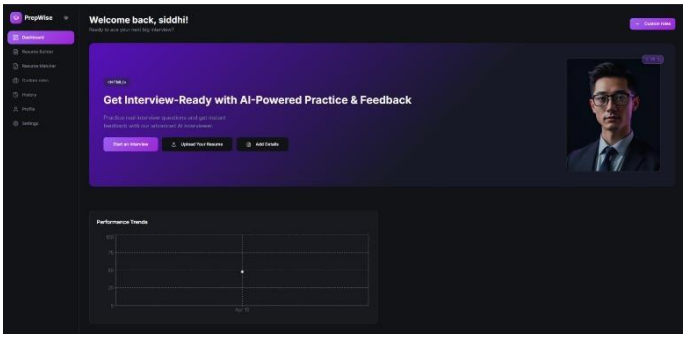

Figure 2: Dashboard Interface

2. The dashboard serves as the main entry point for users after logging in. It provides a personalized welcome message along with quick access to key actions such as starting an interview, uploading a resume, and adding details. The interface is visually appealing and organized, allowing users to navigate easily.

In addition, the dashboard displays **performance trends** using graphical representations. These charts help users track their progress over time and understand their improvement in terms of their interview performance.

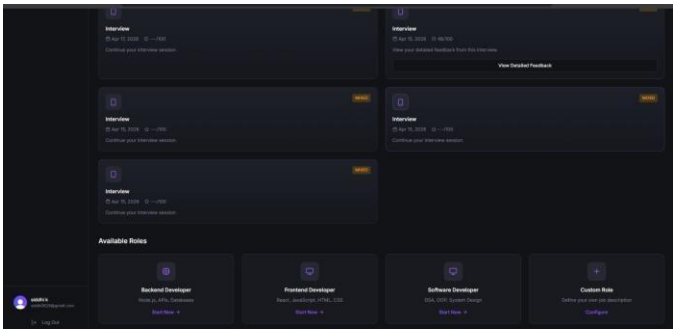

Figure 3: Interview Management Section

3. The platform includes an interview section in which users can view and manage their interview sessions. Each interview card displayed the following information:

- Date of the interview
- Score obtained
- Option to continue or review feedback

This section ensures that users can revisit previous sessions and continue with incomplete interviews, thereby promoting continuous learning.

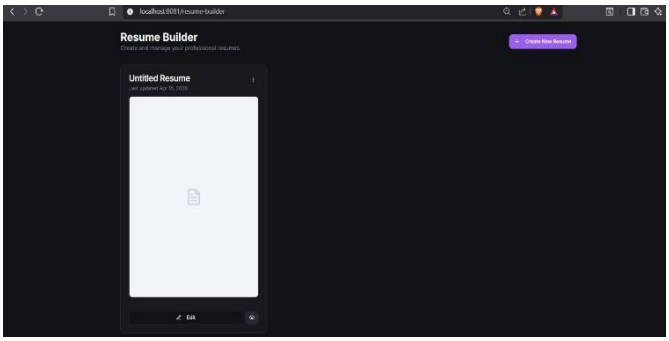

Figure 4: Resume Builder Module

4. The resume builder enables users to create and manage professional resumes directly on the platform. It provides a structured interface where users can input the following information:

- Personal information
- Work experience

- Education details
- Skills and projects

The system also supports features such as saving drafts, previewing resumes, and exporting them as PDF files. This ensures that users can generate ATS-friendly resumes efficiently.

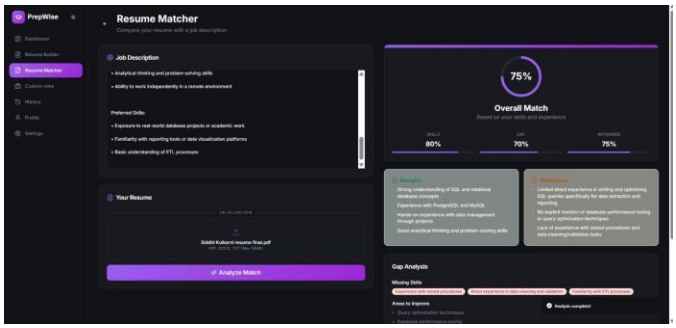

Figure 5: Resume Matcher Interface

5. The resume matcher compares the user's resume with the job description and provides a detailed analysis of the results. The interface displays:

- Overall match percentage
- Skill match, experience match, and keyword match
- Strengths and weaknesses
- Gap analysis highlighting missing skills

This feature helps users understand how well their profiles align with job requirements and what improvements are necessary.

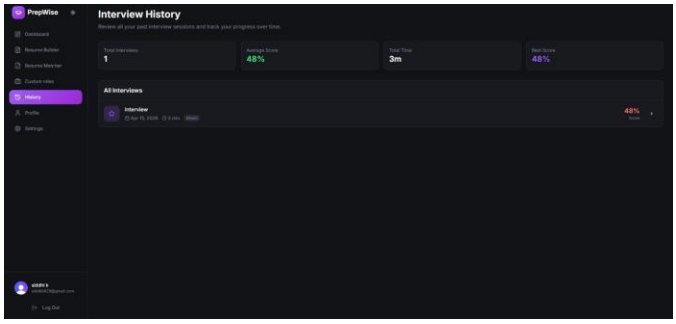

Figure 6: Interview History Section

The history page provides a complete record of past interview sessions. It includes:

- Total number of interviews
- Average score
- Best score
- Time spent

Users can review previous interviews and track their performance over time, enabling continuous improvement.

The admin-side interface of the PrepWise AI Interview Ecosystem is designed to provide centralized control, monitoring, and management of the platform. This enables administrators and recruiters to oversee system activities, analyze candidate performance, and efficiently manage interview processes. The interface is structured to present critical insights in a clear and actionable format to ensure effective decision making.

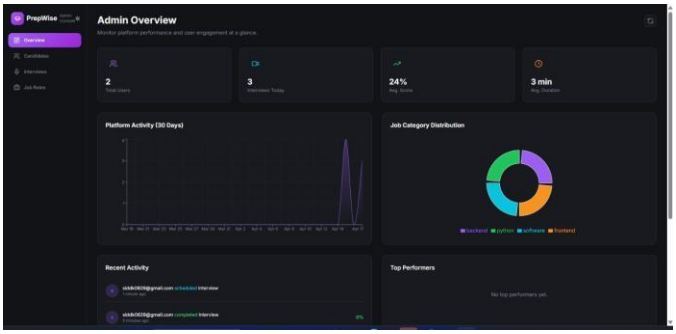

Figure 7: Admin Overview Dashboard

The admin dashboard serves as a central hub for monitoring the overall platform's performance. It provides a high-level summary of key metrics, such as

- Total number of users
- Number of interviews conducted
- Average performance scores
- Average interview duration

In addition, graphical visualizations, such as activity trends and job category distribution charts, help administrators understand system usage patterns and performance. This overview allows for a quick assessment of platform engagement and its efficiency.

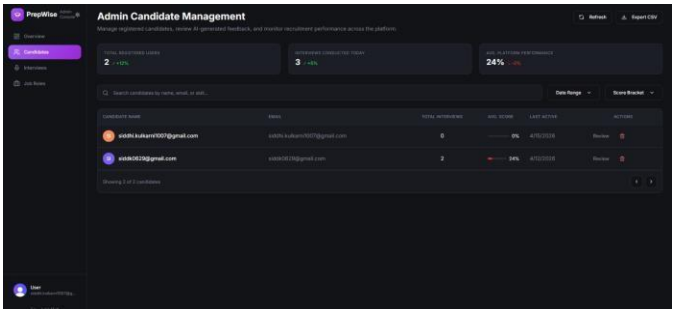

Figure 8: Candidate Management Module

The candidate management section enables administrators to view and manage all registered users on the platform. It includes:

- Candidate details such as name, email, and activity status

- Number of interviews completed
- Average performance scores
- Last active date

The interface also provides search and filtering options, making it easier to locate specific candidates. Administrators can review individual profiles and track performance, which helps to identify high-potential candidates.

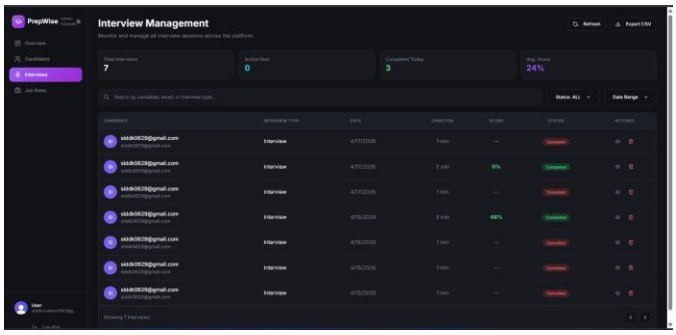

Figure 9: Interview Management System

The interview management module provides complete control over all interview sessions conducted on the platform. It displays:

- Total interviews conducted
- Active and completed sessions
- Interview duration and scores
- Status of eac h session (completed, canceled , etc.)

This section allows administrators to monitor ongoing interviews and review the previous sessions. This ensures transparency and helps to maintain the quality of the evaluation process.

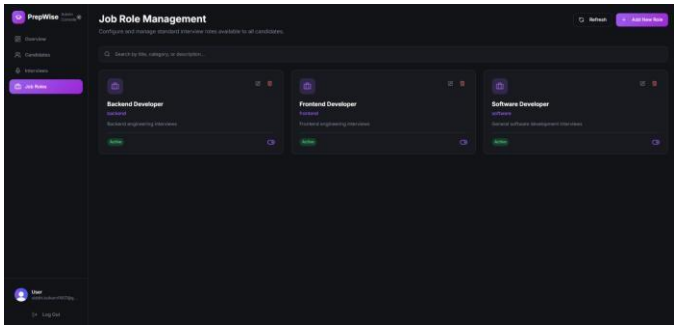

Figure 10: Job Role Management

The job role management interface allows administrators to create, update, and manage the interview roles available on the platform. Each role includes:

- Role title (e.g., Backend Developer, Frontend Developer)
- Category and description
- Status (active/inactive)

Administrators can add new roles or modify existing roles according to industry requirements. This flexibility ensures that the system remains relevant and up-to-date with current job market demands.

Discussion:

The PrepWise AI Interview Ecosystem effectively addresses the limitations of traditional interview preparation methods by introducing personalization, automation, and providing real-time feedback. The system improves candidate readiness by generating role-specific questions and providing a multidimensional evaluation that helps users identify their strengths and areas for improvement. From a recruiter's perspective, it simplifies candidate assessment by using structured analytics and objective scoring. The platform demonstrated good performance, scalability, and usability, making it suitable for real-world application. However, its current reliance on text-based evaluations may limit the assessment of communication aspects such as tone and confidence. Future enhancements, such as voice and video analyses, can further improve the accuracy and realism. Overall, the system shows strong potential for transforming the interview preparation and recruitment processes.

CONCLUSIONS

The version of this template is V2. Most of the formatting instructions in this document have been compiled by Causal Productions from the IEEE LaTeX style files. Causal Productions offers both A4 templates and US Letter templates for LaTeX and Microsoft Word. The LaTeX templates depend on the official IEEEtran.cls and IEEEtran.bst files, whereas the Microsoft Word templates are self-contained. Causal Productions has used its best efforts to ensure that the templates have the same appearance.

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ACKNOWLEDGMENT

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Causal Productions wishes to acknowledge Michael Shell and other contributors for developing and maintaining the IEEE LaTeX style files which have been used in the preparation of this template. To see the list of contributors, please refer to the top of file IEEETran.cls in the IEEE LaTeX distribution.

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