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PrepTalk – Applicant Selector AI

DEEPAK S[1], YESWANT B.V[2], T. RAJESH[3]
[1,2,3]*Department of Computer Science and Engineering Velammal Engineering College, Tamil Nadu, India*

Abstract- ***In today's competitive hiring landscape, candidates often struggle to access realistic, structured interview practice, while recruiters face challenges in maintaining consistency, fair- ness, and efficiency in evaluation. PrepTalk – Applicant Selector AI is a hybrid Full Stack + AI interview simulation platform that provides a real-time, boardroom-like mock interview experience using webcam, microphone, and intelligent feedback mechanisms. The system dynamically generates role-specific technical and non- technical questions using the Gemini API based on job role, tech stack, and experience, and evaluates candidate responses through AI-driven analysis of recorded audio (speech-to-text) and stored transcripts. The platform integrates an enhanced speech recognition module with a Drizzle ORM–backed Post- greSQL database to securely store questions, answers, feedback, ratings, and past interview sessions for continuous review and improvement. Users can log in, configure their job profile, start a mock interview, record answers in real time, and finally receive structured feedback that includes ideal answers, detailed improvement suggestions, and an overall performance score. By automating question generation, response evaluation, and feedback delivery, PrepTalk reduces manual effort, improves con- sistency and fairness, and offers an accessible, scalable solution for candidates preparing for campus placements and professional interviews.***

Index Terms- ***AI Mock Interview, Gemini API, Speech Recog- nition, Full Stack Application, Drizzle ORM, PostgreSQL, Inter- view Simulation, Automated Feedback, Applicant Assessment, Web-based Interview Platform***

I. INTRODUCTION

E-commerce is a vital part of the overall business landscape today. By providing a more effective way to connect with potential candidates and evaluate them, the interview process is an essential factor in hiring the best candidates for most companies, as well as in growing a business. As competition increases and the skill set required for jobs changes rapidly, it becomes increasingly difficult for a candidate to conduct an efficient and equitable interview, and for the recruiter or hiring manager to evaluate candidates appropriately. Candidates often do not have access to structured and realistic practice environments to prepare for interviews, and recruiters struggle with manually evaluating candidates through time-consuming, inconsistent, and subjective interview assessment procedures. Therefore, all of these constraints result in a negative impact on recruiting, interview preparation and efficiency in making hiring decisions.

Through recent advancements in the fields of artificial intelligence, natural language processing and speech technology, new opportunities have emerged to automate and increase the effectiveness of the interview process. An AI-based interview system can now generate interview questions based on a candidate's social context; evaluate speech transcripts for content, clarity, and stylistic communication; and offer feedback to candidates about how well they performed in an interview. These technologies are gaining attention because they have the ability to decrease the bias of the interviewer, provide scalability to the recruiting process, and establish personalized learning paths for candidates prior to the start of an interview.

However, most of the slutions that have been created to date either focus on candidate skill development or automated interview evaluation, with little or no combination of the two for creating an integrated, interactive ecosystem. Furthermore, most of the technological solutions available to recruiters are based on static question banks, rule-based assessments, and non-adaptive scoring systems.

II. EXISTING INTERVIEW AND RECRUITMENT SYSTEMS

Earlier forms of recruitment were based on a traditional, manual process of hiring, but it has now

transitioned into a technology-supported, digital platform. Literature reviews found that current trends in recruitment technology are positively affecting hiring efficiency, reducing the administrative burden, and improving candidate evaluation; however, there are also evidence-based concerns regarding the due process, the transparency of the process, and the performance of automated systems [1, 2]. Solutions currently available to organizations can be classified into several general categories. These include traditional manual interviewing, basic online interview platforms, applicant tracking systems (ATS), video interviewing tools, enterprise-level (enterprise-level) recruiting platforms, and AI-based, modern interviewing systems. Each type of solution contributes to the overall recruitment landscape, but all exhibit a number of limitations that impact their ability to scale, their objectivity, and their consistency [3,4].

A. Basic Interview Systems (Traditional)

Historically, interviews have been conducted primarily as face-to-face events that rely on subjective human judgement and manual record-keeping methods. There has been research that has shown these interviewing methods to have many restrictions – e.g., interviewers may have their own biases associated with candidates; no two interviewers ever conduct the same interview (lack of standardisation), and there often are no structured data from a performance aspect. Actual scoring from candidate's responses to soft or factual questions tends to vary drastically in both value and quality, and as a result, the time taken to process or hire people tends to increase with the standard of candidate involved. These problems create difficulties in processing ever-growing numbers of applicants efficiently and effectively. As the number of applicants increase, traditional manual job processes create inefficiencies by placing an excessive burden on interviewers which leads to inconsistencies in assessing applicants, decision making varies from experience levels of those conducting interviews.

B. Basic Traditional Online Interview Platforms

The first true 'digital' aspect of the current applicant tracking system (ATS) was to create the ability to conduct Remote interviewing using webcams or other forms of video conferencing and use of online forms. Research has shown that these systems do not eliminate geographic barriers, offer some level of convenience, but do not provide many automated functions or analytical support. Most basic online interviewing platforms emphasize using different types of methods to communicate with candidates (course of using web video) but do not have AI-enhanced evaluation processes and are effectively limited in variety of structure for types of questions asked.

C. Application Tracking System

The evaluations of performance in online interviewing experiences reflect these limits by providing little to no ability to provide quality feedback to either applicants or interviewers; therefore, the basic online interview systems do not assist with skill set building/ enhancement, nor do they support hiring through data-based analyses/ evaluations.AI-Enabled and Intelligent Interview Systems Recent research focuses on AI-driven interview platforms that leverage NLP, speech-to-text processing, and machine learning. Studies demonstrate that AI-based transcript evaluation, sentiment analysis, and language modeling can improve standardization and reduce subjective bias during hiring [5], [11]. AI-driven question generation further enhances adaptability by tailoring interviews to job roles and skill requirements [9]. Emerging analyses highlight the growing role of large language models (LLMs) in interview automation while identifying ethical concerns related to fairness, explainability, and data privacy [10], [13]. These concerns emphasize the need for transparent and responsible AI-assisted recruitment.

Experience and Employment Impact There is evidence from research studies regarding candidate experiences and their relationship to the types of structured feedback received by candidates prior to and during the interview stage of the hiring cycle, including simulated practice, actual job previews (simulated work experiences), and preparing for interviewing for the specific position. Research also indicates that digital recruiting has produced improved rates of employment-to-job matches. The findings of the study show that workforce readiness and institutional training outcomes are important

factors to consider in today's competitive job market. Therefore, having an interview system that works well for the organization hiring and helps develop the skills required by candidates is crucial.

D. The comparative analysis identifies a number of clear trade- offs in four different areas (Functionality, Scalability, Accessibility). Manual interviews (i.e., those conducted by human beings) do not have standardisation (1, 2), while automated scoring is absent from basic video interview platforms (12). This means that Applicant Tracking Systems do not provide the functionality for measuring the skills of candidates [3], and that there is currently no economically feasible Enterprise Solution that can be used for hiring purposes (7, 8).

E. Several studies indicate, however, that companies using AI-enabled platforms achieve greater consistency in their evaluation processes and allow candidates to experience a more personalized interview process (5, 9, 11). However, the majority of the platforms currently available in the marketplace support isolated components of the hiring and evaluation process, such as resume filtering, video recording and rudimentary skills scoring, rather than providing a complete Practice + Assessment + Feedback Ecosystem.

F. The current lack of an accessible, integrated and scalable project interview system that utilizes realistic simulation, automated scoring, detailed feedback and job role-specific data creates a clear gap for additional research into this market. The PrepTalk application selection Artificial Intelligence project aims to fill this gap through a single solution that utilizes artificial intelligence, speech recognition technology and data analytics for the purposes of providing fair, efficient and data-driven support for both preparation and recruitment.

III. PROPOSED PREPTALK SYSTEM

The proposed PrepTalk – Applicant Selector AI system is designed to address the limitations identified in existing interview and recruitment platforms by providing an integrated, scalable, and AI-controlled evaluation solution. Based on findings from previous studies, many current systems suffer from fragmented assessment workflows, lack of standardized scoring, and limited automation in candidate evaluation, particularly in high-volume or skill-specific recruitment scenarios [1], [2], [12]. PrepTalk aims to overcome these challenges by combining a candidate-facing mock interview interface with an intelligent evaluation module and centralized performance analytics dashboard.

A. Design Objectives of the Proposed System

PrepTalk's design is based on fundamental requirements identified through literature review gap analysis. PrepTalk is designed with a focus on promoting automation for key components of the interview evaluation workflow, including generating interview questions, transcribing audio recordings into text, and scoring candidates in order to reduce evaluator workload and minimize the likelihood of clinical bias (1),(4). It should be noted that PrepTalk also provides centralized administrative and analytical control so that users have clear visibility into the following: candidate performance trends, assessment results specific to each role, and feedback from interviewers. Finally, PrepTalk was designed to be scalable and flexible, making it feasible for any organization (including educational institutions, the recruitment community or training entities) to leverage an AI-powered assessment system without the expense associated with an enterprise assessment solution.

B. Admin Dashboard and Centralized Management

One major contribution of PrepTalk is the integrated administrative and analytics dashboard that provides solutions to the lack of back-end management capabilities in simple interview tools (12). Administrators (recruiters, faculty, training coordinators, etc.) can access all candidate's session monitor whose recordings are identified with performance metrics for each candidate through one interface. Whereas using fragmented evaluation records was also proven through empirical evidence that suggests when Administrative Visual provide by means of accessibility for Administrative Purpose improves Operation Efficiency and Fairness in Assessing (3, 4).

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C. Automation and Data Synchronization

With PrepTalk's automated assessment system, it is possible to implement key phases in an automated way, including dynamically generated questions, assessments that are transcribed, and structured feedback delivery. Research studies on automated assessment and recruiting processes will cite the need for evaluations in real-time and data synchronization in order to maintain fairness, consistency, and quick turnaround times on decisions. [1],[8]. The PrepTalk platform allows for the alignment of candidate responses to evaluation criteria and stored performance records, which reduces subjectivity, and increases the reliability of assessment results.

D. PrepTalk uses contemporary web and AI technologies as a solution for future-proof development and continuing scalability (that is, ensure that the architecture grows with an organization's demand) of PrepTalk an entity will utilize Web technologies. There are 2 main components of PrepTalk's technology stack: 1) A Web based Frontend, consisting of the user interface (i.e., what users see) for the prospect, employer, and administrator; 2) the Backend Orchestrator, where various functions are conducted for the system by interfaces with the database. Studies of digital recruitment systems indicate that a scalable architecture is critical for maintaining large volumes of candidates and numerous rounds of inferences, particularly at campus recruiting or mass screening activities [4],[7]. The proposed PrepTalk system will be capable of supporting the growth of an organization without substantial changes to the architecture.

E. Security and Data Management

Security and privacy are critical concerns in AI-based recruitment systems, as identified in multiple studies [3], [10]. PrepTalk incorporates secure authentication, role-based access management, and protected data storage to safeguard candidate profiles, audio/video data, and evaluation results. By addressing confidentiality and integrity requirements, the system enhances trust and supports compliance with ethical standards in digital assessment platforms.

F. Advantages Over Existing Systems

PrepTalk is an all-in-one AI driven assessment solution, unlike any other traditional evaluation methods such as face-to-face &/or limited feature type interview platforms. Where most interview platforms only provide a question bank or video call; this design includes candidate study/practice, an AI-driven scoring system, and central reporting system/centralized analytics. Enterprise level hiring suites offer similar capabilities as PrepTalk; however, PrepTalk offers a complete solution that is cost-effective, accessible and easy to use for School Institutions, and Training Centres and Emerging Businesses [7], [8], therefore these benefits directly fix the gap present in the current interview and recruitment related research

G. Summary of the Proposed Approach

PrepTalk is an integrated and practical way to prepare for interviews and evaluate candidates. This system uses automation, analysis, scalability, and security to address gaps in traditional methods of preparing or evaluating candidates. The way PrepTalk is aligned with current research studies confirms its effectiveness for helping people learn how to interview; it also makes PrepTalk valuable to researchers who study recruiting and assessment systems that use AI to help companies

IV. SYSTEM ARCHITECTURE

The PrepTalk Applicant Selector AI platform was created to allow users the opportunity to conduct simulated interviews in a controlled setting. It accomplishes this by utilizing speech processing technology, large language model (LLM) evaluation technology, and structured data management. It consists of four major architectural layers, i.e., (1) User Interface Layer, (2) Application Server Layer, (3) AI Evaluation Layer, and (4) Data Persistence Layer. Each of the above-mentioned modules is configured as a standalone module and communicates through REST APIs and processed pipelines to provide secure and efficient simulated interview feedback.

A. Overview of the Architectural Design

The architectural system (or workflow) for candidates in their interview process happens in a

three-step process of request>process>evaluate>store. The candidates begin their interviews at the User Interface (UI), which then relays the candidates requests for an interview session to a back-end process that retrieves the interview questions. The candidates' spoken answers are captured and translated into text, and then evaluated by an A.I. process based on correctness, relevance, and clarity of communication. The score and feedback from this A.I. module is stored in a database that allows the candidate to track their improvement over time through previously accessed sessions. This type of layered architecture allows continuity of processing in real-time, less reliance on manual assessment and promotes fairness, consistency and accessibility when using this type of system to prepare for or participate in an interview. The modularity of this system allows for ease of integration of additional functionality (for example) facial expression analysis, difficulty scaling of interview, or recruiter dashboards, and its extensibility and future readiness through this design.

B. User Interface Layer

The User Interface (UI) of this platform is the main point of contact for the mock candidate interviews and will allow the user to use the platform by providing them with a web-based interface where they can start, resume and manage their interviews in real-time (using webcam), receive questions from their interview and provide feedback on their interview experience. Further, the UI will allow the user to view all past attempts in the platform as well as provide a method for capturing media (webcam and mic), navigating the platform and send input streams to other backend systems.

C. Application Server Layer

The Application Server handles all business logic workflow execution and serves as the primary controller of the project workflow in regard to user request types, including the following: Starting interview session Managing the transfer of questions and answers to Gemini API Transcribing spoken responses from audio using speech-to-text technology Storing and retrieving interview data from its database Maintaining secure communications with external AI providers. The Application Server serves as the middleware between the User Interface and the AI evaluation engine.

D. AI Evaluation Layer

The system's core intelligence, the AI Evaluation Layer, evaluates spoken answers as they are converted from spoken form to written using an STT process and then checks each answer for technical correctness, communication clarity, and behavior appropriateness. The results of the evaluation process will be used to generate structured feedback: identifying a candidate's strengths and weaknesses, providing suggestions for improvement, and scoring the correctness of their answers. This layer serves to take away any potential for bias or discrimination against candidates based on different characteristics while ensuring that all potential candidates are evaluated fairly and consistently, as stated in the existing evaluation system's limitations.

E. Data Persistence Layer

Based upon the diagrams provided, it has been indicated by the proposed systems utilize:
Drizzle ORM to access databases in a structured way
SQL server as a secured database to store:
History of past interviews
Log of A.I. feedback
Questions asked and answers received
User profiles and login information
Persisted feedback allows for:
Reviewing past sessions
Historical analysis
Next steps for continuing to monitor progress of skill development and the ability for users to be able to "interview at any time" and "review past interviews" referenced in your proposal.

F. System Workflow

Workflow of operation: 1. Login to platform. 2. Select Work: Role/Category of Interview. 3. Retrieve Questions from API (Gemini) to appear in the system. 4. User answers the questions using the MIC or WEBCAM. 5. Speech recognition engine converts the user's answers into a text format (transcript). 6. API (Gemini) evaluates each transcript and returns feedback on each transcript. 7. All feedback and score from above steps are saved in the database. 8.

User can review previously conducted interviews to practice for additional jobs/interviews.

G. Architectural Advantages

Based on the proposed feature set, the proposed architecture was designed to include five features: 1. Webcam + microphone simulations of realistic environments 2.AI evaluation of fairness & consistency 3. Automating the process by giving feedback instead of performing it manually saving time 4. History tracking is providing continued growth & improvement 5. Resumes are kept with history for re-activation.

H. Analytics and Reporting Module

This system has an analytics and reports module within the admin dashboard which provides insight into trends related to the candidate's performance, completion rate of interviews, success rates by job type, and usage activity on the platform. Prior research shows analytic reporting greatly enhances decision making and improvement consistency where automated assessments or recruitment platforms are utilized [4], [12].

I. Scalability and Depolyment Considerations

The PrepTalk is designed in a modular way so that it can adapt and expand in an efficient manner based on the use of multiple instances of its modules i.e., the interview system, the AI evaluator, and the data storage system. In addition, if necessary, this design provides the opportunity to add or change modules to cope with growth or failure without much impact to the overall system. There are several different studies of intelligent interviewing systems and education systems that support the need of having scalable architectures that support very large user bases and in order to support greater levels of inference processing. These studies have shown that having to create new systems using modern technology is not an easy task and can be costly, so by utilizing this design methodology to adapt to current and future demands of PrepTalk will greatly improve its long-term availability and maintainability.

J. Architectural Summary

To summarize, the PrepTalk system architecture integrates real time candidate engagement and AI based evaluation and performance analytic data all in one system with secure data storage. It also incorporates a client-server-based modular system. This architecture has addressed the deficiencies seen in traditional recruiting and interviewing systems, and is consistent with published data from previous academic and commercial studies [1 - 13]. The overall framework of the architecture provides a dependable, scalable, and cost-effective AI driven simulated interview and evaluator platform that will work for both educational training purposes, as well as in corporate recruitment process environments.

V. FUTURE WORK

There are numerous potential improvements to the PrepTalk system. One of the improvements that could be introduced is adding behavioral analysis via computerized visual and auditory analysis. Through analyzing facial expressions, tone of voice and level of certainty, candidates would receive a much clearer indication of their performance when preparing for an interview. Employers are also able to gain insight on their employees by analyzing the data collected from each individual employee's performance against the various job functions or industries, and making training recommendations that directly address the individual's weaknesses.

Optionally, interviews could be offered in different languages and also provide industry specific questions banks so that individuals who come from different backgrounds or have different abilities will be able to access the system. Finally, a mobile application may be created so that all users (candidates and/or evaluators) can access the system via their mobile device.

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